

THE STONE AGE CULTURES OF
THE BAJAUR-MOHMAND AREA,
PAKISTAN

By

Lutf-ur-Rahman



DEPARTMENT OF ARCHAEOLOGY
UNIVERSITY OF PESHAWAR
2009

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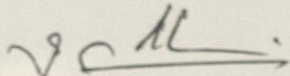
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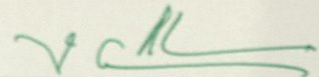
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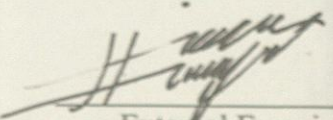
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Chapter One

Introduction

1. 1. Aims and Objectives of the Present Research Work

The present work aims to introduce the cultural heritage of the Bajaur-Mohmand area in a more scientific way. The area is rich in cultural heritage. All previous research was confined to the historical archaeology of the area (Rahman, 1996). The known written history of the Bajaur-Mohmand area goes back to 4th century B.C. In 327 B.C., Alexander invaded northwestern Indo-Pak subcontinent. Greek historians provide us with written accounts of Alexander's military operations in the region (M'Criindle, 1896; Rahman, 1996). Alexander was followed by successive waves of foreign invaders from Central Asia, Iran and north-west China (Caroe, 1958). Afghanistan happened to be a safe passage for these peoples. Besides, we have also the accounts of foreign travellers and pilgrims who, in pursuit of collecting necessary information about Buddhism in India, had written about the sacred Buddhist monuments. Among these foreign invaders, the most notable are Aryans, Indo-Greeks, Scytho-Parthians, Kushans, Iranians, White Huns, and the Muslim Turks and the Mughals (Beal, 1884; Caroe, 1958; Puri, 1965; Rahman, 1979; Dani, 1991; Rahman, 1996). Last of all came the British to secure the possession of this territory. A great deal of our cultural heritage is vouchsafed in the historical records, but archaeology still has role to play, for it is the principal source for reconstructing the historic past of this region.

For the early historic period (i.e. before 4th century B.C.), we entirely depend on the archaeological material. To know the chronological sequence of the region the author conducted an archaeological survey under the supervision of Prof. (Dr.) Abdur-Rahman (Rahman, 1996). As a result, a chronological framework was worked out and a sequence was established for Bajaur-Mohmand region. This sequence included proto-historic cemeteries and the so-called Aryan settlement. The latter sites provided the earliest evidence of the archaeological presence therein. Comparable cultural materials from other sites have a C14 date of the second millennium B.C. (Dani, 1967: 1-55). The latter date correctly corresponds to the Aryan migration into this region. The sequence covers all the succeeding phases of the historic period. At

the present state of our knowledge, no site of the Bronze Age exists in this region; although such Bronze Age cultures had flourished in most parts of Pakistan. The principal centres of these cultures have been in Bannu basin, Dera Isamail Khan, Punjab, and Sind (Marshall, 1931; Vats, 1940; Wheeler, 1950 and 1953; Khan, 1965; Dani, 1970-71; Haleem, 1972; Durrani, 1988; Khan, et al., 1991, and Possehl, 2002). Many different village cultures with unique terracotta ceramics are found in Baluchistan, which are distinguished from each other through diagnostic features like typology, technology and decorative designs (Astana, 1985).

During 2003-2004, an archaeological survey was conducted in the Bajaur-Mohmand area (Ali and Rahman, 2005). This time our interest was mainly focused on the northwestern limestone mountains, which form the southern slopes of the Hindu Kush. The dominant feature of this area is the presence of large numbers of natural caves and rock shelters. Some of these natural sites had been chosen by the prehistoric men for living and cultural activities. The cultural deposits formed within these natural habitats over millennia attest to the great antiquity of the buried relics in the form of crude stone artefacts and weapons. From the point of view of archaeology, in particular prehistory, these discoveries were significant. The sites yielded certain cultural materials of stone tools, which form Palaeolithic, Mesolithic and Neolithic periods in this area. In view of their cultural importance, we chose some of the sites and their materials for research. Thus, the new discoveries determined the course of our research work - investigations into the prehistoric archaeology of the region.

At the strength of the present available data, we have established a firm chronological sequence for the Bajaur-Mohmand region. It covers all the Stone Age cultures of the upper Pleistocene geological era before ca. 12, 000 B.P and the Holocene after 12, 000 B.P. Besides, efforts have been made to correlate the Stone Age cultures of this region with other regions of the world particularly Central and Western Asia, India, Afghanistan, and Iran. We have made special reference to Sanghao Cave in the Peshawar valley and sites in the Soan Valley of the Potwar region in northern Punjab, and the groups of Palaeolithic sites of the Rohri Hills in Lower Sind, Pakistan. We studied all these sites in detail but mentioned them briefly in this work. We have to know to what extent these Palaeolithic cultures have influenced each other. In this context, we have to answer two important questions.

First, are the Stone Age cultures of this area local variants that originated and developed independently? Secondly, have they been a phenomenon of mere diffusion or vice versa? Some authorities are of the view that the Middle Palaeolithic cultures of India and Pakistan have their roots in Africa. Then in the course of millennia, it spread from the latter area and reached the subcontinent along the coastal route (Field, et al., 2006). They considered some parts of the subcontinent as dispersal affected in which they also include Pakistan, in particular the southern coastal zone. The southern dispersal hypothesis remains a question for us to be answered in future. The Lower Palaeolithic, the oldest and longest phase of the Old Stone Age, does not occur in this part of the country. A few crude Acheulian type hand axes collected from the surface suggest the presence of Lower Palaeolithic in the area (see Pl. 105). It is hoped that the latter problem will be solved by conducting intensive explorations and investigations in this region. At present, our research is mainly focused on the Stone Age cultures, which include Middle, Upper, Mesolithic and Neolithic. The most outstanding problem was the controversy over the existence of Upper Palaeolithic in Pakistan, which was set aside by most researchers who worked in the Soan Valley and in N.W.F.P.

Having substantial evidence at our disposal, we have to find solution to a number of problems faced by prehistorians of Pakistan in the field of prehistory. The first problem was which terminology should be adopted for the Palaeolithic cultures of this region. Since, there are two terminologies usually used by the prehistorians for the Palaeolithic archaeology of Pakistan (see Table 1.1). Another main problem was the controversy over the presence of Upper Palaeolithic industries with blades and burins as dominant tools. This problem has been resolved, as implements characterizing the latter period have been recognized in this area. The attribution of these artefacts to Upper Palaeolithic period is based on artefact typology and technology. It should be noted that until recently it was believed that Upper Palaeolithic industries of blades and blade tools did not occur in Pakistan. After the recognition of certain Aurignacian type tools that are found in the Aurignacian phase of Europe and Western Asia, we have also assigned the stone industries of layers 4 and 5 to 'Aurignacian' at the rock shelter of Ango Gatkai. Which place the Aurignacian owes its origin? Who was the author of the Upper Palaeolithic culture? Answers have been sought for the same questions. Attempts have been made to locate the transitional phase between the

Upper and Middle Palaeolithic in the stratigraphical sequence at the site. In this context, the upper part of layer 6 characterizes the presence of both Mousterian and the Upper Palaeolithic industries. Based on this evidence, we have assigned some certain tools to the transitional phase between the two periods.

Keeping in view the presence and richness of all dominant Middle Palaeolithic artefacts, the term 'Mousterian' has been adopted for all lithic industries that flourished in this region during the first half of the last glaciation (Wurm). Of the formal types tools we mean those tools characterizing the Mousterian industries elsewhere, they include side scrapers often with scalariform retouch, points both bifacial and unifacial, and specific oval shaped Levallois flakes. Besides, we see stronger cultural contacts between the Middle Palaeolithic of Europe, Western Asia and that of the northern Pakistan. Again, by the presence of almost all formal type Mousterian tools in the Bajaur- Mohmand area and their marked resemblance with the latter regions suggests a common birthplace. The Bajaur-Mohmand area (northern Pakistan) presents all the principal Mousterian groups. Having all these facts in view, we have put forward the hypothesis that the southern slopes of the Hindu Kush including the Peshawar valley, ancient Gandhara excluding Afghanistan were home of the Mousterian cultures and within it the original birthplace was the Bajaur-Mohmand area. We are again of the view that the Mousterian cultures comprising distinct variants are autochthonous in character without any dominant influences from abroad. Another characteristic feature of the Mousterian industries of this region is the presence of microlithic tools that occur almost in equal proportion to large artefacts. The co-occurrence of these Mousterian tools is not beyond culture significance. Who was the author of the Mousterian culture, Neanderthal or *Homo sapiens sapiens*? A reasonable answer has been given to this question.

The Upper Palaeolithic was succeeded by the Mesolithic in the region. As compared to other periods of the Stone Age, the Mesolithic is poorly represented in the area. It is also absent from the cultural sequence at Ango Gatkai rock shelter. However, the Mesolithic people used geometrical and non-geometrical tools and weapons. Their economy was based on hunting and food collecting.

The last period of the Stone Age in the area is Neolithic. It is represented by layers 1-3 at Ango Gatkai. It is purely aceramic or pre-pottery Neolithic. The site

yielded Clactonian type large flakes, true Levallois points and a good number of choppers and chopping tools. Their presence at the site during the Neolithic phase is significant. The latter tools (pebble tools) were first reported by Ranov from Central Asia. We are of the view that most of the surface collections from the Soan Valley fall in this category. Those assemblages have provisionally been dated to Palaeolithic periods.

Evidence of plant and animal remains has been found. The site produced a good number of faunal remains. We do not know whether they belong to domesticated animals or not. The presence of ground stone tools and struck stone suggests that the Neolithic people exploited both animal and plant resources for their economy. From all these factors, we concluded that the economy of the Neolithic people at the area was based on hunting and food collecting.

For the dating of our assemblages, we depend on relative chronology and stone typology, and technology and absolute dating obtained from sites in the neighboring regions as well.

Based on comparative study of all Palaeolithic cultures of the region and their distinct technological and typological characteristic, we have assigned the stone assemblages of the area to different Stone Age cultures. It may be mentioned here that no two Stone Age cultures can present similar features but only in mixed deposits particularly those found along the river courses as in the case of the Potwar plateau and many Palaeolithic sites in India. The Mousterian type tools serve as markers for the identification of Middle Palaeolithic industries. Similarly, the Upper Palaeolithic exhibits its own characteristic features throughout the world. In this region the latter is characterized by the presence of carinated or keel shaped core scrapers, by elongated end scraper made on blades, thin wide blades, and various kinds of burins; but the most dominant tool is the point, the same has been named as the 'Taqarian' point. These and other tools are helpful for the interpretation of various kinds of tools and may be applied to stone assemblages from other sites.

As far as the scientific dating of the site is concerned, we have a rich collection of organic materials such as bones both charred and intact, and charcoal. The samples have been collected from different localities within the excavated area. The samples

badly need to be processed for C14 determinations to secure scientific dating of the site and its cultural material. However, for absolute dating of the site we have referred to dated sites in the region. In this context, the nearest notable C14 dated sites are Sanghao Cave in Peshawar valley (Ranere, 1982; Khan and Gowlett, 1995), Riwat 55 in the Soan Valley (Rendell et al., 1989), and Kara Kamar in Afghanistan (Coon and Ralph, 1955). Other dated sites are caves and rock shelters from the Zagros Mountains of Iran and Iraq in Western Asia. All the prevailing problems in the study of prehistoric archaeology have been dealt in this and the forthcoming chapters of the present work.

1. 2. Geographical Setting

The Bajaur- Mohmand area is located in the North-western Himalayan Zone. It is physically the most formidable and inaccessible of all the areas of Northwest Frontier Province. This region includes three N.W.F.P. districts, Swat, Dir and Chitral, along with three Agencies of Bajaur, Mohmand and the adjacent Malakand. The characteristic feature of this zone is the towering Hindu Kush range, which merges with Afghanistan's Wakhan area, known as the roof of the world corridor. The highest elevation is found in this area. Lesser ranges extend southward from the Hindu Kush and divide several river valleys formed by the Chitral, Kunar, Swat, Punjkora and Indus rivers (Dicter, 1967; Rahman 1996; Ziauddin et al., 1992: 1).

Bajaur Agency has an area of 1290 square km. It falls in the western tip of Kohistan, northwestern Himalayan Zone, running roughly east west, following the course of Bajaur River. The area lies between 34°-30' to 34°-58' north latitudes and 70°-11' to 71°-48' east longitude. The area is connected to Dir from the east through Khar-Munda road and in the west through Khar-Nawagai road, which passes on to the Mohmand Agency. The Bajaur Agency is bordered by Afghanistan in the north, Dir district in the east, Mohmand Agency in the south and Malakand area in the southeast (Census Report 1981; Ziauddin et al., 1992: 1-9; Census Report 1998; Rahman, 1996). Similarly, Mohmand Agency lies between 34°-10' to 34°-43' north latitudes and 70°-58' to 71°-42' east longitudes. It is bounded on the north by the Bajaur Agency, on the east by Malakand Protected area and Charsadda District, on the south east by Peshawar district, on the south by Khyber Agency and on the west by Afghanistan. It has a total area of 2,296 square kilometers (Census Report 2001: 1).

The Bajaur and Mohmand hills of this northern region can be considered as a transitional zone. This zone lies between the towering mountains of the Hindu Kush, with their shoots, extending on the south from Khyber and northward to the valley of Jandul River in Dir. The grim looking Mohmand and Bajaur hills run parallel to the North-west Frontier Province in the north east and southwest directions. On the one hand, these hills present a rather bold outline to the Peshawar basin with their relatively low average elevation of 1120m, between the Loesam, Jandul and Swat rivers. On the other hand, there are higher mountains, which rise in the altitude in a northwestern to western direction from the Khar to the Afghanistan border. The altitudes vary from about 915 m above the mean sea level to 3060 m. Lawatai at 3060 m above mean sea level receives snow in the winter and is the prominent peak in the area.

1. 2. 1. Important Passes: Totaino Kandao, Alingar along with Kaga Mukha, Ghakhai Kandao and Nawa pass are some of the low and high altitude passes which serve as communication routes to Afghanistan. For the most part, the region is exceedingly wild. The main topographic feature is endless maze of dry ravines, flanked by row upon row of rocky hills and mountains, which make up around forty percent of the total area. The adjacent Mohmand hills are completely devoid of any thing but the most drought resistant species of vegetation and present all the aspects of the desert region. Bajaur, on the other hand has some diminishing forests in its difficult terrain in the north and northwest as well as those of Koh-i-Mor in the south (Rahman, 1996: 2-5; Ziauddin et al., 1992).

1. 2. 2. Important Plains: About sixty percent of the total land area in Bajaur is comprised wide valley floors and slightly undulating land, and lower slopes of the foothills among the margins of the valley. The most important plains in Bajaur are those of Nawagai, Loesam, Khar, Jar, Charmung, Loesam and Wara Mamund, Inayat Kili, Umarain, Khar to Jar and Jar to Munda. The general elevation of these plains varies from 800 to 1280 m. The area is mostly broad and even suited for hunting purposes (Ziauddin et al., 1992:2).

1. 2. 3. Streams: The Bajaur valley is drained by the west-east flowing Bajaur river that joins the Jandul river at Mian Kili. Most of the major tributaries have a northwesterly configuration and have a seasonal flow of water. The Bajaur river in

Khar, Babu Qara river in Salarzai, Watalai Khwar in Mamund tehsil and Loesam river have some perennial flow of water (Rahman, 1996: 2).

1. 2. 4. **Climate:** no reliable and accurate climatic data is available for Bajaur. However, during the hottest months from May to September, maximum daily temperatures average from 32 to 39 degree and the rate of evaporation is high. Maximum daily temperatures during the three winter months average to 18 to 20 degree C. Minimum temperature falls close to zero in December and January. High frosts are common in the plains with the severity of frosts and the likelihood of snow increasing in the upper valleys and in the mountains.

1. 2. 5. **Rainfall:** as the Bajaur area is located at the extreme end of the Himalayan Range, so it creates variation and uncertainty in the monsoon from month to month and year to year. Nevertheless, in terms of peculiar geographical position of the area, Bajaur gets its share of the rains with winter and spring rains being more predictable than at the other times of the year. The nearest rain gauge is installed at Amandara at a distance of more than forty miles southeast from Bajaur Khar. Although the figures are not representative, they suggest that the main agricultural areas in the valley of Bajaur receive about 600 mm of rainfall per annum.

1. 2. 6. **Geology and Minerals:** Bajaur Agency is mostly composed of metasedimentary rocks, mainly schists and slates of the Nawagai group, which extend into Mohmand and westward into Afghanistan. Igneous rocks are also found which are mainly diorite and granite. Volcanic rocks are exposed along the southern and western borders of the Agency. The metasedimentary rocks are mainly Paleozoic and the granites and diorite are Mesozoic-Tertiary. Nawagai limestone lies to the southwest. The pelitic sediments include amphibolites, epidote chlorite schist, piemontite schists, talc carbonate schists, graphite schists and slates. Extensive distribution of granite schists is observed in the Shamuzai area, lying to the southeast of the agency. The southwestern part of the area is basically igneous and metamorphic in nature but some limestone and dolomite also exist.

Garnet schists are abundantly exposed to the southeast and constitute the main divide of Arang and Barang-Shamuzai area. Limestone and dolomite, besides constituting a unit in the southeast, also occur as lenses and pockets in the

metasediments. Quartz veins and pegmatite bodies probably both of igneous and metamorphic origin, exist sparsely throughout the area. A few hydrothermal quartz veins Gabarai and Inayat Kili bear copper mineralization. Some manganese mineralization is present at Asghar-Charmung. At certain places in Nawagai area, Ambhar, Utmankhail and Targhao low to medium commercial grade soapstone exists in the chlorite schists. The talc schist in the Aman Kot area of Barang bears low to medium quality emerald mineralization. Some transported boulders and pebbles of ultramafics carry stringers and veins of chromites. Huge deposits of white marble exist in the hills exposed to the north of Gumbatia. Workable deposits of green zebra marble exist in Pampokha (Badshah, 1979:163-179; Ziauddin, et al., 1992).

1. 3. Historical Significance of the Bajaur-Mohmand Area.

Bajaur and Mohmand agencies are situated in the north west of Peshawar, the capital of the Northwest Frontier Province of Pakistan. Both agencies are situated across the ancient trade route connecting Afghanistan and Central Asia with the valleys of Swat and Peshawar. These have been the richest centres of the Mahayana and Hinayana Buddhism during the early historic period (Rowland, 1953: 73-99; Ingholt, 1957: 13-41; Sehrai, 1986). The Bajaur-Mohmand region has many low altitude passes across the Pak-Afghan border (Rahman, 1996: 2). Through these passes traversed both trade caravans for peaceful purposes and armies for grabbing lands and wealth. Because of its strategic position controlling low altitude passes, the Bajaur-Mohmand region has been a gateway to Gandhara (Peshawar valley), Uddyana (Swat), and India, and a centre of trade and cultural interaction for the region. The northern mountains of the area have some important passes amongst which Nawa pass presents great historical significance on account of its being traversed by both Alexander the Great and Zahiruddin Babur. Most of the invaders, peaceful caravans and pilgrims used the same pass to enter India. Alexander the Great was one of such example in the early historic era to have crossed Nawa Pass to invade India. Even the prehistoric people seem to have crossed these passes because in the survey of the area we have found rock shelters and caves not far away from these passes (Caroe, 1958: 15; Babur, 1987; M'Crindle, 1992: 57-66).

The significance of the new discoveries is that all the explored sites are located in the western Bajaur region and the northwestern Mohmand Agency (Ali et al., 2002:

207-215; Ali and Rahman, 2005: 55-90). Most of the caves and rock shelters are rich in cultural remains and many of them are still intact, except for some minor disturbances caused by either later human occupation or natural agencies. These sites are located in the southern slopes of the Hindu Kush in the limestone formations. Prehistoric man without any labour took possession of the naturally formed caves and rock shelters, which provided safety and protection to them against wild animal and natural catastrophes (Ali and Rahman, 2005: 55-90; Ali and Rahman, 2005: 123-134).

1. 4. Previous Research work on the Bajaur-Mohmand Area

Being part of the tribal belt, its uncongenial political conditions and the inaccessibility of some of its valleys, the Bajaur-Mohmand area was a terra incognita archaeologically. However, in 1962-63, Dani and Durrani visited Bajaur and explored an ancient cemetery near Anayat Qila and a Mughal mosque of the Aurangzeb period at Khar (Dani, 1967: 16). In 1994-95, the present author conducted an archaeological survey of the area under the supervision of Prof. (Dr.) Abdur Rehman for M.Phil. Thesis (Rahman, 1996). As a result of the 1994-95 survey, 109 sites (including thirty-eight settlements, fifty-two stupas, ten cemeteries, 3 wells, 2 inscriptions one each in Śāradā and Persian) were explored. A number of rock-carvings in Alingar, Nawagai and Ambar Nao were also explored. The analysis of archaeological, numismatic and inscriptional records from the area provided a firm base for the M.Phil Thesis under the title '*Bajaur in Antiquity: An Analysis of Archaeological, Numismatic and Inscriptional Records*' (Rahman, 1996). The degree was awarded by the University of Peshawar in 1996.

During 1994-95 survey, the earliest explored sites were cemeteries referred to by Dani as 'Gandhara Grave Culture'. These gravesites have been assigned to the Aryans who migrated from Central Asia in the second millennium B.C. The cemeteries of these people are found in a large number in the Bajaur-Mohmand area. They usually occupy the slopes of mountains, hills, and hillocks. The date of their presence has been confirmed by C14 determination (Dani, 1963: 48).

In 1995, a team from the Department of Archaeology and Museum Government of Pakistan also conducted an exploration in the Bajaur Agency and explored 105 sites of different periods (Rahman, et al., 1996: 12-175).

1. 5. The Present Research

The present research is the result of the survey and explorations conducted by the author during 2002-03 under the supervision of Prof (Dr) Ihsan Ali, Director, Directorate of Archaeology and Museums, Government of N.W.F.P., currently, Vice Chancellor, Hazara University, Mansehra. The finances for this research were provided by the Directorate of Archaeology and Museums, Government of N.W.F.P. About 125 new archaeological sites were explored during this survey which included 24 Prehistoric caves and rock shelters, 17 Gandhara Grave sites, 51 Settlement sites, 14 Buddhist sites, 6 Śāradā inscriptions, 5 Rock-carvings, 7 Wooden mosques and a single Tomb. A preliminary survey report has already been published in the journal of the Frontier Archaeology (Ali and Rahman, 2005: 55-90). The characteristic feature of this survey is that it added a new chapter to the chronology of the area relating to the Stone Age (Palaeolithic and Neolithic). In the previous surveys and explorations we could not find any Palaeolithic or Neolithic sites (Rahman, 1996: 34 -37; Rehman *et al.*, 1996: 122-175).

In 2004- 05, we have conducted more surveys and explorations in the area of our research and a good number of archaeological sites were recorded, this time mostly in the Mohmand Agency. The most significant and important evidence offered by this survey was the discovery of a number of Stone Age sites, which on the basis of analysis of the collected stone tools range from the Middle Palaeolithic to the Neolithic period. The discovery of a good number of stone artifacts at these sites amply adds to the richness of the cultural heritage in the area. From these discoveries, it is obvious, that Bajaur and Mohmand area is not lagging behind the other neighboring regions in the relics of the past. However, to establish a cultural sequence for the area, the rock shelter of Ango Gatkai was excavated in 2004 (Ali and Rahman, 2005: 124-34). The excavation of this site has yielded two periods of the Stone Age; the Palaeolithic and Neolithic.

1. 6. Prehistoric Research in Pakistan.

Palaeolithic research in northern Pakistan had started in the early thirties of the last century. This research owes its origin to the work of Wadia, a geologist, who

reported some Palaeolithic artefacts while examining the geological contexts in the Soan Valley of northern Pakistan (Wadia, 1928:290).

Then Todd discovered the Palaeolithic site of Pindi Gheb near the Sil river (Hawkes et al., 1934). However, scientific Palaeolithic research began with the visit of the Yale North India Expedition in 1932-33. Besides, studying the artefacts in the Pindi Gheb collection, additional Palaeolithic artefacts were collected from two sites in Kashmir and Chita localities I and II in the Punjab (Hawkes et al., 1934)). In terms of Palaeolithic artefacts and a good collection of bone fossils, the latter Expedition had produced good results. On account of its success, a second expedition led by de Terra and Paterson was sent to Indo-Pak subcontinent in 1935. It was named the Joint Yale-Cambridge Expedition (De Terra and Paterson, 1939). Since the authors were a geologist and an archaeologist respectively, so they made extensive studies in Kashmir as well as the foothills and the plains of the Punjab. They identified and distinguished four glacial phases in Kashmir ((De Terra and Paterson, 1939; Paterson and Drummond, 1962; Fig. 2). Similarly, they related the glacial phases to different terraces of the Soan and the Indus rivers in the south-west from the foothills. While examining these terraces in the geological deposits in the Potwar, they collected Palaeolithic artefacts from different horizons. Paterson studied the Palaeolithic tools. (De Terra and Paterson 1939: 301-312; see Fig. 40 this volume). According to Paterson, two separate traditions were represented, the Abbevillian-Acheulian with hand axes and the Soan tradition with pebble tools. As they write, "it is interesting to note the parallel development of the Soan flake and pebble industries, along side the Abbevillian-Acheulian complex. So far these two entirely different cultures have been found in contact at one site only, Chauntra, where hand axes of late Acheulian are associated with cores and flakes of the late Soan"(de Terra and Paterson, 1939:312).

The work of De Terra and Paterson was elaborated by Movius. He properly referred to the location and names of the Palaeolithic sites in some details (Movius, 1944, 1949).

He supported Paterson's hypothesis of two traditions (Abbevillian-Acheulian with hand axes and Soan tradition with pebble tools). The Palaeolithic artefacts of the Soan tradition were coined by him as choppers and chopping tools. Owing to

Movius's publication, the prehistoric archaeology of Pakistan became known to the various research workers of other regions.

Similarly, in 1954 an Italian expedition under Graziosi undertook survey in the Soan Valley and discovered some new Palaeolithic sites. Graziosi's study and analysis of the Palaeolithic artefact types led him to conclude that the Abbevillian-Acheulian and the Soan type tools do not represent two distinct traditions as already proposed by De Terra and Paterson but a single tradition (Graziosi 1964: 18). He drew this conclusion on the production of hand axes and pebble tools at Morgah and other sites near Rawalpindi, where hand axes and pebble tools were found together in similar geological contexts. Paterson who had worked with De Terra in 1935, later on collaborated with J. H. Drummond and published a book 'Soan the Palaeolithic of Pakistan' (Paterson and Drummond, 1962). As compared to the earlier publication (De Terra and Paterson 1939), this time the authors made considerable changes to the chronology and to the interpretation of various artefacts types. Two of the most important changes in the terminology are cited as follows. A new name 'Stellenbosch' was adopted for the hand axe element; for they believed, their presence in Pakistan was due to the invasion from east Africa (Paterson and Drummond 1962: 95). Another name 'Clacton' was applied to stone artefacts collected in the Soan Valley which in their view represented another foreign intrusion into the Potwar region (Paterson and Drummond, 1965: 89).

Subsequently, in 1963 Dani discovered the Sanghao Cave in Mardan district (Dani, 1964). This Palaeolithic site was later on excavated that yielded a stratified deposit of 12 layers encompassing two periods of our cultural heritage—Palaeolithic and the historical periods.

Dani was followed in 1964 by E. Johnson, who conducted survey for the Palaeolithic sites in northern Pakistan in the Soan and Khanpur valleys. (Johnson 1968, 1972) Following Johnson, some Stone Age sites have been investigated by archaeologists from the Department of Archaeology, University of Peshawar. One of the cave sites was excavated by Farid Khan (Khan, 1974).

In 1975 Farid Khan and Ranere conducted excavation at the Middle Palaeolithic (Mousterian) site of Sanghao Cave (Ranere, 1982). The excavation has added more

information to the Palaeolithic stratigraphical sequence in the Sanghao Cave (see Fig. 39). However, they worked out a new scheme of the stratigraphical profile. Ranere concluded that the Sanghao lithic industry shows homogeneity throughout the cultural deposit from top to bottom of the Stone Age. Salim in 1974 surveyed more Paleolithic sites in the Potwar region in the loess deposits along the Grand Trunk road. He discovered more Palaeolithic sites (Salim, 1986: 56-66). A survey of Palaeolithic sites in the province of Sind was conducted by B. Allchin (1976), and Allchin et al. (1978) of the Cambridge University. Allchin also conducted a survey in the Soan Valley in 1980-81 (Allchin and Allchin, 1982).

In 1976, Stiles in collaboration with Geological survey of Pakistan, Peshawar University-Dartmouth College and Yale University conducted fieldwork on the Siwalik deposits and Palaeolithic collections in the Potwar plateau, Pakistan. He gives a summary of stratigraphy, Palaeo-magnetic chronology and drew some conclusions that four glacial chronology of De Terra and Paterson should be dropped, and that the pre-Soan and early Acheulian are of natural origin i.e., not manufactured by early man (Stiles, 1978: 129-148).

B. Allchin went to the Sanghao Cave and briefly studied the lithic assemblages and presented her views on the stone industries (Allchin, 1973: 39-50). She also conducted survey in the Rohri Hills in 1975 and discovered Lower, Middle and Upper Paleolithic sites. The main explored Palaeolithic sites are Chancha Baluch and Nawab Punjabi in Rohri Hills and Milestone 101 from Hyderabad, Sind (Allchin, 1976: 471-489). The Rohri E locality seems to be of the Middle Palaeolithic appearance as the flakes amount to 34% (Allchin et al., 1978). Salim has undertaken survey in the Soan Valley to collect data for his research work. He discovered some new Palaeolithic sites most of them belong to the Middle Palaeolithic. He also re-examined some of the already explored sites (1986: 60-65).

The British archaeological Mission to Pakistan initiated a Palaeolithic studies Project in Potwar in 1980. Rendell and Dennell being members of the team surveyed Soan Valley along the Grand Trunk Road. They re-examined some of the already explored Palaeolithic sites. They studied Pleistocene deposits and excavated the Palaeolithic site of Riwat 55, a main 'initial Upper Palaeolithic site' (Rendell et al., 1989: 204). The site has been dated by TL to ca. 45,000 B.P (ibid). Both Rendell and

Dennell have rejected and disfavoured de Terra and Paterson's four glacial chronological sequence (Fig. 40). They also carried out archaeological and geological investigations in the Pabbi hills, east of Jhelum River, where Palaeolithic artefacts along with fossilized bones have been reported. Rendell has recently produced a series of dates on the Potwar loess ranging between 170 ka and 18 ka B.P (Rendell et al., 1989: 85-95; see Table 6.2).

Tusa in 1986 excavated a trench at the Sanghao Cave. This cave has already been excavated by Dani and Ranere. Tusa's excavation has added some more information on the stone industry clearly describing the Mesolithic or Neolithic in the upper levels of the cave (Tusa, 1988: 76).

Also in 1986, Biagi and Cremaschi conducted survey in the Rohri Hill, Sind and discovered several new archaeological sites with Palaeolithic artefacts (Biagi and Cremaschi, 1988: 421-437). Since 1993 a program of archaeological investigations under the name of Joint Rohri Hills Project was undertaken by the Shah Abdul Latif University of Khairpur and the Ca' Foscari University of Venice, Italy (Biagi and Sheikh, 1994). Subsequently, from 1994-97 surveys and excavations were undertaken. Several collections were made at the site of Shadee Shaheed, Adam Sultan, Shiraz and Unar. They have made a good collection of Palaeolithic artefacts. The artefacts were classified on the basis of physical condition, patina, and typology (Negri and Kazi, 1996: 7-38). These Palaeolithic artefacts have been subdivided into six groups or series (1-6). They have attributed these assemblages to Early, Middle and Late (Upper) Palaeolithic on the basis of comparative study and the evidence produced by dated material in India and Pakistan (ibid: 35-36).

During 2002-2005 archaeological surveys, explorations and excavations were conducted in the Rohri Hills and Veesar Valley in the Thar Desert by experts from the Department of Archaeology, Shah Abdul Latif University, Khairpur (Sind, Pakistan). They have discovered 328 archaeological sites ranging from Lower Paleolithic to the Mature Indus phase. The evidence produced by these investigations is significant because the discovery of Lower Palaeolithic workshops was first of its kind. They have also reported Lower Palaeolithic artefacts made on limestone from Veesar Valley. The latter artefacts were collected from the surface randomly. Middle and Upper

Palaeolithic industries within Palaeolithic workshops were identified in both regions. A large number of Mesolithic sites were recorded (Shaikh et al., 2002-2003).

The French Mission since 1974 has been excavating the Neolithic site of Mehrgarh and the Harappan site of Nausharo in Kachhi district, Baluchistan (Jarrige, 1996: 52-103). L. Wengler one of the members of the team studied Quaternary geology of Bolan basin. He reported Middle Palaeolithic artefacts including Levallois flakes from the surface site among pebbles near Bolan River (Wengler, 1988: 1121-1124).

Farid Khan from the Department of Archaeology University of Peshawar in collaboration with the British scholars J.R. Knox and K.D. Thomas have been busy for the past few years in Bannu basin on Mesolithic, Neolithic and Bronze Age sites. In 1986, they reported Palaeolithic artefacts near Trakai Kanda Nala. Recently, Late Palaeolithic artefacts have been reported from surface site of Dre Ghundai also in Bannu basin. These artefacts made on chert are patinated and collected from ancient terraces. Some artefacts are polished an indication of dry desert windy conditions. Salim and Farid Khan discovered Middle Palaeolithic artefacts, opposite Dre Ghundai and across the road. The flakes had prominent bulb of percussion and retain desert varnish (Allchin et al., 1986: 183-195; Khan et al., 1991: 4-7).

Salim from 1985 onwards carried out survey and exploration in the Punjab and N.W.F.P. He discovered some new archaeological sites among which 23 belong to the Stone Age (Salim, 1992: 34-77).

1. 7. Proposed Terminology for Prehistory in Pakistan.

In view of distinguishing different tool types, the Stone Age has been subdivided into particular periods. On the basis of technology and typology, each period is defined by the presence and absence of specific artefact types. In 1960, the first international conference on Asian archaeology was held in New Delhi. The members agreed on a three fold division of the Indian Stone Age i.e., Early, Middle and late. The Neolithic was put into a separate category. This terminology, had already been adopted for the Stone Age of south Africa, was first used by some Indian prehistorians; on account of the absence of Upper Palaeolithic tools or no sufficient data that could characterize the Upper Palaeolithic.

Cammiade and Burkitt were the first ones to classify in some detail the southeast Indian Stone Age collections into the European pattern. They put forward the terminology of series I-IV as follows. A good collection of stone artefacts was made from southeast India by Cammiade. The same collection was studied and analyzed by Cammiade and Burkitt. Based on stratigraphy and typology, they classified these tools into four series that include four distinct cultures and dates. Of them Series I includes characteristic tools of hand axes made of quartzite which are comparable to similar tools from south Africa, Series II included flakes industries with well-made hand axes of quartz and sand stone and chalcedony. The artefacts of the series III are characterized by slender blades with blunted backs, burins, planning tools and scrapers made from flinty Lydian stone. The last Series IV included microlithic tools made of agate and quartzite (Cammiade and Burkitt, 1930: 337-38). They related and equated these four series to Lower, Middle, Upper and Mesolithic of Europe. Todd followed and adopted European terminology for stone artefact collection from river gravels and clay exposed due to quarrying near Khandivili, Bombay. The site was more important because all artefacts such as hand axes, flakes, blades and burins were found in situ (Todd, 1939: 257-273). Following Todd, some prehistorians faced difficulty to apply the Middle and Upper Palaeolithic terminology, as they could not find any archaeological evidence for Middle and Upper Palaeolithic in some parts of India. For Example Joshi (1953) attributed the Malprabha collection to Lower, Middle and Upper Palaeolithic. Again Sankalia (1956: 35-52) claimed to have found series II, III and I when he excavated the open air site at Nevasa, located on the river Pravara in Maharashtra, and by doing this he revised and reviewed the Cammiade and Burkitt Terminology (1930), which was adopted by Soundarrajan (1952: 62-92).

Since there was absence of blades tools from the Palaeolithic sites in the subcontinent, and the sequence of division was not plausible, Subharao again proposed to adopt the South African terminology of Early, Middle and Late Stone Age (1956: 13-14). This terminology was adopted by Sankalia and Banerjee (1958: 158), Mahapatra (1960) and later approved in 1961 by the International Congress on Asian Archaeology held in New Delhi. After then there were some discoveries of blade dominance industries in some areas of the subcontinent, which did not fit the new scheme (Murty, 1968).

For a few years, both terminologies were used i.e., Early, Middle and Late Stone Age; Lower, Middle and Upper Palaeolithic and the post-Pleistocene industries were given a separate name-the Mesolithic and Neolithic. The former terminology was adopted for the stone industries that characterized by the absence of blades and blade tools. Similarly, the latter terminology was used for the late Pleistocene industries that comprised blades and blade tools like awls and burins.

The European terminology was adopted by Murty who found stone industries comprising blades and blade tools at Renigunta (Murty, 1968: 83-101). Similar blades tools were discovered by Sharma in the Belan valley (Sharma, 1973a: 106-110). B. Allchin conducted survey in the Rohri Hills and discovered a large number of chert blades at the factory sites of Rohri in Sind. She has attributed some of the artefacts to Upper Palaeolithic. The Upper Palaeolithic artefacts have also been reported from the Potwar plateau, (Allchin and Allchin, 1978: 60; Allchin, 1999: 77-79). Salim also used the terminology of Early, Middle and Late Stone Age for the Palaeolithic assemblages from the Potwar plateau (Salim, 1986: 11). Even in his recent publication, Salim again used the European terminology but dropped the term 'Upper Palaeolithic' from the sequence (Salim, 1997: 55; Fig. 2).

Table 1.1: Terminologies of the Palaeolithic Age in Pakistan.

(after Salim, 1997).

Terminology I	Terminology II	Artefacts
Mesolithic	Late Stone Age	Microlithic artefacts
Late Palaeolithic	-----	Blades, flakes
Middle Palaeolithic	Middle Stone Age	cores, flakes, hand axes, cleavers, pebble tools, Levallois technique
Lower Palaeolithic	Early Stone Age	core, flakes, hand axes, cleavers, pebble tools.

Table 1.2: Proposed Terminology for the Stone Age cultures of Pakistan.

Periods	Geological era	Associated cultures
Neolithic	post-Pleistocene	ground and struck stone tools, no pottery.
Mesolithic	post- Pleistocene	microlithic tools
Upper Palaeolithic	Pleistocene	blades and blade tools along with scrapers, rare cleavers and hand axes
Middle Palaeolithic	Pleistocene	predominately flakes tools, pebble tools (cleavers and hand axes) typical Mousterian artefacts
Lower Palaeolithic	Pleistocene	flakes, pebble tools, hand axes and cleavers,

The surveys and excavation conducted by the present author in the Bajaur-Mohmand area have brought to light a number of sites ranging from Paleolithic to Neolithic (Ali and Rahman, 2005: 55-90; also see, Ali and Rahman 2005: 123-134). Having a lot of Upper Palaeolithic material in our collection, now we are in the position to adopt the terminology usually used by the European prehistorians. As many as 12 sites yielded Upper Palaeolithic stone tools and most of the material

comes from surface. In addition to survey, we have also conducted excavations at the rock shelter of Ango Gatkai. The excavation yielded a stratified cultural deposit of seven layers in which layers 4 and 5 from top to bottom are Upper Palaeolithic (Fig. 34). Having such a data regarding the Upper Palaeolithic, we are not hesitant to adopt the three-fold division of the Palaeolithic. Although most prehistorians in Pakistani are still not agreed to follow this scheme of the Palaeolithic Age used in Europe. One of the reasons for our adoption of the three-fold scheme is that we have clear evidence of the Upper Palaeolithic in the rock shelter, which has been excavated in the recent past (Ali and Rahman, 2005: 124-34). The stratified deposit in the shelter shows long sequence of the Upper Palaeolithic period, though there is no absolute dating from the site. Our attribution of the material to different periods is mainly on the basis of tools typology and technology. As we have ample evidence of the Upper Palaeolithic sites, there is no reason to disagree with those who have adopted the terminology Lower, Middle and Upper Palaeolithic for the stone industry of India and Pakistan. Prior to the excavation of Riwat 55, there was controversy over the existence of Upper Palaeolithic. The site of Riwat has yielded material that the excavator has attributed to Upper Palaeolithic (Rendell et al., 1989: 137-151). Allchin has also conducted survey and exploration in the Rohri Hills, Sind, who collected, among other periods' material, the Upper Palaeolithic tools which she identified on the basis of typology (Allchin, 1976). Now we are on a firm footing to adopt the terminology of Lower, Middle and Upper Palaeolithic for the stone industries of the region and for the whole country as well (see Table 1.2). Although having blades and burins of the Upper Palaeolithic in the Sanghao collection, Dani, by contrast, used the terminology of Early, Middle, and Late Palaeolithic (Dani, 1964). Similarly, Salim one of the experts on Pakistan prehistoric archaeology has undertaken much fieldwork in the Potwar region of northern Pakistan but he could not find Upper Palaeolithic material to clearly make distinction between Middle and Upper Palaeolithic material (Salim, 1986; 1992; 1997; also see Table 1.1 this volume). Most of his researches are confined to Middle Stone Age.

Chapter Two

Middle Palaeolithic

2. 1. The Pleistocene and the Emergence of Man and his Rudimentary Palaeolithic Cultures.

The Palaeolithic or Old Stone Age has been divided into three main periods (1) Lower (2) Middle and (3) Upper Palaeolithic. All of the three periods belong to Pleistocene. The Pleistocene has been further divided into three parts-lower, middle and upper. These three subdivisions are largely based on fauna and flora throughout the world. During this period, the major areas of the world had their own fauna and flora. The same period saw the emergence of man and his rudimentary Palaeolithic cultures. Most of the Middle Palaeolithic cultures are related to upper Pleistocene geological epoch. Zeuner has defined the Plio-Pleistocene boundary on the basis of three main criteria: first the changes in the marine molluscs; second the appearance of horses, elephants and cattle; and third the advance of the first major glaciation-the Alpine Gunz. Recent researches on deep-sea cores have provided evidence for a clear-cut Plio-Pleistocene boundary at about 2 my. It is marked by the disappearance of some of the sea bugs which had abounded during the preceding 7.5 my and also by the appearance of some new foraminifera. This is also established by a Palaeomagnetism event. It has been found that the earth's magnetic field had been changing its polarity in the past and one gets a complete sequence of these reversals of the magnetic poles. It flipped about 2 my and the Matuyama Magnetic Reversal was the result. Before 2.5 my polarity was normal and was normal as today. During this long reversal period or Matuyama, two events of normality occurred the first called the Olduvai and dated to 1.9 my and marks the Plio-Pleistocene boundary and the second is Jaramillo which is dated from 0.94 my B.P to 0.89 my B.P. (Agrawal 1982: 12-13; Ashfaq and Haq, 1986: 1-42).

Holocene means "recent" and it is the period, which was preceded by the Pleistocene. We are living in this period. Most of the Middle Palaeolithic cultures flourished in upper Pleistocene with an approximate date of about 150,000 years P.B (Waechter, 1976: 34-35). However, the main Middle Palaeolithic or Mousterian industries largely appeared in the last glaciation or Wurm, it has short four less cold periods called interstadials separated by three stadial periods. In the temperate and

tropical areas such as Africa and the Thar Desert there occurred pluvials and inter-pluvials which took the place of glacials and interglacials (Mc Burney, 1969: 21-29). In the Thar Desert of the Indian subcontinent arid and humid phases prevailed during the upper Pleistocene (Allchin et al., 1978: 306).

As far as the area of our research is concerned, no scientific study of the Palaeolithic environmental conditions has so far been made. Therefore, it is not certain that what kinds of climatic conditions prevailed during the upper Pleistocene in this part of the world. It seems most probably a periglacial area. Being situated in the southern slopes of the Hindu Kush, it must have experienced the severe cold climatic conditions to which the Middle Palaeolithic man had adapted himself by making some essential arrangements such as using warm leather/skin dresses, using natural caves and rock shelters and excessive use of fire. It should be noted that the Middle Palaeolithic dates are vary from area to area, region to region and country to country (Ali and Rahman, 2005: 55-90; Clark and Piggot, 1965: 60-61).

2. 2. Middle Palaeolithic: a definition

Middle Palaeolithic may be defined as the Stone Age that appeared in the upper Pleistocene; it succeeded the Lower and preceded the Upper Palaeolithic with some characteristic tools. It appeared in the upper Pleistocene with some characteristic tools and is distinct technologically and typologically from the former and latter periods, it is basically a flake industry with a limited numbers of core tools, with two prominent manufacturing techniques known as Levallois or prepared-core technique and the discoidal flaking technique; in terms of typology it comprises well-established artefact types or formal type tools, generally referred to Mousterian industries; similar industries are associated with the so-called Neanderthal man, dominant tools include scrapers of different kinds, points, burins, blades and blade flakes, awls, tranchets, limaces, and core tools, all these tools may be retouched and unretouched. It should be noted here that the Middle Palaeolithic or Mousterian of the Bajaur-Mohmand area is more close to the Western European and Western Asia Mousterian cultures. The presence of the formal type Mousterian tools in all these regions suggests a common ancestral birthplace. In view of having the presence of all the principal Mousterian types in the Bajaur-Mohmand area, we put forward the hypothesis that the same

region most probably seems to have originated the Middle Palaeolithic cultures which in the course of time diffused to other parts of the world.

The stone artefacts of the Middle Palaeolithic in the Bajaur-Mohmand area are characterized by the presence of formal Mousterian type tools. In these tools, the scrapers have predominance over other types. All types of scrapers are present in the stone assemblage. Francoise Bordes has classified the Mousterian tool kit from France into four principal groups, which flourished most probably in the last glaciation-Wurm. It has four subdivisions in France which are I, II, III and IV. These groups are Mousterian of Acheulian tradition, Denticulate Mousterian, Typical Mousterian and Quina type Mousterian. The earliest Mousterian is traced back to the Riss glaciation and there are some elements in the Wurm/Riss interglacial (Bordes, 1961: 1-10; Bordes, 1968: 98-105). The Middle Palaeolithic sites of the area are located in caves and rock shelters of the limestone formation (Ali and Rahman, 2005: 55-90). No open-air Palaeolithic sites have been found so far. The caves and rock shelters are found in the limestone formation near perennial water sources in the very proximity of the sites. Generally, the tools are found within the caves and rock shelters or on the slopes or talus below the caves. The Middle Palaeolithic man had occupied the caves and rock shelters wherever he found them in the area. It should be mentioned here, as these prehistoric sites do not yield valuable cultural material to attract the antique dealers. Thus, most of these sites are intact with partial disturbance caused by either human activities or natural agencies. The caves and rock shelters seem to have seasonally occupied by the Palaeolithic man particularly during the severe cold conditions of the last glacial times when living in the open was difficult and intolerable (Ali and Rahman, 2005: 55-90; Ali and Rahman 2005: 123-134).

2. 3. The Pleistocene Glacial record in northern Pakistan.

Glaciations dominated the climate during the last two million years. The Pleistocene glacial record can be established by identifying points of maximum glacial advance, the number of glacial advances and glacially related deposits. Most of early workers estimated that glaciation extended down to a level in the range of ca .2440-1800 m. Coulson (1938) concluded that glaciation extended to 4,500 feet in Hazara. More recently, Porter (1970: 1421-1426) has identified a lower limit for the Pleistocene glacial advances in Swat Kohistan at 5,000 feet and found traces of only

three main periods of glacial advances in Swat-Kohistan. Porter three-fold glacial sequence does not contain any interglacial but stadial periods, which means that warmer conditions never prevailed for any length of time. It is in this climatic context that it is difficult to understand the recent discoveries of the early Palaeolithic artefacts in Kashmir (Agrawal, 1982: 14). Some of the Kashmir moraines identified by De Terra and Paterson (1939) have been reinterpreted as tectonically controlled fanglomerates (Burbank 1983: 77-92; Burbank and Johnson, 1983: 205-235; Singh, 1982: 71-110). According to Holmes' recent re-evaluation of the glacial records in Kashmir led him to conclude that the extent of Quaternary glaciation in Kashmir was smaller as compared to the previous works. Since moraines were confined to the high altitudes of the Pir Panjal and Swat Kohistan, there is no direct evidence of glacial advance in the Peshawar basin and the Potwar plateau (Rendell et al., 1989). Morris studied the Bain boulder bed outcrop in the Marwat Kundi range in the southern portion of the Bannu Basin. He considered that the Bain boulder bed was tillite. Morris interpreted the boulder bed and related it to the glacial material of a floating ice tongue which is of early Pleistocene times descended from the heavily glaciated high land of Waziristan and Afghanistan pushed out into the waters of Siwalik lake. Then in due time melted (Morris 1938: 403.). A new interpretation of the Bain Boulder diamictite has recently been suggested by Khan et al. (1985). They interpreted the deposit as a volcanic lahar derived from the Dasht-i-Nawar in Afghanistan caldera 350 km to the north-west in Afghanistan. They pointed out that Morris criteria for establishing the boulder bed as a tillite are by no means diagnostic and such interpretation may be applied to debris-flow deposits. Such as lahars which are debris flows and associated with volcanic activity (Crandell, 1971).

Nevertheless, it should be mentioned here that such research had not been carried out in this area. To know the exact situation that prevailed in the Quaternary geological era and the Palaeoenvironments to which we can relate the Palaeolithic cultures; for this, we entirely depend on the evidence found in the surrounding region. As we have noted earlier that this region lies in the southeastern slopes of the Hindu Kush, it must have experienced the cold climatic conditions of the polar region. It must have been a periglacial zone attractive for both human beings and animals as well. The deposits in the caves and rock shelters attest to our hypothesis. The deposits are clayey silt with minute grits laid in the humid period.

2. 4. Material, techniques, Retouch and Faunal Remains.

2. 4. 1. **Material:** throughout the Middle Palaeolithic period the chert was used to a greater extent by the Palaeolithic man or Mousterian for manufacturing various kinds of tools in the area. The chert nodules are found in a variety of forms in the river beds washed down by floodwater from the mountains sides. It was also obtained from the original sources and most probably quarried by the Palaeolithic man or picked up from the exposed veins. Even at present, a great number of chert nodules can be seen in the riverbeds. Although chert is found in different colours but light brown and blackish colors predominate. Apart from chert the other principal material for tools is quartz of milky colour and to a lesser extent its crystal. Besides, limestone has also been employed for the making of a few artefacts in layer 6 of Ango Gatkai and at Tango Nao Mousterian site.

2. 4. 2. **Techniques:** as already mentioned the Palaeolithic man manufactured his tools by using different techniques. Prominent among them is the discoidal flaking technique generally employed by the Middle Palaeolithic man or the Mousterian for majority of his tools. Another known technique is the prepared core or the Levallois, tortoise core technique that shows parallel existence with the former. In some cases the tools exhibit minute flaking scar suggesting that the tools have been detached from the cores by using a punch of wood, bone or antler.

2. 4. 3. **Retouch or Secondary trimming:** as a whole, the retouch or secondary trimming is rare in this area. Since the tools made on chert produced very sharp edges even from the primary flaking that further trimming was not needed. Some flakes show very thin cutting edges and thin shallow scars like burin spalls suggesting the use of soft hammer or the use of punch. If we have any secondary retouch, it is found on the tools from the Mousterian industry of Guloono Kamar, Ambar-Kamangara. Here D-shaped or convex Mousterian side scrapers show scalariform retouch characteristic of the Mousterian or Middle Palaeolithic tools elsewhere (Fig. 3, Nos. 2, 40 and 42). However, as a whole the Middle Palaeolithic or Mousterian tools show partial secondary retouch on their edges. The simple reason for such type of retouch may be given that the caves dwellers were not unaware of employing secondary retouch to their stone artefacts but they deemed it useless, as the first hand tools served them in a better way. Thus, it may be concluded that the Palaeolithic man in

this part of the world was highly efficient in making stone artefacts without further trimming.

2. 4. 4. Faunal remains: the evidence of faunal remains is found in the cultural deposit of Ango Gatkai. Many bone fragments of various animals have been found but no analytical study of them has been carried out so far. Although the Palaeolithic layers at the site do not yield so much faunal remains as compared to other sites in the region particularly the Sanghao Cave in Mardan district in N.W.F.P (Dani, 1964), and Afghanistan (Srivastava, 1982: 195) and Central Asia (Ranov and Davis, 1979: 251). The same is also true of the Palaeolithic sites of Sind in Pakistan and the Indian Rajistan (Allchin et al., 1978).

Most of the stone artefacts in our collection are from surface, collected randomly without conducting proper excavations. The only exception is the Palaeolithic rock shelter of Ango Gatkai where we conducted excavation. Although it yielded rich Palaeolithic cultural material, yet it did not provide any skeletal remains of the author of these industries. However, based on general comparison of the stone artefacts, now we are on a firm footing to assign our lithic assemblages to different Palaeolithic periods. This area shares its features and the climatic conditions with those prevailed in other regions of the world during the Pleistocene. Thus, on the basis of technological and typological evidence at our disposal we have assigned the lithic industries of the Middle Palaeolithic of this area to the so-called Neanderthal man whose race had populated almost the entire world during the upper Pleistocene. In some Middle Palaeolithic or Mousterian sites, the remains of the actual user have been exposed like Teshik Tash (Gupta, 1979: 57-71) and Skhul (Brace, 1976: 94-100) where it was buried within the caves or habitational area. We are hopeful that future research in the area might expose the remains of the Palaeolithic man by conducting large-scale excavations.

2. 4. 5. Bone tools: the lower layers 6 and 7 at the rock shelter of Ango Gatkai produced only a few worked bones. The bones show marks of scratches on their surfaces suggesting bone working at the sites. Most of these worked bones seem to have been used as bone flakers (Pl. 5).

2. 5. Middle Palaeolithic Sites in the Bajaur-Mohmand Area.

2. 5. 1. Middle Paleolithic Sites

The Middle Palaeolithic or Mousterian sites are located in the limestone formation. They are located in the north-west of the area. All of them are caves and rock shelters. A good collection of artefacts was made from the surface of these sites. Prior to our survey in the area, there were no Palaeolithic sites. No discovery was made in terms of prehistoric archaeology in the northern part of Peshawar valley (Ali, 2005). The only exception is the rock shelter of Jamalgarhi and Sanghao Cave in Mardan (Dani, 1964; Salim, 1986). The attribution of these sites to Mousterian or Middle Palaeolithic is based on typological and technological analysis of the assemblages. Since the stone industries of the Middle Palaeolithic show characteristics that distinguish it from the preceding period with heavy duty tools such as hand axes and cleavers and the succeeding period of the Upper Palaeolithic with specialized blades and blade tools.

2. 5. 2. The Tango Nao Smast (Fig. 33, No.1): the cave is located at the mouth of Tango Nao (gorge). It is about 4 km from Nawagai in the north. The site can be approached by a paved road. The cave is in a steep cliff of the limestone formation. The mouth or entrance of the cave opens into the south direction. Externally the cave seems to be the work of man not of nature. The internal cave offers a favourable habitation except in winter when excessive rains cause water leakage in the front portion near the mouth. It measures 17 m long, 14 m wide and about 3 m high (Ali, et al., 2002). The cave yielded a good number of stone artefacts. Both externally and internally, the cave has great archaeological potentials in the form of stone artefacts. A proper and scientific excavation in the future will provide us with a stratified cultural sequence. The total collection of 99 artefacts is comprised the following main types: scrapers of various kinds- 41 (41.41%), hand axe type tools- 2 (2.02%), burins- 8 (8.08%), points-10 (10.10%), flakes-13 (13.13%), blades- 18 (18.18 %), limaces- 2 (2.0%) and knives- 5 (5.05%).

2. 5. 3. Hisar Kot (Fig. 33, No. 3): the cave and rock shelter are located on the eastern side of Hisar Kot spur. There is another cave on the western side of the Hisar Kot spur. It may be about 20 m from the hill torrent and just on the side of the modern

by-pass road. The rock shelter faces east and superimposes by a small cave. It also opens into the east like the shelter below. Stone tools were collected from the shelter below. It may be noted that the cultural remains must contain mixed material, as the upper cave has no cultural deposit, since it is a living rock and only a few tools were collected from the front portion of the cave. However, the rock shelter is rich in cultural deposits. 19 artefacts from the surface include: scrapers- 8 (42.10%), points- 4 (21.05%), burins-1 (5.6%), flakes-3 (15.78%), points-1 (5.26%) and blades- 2 (10.52%).

2. 5. 4. Smasto Arkhai (Fig. 33, No. 5): the Smasto Arkhai caves and rock shelters are located in upper Mohmand *tehsil* in Tangi area. The site can be approached by a *kachha* road that passes through Bedmanai and leads along the Bedmanai Tangi-khwar. The site is located to the east on equal distance between Bedmanai and Spinki Tangi. These caves and rock shelter are found on a terrace to the west near the confluence of Tangi and Bedmanai torrents. The site seems to be the largest explored prehistoric site in the area. A large number of stone tools are found on the surface near the caves and rock shelters on the slope. The slope on the northern extreme has been disturbed by the construction of a modern house which is itself now in ruined condition. The whole series of these rock shelters lies in the north and south direction. The entire site covers a distance of about 100m with intervening spaces between them. A total collection of 35 tools includes the following tools: scrapers- 22 (62.85%), points- 3 (8.57%), flakes-1 (2.85%), knife -1 (2.85%), tranchets - 1 (2.85%), awl-1 (2.85%), blades-3 (8.85%) and burins- 3 (8.85%).

2. 5. 5. Guloono Kamar Kamangara Rock shelter (Fig. 33, No. 4): it is located in western Kamangara about 3 ½ km from the main Ambar road. It faces north-west to southeast. The site measures about 25 m in length. The height of the rock is about 11m from the present ground level. It over looks the low-lying terraced fields below in the west. The whole site is intact except a small ditch dug in the northwestern corner where the local people seem to have taken away the cultural deposit for construction purposes. The site yielded 48 artefacts which include the following tool types: scrapers- 12 (25%), points- 9 (18.75%), blades- 7 (14.58%), flakes- 7 (14.58%), burins-5 (10.4%), knives- 3 (6.25%), tranchets- 2 (4.16%), awls- 2 (4.16%) and cleaver - 1 (2.08%).

2. 5. 6. Shahidano Kamar (Fig. 33, No. 6): the site is located in Gudar Nao khwaga Ambar. It is about 5 km from the main Ambar road. It can be approached by a *kachha* road that diverts near Dab village. The rock shelter is facing west and is on the eastern side of the Gudar Nao above the terraced fields. It yielded tools of the Middle Palaeolithic period. Among the 27 artefacts from the surface include: scrapers-12 (44.44%), blades- 5 (18.51%), tranchets- 2 (7.40%), burins- 4 (14.81%) and points- 4 (14.81%).

2. 5. 7. Ango Gatkai Rock Shelter (Fig. 33, No. 2): the rock shelter of Ango Gatkai is located in the southwestern part of a small and narrow valley of Nawagai. The site was discovered in 2003 and excavated in 2004 under the aegis of the Directorate of Archaeology and Museums Government of N.W.F.P. Locally the site is known as '*Gule Taqar Kamar*'—a name that literally means 'the rock of *Gule Taqar*' a plant that blooms in the spring. Ango Gatkai lies about 300m from the main Peshawar-Bajaur highway to the west and about 25 m above the Bando *Khwar*/ hill torrent. The same stream (now dried up) provided a perennial source of water to the region until recently and may have served as water source of water for the prehistoric settlers.

The rock shelter at Ango Gatkai opens to the east, measures 17 m from south to north, 6m from east to west and 7.5 from the ground to the overhang of the rock. The cultural area of the site was divided into two trenches of 5 x 5 m, separated by 1-m baulk. The excavation exposed a two-meter thick cultural deposit in seven layers bringing to light stratified profile of the site. The four lower layers at the bottom 7-4 are assigned to Palaeolithic period based on stone artifacts showing characteristics of the Old Stone Age. The Palaeolithic period is further divided into Middle and Upper Palaeolithic. Thus, according to the new scheme, the lower layers (7-6) are Middle Palaeolithic or Mousterian with some elements of the Upper Palaeolithic in layer 6. These two layers form Period I. The next two layers (5 and 4) are Upper Palaeolithic, which forms Period II in the new chronological sequence. The remaining three Layers (3-1) are Neolithic and form Period III. These have been assigned to the New Stone Age based on stone typology. As, such the excavation yielded a cultural sequence of three periods. The lithic industry of Period I is characterized by the presence of Mousterian type tools including points, scrapers of various forms, awls, limaces,

burins, triangular Levallois flakes, small cleavers, blades, typical Mousterian discoidal cores, and microlithic tools. The raw material used is mainly chert in its different colours along with quartz and its crystals and limestone and flint. The Upper Palaeolithic Period II directly succeeds Period I. The attribution of layers 5 and 4 to Upper Palaeolithic is on the tools typology. There are certain tools that distinguish this period from the preceding period of Mousterian and the overlying Neolithic period. The Mesolithic period is missing from the sequence. For this, we have no reason at the present state of our knowledge. Period III is Neolithic because it yielded characteristic tools and implements of the New Stone Age. The stone industry includes large ground stone tools as well as struck stones. A few bone tools were also recovered from layers 5 and 4. The raw materials in period III are numerous among which chert, sand stone, granite, limestone, quartz and crude bone tools are notable. We have collected several charcoal samples along with both charred and intact bone pieces from different layers for C14 determinations but they have yet to be processed for dating.

2. 6. Analysis of the Artefact types of Mousterian or Middle Palaeolithic.

We begin the analysis of different artefact types from the excavated site of Agno Gatkai (layers 7 and 6). The analysis of artefact types from different Middle Palaeolithic sites can be seen within the sites description as cited in the foregoing pages.

2. 6. 1. Layer 7: main artefact types and their analysis

Layer 7 of Ango Gatkai is characterized by the presence of Mousterian type tools made or manufactured by the Levallois and discoidal flaking techniques. It is a flake industry of Mousterian tradition. The lithic assemblage of layer seven is comprised the following main tool types. They are points, scrapers of various types, burins, awls, flake tools and hand axe type tools. They are described in detail as follow.

2. 6. 2. Points: typical Levallois points of the Mousterian tradition are found in layer 7. They have faceted striking platforms characteristic of the Levallois technique. These points are well proportionate showing symmetrical outlines. Both large and small points are found in layer 7 (Fig. 5, Nos. 4 and 15; Fig. 4, Nos. 8,14 and 15; Fig. 6, Nos. 1, 9, 12, 13, 15 and 16; Fig. 8, No. 22). Besides, there are elongated Levallois

points with thinned butts on the dorsal surface, such points are also found in layer 6. A Mousterian point in layer 7 shows a broken bone splinter attached to it suggests the bone working at the site (Fig. 6, No.13). Microlithic points are also found in layer 7 (Fig. 7, Nos.1-16).

2. 6. 3. Burins: the characteristic feature of the burins of layer 7 is the presence of double and multiple burins. The double burins are like horned heads. Some ten kinds of burins have been yielded by layer 7 of Ango Gatkai. Microburins are also found in layer 7. Quartz and its crystal and chert are the principal raw material for artefacts of layer 7. Fig. 5, Nos. 14 and 15; Fig. 7, Nos. 21-28. Fig. 4, No. 26 is a burin-cum-side scraper.

2. 6. 4. Cleavers: A few small cleavers are present in the lower layers. They are made on flakes and cores. One of the largest cleavers is found in layer 4 (Fig.14, No.11, and Pl. 47, No. 2). On account of its large size and different material used we assigned it to the earlier periods of the Stone Age. Its presence in layer 4 must be considered an intrusion. Other specimens are (Fig. 4, Nos. 2, 3, 10).

2. 6. 5. Triangular flakes: these flakes show thin profile and sharp cutting edges (Fig. 6, No. 3)

2. 6. 6. Spoke shave or notched tools: (Fig. 6, No. 17).

2. 6. 7. Scrapers: The scrapers are found in a variety of forms in the tool kit. They are made on flakes and cores, which constitute the largest group in the lithic industry of layer 7. The scrapers present the typical Mousterian type artefacts. The following types of scrapers have been noted.

1. Concavo- convex side scraper (Fig. 4, No. 11).

2. Convex side scrapers made on core (Fig. 5, No.13 and 18), these are microliths.

3. Denticulate scrapers: since these tools have, irregular outlines of their working edges, so they are called denticulates (Fig. 6, No. 8, 11 and 26; Fig. 5, No. 10b).

4. Canted scrapers: a large number of canted scrapers are present in our stone assemblage. A tiny or micro canted scraper is also found in the assemblage (Fig. 5,

Nos.1, 2, 24 and 26; Fig. 6, No.14). These are Mousterian beveled tools with convex and beaked working edges. Layer 6 also yielded a great number of such tools. This is the characteristic feature of Western Asia Mousterian assemblages.

4. Rectangular scrapers with transversal cutting edges: these tools are also found in the microform. These are very specialized tools of the Mousterian tradition in this area (Fig. 5, No. 9; Fig. 7, No. 42).

5. High ridged biconvex double scrapers with frontal notch (Fig. 4, No.12).

6. Humped scraper: they are rectangular in form (Fig. 4, No. 20)

7. Bill hooks type scrapers similar to those found in the Clacton on Sea (Pl. 22; Fig. 4, No. 26).

8. Convergent scraper (Fig. 5, No. 18.).

9. Transversal convex scrapers (Fig. 5, No. 9; Fig. 6, No. 7)

10. Convex end scraper (Fig. 4, No.19; Fig. 5, No.5).

11. Carinated scrapers (Fig. 5, Nos.10a and 11).

12. Small or microlithic transversal convex side scrapers (Fig. 5, Nos. 2, 13 and 28).

13. High keeled scraper (Fig. 4, Nos. 20, 22).

14. Oblique scarper (Fig. 4, No.9) and micro scraper (Fig. 5, No. 27).

15. End-cum-double sided scraper (Fig. 4, No. 23).

16. Transverse scraper (Fig. 4, No.19).

17. Transverse end scraper (Fig. 4, No. 12)

18. Side blow cleaver or scraper (Fig. 4, No. 10). The same type has been reported by B.Allchin from Nagari India (1978; Fig. 6.4, No. 2).

19. Small transverse scraper (Fig. 7, Nos. 34, 38, 39, 41, 49).

20. A few carinated, nosed scrapers are found in layer 7 (Fig. 5, Nos. 10, 11 and 30). The last type of flat nosed shaped has been described by the French as proto type of nosed scrapers.

2. 6. 8. Cores: discoidal, Levallois, tabular and globular flake cores are found in layer 7 (Fig. 4, Nos. 1, 7 and 17).

2. 6. 9. Flakes: there are triangular flakes such as (Fig. 6, Nos. 3, 6 and 19; Fig. 4, No. 13; Fig. 4, No. 21).

2. 6. 10. Tranchets: these are small tools with short chisel like working edges often on the distal ends. These artefacts characterize the Mousterian lithic industry, but they are found in small numbers (Fig. 4, No. 21; Fig. 5, Nos. 22 and 29).

2. 6. 11. Awls and borers: typical and atypical bores are found in layer 7 (Fig. 4, No. 13; Fig. 5, No. 23; Fig. 7, Nos. 50-56). The latter Figure shows microlithic awls.

2. 6. 12. Blades: the blade industry of layer 7 is represented by microlithic blades. There is complete absence of larger blade tools. The technique for the manufacturing of these blades is Levallois and non-Levallois in layer 7. The blades are completely different from the blades of the Upper Palaeolithic (Fig. 5, Nos. 20 and 21; Fig. 7, Nos. 58-72). The blades of the latter Figure are microliths.

2. 6. 13. Backed knives or blades: there are a few blades in layer 7 with backs curving to the tips. Such examples also occur in the lithic industry of Hortus in France. It is a rare type (Fig. 6, Nos. 10 and 21).

2. 6. 2. Analysis of Artefact types Layer 6

The stone industry of layer 6 is characterized by the presence of blades, points, burins, scrapers of different kinds, hand axe type tools, awls, tranchets and core tools of various types. All of these tools are described in detail as follows.

2. 6. 2. 1. Blades: the blade industry of layer 6 comprises well-formed backed blades with curved cutting edges and properly blunted backs (Fig. 9, Nos. 20-28). Here we find broad as well as thin varieties of blades. A blade with straight snapped back and sharp cutting edge, which slightly curves towards the tip, is (Fig. 9, No. 36). No. 28 is a blade-cum-double burin. There are knives and blunted blades that we have assigned to the transitional phase between the Middle and Upper Palaeolithic. Although these blades are knives but they may be called convex side scrapers on account of their form (Fig. 9, Nos. 21-23). Also (Fig. 12, Nos. 59, 67, 74 and 75); a flat broad flake blade with trimmed edge and slightly convex distal end and inner truncation at the proximal end is (Fig. 9, No. 27). This type of blade seems to have been developed in layer 5 where it is well formed with narrow base and flat wide distal end. The technique is Levallois; it is devoid of central ridge characteristic of the Upper and Middle Palaeolithic prismatic blades. A medium size blade with parallel sides; it is truncated at the basal end while a small scar is on the distal end near the tip (Fig. 9, No. 25). Short flat blades as well as microblades are characteristic of layer 6 (Fig. 12, Nos. 13-25). No.16 is a strangulated blade. In layer 6, like layer 7, there are small microliths, which are equal in size to the Mesolithic microliths. Similarly, (Fig. 11, No. 4) is a slenderical prismatic blade.

2. 6. 2. 2. Burins: the amount of burins in layer 6 is relatively smaller in proportion to layers 7 and 5. The dominant feature of burins in Layer 6 is the presence of multiple as well as double burins. They are made on chert and quartz. Bifacially worked burins are also found in layer 6 (Fig. 9, Nos. 35, 32, 49, 31; Fig.11, Nos. 26, 27, 21, 28 and 14). Among these, burins with beaks and semicircular or round backs are the characteristic tools that most probably mark the transitional phase between Middle and Upper Palaeolithic in the area. Notable piece is (Fig. 9 No.35). The latter type is also found in Sanghao Cave layer O3 (Pl. 9, No.3 from left to right).

2. 6. 2. 3. **Points:** the points in layer 6 are represented by both bifacial and unifacial pieces. Levallois and non-Levallois points are found in equal proportion. The characteristic features of these points are that they are thinned at the bases. On the basis of this feature we have assigned these points to the transitional phase. A few points show bilateral projections at the middle portion of the tools and they have thinned bases. They have been manufactured by Levallois and non-Levallois techniques. Some points are obliquely truncated at the bases thus the resultant butt shows dihedral cutting edge like a burin edge. Technologically and typologically, the points in this area show close resemblance to the Emiran points of Western Asia. It may be noted that the material is comparatively of poor quality thus the tools made of it are crude as compared to the tools from other regions. Typical Mousterian points are represented by small and medium sizes but the characteristic feature of the point is the presence of very small or microlithic points with very fine symmetrical outlines (Fig. 8, Nos. 12, 13, 14, 15, 20; Fig. 11, No. 11 and 25, Fig. 9, Nos. 5, 6, 8, 9, 11, 12, 13 and 15 and 19; Fig. 12, Nos. 1-10) All the examples of (Fig. 12) are microlithic points.

2. 6. 2. 4. **Borers:** borers are rare in layer 6. The awl of (Fig. 10, No. 47) is like a Gravettian awl. Similarly, (Fig. 10, No. 26) is a flake borer-cum scraper.

2. 6. 2. 5. **Notched tool:** notched tools are (Fig. 11, Nos. 7, 9 and 31).

2. 6. 2. 6. **Levallois flakes:** there are Levallois flakes that have been struck from prepared cores. Some are side struck while others are proximal end struck. The largest Levallois flake is found in layer 6; it shows faceted striking platform and has been struck from prepared core; the butt end has thinned down by the removal of two short flakes from the dorsal surface. It is oblique scraper (Fig. 10, Nos. 1, 15; Fig. 8, No. 22). The latter is oval in outline and closely resembles the Mousterian of the European Levallois flakes. A similar flake has also been yielded by the Mousterian site of Guloono Kamar (Fig. 3, No. 39).

2. 6. 2. 7. **Cleavers:** only a single cleaver has been found in layer 6; it is made on a core with transversal working edge (Fig. 8, No. 28).

2. 6. 2. 8. **Scrapers:** numerous types of scrapers are represented in layer 6. They are as follow:

A. Large and heavy side scrapers: these resembles the D-shaped or convex side scrapers in the Mousterian industries of the western Europe, but here the raw material is very poor or crude and did not permit the Mousterian knappers to shape the tools in a desirous manner. Some of these scrapers show short tails produced by the removal of a flake snapped across the butt ends. The same flaking scar may have been employed as a burin edge since it projects enough and appears to have served as burin edge (Fig. 8, No. 24). One secondary flake removal is the characteristic feature of the canted and some side scrapers often found in the Mousterian industry. Often a large flake scar is supplemented by small flakes scars.

B. Denticulate scrapers: these tools represent irregular or asymmetrical outlines or the cutting edges; they show little secondary work along the cutting edges (Fig. 8, Nos. 3, 6, 15, 23 and 26; Fig. 10, No. 7).

C. Concave side scrapers: these can be compared with Mousterian side scrapers of the Acheulian tradition often found in European Middle Palaeolithic industries (Fig. 9, No.7; Fig. 11, Nos. 18 and 29).

D. Bill hook: this type of scrapers is often formed by the concave transversal distal end and intersected by a beak or burin edge, such type of tools is also found at the Mousterian site of Tango Nao and layer 7 of Ango Gatkai. Here we have just a single specimen (Fig.10, No.12)

E. Convergent scrapers: these scrapers have almost double convex cutting edges, and triangular shape, they show retouch along the working edges (Fig.10, Nos.16 and 43).

F. Transverse scrapers: A unique variety of scrapers is the transverse scrapers (Fig. 10, Nos. 32, 37, 38 and 39)

G. Scraper with straight working edge: (Fig. 10, No.18).

H. Double scrapers: a great many scrapers fall in this category (Fig. 8, No.29; Fig. 9, No.42; Fig.10, No.22).

I. Scraper with notch or spoke-shave: we have two examples of this variety (Fig. 11, No.9 and 31; Fig. 10, No.15).

J. Concavo-convex scraper: (Fig. 8, Nos. 6 and 15).

K. Convex/ round end scraper: they show step retouch on the dorsal surface (Fig. 10, No. 20).

L. Bifacially worked scraper on pebble core: (Fig. 10, Nos. 11 and 13).

M: Elongated beaked scrapers on flakes: the backs of these tools are curved to the tip of the tools. One has straight cutting edge (Fig. 10, No. 5 and 48; Fig. 11, No. 36).

N. Carinated scrapers: they are found in the following varieties.

I. Narrow beaked scraper (Fig. 9, No.14; Fig. 10, No. 35).

II. Nosed scraper (Fig. 9, No. 41; Fig. 10, No. 48).

III. Carinated end scraper with lamellar retouch (Fig.9, No.39; Fig.10, Nos.33 and 49).

IV. Steep carinated scraper (Fig.9, Nos.30, 37, 38, 39 and 40). No.37 bears a fragment of worked bone

V. High keeled scraper: (Fig. 8, No. 25).

O: Convex side scrapers: they are usually made on cores (Fig.10, No.14). This type of scrapers is also found in Tango Nao lithic industry. They are like chopping tools.

P. Canted scrapers: a large number of canted scrapers in Ango Gatkai are represented by canted type generally known as Quina type Mousterian. These are (Fig.10, No.17, 19, 21, 23 and 45; Pl. 28, Nos. 1 and 2).

Q. Transverse end scrapers: (Fig. 9, No.2 and 17; Fig. 11, No. 42).

2. 6. 2. 9. Tranchets: a few tranchets are also found in our collection (Fig. 12 Nos. 32 and 62). These are microlithic in form.

2. 6. 2. 10. Cores: tabular, unifacial and bifacial discoidal cores, unipolar and bipolar, and inverted pyramidal (platform) flake and blade cores are found in the tool kit of layer 6. Bifacial, struck and unstruck Levallois and non-Levallois flake cores are found in the tool kit, inverted pyramidal blade and flake core are also found in the assemblage (Pls. 18, 19 and 20; Fig. 8, Nos. 4 and 9).

2. 6. 2. 11. Hand axe type tools: a few backed and beaked tools which may be called borers but their heaviness suggests that they must have been used as hand axes, these are thick in cross section, often made on core with lateral Clactonian notch on either side of the beak (Fig. 10, Nos. 8, 9 and 27).

2. 6. 2. 12. Flake tools: (Fig. 6, Nos. 6, 19).

2. 6. 2. 13. Borers: small and large borers are found in our collection, one awl resembles the Gravettian borer (Fig. 10, No. 47).

2. 6. 2. 13. Choppers: these are made on cores with plain striking platforms, the working edges are formed by the removal of wide flat flakes from the frontal portion making it two-beveled cutting edge (Fig. 8 No. 24), they resemble core scrapers.

2.7. The Evidence of Common Mousterian Tools in the Area.

Some tool types occur in all sites and may be compared based on typology and technology. The main object of this comparative study is to trace the common tools of the period which exhibit marked uniformity throughout the Mousterian industries in the region.

2. 7. 1. Scrapers: Among the scrapers, the disc or round or convex side scrapers are common to all Mousterian sites. These are from Tango Nao (Fig. 1, Nos. 9, 12 and 13); Guloono Kamar (Fig. 3, No. 40 and 42); Smasto Arkhai (Fig. 25B, No. 10). The best examples are from Guloono Kamar (Fig. 3, Nos. 40 and 43). Similar examples from layer 7 of Ango Gatkai are (Fig. 5, No. 8; Fig. 6, No.14 and Pl.30).

2. 7. 2. Naturally backed blades: these are found in Guloono Kamar (Fig. 3, Nos.19, 20 and 21), Shahidano Kamar (Pl. 102, No.1 middle row), two examples from Smasto Arkhai (Fig. 25B, Nos.19, 21, and 24), and Ango Gatkai (Fig. 9, Nos. 23 and 36).

2. 7. 3. Blades: the blade from Tango Nao(Fig. 1, Nos.15,17,18,19 and 44) the last blade is the unique piece, it is the original type of blade tools and termed or called by Ranov as proto-blade (Ranov, 1995: Figure 5.2). Tango Nao (Fig. 1, No. 36) is a very sharp blade now broken. Fig. 5, No. 20 is flat with double ridges on the dorsal surface (Fig. 9, No. 25; Fig. 11, No. 7).

2. 7. 4. Levallois Flakes: typical Levallois flakes are from Guloono Kamar (Fig.3, No.38). Similar examples are also from layer 6 Ango Gatkai (Fig. 8, Nos. 15 and 22).Tango Nao (Fig. 1, Nos. 11 and 43). These flakes are also reported from European Mousterian sites. They are almost in oval shape, which fit in the criteria set for the definition of Levallois flake tools.

2. 7. 5. Triangular flakes: such type of tools is found in Tango Nao (Fig. 1, No. 20). Also Layer 6 (Fig. 8, Nos.18 and 21; Fig. 11, No. 5).

2. 7. 6. Hand axe type tools or beaked tools: such type of tools occurs in the industry of Tango Nao (Fig.1, No. 8). Layer 6 of Ango Gatkai also yielded a few tools (Fig. 10, Nos. 8, 9 and 10; and Fig. 9, No. 1).

2. 7. 7. Cleavers: Guloono Kamar (Fig. 3, No. 37) and Ango Gatkai (Fig. 4, Nos. 2 and 3).

2. 7. 8. Choppers: Ango Gatkai layer 6 (Fig. 8, Nos. 24 and 27; Fig. 10, Nos. 14 and 27), and Tango Nao (Fig. 1, No.10).

2. 7. 9. Bill hook type tools: they are found in layer 6 (Fig. 4, No.26; Fig. 10, No.12. Even layer 5 also yielded a single example.

2. 7. 10. Triangular flakes with dihedral butt: both layers 6 and 7 yielded this type of tools. These are layer 7 (Fig. 4, No.8); and layer 6 (Fig.10, Nos. 3, 4 and 12).

2. 7. 11. Large Levallois flakes: Layer 7 Fig. 4, No.18, Fig.8, No.15; Fig.10 No.1 layer 6; Tango Nao Fig. 2, No.2. A similar Levallois flake is found in the Mousterian industry of Teshik-Tash (Allchin, 1999, Fig. 7, No.8).

2.7. 12. Core scrapers or carinated scrapers: Fig. 5, Nos.10a, 11 and 19 layer 7; Fig 9, Nos. 29,37,38 and 39, Fig. 10, Nos.33,34, and 35) layer 6; However, it is strange that the Tango Nao could not yield any carinated scrapers. But Guloono Kamar yielded core tools and carinated scrapers (Fig. 3, No. 44); and Smasto Arkhai (Fig. 25B, No.1).

2. 7. 13. Transverse scrapers: Tango Nao (Fig. 2, Nos.5 and 15), Hisar Kot (Fig. 25A, No. 6), Smasto Arkhai (Fig.25B, No. 20); layer 6 (Fig. 9, Nos.2 and 17; Fig. 10, Nos. 32, 37, 38 and 39; Fig. 11, No.5) and Tango Nao (Fig. 1, No.52).

2. 7. 14. Side scrapers: Tango Nao (Fig.1, Nos. 1- 6), Hisar Kot (Fig. 25A, Nos. 2 and 3), and Ango Gatkai (Fig. 10, Nos.5, 13 and 28).

2. 7. 15. Triangular point like knives or blades: Hisar Kot (Fig. 25B, No.14); layer 6 (Fig.11, Nos.11 and 24); Smasto Arkhai (Fig. 25B, No. 27; Layer 6 (Fig. 9, Nos. 21, 22 and 24) and Tango Nao (Fig. 2, Nos. 25 and 30).

2. 7. 16. Canted scraper: Smasto Arkhai (Fig. 25B, No. 30), Fig. 5, Nos. 23 and 24 and 26) and (Fig. 10, Nos. 17, 19, 22 and 23).

2. 7. 17. Sub-rectangular transverse scrapers: these tools occur in layers 6 and 7, they are flat on the ventral surface but taper toward the cutting edge (Fig. 10, Nos.

37, 38 and 39), (Fig. 5, No.9) and (Fig. 5, No.7) the last example may be called cleaver.

2. 7. 18. Convex-end scrapers: Tango Nao (Fig. 1, No. 11), Fig 2, No.13), Guloono Kamar (Fig. 3, No. 14), (Fig .5, Nos.5 and 7), (Fig. 10, No. 20) and (Fig. 11, Nos. 20, 19).

2. 7. 19. Denticulates: Tango Nao (Fig. 2, No.10), layer 7 (Fig. 5, No.10b; Fig. 6, No. 8 and 11); Guloono Kamar (Fig. 3, No. 44); Smasto Arkhai (Fig. 25 B, No. 2).

2. 7. 20. Points: Guloono Kamar (Fig. 3, Nos.1, 2, 3, 4 and 15). Among these the best example is No.2, which is bifacially worked, it must have derived its shape from the heart shaped Mousterian late Acheulian hand axes but here these are flatter. Tango Nao (Fig. 1, Nos.28, 29, 30 and 33), here (Nos.1 and 30) are typical Mousterian point. Tango Nao (Fig. 2, Nos. 1, 34 and 37) here also (No.1) is the typical Mousterian point; Hisar Kot(Fig. 25A, Nos. 9, 13 and 16). No.16 is the best example, Smasto Arkhai Fig. 25B, Nos.15, 16 and 17). No. 15 is the best example of Mousterian point. Ango Gatkai layer 7 bears points as shown in (Fig. 6, Nos. 12, 13, 15, 16, 22 and 28). No. 22 is a tanged point. All these are Mousterian points. Fig. 6, No. 13 shows a bone splinter suggesting bone working at the site. Similarly, (Fig. 6, No. 15) is a point with thinned butt / base. Fig. 4, No.14 is a point Soyons only single example from the excavation but we have also a surface piece (Pl. 42). Fig. 9, Nos.5, 6, 8-12, 13, 15, 18 and 19); layer 6 (Fig. 8, Nos. 12-14 and 20); Fig. 11, No. 25 layer 6; Shahidano Kamar (Pl. 102, Nos. 1-3).

2. 7. 21. Awls or borers: Fig. 4, No. 13; Fig. 5, No. 23; Fig. 8, No. 17, 19; Fig. 10, No. 47 ; Guloono Kamar Fig. 3, Nos. 8 and 28).

2. 7. 22. Burins: Fig. 11, Nos. 21, 26 and 27; Fig. 1, Nos. 34 and 45 ;Tango Nao Fig.2, Nos. 9,16, 26; layer 7 Fig. 5, No.14, Fig. 9, Nos. 31, 32, 28, 33 and 35; Fig. 10, No. 46; Fig. 11, Nos.13, 14, 21, 26 , 27 and 28). Smasto Arkhai (Fig. 25B, Nos.25 and 34).

2. 7. 23. Notched tools: (Fig. 11, No.,9, 31); Smasto Arkhai (Fig. 25B, No. 28) Fig. 5, No. 17).

2. 7. 24. Tranchets: (Fig. 5, Nos. 22 and 29; Fig. 4, No. 21 and Fig. 3, No. 51; Guloono Kamar (Fig. 3, No. 29).

2. 7. 25. Knives blades: Tango Nao (Fig. 2, No.17), Guloono Kamar (Fig. 3, Nos.19, 21, 22, 23 and 24) and (Fig. 6, Nos. 10 and 21).

2. 8. Microliths or Micromousterian.

The most significant evidence of Micromousterian or small tools was provided by the Stone Age site of Ango Gatkai. The site yielded microliths of the Middle and Upper Palaeolithic periods (Figs.7 and 12). The Palaeolithic site of Ango Gatkai has been excavated in the recent past (Ali and Rahman, 2005: 124-143). The evidence produced by the excavation covers the Palaeolithic (Middle and Upper) and the Neolithic periods of the Stone Age while the Mesolithic period which is transitional between these periods is missing from the stratified cultural deposit. The significant evidence yielded by the excavation of this rock shelter is the co-occurrence of small and large tools. Such type of small tools or Micromousterian has also been reported from Jabrud in Syria in Western Asia (Bordes, 1968: 26, from Sanghao Cave in the North-west Frontier Province (Dani, 1964) and Riwat 55 from the Soan Valley in the Punjab (Rendell, et al., 1989: 188-190). It may be mentioned here that the Mousterian tools from this area have very close resemblance with those found in Europe and Western Asia. On the contrary, the tools from the Middle Palaeolithic of the Soan valley and India are markedly different from this area. The stratigraphical sequence of seven layers is (1-7) from top to bottom. The lower two layers, 7 and 6, are Mousterian while layers 5 and 4 are Upper Palaeolithic, and the upper layers from 3 to 1 are Neolithic. Our chronology here bases upon typology rather than absolute dating. However, layer 6 also demonstrates some characteristic features of the Upper Palaeolithic. The distinguishing feature of the Bajaur-Mohmand Middle and Upper Palaeolithic is the presence of microliths or small tools that occur in equal proportion with those of the large tools. Perhaps this feature distinguishes the area in the entire south Asia and in the neighboring countries of Central Asia including Afghanistan. Such evidence of the small tools is provided only by the Sanghao Cave but in a limited number. The presence of the very small tools raises two questions to the mind. First, there was no scarcity of raw material in the area. The source of raw material to

the Palaeolithic man of Ango Gatkai was the perennial *khwar* (stream) that flows very close to Ango Gatkai rock shelter. He obtained pebbles and nodules of chert from the same *khwar* for his tool kit. Secondly, the Palaeolithic man in spite of abundantly available raw material, resorted to small and tiny tools is not beyond cultural significance. From the above facts we come to the conclusion that the Palaeolithic man at Ango Gatkai had full command over shaping and manufacturing both microlithic and large artefacts of chert and quartz. They showed high skill in making these artefacts by using Levallois and discoidal flaking techniques. We also believe that all these small tools must have been used at the site rather than out side for skinning small animals, shaping wood and bone implements, and also for the preparation of vegetable food. In the making of these microlithic tools, they have demonstrated high specialization. The cultural significance is that earlier it was believed that the microliths or small tools were the characteristic of the Mesolithic cultures only but now we are of the view that small tools are also found in the Middle and Upper Palaeolithic industries. From the above facts, we have concluded that the microlithic tools are not the result of any simple diffusionary mechanism from abroad. We emphasize the point that these small implements represent local variant of its own origin. The same may be said about the author of these artefacts. The maker of these tools is not known whether it was Neanderthal or *Homo sapiens sapiens*. The use of the Levallois and discoidal flaking techniques persisted throughout into the Paleolithic period. As mentioned above we do not know to why the Paleolithic man in this area resorted to the manufacturing of such small tools. From the analytical study of these tools, one can reach the conclusion that the prevailing environmental conditions in the area during the last glaciation pressed the Palaeolithic man to fashion his tools to serve him in a better way. He also chose to inhabit rock shelters and caves as compared to Lower Palaeolithic. He modified his tools largely.

In conclusion, the area under discussion must have played a significant role in the manufacturing of microlithic artefacts of the Middle and Upper Palaeolithic periods and in their regional and extra-regional diffusionary mechanism. The hypothesis that Neanderthal, the alleged author of various Mousterian cultures throughout the world, does not seem to be logical as much research yet to be carried out to prove this hypothesis. Neither there is any confirmed evidence that Neanderthal was replaced by *Homo sapiens sapiens*. It may be noted here that typical Mousterian tools also

persisted into the Upper Palaeolithic industries. Thus, the Paleolithic man at the Bajaur-Mohmand area had a vast range of small and large characteristic Mousterian tools. The presence of all common tool types of the Middle Palaeolithic suggests that the Mousterian culture must have originated in the area under discussion and is not the result of any dispersal or migratory phenomenon (Field et al., 2006). In view of the above, we assume that the Mousterian industries found in the area had their original birthplace in the Bajaur-Mohmand, and remained as ancestral point to the rest of the Mousterian cultures elsewhere in the region whether it is Afghanistan or Central Asia or even Western Asia. The same may be said about the succeeding Upper Palaeolithic of the area where characteristic Upper Palaeolithic tools have been found. There are certain tool types that characterize the Aurignacian elsewhere in the world. Because of the presence of all Aurignacian type artefacts, we have also assigned the Upper Palaeolithic of the Bajaur-Mohmand area to the Aurignacian of Europe and Western Asia. Besides, we put forward the hypothesis that this area must have originated the Upper Palaeolithic that diffused in all directions in the course of time.

2. 9. The Middle Palaeolithic in Pakistan and its Neighboring regions

2. 9. 1. Soan Valley in the Potwar Plateau

The first evidence of the Middle Palaeolithic in Pakistan was found by De Terra and Paterson in the Potwar region who assigned the stone artefacts to the third glacial age. In terms of typology and technology, they assigned these artefacts to Late Soan A and Late Soan B of the Soan industries (De Terra and Paterson 1939: 308-310). These industries are found in association with Terraces 2 and 3 of the Soan terrace system bearing the Potwar Basal gravel and Potwar Loess (Paterson and Drummond: 1962: 13; Fig. 2).

The Late Soan A: The Late Soan A industry comprised a variety of pebble tools but predominately flake tools with distinct Levallois manufacturing technique. The flakes show simple plain and high angled platforms. There are also found some worn specimens (De Terra and Paterson, 1939: 308; Pls. XXIX-XLI). Commenting upon the flakes of the Late Soan A de Terra and Paterson noted that "the number of the

retouched flakes is comparatively smaller, which may be due to the quartzite being so hard that retouch of the edge is unnecessary" (ibid: 309).

The Late Soan B: artefacts of this industry are found in the Potwar loess/silt above the third glacial age (Ibid: Pl. XLII). The tools associated with this industry are very fresh and unworn with no sign of wind blown abrasion as they occur in a wind blown deposit. In this industry about half flakes show faceted platform with complete absence of retouch but few bear marks of utilization (ibid: 309). The flakes are characterized by blade or elongated flakes and a few take the form of triangular and oval shape. Almost all the flakes show large primary flaking scars on their upper surface. These flakes show marked resemblance to the Late Levalloisian of Europe (ibid: 310). Paterson and Drummond in their later publication 'Soan the Palaeolithic of Pakistan' have elaborately described the same collection from the Soan Valley (Paterson and Drummond, 1962). They termed the collection from the same geological context (T2 and T3) of the third glacial age as Upper Soan A and B of the Upper Pleistocene.

Upper Soan A: They observed that the upper Soan A predominate the Soan culture and the sites are widely spread along the Soan terrace system. During this time, the whole Soan Valley basin seems to have been well populated as compared to the Lower Palaeolithic until the rise of the food growing population. The site of Ghila Khan was selected as representative. All main types from elsewhere were present there. This is the richest among the Upper Soan A stations. A total number of 380 artefacts of the Upper Soan A were found in which 120 came from Ghila Khan.

Eight Soan types tools were identified which are : 1, Terminal flat base 2, unilateral flat base 3, bilateral flat base 4, convex oblate 5, pointed oblate 6, unilateral nucleate 7, peripheral nucleate and 8 the turtle back other than cores and flakes. The characteristic feature of the cores is the appearance of the discoidal or tortoise core (ibid: 74).

Table 2.1: Relative chronology of the Pleistocene deposit of the Potwar Plateau, according to de Terra and Paterson, 1939.

<i>Depositional Unit</i>		<i>Correlation with Alpine glacial sequence</i>
Pink loam / silt / gravel	Terrace 4	4 th glaciation (Wurm)
Thin loam	Terrace 3	3 rd interglacial
Potwar Loessic silt	Terrace 2	3 rd glaciation (Riss)
Upper Terrace Gravel	Terrace 1	2 nd interglacial
-----erosion / tilting-----		
Boulder Conglomerate		2 nd glaciation (Mindel)
-----erosion / tilting-----		
Pinjor Beds		1 st interglacial
Tatrot Beds		1 st glaciation (Gunz)
-----Unconformity-----		
Dhok Pathan		

Table 2.2: Modified relative chronology of the Siwalik and Pleistocene deposits of the Middle Soan Valley, after H. Rendell, 1982.

		<i>Tentative dates</i>
-----erosion / deposition-----		
Loess deposition		
-----erosion / warping-----		
Lei Conglomerate Complex (valley fill) includes deposition of loess/uplift partly contemporaneous		—Middle Palaeolithic (0.4 mya)
-----uplift/folding start of erosion-----		0.7- 0.5 mya
Upper Siwalik conglomerate		1.9 mya
Siwalik groups {	Soan formation	
	Pinjor Beds	2.5 mya
	Tatrot Beds	
	-----unconformity-----	
	Dhok pathan formation	
Nagri Formation		
Chinj Formation		

Most of the flakes of this industry show unprepared, cortical, high angled platforms. Blade are absent but squat, sub-triangular or sub triangular shapes are present which have been worked out from the tortoise cores – a tendency towards the European Levalloisian technique but no faceting of the platform. Generally, the platforms are small and nearly at right angles to the surface. Flakes from the disc-like cores yielded the triangular forms a step towards Mousterian cultures. These tools are heavier near the platform and thinning away towards the distal end-a characteristic of the true points. In the upper Soan A the retouch or secondary trimming of the tools is rare. The use of the hard quartzite raw material, when struck yield sharp edges and secondary trimming is unnecessary (ibid: 75).

Upper Soan B: The upper Soan B artefacts are found in the thin Basal Gravel and re-deposited Loess of Terrace 3 of the Soan Valley and attributed to the 3rd glacial of Kashmir. A factory site or working floor was discovered by De Terra at site Adiala (ibid: 40) where about 600 artefacts were collected. The artefacts were fresh and unpatinated. The Soan type's tools of the previous industry continue which are 8 and 9 type of core and two types of flakes-with faceted platforms and flakes with unfaceted platform. Mousterian type's tools appeared. The secondary trimming of the flakes is not developed while step retouch is rare.

Some of the Late Soan A and B artefacts of De Terra and Paterson (1939) and Movius (1944), have been attributed by Paterson and Drummond to a so-called new tradition-upper Clacton A and B (1962: 93). Artefacts of the upper Clacton were collected from four sites. A total number of 100 specimens were found. About 40% are cores or Soan pebble tools while the remaining artefacts are flakes and form a different group, distinct from the preceding upper Soan A. Based on this distinction and the absence of the typical Soan type tool led the authors to suggest a new industrial tradition of intrusive character during phase u1 and terrace 2 ((Paterson and Drummond, 1964, Fig.2). There are 10% biconical cores, 10% of pebble cores, 10% spindle cores about 3% Mousterian /Discoidal cores.

Upper Clacton (Punjab) B: In the Potwar Loess and a few feet above the Basal gravel, almost contemporaneous with the upper Clacton A, nearly 60 flakes and cores were found at two sites. The small assemblage comprises developed cores and their flakes. Majority of the artefacts are very fresh, sharp and unpatinated (ibid: 91).

Pebble cores are absent from this group. However, a small disc core, a double faceted core and small reduced unfaceted tortoise and a spindle cores are present.

The flakes struck from the above cores are generally triangular or blade-like in shape and thinner compared to those of the basal gravel. The flakes and points show sign of wear on the edges. These two groups (Upper Clacton A and B) are contemporary in geological time. Both the cores and flakes are closely resembled with European Mousterian in terms of typology and time range. The most striking aspect is the absence of the Soan type tools characteristic of the Upper Soan A and B. "This sudden disappearance of the Soan and the appearance of disc cores and finely faceted tortoise cores can only mean the intrusion into or invasion of the region by an extraneous culture complex (ibid: 92). However, concluding on the Clactonian the authors opined that the Clactonian was an intrusive culture rather than an invading culture (ibid: 93). As we viewed earlier that the Bajaur-Mohmand area must have remained an ancestral point to the neighboring region lends support to this viewpoint.

In 1974, Dr. Salim conducted survey in the Soan Valley and discovered a few Palaeolithic sites. These sites are located along the Grand Trunk road, he numbered them as Ps1- to Ps 9 and a separate name was given to a site found near the Gujar Khan as no. 10. He re-examined some of the already explored sites and made in-depth study of the stone assemblages from these sites (Salim, 1986: 60-65). From 1985 to 1988, Salim conducted surveys and explorations in the Potwar region to locate new Palaeolithic sites. He discovered 23 Palaeolithic sites of which 13 belong to Middle Palaeolithic (Salim, 1992: 34-51).

The British Archaeological Mission to the Potwar region has conducted excavation in 1981- 1982 at the site of Riwat 55. As a result of the excavation, they have noted some artificial Palaeolithic architectural features. However, they all seem to have been natural rather than deliberate at this primitive Palaeolithic stage. The site has been dated by thermoluminescence (TL) to ca 45,000 B.P. (Rendell et al., 1989: 151). As regards the stone assemblage, they have classified it into two groups. The first group consists of fresh, sharply edged flakes, blades and cores and the other one of deeply patinated and often abraded flaked cobbles and flakes.

Raw material and tool making technique: the main source of raw material for making stone tool in the Soan Valley is quartzite cobbles. In the Riwat area, tortoise or Levallois cores and flakes are occasionally found as surface finds. On the contrary, none was found in the excavation of site 55 and the flaking of the quartzite cobbles show minimal core preparation (ibid: 182).

Three types of artefacts have been recognized at Riwat 55. They are as flakes, blades and cores.

Flakes: in the stone assemblage of Riwat, both cortical and non-cortical flakes are present.

Core preparation: at the site of Riwat 55, core preparation seems to have been minimal. The whole site contained little evidence of disc and prismatic cores or of Levallois tortoise cores.

Blades: commenting upon the blade industry, "some blade pieces stand out as unusually small and delicate. Most of these are broken. The blades suggest that they were integral part of the fresh assemblage and when occasion demanded, the quartzite from which they were made could be worked into extraordinarily delicate and skillful manner (Rendell et al., 1989: 188).

Retouch and edge damage: many pieces have small flake scar on one or more edges and this type of modification may have been deliberate or unintentional (ibid: 189).

The stone industry of Riwat 55 is characterized by the absence of prepared-core technique; absence of centripetal flaking of either of cores and flakes; the mass production of cortical primary and non-cortical secondary flakes. The former flakes show cortex on their surfaces and the latter flakes are found without cortex. There are some blades with and without cortex on their dorsal surfaces. The presence of tiny or microlithic tools is the dominant feature of the lithic industry of Riwat 55. This very element-the microliths or Micromousterian is the clear evidence of the Middle Palaeolithic in the Soan area. Based on the presence of these micro artefacts we are of the view that the Riwat industry definitely belongs to the Middle Palaeolithic rather than the 'Initial Upper Paleolithic'. Such microtools are the characteristic feature of

the Middle Paleolithic or Mousterian in this area, even the Sanghao assemblage is contained small tools.

However, Rendell et al (1989) have shown that the stone assemblage from Riwat do not fall in the range of Middle Palaeolithic as they remarked, "The paucity of evidence for the Levallois technique of core preparation at site 55 implies that this assemblage should not be called Middle Palaeolithic, in the sense used in areas further west, or Middle Stone age as defined in peninsular India. The assemblage from Riwat 55 cannot be regarded as Late Soan in the sense defined by Paterson (De Terra and Paterson 1939:185-90). Paterson Late Soan was poorly dated and largely on typological grounds. It was also identified from surface collection that they have excluded certain small items seen at the site of Riwat 55. Paterson Late Soan also included large numbers of keeled scrapers high angled burins (ibid, 1939: 277) and large numbers of items made by Levallois technique (ibid: 28-50) that are not found at Riwat 55" (Rendell et al., 1989: 109-191). Referring to the work of De Terra and Paterson (1939), Paterson, and Drummond (1962), they have not agreed with the classification of Late Soan Industries as they are poorly dated and exclude some microliths, which are part of the Riwat assemblages. Keeping in view these factors, they defined the lithic assemblage from Riwat 55 as 'late Early Palaeolithic or initial Upper Palaeolithic' characterized by the presence of blades and bladelets (ibid: 191). They have not agreed with de Terra and Paterson (1939) and Paterson and Drummond (1962) that there were two parallel but separate Palaeolithic traditions- flake and hand axe in the Punjab. Only the site of Chauntra provided the existence of hand axes of the late Acheulian type in association with core and flakes of late Soan Age (De Terra and Paterson, 1939: 312; Paterson and Drummond, 1962: 115). Instead, it was suggested by the British Archaeological Mission that there was only one Middle Pleistocene tradition in the Punjab and this used and discarded both hand axes and flakes. As Graziosi stated, "everything I found gave evident proof that the flake industry existed in the same period as the pebble tools and hand axes" (Graziosi, 1964: 39).

2. 9. 2. Sanghao Cave: the most important Middle Palaeolithic (Mousterian) site of the North-West Frontier Province is the Sanghao Cave. The Sanghao Cave was discovered by Dani in 1962. He collected some artefacts from the cave and realized

its cultural importance. In 1963 the cave was excavated which gave stratigraphical sequence of 12 layers (Dani 1964; Fig. 6). Five periods were identified by the excavator. The upper two periods (V-IV) belong to the historic periods while the lower three periods (I-III) belong to the Stone Age. Dani's periodization of the Sanghao Cave cultural deposit depends upon the falling and sliding of rocks within the cave (Dani, 1964: 13). However, Dani sees continuity and homogeneity in the stone industries of quartz artefacts. Similarly, Ranere also noted the continuity of the quartz industries in the cultural horizons of the cave deposit (Ranere, 1982:133-142). Similar view was presented by Dr. Salim on the Sanghao Cave lithic assemblage when he noted that there was continuity in the Sanghao Cave assemblage (Salim, 1986: 110). Dani attributed the lithic industry of Sanghao to the Levallois-Mousterian tradition of Western Asia. Bridget Allchin visited Sanghao Cave and examined the excavated material there. She compared the stone industry of Sanghao Cave to the Mousterian of Western and Central Asia (Allchin, 1975: 39; Allchin 1999: 80-81).

We noted a considerable affinity in the Mousterian artefacts of the Sanghao Cave and those of the Bajaur- Mohmand area. The artefacts of layer 11 and 12 of the Sanghao Cave are comparable to the layer 6 of Ango Gatkai (Ali and Rahman, 2005). The presence of typical Mousterian industry in both areas and regions, what is generally known as Gandhara, suggests a common origin. Of the typical Mousterian we mean all the principal groups within the industries that are noted by prehistorians, they are found in separate archaeological horizons (Bordes, 1968; Ranov and Davis, 1979; Davis and Ranov 1999). No two groups are found in similar archaeological context. All these made their appearance in the first half of the last glaciation (Wurm) of the Alpine. There is a consensus among the prehistorians that all the groups belong to the Mousterian tradition. We also noted that there are no marked variations in the Mousterian industries of this region. The same uniformity in the stone industries favours a single variant of Mousterian tradition for this region. The lower layers, especially 11 and 12, show close resemblance with the layer 6 of Ango Gatkai. Though most tools of layer 7 of Ango Gatkai are absent from the earliest levels of Sanghao Cave, yet many artefact types present similarities with the former. Some of the formal type Mousterian artefacts are absent from the Sanghao Cave suggesting a later manifestation of the Mousterian tradition at the site. In brief, the Sanghao Cave Mousterian shows very developed form, which according to our view had originated

in the Bajaur–Mohmand area, and spread in different directions from its ancestral centre. The lowest layer 13 (Ranere, 1982) at Sanghao Cave has been dated by C14 determination to ca. 40,000 B.P. (Khan and Gowlett, 1995: 182-87)

2. 9. 3. Rohri Hills in Sind, Pakistan: a survey was conducted in the Rohri Hills, in the province of Sind, Pakistan by B. Allchin in 1976 (Allchin, 1994: 131-151). She discovered a large number of artefacts of the Palaeolithic period among which Middle and Upper Palaeolithic tools are found beside Harappan blade tools. The Middle Palaeolithic artefacts were heavily sand blasted with blunted edges. They show a dark brown patina on their surface. The Middle Palaeolithic man used chert of dark gray with mottled and rust color patina. About the Middle Palaeolithic B. Allchin writes, "A curious feature of the Middle Palaeolithic of the northern Rohri Hills is the use of chert nodules in appropriate size as cores, with minimal amount of preparation, often without removing the cortex. Flakes after flakes appear to have been struck from the same face of a larger core /nodule in the same direction" (ibid: 137).

Chancha Baluch and Nawab Punjabi are the main Middle Palaeolithic sites in the Rohri Hills. She also reported Lower, Middle and Upper Palaeolithic artefacts from Milestone 101, Hyderabad, in Sind (ibid: 141).

In 1994-97 survey and excavation were conducted in the Rohri Hills by a team from the University of Khairpur (Pakistan) and the Ca' Foscari university of Venice (Italy). They discovered new Palaeolithic sites. These sites include Shadee Shaheed, Alam Sultan and Unar. The artefacts yielded by these sites are ranging from Lower and Middle Palaeolithic through Upper Palaeolithic. In this context, series 5 has been attributed to Middle Palaeolithic. In terms of physical conditions, these artefacts were attributed to the Palaeolithic period. The tools have been attributed to certain flakes made on Levallois technique (Negrino and Kazi, 1996: 7-38).

2.9.4. Middle Palaeolithic in Afghanistan: there are five Middle Palaeolithic sites in Afghanistan. They include Darra-i-Kur, Ghare-i-Gusfand, Hazar Sum, Kara Kamar II, IV, and Dasht-i-Nawar. However, in terms of tools types Darra-i-Kur may be regarded definitely as the Middle Palaeolithic site (Dupree, 1972: 5-13 Dupree, 1978:260-61). The prehistoric research in Afghanistan began after the discovery of a flake tool by R. Allchin (1953) in the Oxus Valley in western Afghanistan. The flake

tool was attributed to Middle Palaeolithic (Mousterian) on the basis of typical Mousterian retouch (Allchin, 1953: 227).

The lithic industries show two technological traditions for which Levallois prepared core technique and the discoidal flaking technique were employed by the Middle Palaeolithic man in Afghanistan but the latter was used predominantly. The stone assemblages comprised discoidal cores, multiple platform cores, few hand-axe type tools, side scrapers were rare, and blades were different considerably from the Upper Palaeolithic types. Irregularly or partially retouched tools were too frequent (Srivastava, 1982: 192-199; Puglisi, 1963: 5-6).

Faunal remains: associated faunal remains at Darra-i-Kur Middle Palaeolithic included sheep, goat and large bovids. From other sites, no evidence of fauna has been found. Davis has suggested that the Middle Palaeolithic hunters in Afghanistan and Iranian Plateau and the Turan low land concentrated on essentially modern ungulates such as sheep, goat onager, auroches, red-deer and gazelle. No evidence of onager red deer and gazelle has been found from Darra-i-Kur Middle Palaeolithic level though such evidence have been reported from Darra-i-Kur Goat cult Neolithic. Thus it is obvious that Middle Palaeolithic man in Afghanistan has adapted to the hunting of selective group of small animals such as goat, sheep, and cattle of wild variety which eventually were domesticated in the later times (Srivastava, 1982: 165).

Floral remains: no floral evidence has been found from the Middle Palaeolithic levels in Afghanistan. The economy of the Middle Palaeolithic stage in Afghanistan was the same as of the preceding period i.e., hunting and gathering but there was definite improvement in man's environment adaptation which is well evidenced by the exploitation of a selective species of animals.

The Middle Palaeolithic man lived in caves and rock shelters that were provided by the natural shelters to nomadic bands of hunters from the cold climate of the period. Of the five Middle Palaeolithic sites of Afghanistan three Darra-i-Kur, Ghare-i-Mordeh Gusfand and Kara Kamar are rock shelters or caves while the remaining two- Hazarsum and Dasht-i-Nawar are open-air sites. The cultural zone of the Middle Palaeolithic is very wide extending from Western Europe through Western Asia and central Asia, and Afghanistan to inner India. Afghanistan and the Bajaur-Mohmand

area occupy the very central point in it. Some scholars have used the term Mousterian for this industry in Afghanistan but according to Davis careful comparative study of the Middle Palaeolithic industry with that of Western Europe, particularly of France, disproves this and any genetic or direct relationship of Afghan Middle Palaeolithic industry with the Mousterian industry of France. Therefore, the term Mousterian should be dropped in the case of the Afghan Middle Palaeolithic. In view of all these facts, the beginning of the Middle Palaeolithic may be pushed back to ca. 45,000 B.C. Therefore, the time bracket of ca. 45,000- 35,000 B.C for the Middle Palaeolithic culture in Afghanistan seems to be reasonable (ibid: 192-94). There is absence of Mousterian type tools in Afghanistan so some scholars like Davis and others are not in favour of using the term Mousterian for Afghan Middle Palaeolithic culture (Dupree, 1978: 254, 260). Since there is not sufficient evidence of Mousterian tools that are found in the industries of France or Western Europe. The lithic industries of the Middle Palaeolithic of Afghanistan contained very few side scrapers, which is the characteristic features elsewhere. However, Srivastava is of the view that Afghanistan has been remained an independent centre of the Middle Palaeolithic culture which was a part of the macro region extending from Western Asia to India (ibid, 1978: 199)

2. 9. 5. Middle Palaeolithic of Central Asia: the Middle Palaeolithic of central Asia is well defined and best documented phase of the Palaeolithic period of Central Asia. There are caves and open-air sites with stratified cultural deposits. In one case the cultural material yielded by these sites are also associated with the faunal remains of the author of the cultural relics. In this context, the famous cave site of Teshik Tash was discovered and excavated by Okladnikov. The Mousterian industry of Teshik Tash is characterizes by the presence of various kinds of scrapers with steeply trimmed working edges, long blade flakes worked on one or both edges, large flakes resembling chopping tools, characteristic Mousterian points and a few simple burins. The cave site is located within the gorge of Gissar range of the Pamir-Alai mountain ranges (Gupta, 1979: 61). The common material used for tools was locally available rock for the manufacturing of tools.

The fauna of Teshik Tash included mountain goat, wild horse, leopard, brown bear, hyena and remains of small animals and birds (Allchin, 1999: 84-85).

Within the habitational deposit was found the skull and a few large bones of an eight to nine years old boy. They were kept in a shallow pit encircled by horns of the mountain goats planted on the ground. Mountain goat was the more preferred hunting animal hunted by the Teshik Tash man (Gupta, 1979: 61; Fig. 4.2).

For the Middle Palaeolithic culture of Central Asia, on the basis of tool typology Ranov has identified four different tool making traditions. These went into the make up of the Central Asian Middle Palaeolithic cultural complex. Ranov (1968) has divided the known Middle Palaeolithic into four technological variants or facies on the basis of artefact typology and technology (Ranov and Davis, 1979: 256-57; Gupta, 1979: 62; Davis and Ranov, 1999: 186-93). They are as follow:

1. Levallois type sites are Obi Rakhmat, Dzhar Kutan and Khodzhakent.
2. Levallois-Mousterian type-sites are Kapchgai, Tossor, Ferghana, and Kayrak Kum.
3. Typical (Mountain) Mousterian type-sites are Teshik Tash and Ogzi kichik.
4. Mousterian of the Soan tradition are Kara Bura and Ak Dzhar.

However, Davis and Ranov expressed their view that they do not consider these technological variants as separate cultural groups (ibid: 256). However, contrary to the above four variants or forms, Formozov thinks of a single wide spread Mousterian population without strong internal segmentation (Formozov, 1977).

Most recently Vishmastkii has pushed the pendulum in the opposite direction instead of finer distribution he has lumped together all the Central Asian Middle Palaeolithic into one category "ordinary Mousterian." He assigned most of the Central Asia Middle Palaeolithic variability to sites types. As a whole the Central Asia Middle Paleolithic is based on flakes struck from platform and discoidal flake cores. In a recent review and assessment of the Zagros Mousterian has lent support to the long held view that there is basically only one variability of the Mousterian in that large area. Moreover, both Vishmastkii and Ranov pointed to the Zagros as the most likely source of the Central Asia Mousterian because the two regions share many similarities. Similarly, Okladnikov about 60 years ago saw a strong resemblance between the Levallois Mousterian of the near east and that of Teshik Tash cave

(Movius, 1953: 11-71). Recently, Middle Palaeolithic chronology has been greatly expanded because of discoveries in Tajikistan loess. The prevailing view stemming from excavations in caves and open-air sites had placed the Middle Palaeolithic within the last glacial period with a maximum age about 100,000 years. One of the C14 determinations from the Middle Palaeolithic is from Khudzhi near Dushanbe in Tajikistan and it is (Gin 2905) 38000 ± 700 years. Another date is from the excavated Middle Palaeolithic industry from Pedocomplex at Khonako locality in Tajikistan. This soil complex has been dated to 200,000 years B.P. It doubled the Middle Palaeolithic date in Central Asia. However, there is no intervening material to bridge the gap between the Khonako and the Middle Paleolithic cave (Davis and Ranov, 1999: 191).

Chard also viewed Central Asia Mousterian as originating in the Middle east and then continuing on to Mongolia and Altai (ibid: 191).

From the above lines, it is clear that the prehistorians of Central Asia had no Mousterian cultures in their neighborhood then so they considered Middle East as the ancestral point to their own Mousterian cultures. By contrast, we are of the view that most of the Central Asian Mousterian cultures most probably owe their origin to the Middle Palaeolithic in the Bajaur-Mohmand area. Our hypothesis bases upon the facts that all Mousterian type tools are present in our collection. We have no absolute date for our material. However, stone artefact typology, technology are the main source of information for the Mousterian culture in the area.

2. 9. 6. The Middle Paleolithic of India: the Middle Paleolithic of India was first identified by Sankalia at Nevasa. Then extensive and intensive explorations had taken place all over the subcontinent, which brought to light numerous Middle Palaeolithic sites from different parts of the country. This phase of the Middle Palaeolithic is well established. The stratigraphical position is very clear. Generally the Middle Palaeolithic industries belong to 'Gravel II' or the finer gravel which overlies the 'Gravel I'. The latter bears the Lower Palaeolithic horizons. The industries of the Peninsula India are believed to constitute a single culture group designated by Sankalia as 'Nevasan'. In the light of recent research, the Middle Palaeolithic industries of northern, central and the peninsular India show a homogeneous character. In western India Middle Palaeolithic artefacts are found in the cemented sandy pebbly gravel, overlying the mottled clay. Several Middle Palaeolithic sites

have been found in Wagaon and Kadmali river valleys in Mewar. There is distinct change in the tool kit. Now the tools are smaller than the Early Palaeolithic. They are made from cryptocrystalline silica fine grained such as chert, agate, jasper etc. Hand axes and cleavers become rare, choppers and chopping tools are absent altogether. The assemblage comprises a variety of scrapers, awls, points, blades and flake tools. In western Rajistan (Marwar), as well many Middle Paleolithic sites have been found in the valleys of Luni and its tributaries. In the Luni Valleys, materials such as silicified wood, rhyolite, porphyry have been used for tools manufacturing. The stone industry still contained hand axes and cleavers. The Levallois technique is more prominent. Similarly, from Buddha Pushkar Middle Palaeolithic industry comprises scrapers, chopping tools, cleavers, blades, burins and flakes struck from prepared cores. These tools belong to the weathered soil horizon representing a wet or humid phase.

Table 2.3: Misra has worked out the following stratigraphy of the various sediments and their cultural association (after Misra, 1977).

Lithological Units	Cultural Association
Basal or bed rock	_____
Mottled clay	_____
Bouldery pebbly gravel	Acheulian assemblage.
Mottled clay	_____
Sandy pebbly gravel (cemented)	Middle Palaeolithic
Silt	Microliths on its surface
Sand dunes	Mesolithic.

Table 2.4: Tentative chronology of major climatic phases in late quaternary of Gujarat and Rajasthan (after Allchin et al., 1978).

Phase	date	Evidence
Moister phase	10,000-9500 B.P	pollen profiles
Major dry phase	pre -10,000 B.P	
	Later Upper Palaeolithic	dunes extend over Lake basins and M.S soils.
Major wet phase	Middle Stone Age	Major phase of weathering Decalcification of dunes
Major dry phase	pre-Middle Palaeolithic	integrated drainage of River Luni

Dating: no precise dates are available for the Middle Palaeolithic of India. There are few absolute dates, which are subject to serious reservations. However, the C14 dates show that the Middle Palaeolithic of India falls in the range of ca.37, 000-11000 B.P (Agrawal 1982: 31, 55).

The lithic industry of the Middle Paleolithic is characterized by the presence of various types of scrapers, awls, points of different types, choppers, some with denticulate edges, smaller cleavers with thinned butts for hafting, hand axes smaller and larger, carinated scrapers, blades and burins.

Levallois or prepared core technique and discoidal flaking technique were employed by the Middle Paleolithic man in India. The tools seem to have been manufactured by direct as well as indirect punch techniques.

From the above details regarding the Middle Paleolithic of India, it is clear that stratigraphically, technologically and typologically the period shows homogeneity to some extent.

2. 9. 7. Middle Palaeolithic in Iran: the Middle Paleolithic in Iran is found in several caves and rock shelters. Most of these sites are located in the Zagros Mountains in western Iran.

A few of these sites are described briefly as follow.

Bisitun: this cave site was excavated by Coon (1951: 53-65). It yielded about 1100 finished tools of jasper and flint. This lithic industry comprised points, scrapers, knives, flakes, and limaces. Both Levallois and non-Levallois techniques were employed for the tool manufacturing. Except points most of the typical Mousterian tools are absent from the assemblage.

Tamtama: there is insignificant evidence from the cave. A total number of 27 pieces were noted which Coon termed as nibbled pieces (Coon. 1951: 65; Pl. IV). The material is chert and cherty limestone.

Khunik: this site is located in southern Khorasan in eastern Iran. About 98 artefacts have been recovered from the site by Coon (1952: 66.). Flint, cherty limestone and quartz crystal were used for tools. The tools included blades, awls, saws and knives. The Levallois technique is not present in this industry. However, there are typical Mousterian tools.

An expedition from rice University carried out archaeological investigations into the Zagros Mountains of western Iran (Howell, 1966; Howell and Flannery 19967: 150-158). Three Mousterian sites were excavated, Kunji cave, Ghamari cave and Gar Arjeneh. All these sites are located near Khorramabad hence the lithic industry was named Khorramabad Mousterian (Hole, 1966: 3-4). The assemblage is non-Levallois in technique.

Summarizing the Middle Paleolithic sites in Iran Smith (1971) noted that the Mousterian or Middle Paleolithic in both Iran and Iraq belonged to a uniform Mousterian tradition. In Iranian Middle Paleolithic sites the Levallois technique is nearly or completely absent. Smith noted a tendency towards thick, narrow and rather small implements as compared to thin wide and flat forms in the Levant. The Levallois technique is prominent in the latter area. The Middle Palaeolithic in Iran is characterized by the presence of points, racloirs on thick blades and flakes, knives and rare burins, and discoidal cores. As to the origin of the Middle Palaeolithic cultures Smith (1971: 686) viewed that there was no substantial evidence to prove that Iran had been an ancestral center to the creation of the Mousterian cultures.

From the details given above about the Mousterian sites, it is clear that the Irano-Iraqi Mousterian shows few forms of the true Mousterian industries. They can be compared with the Bajaur-Mohmand area. However, there is marked difference in the number of dominant Mousterian tool types. In the latter region, all typical Mousterian tools occur in better form than those found in Western Asia Mousterian tradition.

Chapter Three

The Upper Palaeolithic

3. 1. Upper Palaeolithic: problems and their solutions

3. 1. 1. Upper Palaeolithic a Problem

The Palaeolithic period that covers the second half of the last glaciation (Wurm) has been designated as Upper Palaeolithic. In terms of chronological sequence, the Upper Palaeolithic has different dates of its origins with different regional variants in different parts of the world. The Upper Palaeolithic is primarily characterized by the presence of blades and blades tools. There seems to have been no scarcity of Upper Palaeolithic material from the Palaeolithic sites of the Soan Valley but due to lack of proper investigation into the Upper Palaeolithic tool types, the earlier researchers could not find the latter period. Although, it is more probable that the Upper Palaeolithic must have been a part of the Middle and Lower Palaeolithic assemblages whose presence has been claimed by many researchers in the Soan Valley (De Terra and Paterson, 1939; Paterson and Drummond, 1962 and Salim, 1986). In addition, no scientific excavations have been conducted to highlight the dominant features of the tool kit of the Upper Palaeolithic. Most of the assemblages from the Soan Valley are from surface and related to the undated boulder conglomerate and below to the thick mantle of loess (Allchin, 1999). The tools from the Sanghao Cave have not been well defined, although it has a clear-cut Upper Palaeolithic sequence in the stratigraphical sequence (Dani, 1964; Fig. 6). Right from layer 10 onward the Sanghao Cave has characteristic Upper Palaeolithic tools that are the criteria of Upper Palaeolithic in most parts of the world. Even Dr. Salim, a researcher on the same material, is unwilling to use the term Upper Paleolithic for some tools in the Sanghao Palaeolithic industry (Salim, 1986: 11). Instead, he used the term Middle Stone Age for all pre-Holocene industries of Sanghao and the Soan Valley (ibid: 25-26). There are other experts on the Palaeolithic who could not mention the Upper Palaeolithic in its proper context. For the Paleolithic of northern Pakistan Dr. Salim argued that no blade collections or assemblages of undoubted upper Pleistocene are known from Pakistan (ibid: 11). In his recent publication Salim is of the view that the Potwar region is

lacking blades and blades tools and they are not in sufficient quantities to warrant the use of the Upper Palaeolithic (Salim, 1997: 55).

There has been a lot of controversy over the presence of Upper Palaeolithic in Pakistan. Attempts have been made to solve this outstanding problem. Since the early thirties considerable researches have been carried out in the Soan Valley of northern Pakistan. As a result, many rich surface collections of Palaeolithic artefacts have been come to light. It should be mentioned here that the earlier researchers undertook extensive fieldwork in the region and analyzed the collected stone artefacts, yet they interpreted all the stone industries under the Early and Middle Palaeolithic of the Stone Age. They could not recognize the Upper Paleolithic tools in the stone assemblages. A brief reference, however, can be found in the 'Final Soan' of De Terra and Paterson (1939: 310-11; Paterson and Drummond 1962: 84-88). Allchin also briefly mentioned the existence of Middle and Upper Palaeolithic sites along the course of the Soan river (Allchin 1999: 77; also see Fig. 41 this volume). Since all the collections or assemblages from the Soan Valley were obtained from disturbed or insecure geological contexts, so the earlier researchers have no choice except to attribute all the surface collections to Middle and Early Stone Ages.

3. 1. 2. Upper Palaeolithic: a solution.

We discovered many prehistoric sites of the Stone Age during the survey of the Bajaur-Mohmand area. Many sites yielded Upper Palaeolithic stone industries. The industries comprise blades and blade tools (Ali and Rahman, 2005: 55-90). Apart from surface collection, the excavation of Ango Gatkai Palaeolithic rock shelter has yielded sufficient evidence regarding the blade and blade tools; now we have ample evidence of the presence of the Upper Palaeolithic in the area. The cultural sequence is based upon stratigraphical evidence (Ali and Rahman, 2005: 124-34).

The excavation exposed a two-meter thick cultural deposit in seven stratified layers consisting of three periods of the Stone Age at the site. On the basis of stone tools exhibiting characteristic features of the Old Stone Age, the lower four layers (7-4) from bottom to top have been assigned to the Palaeolithic period. As we have no absolute dates for our material in the area, the attribution of these layers and the material they contained are primarily based on typology and relative chronology

obtained from Palaeolithic sites in the region (Coon, 1957; Dani, 1964; Tusa, 1977; Ranere, 1982 and Salim, 1986).

After in-depth study and analysis of the artefacts from the lower layers at Agno Gatkai, we have reviewed our previous report on the excavated material of Agno Gatkai (Ali and Rahman 2005: 93). The previous stratigraphical sequence contained only Upper Paleolithic and the Neolithic periods. Now after the recognition of characteristic Mousterian tools in the lower levels, the Middle Palaeolithic has been added to the chronological sequence. Now according to the new scheme layers 7-6 from the bottom should read as the Middle Palaeolithic or Mousterian. With the new chronological order we would not change the term Aurignacian. Thus with the new order period I is Middle Palaeolithic or Mousterian; period II is Upper Palaeolithic while period III is Neolithic. Mesolithic or pre-Neolithic period is absent from the cultural profile by one reason or the other. There are certain features that characterize the Upper Palaeolithic. On the basis of marked features that are found in the Upper Palaeolithic elsewhere, we have signified it as 'Aurignacian'. It is comparable to the stone industries of Upper Palaeolithic of Western Europe and southWestern Asia (Garrod, 1938: 1-26; Oakley, 1964: 92-108; Braidwood and Howe, 1966; Braidwood, 1967: 59-74; Bordes, 1967: 19 and Bordes, 1968: 147-97).

All characteristic features of the Upper Palaeolithic are present in layers 4 and 5. Having discovered a solid evidence of the Upper Palaeolithic in the Bajaur-Mohmand area we are inclined to use the European terminology of the Palaeolithic- Lower, Middle and Upper Palaeolithic for the Palaeolithic cultures in this region (see Table 1.2).

3. 1. 3. Definition of Upper Palaeolithic.

The Upper Palaeolithic may be defined as the period in which certain characteristic features made their appearance. They include blades and blade tools of the parallel sides produced by the use of punch technique. These tools were supplemented by some special type tools such as carinated scrapers of the end and round varieties. As referred to the Upper Palaeolithic in the area it exhibits blade tools in equal proportion with flake tools like scrapers etc. The blade industry includes specialized implements such as awls and burins. Apart from awls and graters, mass

production of bone and perhaps of wood tools had also begun. All these tools are present in the preceding period of Middle Palaeolithic or the Mousterian. It is interesting to note that carinated or keel shaped scrapers of the round and end varieties had already made their appearance in the preceding period of Middle Palaeolithic. All these implements were used for the working of bones, antler, and wood and even for the soft stone as attested by a thin perforated rectangular piece of stone (Pl. 6, layer 7). Two artefacts show splinters of bone attached to them, a point in layer 7 (Fig. 6, No.13) and a carinated scraper in layer 6 (Fig. 9, No. 37).

3. 2. Upper Palaeolithic in the Area.

The excavation at Ango Gatkai has yielded two layers of the Upper Palaeolithic. The attribution of these two layers to Upper Palaeolithic is based on tools technology and typology. The same period is preceded by two layers of the Mousterian culture or Middle Palaeolithic industries. In the Upper Palaeolithic, a certain type of Middle Palaeolithic tools persists that are generally called formal type Mousterian tools. As we have assigned the Upper Palaeolithic of the Bajaur-Mohmand area to the Aurignacian phase of Western Asia and that of Europe, the attribution is on account of certain type of tools that share common features in all the three regions. Similar Aurignacian artefacts are abundantly found in the stone assemblages of the area. In view of the above facts, it is suggested that the Bajaur-Mohmand area, lying in the southern slopes of the Hindu Kush must have been the original birthplace of the Aurignacian. Then it diffused in all directions from the central point. In this context reference may be made to Garrod's view who first favoured the near east as the centre of origin of the Aurignacian but then she spoke of "some yet unidentified center in Asia" which she favoured in the Iranian Plateau or highlands or beyond further east (Garrod, 1938: 20). To confirm the hypothesis of Garrod as to the origin or birthplace of the Upper Palaeolithic in Iran, Mc Burney carried out archaeological investigations in northeastern Iran. He found no clues to such origins and led him to conclude that the supposed area of Iran most probably has been a passage/route than a central place of the earliest Upper Palaeolithic (Smith, 1971: 688). Similar efforts had already made by Coon to find stone industry such as that he found at Kara Kamar, Afghanistan (Coon, 1957: 127). Nevertheless, he failed to recognize such industries in Iran. The archaeological investigations, carried out by Garrod (1939), Coon (1957), McBurney

(1968) and Smith (1971); their virtual failure to find Upper Palaeolithic (Aurignacian) in Iranian Plateau, lends support to our hypothesis that this unknown birthplace of the Aurignacian (Upper Palaeolithic) is most probably the Bajaur-Mohmand area.

3. 3. Analysis of Artefact y Types.

3. 3. 1. Raw material: the lithic industry of the Upper Palaeolithic is made on chert found in a variety of colours. Chert of blackish and light brown colours is the most preferred and favourable material for artefacts manufacturing. It occurs abundantly in this area near the prehistoric sites in the form of nodules in the riverbeds. Other colours include grey, brown, greenish and honey colors, etc. Besides, milky quartz and in some cases its crystals are also used. All these materials are locally available.

3. 3. 2. Manufacturing technique

The Upper Palaeolithic man in this area manufactured his tools by using both prepared core (Levallois) and discoidal flaking techniques. However, the use of discoidal flaking technique predominates. There are many flakes showing negative flaking scars on their dorsal surface suggesting previous preparation of the cores. On the other hand, the ventral surfaces show only a single positive scar or conchoidal fractures. The presence of many prismatic elongated blades suggests the use of Levallois technique. There are many prismatic elongated blades, which seem to have been detached with a punch of wood or bone from previously prepared cores. A good number of domical shaped (platform) or inverted pyramidal cores predominate. Prominent cores types include prismatic, conical, discoidal, unipolar and bipolar.

Analysis of Upper Palaeolithic Artefact Types.

3. 3. 3. Layer 5 Ango Gatkai

Layer 5 at Ango Gatkai is characterized by the presence of blades, burins, points, knives, awls, few hand axes, chopping tools and scrapers of various kinds. Each type is described in detail as follows:

3. 3. 4. Blades: the blade tools of layer 5 are characterized by the presence of both thin and thick long prismatic blades. The largest blade in the whole series of the

Upper Palaeolithic industry is also found in layer 5. The blades of layer 5 are larger and thinner than the preceding period of the Middle Palaeolithic. Of the blades, some have low ridges or they are thin in cross section while other blades are high ridged with thick cross section. These blades are narrow at the butt ends but are broader at the other end towards the tips (see Pls.52, 53 and 56). They have been detached from the parent cores by Levallois technique with the help of a punch of wood, bone or antler (Fig.14, Nos.1, 13, 16, 26, 18, 19 and 27). No.1 is a small prismatic bladelet core, which must have been used as blade later on. The largest blade is found in layer 5 with both ends broad and narrow at the waist (Fig.14, No. 27). A triangular blade with short point at the distal end and sharp cutting edges is (Fig. 14, No.18). A prismatic blade truncated at the base (Fig. 14, No. 19). Another blade point with the working edge curving towards the tip and has concave back. It is a rare example (Fig. 14, No. 20). A good example of prismatic blade is (Fig. 15, No.17). Similarly, No.19 is a flake blade. A thin Aurignacian blade is (Fig.16, No.40). There are also a number of microblades and blade like flakes in layer 5 (Fig. 18, Nos. 1- 45).

3. 3. 5. Points: points are present in different forms in layer 5. A bifacial Levallois point made on greenish chert was recovered from the western section near the hearth of the Palaeolithic times (Pl. 43). It is tanged at the base with bilateral cutting edge. The same type of point is usually termed as naviform by some prehistorians on account of its oval shape. It is Levallois in technique the characteristic feature of the Middle and Upper Palaeolithic industries (Fig.15, No. 26.) Another point with one side beveled while tanged at the proximal end is (Fig.14, No. 24). It has curved cutting edge. A Levallois point with thinned base is (Fig.14, No. 14). However, the best example comes from layer 5. Based on its excellent workmanship and symmetrical form we have named this point the 'Taqarian' point with no parallel elsewhere (Fig. 14, No. 25; Pl. 45). It may suggest the hallmark of the Upper Palaeolithic industry in the area. Similarly, Fig.13, No.6 is a foliated point. Fig.13, No.25 is a Levallois point. Fig.18, Nos.47-70 shows different microlithic points.

3. 3. 6. Knives: elongated backed knives (Fig.13, No.24) and short backed knives (Fig.13, Nos. 27, 29; Fig. 17, Nos. 27, 44, 49, 50, 51, 53, 54). However, fine example

is (Fig. 18, No. 56). A thick backed knife is (Fig. 16, No. 50) which shows the shortest working edge like a burin edge (Fig. 16, No. 42), it is a unique example.

3. 3. 7. Burins: in layer 5 many different types of burins are found. These include beaked shape, beaked shaped-cum-scaper, polyhedral burin, elongated beaked or chisel burins the largest example, simple burins, dihedral burins, angle burins, burin dejet-cum-scaper, burin-cum-spoke shave, oblique burins with curved bodies unique examples, and parrot beak burins and double burins (Fig. 14, Nos. 2, 8 and Fig. 15, Nos. 4, 5, 6, 16, 20, 24 and 25). Here No. 4 represents fine example of beaked burins. Fig. 17, Nos. 1-21 show various types of burins. Beaked burins with round and semicircular bodies probably mark the earliest evidence of Aurignacian phase in the area. Similar but very few beaked tools are also found in the Sanghao Cave lithic industry (Pl. 99, No. 3, top row).

3. 3. 8. Awls or borers: the borers or awls are represented by very few examples in layer 5. Fig. 15, No. 8 is a specialized borer. Other pieces are (Fig. 17, Nos. 30-35 and 37; also see Pl. 44)).

3. 3. 9. Scrapers: the scrapes form the largest group among the lithic industries of the Upper Palaeolithic in the area. In Upper Palaeolithic, the following variants and types of scrapers are found:

(A). A thick convex side scraper with rough scalariform retouch; the butt end is formed by the removal of two narrow blade like flakes. It is made on milky quartz nodule or core, it is the only example perhaps persisted into Upper Palaeolithic from the earlier Mousterian tradition; it seems to be an intrusion into the Upper Palaeolithic (Fig. 16, No. 2).

(B). Two other convex scrapers made on green and brown chert; but here we have the working edges are formed by rough bifacial retouch which make them small or medium sized chopping tools survival of the Soan chopping tools (Fig. 16, No. 4; Fig. 13, Nos. 12, 18 and 19).

(C). An oval shaped convex scraper with retouch or scalariform retouch on the upper working edge to the top of the tool. All these variants seem to have been persisted into the Upper Palaeolithic in this region from the Mousterian tradition. Mousterian tools

persisted into this region right to the Middle of the Upper Palaeolithic (Fig. 13, No. 20). Of them all show the original cortex with partially retouch on their dorsal surfaces.

(D). Convex side scraper with steep retouch one with a tail at the distal end and other with convex beak, both tools have keels across the axis and there is present a portion of the original cortex on the dorsal surfaces (Fig. 16, No. 22 ; Fig. 14, No. 5)

(E). A round scraper with convex working edge but the butt end shows faceted striking platform and with fine flake scar removal most probably with pressure technique, it is made on greenish chert of coarse grains (Fig. 13, No.18). A large flake scar is visible on the ventral surface.

(F). Transverse scrapers are few with sharp cutting edges and faceted striking platforms; the platform is formed by the removal of one, two or more flakes at the right angle to the dorsal surfaces (Fig. 16, No. 1).

(G). Carinated scrapers: they comprise both end and round varieties, they are thick in cross section, some are beaked. Most of them show broad retouch to form working edges (Fig.15, Nos.2, 3, 10, 15 and 18; Fig.16, Nos. 22, 23, 49 and 52; Fig. 14, No. 22)

(H). Concavo-convex scrapers: these tools are called by the French Authors as denticulates (Fig. 13, No. 16).

(I). Double scrapers: they are triangular in shape with burin edge at the distal end (Fig. 3, No. 17).

(J). Concavo-convex scraper (Fig. 13, Nos. 5, 13; Fig.15, No. 23. 16 No.14).

(K) Convex side scraper (Fig.17, No. 54).

(L). A big denticulate or concave or spoke shave alternated by convex side scraper with very sharp cutting edges (Fig. 16, No. 3).

(M). Bill hook type tool is (Fig. 16, No. 20).

(N). Obliquely transverse scraper with thick butt end (Fig. 13, No. 1).

- (T). Fabricator with marks of extensive use (Fig. 14, No. 11).
- (U). Convergent scraper with triangular shapes (Fig. 16, No. 37; Fig. 13, No. 7).
- (V). Small Mousterian side scraper (Fig. 15, Nos. 12, 20, 21 and 22).
- (W). Levallois flakes (Fig. 15, No. 1; Fig. 13, No. 3 and Fig. 16, No. 46).
- (X). Canted scraper with shallow retouch on the dorsal surface (Fig. 17, No. 56 and 66; Fig. 16, No. 26).
- (Y). Rectangular tool with transverse cutting edge resembling the tranchets of the Mousterian tradition but here they seem to have been used as transverse scrapers with two beveled cutting edges (Fig. 16, Nos. 43, 47 and 48).
- (Za). High humped or high keel end scraper (Fig. 17, No. 52).
- (Zb). Convex end scraper (Fig. 17, No. 68).
- (Zc). Double convex scraper is (Fig. 17, No. 55).

3. 3. 10. Analysis of artefact types layer 4

Layer 4 is characterized by the presence of chopping tools, points, burins, blades, cleavers, scrapers of various types, bifaces and hand axe type tools, Levallois and non-Levallois flakes. Each of these tools is mentioned in details as follow:

3. 3. 11. Chopping tools or pebble tools: these large tools made on chert nodules are of two kinds. Of them, one variant shows the working edge is formed by the removal of small flakes along the margins from the dorsal surface while the ventral surface is left untouched or is cortical (Fig. 20, No. 1). The other variant shows a big flaking scar on the ventral surface while the dorsal surface has several flaking scars. We name this kind of chopping tool as flake choppers (Fig. 20, No. 2). Another type of chopping tools is trapezoidal in form and is rare among the choppers in the whole series of the Upper Palaeolithic. It is a side-chopping tool with transversal cutting edge (Fig. 20, No. 3).

3. 3. 12. Points: a good number of bifacial and unifacial points are found in layer 4. In this case, the points seem to have been used by the Palaeolithic man as knives as well as tips of composite tools. Some points show-thinned butts for hafting. A tanged bifacial point is the characteristic tool of layer 4 (Fig. 19, No. 4). The latter is the characteristic feature of the points elsewhere even in the preceding layer of the same site (Fig. 19, Nos. 7, 22 and 23)). Among the points, the best example is offered by Pls. 65 and 66. It is a foliated or leaf shaped point or knife and seems to have attained the peak of the Upper Palaeolithic workmanship in the Bajaur-Mohmand area.

3. 3. 13. Blades: as compared to layer 5, the number of blades in layer 4 decreased considerably. Most of these are of the flat form. It also represents a few backed blades (Fig. 19, No. 17). Wide thin blades are (Fig. 19, Nos. 2, 16 and 18; also see Pls. 64 and 65). Similarly, Fig. 19, No. 28 shows a nosed distal end. Fig. 19, No. 26 has straight-to-oblique cutting edges.

3. 3. 14. Scrapers: a variety of scrapers is found in layer 4 including end scrapers, and denticulates made on flakes. Fig. 19, No. 1 is a typical Upper Palaeolithic end-cum-side scraper made on blade flake. Fig. 19, Nos. 4 and 5 are scrapers with thick profile and irregular cutting edges. The dominant feature of these tools is that all of them show previous preparation of the core. In a sense, they may be called as Levallois flakes because of their extensive flaking on the dorsal surfaces. Most of these are side scrapers (Fig. 19, Nos. 8, 9, 11 and 12). No. 9 is retouched on the dorsal surface with double working edge. Similarly, No. 13 is very fine primary flake scraper with retouch on half of the dorsal surface. Fig. 19, No. 2 is a flat Levallois nosed shape scraper. No. 30 is a tongue shape scraper retouched on the dorsal surface.

3. 3. 15. Flakes: flake tools are also occurred in layer 4, they are (Fig. 19, Nos. 6 and 10). No. 5 is a flake blade. No. 3 is a blade with concavo-convex working edge.

3. 3. 16. Biface: a single bifacial tool is found in the whole series of the Palaeolithic industries at Ango Gatkai in the area. It is made on light brown chert nodule and is biconvex in cross section. It resembles the late Acheulian hand axes (Fig. 31, No. 3).

3. 3. 17. Burins: seven types of burins have been identified in layer 4. These are very specialized tools from the point of view of workmanship. Fig. 9, No.16 is a multiple tool with scraper edge, spoke shave or notch. Layer 4 also yielded bifacial beaked burins (Pl. 64, Nos. 3 and 4).

3. 3. 18. Backed hand axe: backed hand axes or canted scrapers with very heavy butt end and sharp working edge formed by the intersecting of two beveled surfaces (Fig. 20, No. 6b).

3. 3. 19. Clactonian flake: it is not contemporary with those found at Clacton on sea but their technique is similar in both regions (Fig. 20, No. 6a).

3. 3. 20. Hand axe: a hand axe made on quartz with slight bifacial working near the distal end (Fig. 20, No. 11; Pl. 61).

3. 3. 21. Backed knives: (Fig. 20, Nos. 19, 20).

3. 3. 22. Anvils, ground stone tools: apart from struck stone of numerous forms as cited above there are unstruck stone tools in layer 4. Rectangular anvils with pitting are found in layer 4. Anvils with dimple scars on one or both sides predominate. Many ground stones that may have been used for different purposes represents a great number (see Fig. 27).

3. 4. Upper Palaeolithic Sites of the Area.

3. 4. 1. Sara (Sra) Smast Upper Palaeolithic (Fig. 33, No. 10): the rock shelter is located in the west about 3 ½ km from the main Bajaur-Peshawar highway. The site is approached through a *kachha* road that branches at Bando Nawagai from the main road. The site opens to the south and measures 17 m from east to west. The surface of the slope or talus below the shelter is littered with stone tools. Stone tools are not found on the floor of the cave since it is a living rock. The slope or talus below yields large number of artefacts. The slope or talus covers 26 m below the cave. It yielded 54 artefacts which comprise the following tool types: scrapers-21 (38.88%), flakes-8 (14.81%), burins-4 (7.40%), cores- 4 (7.40%), knives-2 (3.70%), limace-1 (1.85%), tranchet -1 (1.85%); lunate -1 (1.85%), points- 6 (11.11%) and blades- 5 (9.25%).

3. 4. 2. Qulgai Smastai rock shelters (Fig. 33, No. 7): These rock shelters are to the north of Mitai road at a distance of about half a kilometer. Both rock shelters are facing south and lie side by side to each other. A good collection of stone tools was made here. Most of the tools are found on the talus below the caves. A zigzag walkway has been made to a modern house through the talus of the caves. Many stone tools are exposed or visible on both sides of the cut section. The western cave shows a thick layer of soot, which suggests long occupation of the cave. They are 10 m above the fields below. The site yielded 46 stone tools which include: scrapers-12 (26.08%), burin-2 (4.34%), flakes-4 (8.69%), lunate-1 (2.17%), limace-1(2.17%), points-9 (19.56%), blades 11-(23.34%), cores 2-(4.34%) and knives-4 (8.69%).

3. 4. 3. Chinar Smast (Fig. 33, No. 12): the site is located about 4 km from Muhammad Gat to the west; it opens to the east and can be seen from the road. It is approached by a *kachha* road that branches at Khazina from the main road. The inner rock shelter has remains of recently built wall now abandoned. The site measures about 15m from south to west. The stone tools were collected from the slope below the cave. The inner cave seems to be intact; it is superimposed by the debris of modern construction. Nineteen (19) artefacts were collected at the site. The following tool types are present in the collection: scrapers- 9 (47.36%); burins-2(10.52%); flakes- 4 (26.3%); blades- 1 (5.26%) and points- 3 (5.78%).

3. 4. 4. Lower Tsagai Inzarai Smast (Fig. 33, No. 13): the site is located at the terminal point of the lower Tsagi valley. It can be approached by a *kachha* road that passes thorough the center of the valley. The site itself is located in a same nook of the valley, it is locally known as *Qoal* literally means deep corner. The rock shelter faces to the east. It measures about 20 m in the north-south direction. 26 artefacts include the following tool types: scrapers-12 (46.15%); points- 6 (23.07%); burins-3 (11.53%); flake- 1 (3.84%); tranchet- 1 (3.84%); core- 1 (3.84%) and blades- 2 (7.69%).

3. 4. 5. Saido Nao Ghond Kamar rock shelter (Fig. 33, No. 8): the site is located in the southwest of Ango Gatkai. The site faces south. It is 7 m from east to west. The site yielded 20 stone tools. They include the following types: scrapers- 10, burins-2, and flake tools- 6 and awls-2.

3. 5. Regional Comparison

For comparative study, we begin from Upper Palaeolithic sites in Sind, Pakistan. The stone tools found at Rohri Hills show close resemblance to the artefacts in our disposal. The tools include blades, flake and blade cores, scrapers of various types including carinated scrapers, burins, choppers, as well as pointed flakes (Allchin et al., 1978: Fig.8.5, Nos. 8-11). Also from Milestone 101, Hyderabad (lower, Sind), Lower, Middle and Upper Palaeolithic artefacts have been reported (ibid: 295). These artefacts were heavily sand blasted. All types of tools recorded in the Rohri Hills were also found there (Allchin et al., 1978: 296; Figs. 8.12, 8.13 and 8.14 and Tables 8-11). Upper Palaeolithic tools from Milestone 101 show resemblance with those from our research area (ibid: 295-304). In this case, all artefact types are present in our collection even small and large hand axes and cleavers. The number of burins is very low in proportion with other tool types. Besides, canted scrapers are absent from Milestone 101. As the evidence offered by the presence of Upper Palaeolithic stone tools one might suggest that the Upper Paleolithic people or population spread over the vast area from the southern slopes of the Hindu Kush to the plains of Sind and Punjab onwards to Rajistan. It is obvious that upper Palaeolithic man not only exploited the mountainous environment but he also extended his activities to the plains of the Indo-Pak border. Thus Allchin's Fig. 8.5, Nos. 3, 4, 5 (1978) may be compared with the layer 5 of Ango Gatkai blades and *lame a crete* or crested blade (Fig. 13, Nos. 8,9 and 24; Fig.14, Nos.13, 19, 26, 27; Pls. 52, 53). Similarly, Allchin et al.'s Fig. 8.6 (1978) may be compared with flakes tools or the pointed flakes of layers 5 and 6 of Ango Gatkai (Fig.13, Nos. 17 and 2; Fig. 11, No.5; Fig. 8, Nos. 18, 21).

The nearest evidence of the Upper Palaeolithic is Riwat 55 from the Soan Valley (Rendell et al., 1989: 128-206). The site has been dated by thermoluminescence (TL.) to ca. 45, 000 B.P. (ibid: 204). It is a blade flake industry with the presence of small blade elements; however, the flake tools predominate without struck and elaborate core preparation. The site Riwat 55 has been defined as "initial upper palaeolithic or 'late early palaeolithic' by the excavator. However, it is suggested that the author seems to have attributed the Middle Palaeolithic artefacts to Upper Paleolithic. The illustrated artefact types, keeping aside the scientific dating of the site, most probably fit into the Middle Palaeolithic rather than the Upper Paleolithic. The site was not a

living site but it was used for other purposes. Following Ikawa-Smith (1978: 1-2) Rendell et al. proposed a two pronged division for the Palaeolithic assemblages of northern Pakistan. This division of the Palaeolithic includes Early Palaeolithic with the upper most limit or margin as 30,000 B. P. and late Palaeolithic with terminal Pleistocene or to the beginning of the Holocene before 10,000 B.P (ibid: 27-28).

There are some tools illustrated by Rendell et al. (1989) which show marked similarity with those in our disposal. In-depth study of these tools shows that they are Middle Paleolithic. They fall in into the Middle Palaeolithic rather than the Initial Upper Paleolithic. These types of retouched and unretouched blades definitely belong to the Middle Palaeolithic; they are Nos.1334, 1356, 1239, 120, 1365, and 1322. Fig. 8, Nos. 1152, 1365A; Fig. J.14, No.1334, and Fig.J.16, N0.1356 are canted scrapers characteristic tools of the Mousterian tradition. The characteristic feature of the Palaeolithic site of Riwat 55 is the presence of microlithic artefacts or tiny tools (Figs. J.4, J.5, J.6 and J.7). The tool kit of the small size includes blades, bladelets, points and scrapers. It is interesting to note that the burins and awls are completely absent from the Riwat 55 site. The latter tools are the characteristic feature of Middle and particularly of Upper Palaeolithic elsewhere in the Mousterian industries. The occurrence of the microlithic tools is significant. As the latter tools are occurred at all principal Middle Palaeolithic sites of western and south Asia (Rust, 1950; Dani, 1964; Bordes, 1968; Tusa, 1974; Ranere, 1982; Salim 1986). The excavations at the rock-shelter of Ango Gatkai yielded similar microlithic implements (Ali and Rahman, 2005). Layers 6 and 7 have produced a good number of such small tools. These tools are co-occurred in equal proportion with those of the larger tools (Figs. 7 and 12 this volume).

To conclude this discussion, it is suggested that the Riwat 55 lithic assemblage is definitely comprised Middle Palaeolithic or Mousterian elements as evident from the above comparative study. It most probably belongs to the Middle Palaeolithic or Mousterian rather than 'initial upper Paleolithic' as suggested by Rendell et al. (1989: 204-205). Though the tools are cruder as the quartzite material is hard to produce well-shaped conchoidal fractures as compared to fine-grained flint and chert.

As far as the rest of the Soan Valley is concerned, attempts have been made to mark and identified some Upper Palaeolithic tools among the stone assemblages have

been described under the Middle Stone Age. So any comparison between the tools has become impossible for any researcher. Dr. Salim (1986) has described and interpreted most of the stone industries from the Potwar region under the Middle Stone Age. We have traced among the tools some Upper Paleolithic tools based on typology that resembles the tools at our disposal. In this connection Salim's Fig. 107, No. 2, 3 and Fig. 111, No. 3 are comparable to tools at our disposal. Similarly, Salim's Fig. 95 (1986) seems to be an umbrella type carinated scraper most probably of the round variety, which occurs in some good number in our collection. The centralized flaking technique also lends support to our viewpoint. The same type of tools is the most characteristic feature of the Upper Palaeolithic in the Bajaur-Mohmand area. It is also found abundantly in all the Upper Palaeolithic of the Aurignacian types. Fig. 80, No. 1 has also some parallels in our collection.

The Palaeolithic site of Sanghao Cave in the district of Mardan has yielded prominent Upper Palaeolithic tools (Dani, 1964; Tusa 1976; Ranere 1982; Salim, 1986), though the earlier researchers could not draw a clear line between the Middle and Upper Palaeolithic tool types. However, we have attempted to resolve this problem through analytical study. Dani's Fig. 11, No. 2 is comparable to the carinated end scraper in our collection. Similarly, Fig. 11, No. 5 is a point with parallel in layer 5 of Ango Gatkai. Dani's Fig. 17, No. 9 is a blade with straight and oblique cutting edge, which is found in layer 4 of Ango Gatkai (Fig. 17, Nos. 27, 51 and 74). Dani's Fig. 17, Nos. 1, 2 are diagnostic Upper Paleolithic tools in Sanghao Cave which also occur in layer 5 (Fig. 18, No. 73 and 79). However, the most characteristic tool is the beaked burin which is found in both collections (Fig. 15, No. 4; Fig. 17, No. 35 and Pl. 27; Sanghao Cave layer 03 (Ranere, 1982; Pl. 99, No. 3 1st row this volume). Dani's Fig. 18, No. 8 is equal with the point in our disposal (Pl. 66, Ango Gatkai layer 4).

Some Upper Palaeolithic sites from India have some resemblance in terms of tool typology with the artefacts in our collection. Mention can be made of the Buddha Pushkar where Upper Palaeolithic tools have been represented by some blade tools, scrapers particularly the carinated types (Allchin et al., 1978: 129, Figs. 4.8 and 4.9; also see Figs. 7.2 and 7.3, Vishadi: 225-227).

There are similar tools in our collection. The Upper Palaeolithic site of Kara Kamar in Afghanistan is the nearest and more reliable that shows considerable

similarity with the stone tools in our area. The excavation was conducted by Coon (1957) has yielded definite Upper Palaeolithic artefacts. Based on close resemblance and parallel tool types he assigned the cultural deposit of period III at Kara Kamar to Aurignacian, which bears close affinities with the Upper Palaeolithic of Europe and Western Asia (Coon, 1957: 248-50). Typical Aurignacian tools include carinated steep scrapers or push planes; these tools are the dominant feature of the Aurignacian phase of the Upper Palaeolithic of Palestine and France (Srivastava, 1982: 57-58; Fig. 2, 4). The most prominent feature that is the burin element is completely absent from Kara Kamar. Aq-Kupruk site II and III are of the late Palaeolithic or Upper Paleolithic in Afghanistan it is dated around $16,617 \pm 215$ years ago. Dupree and Davis discovered two components; the first includes heavy items such as cores, flakes, blades, denticulates, scrapers, chips and ridged blades. The microlithic component includes cores and micro blades, keeled-end scrapers are similar to those in our collection (Dereyanko and Luzun 1999: 94-95).

The evidence presented by the B.A.M to Bannu regarding the Palaeolithic stone tools does not seem to be convincing since most of the tools are from surface collection and lack characteristic Upper Palaeolithic features (Khan et al., 1991: 4-5; Fig. 70).

Two Upper Palaeolithic sites in Central Asia are Shugnou and Samarkand both are open air sites. Other 30 sites of the Upper Palaeolithic are scattered over much in the region. Commenting upon the characteristic features of the Upper Palaeolithic Ranov and Davis are of the view that there was no great technological leap forward to the Upper Paleolithic. Many of the Mousterian elements such as points, denticulates, side scrapers and Levallois technique persisted into the Upper Palaeolithic. For the sake of comparison we see parallel examples from Gupta's (1978: 72-85; Fig.5.5) shows comparable tools with those found in our collection particularly end scrapers and points. But the Central Asia Upper Palaeolithic seems to be a later manifestation of the Upper Palaeolithic that has its roots in the very region of the southern slopes of the Hindu Kush-the Bajaur Mohmand area and the Sanghao Cave in the Peshawar valley or the ancient Gandhara.

The main Upper Palaeolithic sites in Iran are located in the Zagros Mountains. The characteristics tools are found in the industries of Baradostian and Zarzian, they

include burins, scrapers, perforators, microliths, including geometric, steep or carinated scrapers. The Baradostian was identified in the Shanidar cave at layer C by Solecki (1955) in Iraq. The same industry was found at five sites in the Zagros on the Iranian side. They include Warwasi, Ghare Khar near Kermanshah, and Yafteh Cave, Gar Arjenh and Pa Sangar near Khorramabad. The industry is essentially blade characterized by blades of various forms, notched blades, retouched blades named as point Fontyves or Krems points; end scrapers on blades and core tools or carinated scrapers. The earliest date for Upper Paleolithic in Iran is from the Yafteh cave which has been dated to ca. 36,000 B.P. Braidwood and Howe (1968) and Smith (1971). However, the earliest date of any Upper Palaeolithic comes from Riwat 55 which has been dated by Thermoluminescence(TL) to ca.45,000.B.P (Rendell et al., 1989).

In Iraqi Kurdistan a single very important occurrence of such blade tool industry is the Shanidar layer C, typologically and technologically distinct from the underlying Mousterian of Layer D and the overlying Zarzian of layer B. The Shanidar C industry is marked especially by a good proportion of burins including polyhedral burins and by perforators, awls , fabricators, scrapers including round scrapers, points, notched blades and used blades and flakes; it is essentially a blade industry but the blades are of the comparatively irregular forms; the industry has been named as Baradostian (Solecki, 1955: 415). The industry is contained some of the general features of the Aurignacian such as burins, scrapers and notch blades, yet typologically it is more limited. The steep carinated scrapers so characteristics of the Aurignacian elsewhere are absent from Shanidar layer C. The earliest Radio Carbon date from the bottom of layer C is about 34,000 B.P.

3. 6. Transition from Middle Palaeolithic to Upper Palaeolithic

Right from the beginning of the Lower Palaeolithic there has been a constant change in the tool kit of the Palaeolithic man. Although a clear cut line of transition from one period into the other is difficult to discern, the prolonged hand axe phase of the lower Palaeolithic was followed in the upper Pleistocene by the flake tradition of the Middle Palaeolithic or Mousterian. There are some indications that suggest that one industries in due time was replaced by the more advanced industry. Thus, it took an enormous time range to reach the present stage of the story. However, attempts are being made to trace the probable tool types that mark the transitional phase between

the Middle and Upper Palaeolithic in the Bajaur- Mohmand area. Some backed knives most probably mark the transition between the Middle and Upper Palaeolithic. These backed blades / knives show curved cutting edges. The knives with blunted backs perhaps mark the boundary between the Middle and Upper Palaeolithic which are completely absent from the succeeding layer 5 but are present in layer 6 (Fig. 9, Nos. 21, 22, 24). Besides, there are a good number of points that probably mark the transitional phase between the Upper and Middle Palaeolithic. The characteristic features of these points are that they have thinned bases for hafting. In terms of these technological features, they may be compared to the Emiran of the Western Asia where they mark the transitional phase between the Upper and Middle Palaeolithic. From technological point of view, the Emiran points are very close to the 'Taqarian' points of Ango Gatkai. Since most of them present thinned bases either on the dorsal surface or on the ventral surfaces. Some of them show the removal of a burin like spall obliquely struck from the base giving it a burin edge and also turning the oval shape of the tool into a point (Fig. 9, Nos. 8-13, 18 and 19). An excellent piece of this type has been recovered from the western section near the hearth of layer 5 of the Palaeolithic period (Fig. 15, No. 26). It is made on a greenish chert with very sharp cutting edges. Of the same type has also found in layer 6 (Fig. 12, No. 41). Different varieties of these tools are found in layer 6 which we have assigned, except a few, to the transitional phase between the Upper and Middle Palaeolithic. The dominant feature of these points is that they show bifacially thinned bases. However, most of the retouch or secondary trimming has been confined to the base on the dorsal surface. The presence of these tools does not leave any doubt that they belong to the transitional phase between the two Palaeolithic periods. Typologically and technologically, they can be compared with the Emiran of Western Asia where they mark the transitional period between the Mousterian and the blade tool industries (Bordes, 1968: 198-205). Although such type of tools are not found in the neighboring country of Afghanistan where the upper Palaeolithic is very clear and well-defined phase of the Palaeolithic.

In the case of the Sanghao Palaeolithic cave the transition seems to be much elaborate one but the cultural deposits have not been elaborately described by the earlier researchers. We have made a brief survey of the Sanghao material in the University Museum, Peshawar that led us to conclude that the transitional phase from

Middle Palaeolithic to Upper Palaeolithic is clearer since there are some points that are parallel to the Emiran points from Western Asia (Sanghao Cave: Pl. 100, No.1 this volume). Another bifacial tool are the side scrapers made on core which are found in both layers 5 and 6 of Ango Gatkai; the tool of layer 5 is cortical on the ventral surface while retouched on the dorsal surface (Fig. 10, No.14; Fig. 16, No.37). An example of the hearth type is also found in layer 6. The Palestinian Aurignacian has been summarized by McBurney as 'true blade industry in which the blunted blade is scarcely represented, but a miniature blade technique is used for secondary trimming of various shapes of core scrapers, and thick burins, burins of used types are also represented (McBurney, 1960: 49). It should be noted that a great number of tools persisted into both layers 5 and 6. For instance, short thin flat blades occur in both layers 5 and 6. Although many tool types of the Mousterian tradition persist in layer 5 of the Upper Palaeolithic. Core tools or carinated scrapers are common to both layers 5 and 6. The carinated scrapers made their appearance earlier in layer 7 and continued through layer 6 and even layer 5, which is the characteristic tool type of the Aurignacian of the Upper Palaeolithic. Besides, the Palaeolithic of the Bajaur-Mohmand area is characterized by the presence of small tools or microliths. Such small artefacts are even present in layer 7 of the Mousterian period.

From the above facts, it is obvious that the Upper Palaeolithic has its origin in the area and most probably is ancestral point to other Palaeolithic cultures in the region particularly to Afghanistan Iran, and even Western Asia.

3. 7. Upper Palaeolithic in the Neighboring Regions.

3. 7. 1. Sanghao Cave: in the Gandhara region, the Palaeolithic Cave of Sanghao seems to be the nearest site where these cultures (Middle and Upper) manifested themselves after the diffusion from the ancestral point-the Bajaur-Mohmand region. In terms of technology and typology, the Sanghao materials show very close resemblance to the tool kit in this region. The Sanghao flake blade industry presents some characteristics that are common to both areas. The Sanghao industry seems very advance from the beginning or layer 12. It is suggested that the Sanghao lithic industry most probably has its origin in this very area. The Sanghao Cave, one of the most important Mousterian Palaeolithic sites, is located in the Mardan district of N.W.F.P. The Cave was discovered by Dani and was excavated in 1963. It yielded

about a three-meter thick cultural deposit of 12 layers. The excavator identified three different periods perhaps based on stone tools. In this context layers 9 to 5 have been attributed to Upper Palaeolithic. The raw material is red stained quartz.

The Sanghao lithic industry is primarily a flake industry with the occurrence of a few core tools. From the point of view of technology, the Sanghao industry has been compared to the Levallois-Mousterian of Europe and that of Western Asia (Dani, 1964: 17; Allchin, 1973: 40). The lower levels at Sanghao stratigraphical sequence have yielded a C14 determination date of 40,000 B.P. (Khan and Gowlett, 1997: 182-87).

The evidence offered by the Sanghao Cave material attests to our view that the palaeolithic cultures spread there in very advanced stage from the nuclear zone- the Bajaur- Mohmand area. Since the latter area is rich in sites of the Palaeolithic period. Therefore, it is not out of place to assume that the area, as may be discerned from the tool types present in the Sanghao tool kit has already found in the Bajaur-Mohmand area. The Sanghao Cave lithic industry seems to have directly derived from the Stone Age cultures to the northwest of the site. The lower levels in the Sanghao are corresponded to layer 6 of Ango Gatkai. When the population of the Middle and Upper Palaeolithic increased and the food supplies became insufficient for them, they in due time migrated to the neighboring region in which Sanghao and some parts of Afghanistan were easily affected by the Palaeolithic man. The plains of the southeast or Peshawar valley must have been favourable resort for the Palaeolithic man but to due flood activities/inundation over millennia it overlaid fluvial deposits and buried the sites forever. The Peshawar valley is rich in historical period sites but no site of the Stone Age has so far been reported (Ali, 2003).

3. 7. 2. Potwar region : in the Potwar region of northern Pakistan De Terra and Paterson found stone artefacts near Dhok Pathan, on a terrace which they attributed to the 4th glacial phase of Kashmir and described it localized industry (1939: 311). However, Movius termed it late Upper Palaeolithic industry (1944: 22); and he eventually renamed it 'Evolved Soan' (1944: 19). He believed that artefacts of Evolved Soan phase were technically well made than those of Late Soan phase. In the new scheme of Paterson and Drummond, the artefacts from Dhok Pathan and Pindi

Gheb sites were regarded as the end of the Soan tradition and they were labelled as 'Final Soan' (1962: 13).

Final Soan artefacts were collected from the surface of the Pleistocene patinated gravel related to terrace 4 of the Soan valley and also from the top of the loess that is dated to the 3rd glacial phase of Kashmir.

The Final Soan tradition is poorly represented; occurring at only two sites, Dhok Pathan and Pindi Gheb (Paterson and Drummond 1964: 84-88). They have reported 343 artefacts from both sites. According to them there are 169 flake and the rest are cores and pebble tools. Choppers and chopping tools continued but their size reduced. Besides, a new type of the pointed pebble appeared which seem to have developed out of the chopping tools. However, in the light of recent researches Middle and Upper Palaeolithic artefacts are found within the Potwar loessic deposits of various thicknesses along the gullies on exposed surfaces (Allchin, 1999: 77; also see Fig. 41 this volume).

3. 7. 3. Upper Palaeolithic in Sind: Allchin conducted survey in the Rohri Hills and found a large number of Harappan and Middle Palaeolithic working floors. Among these, one definitely belonged to Upper Palaeolithic. This working floor was used by the Palaeolithic man for the manufacturing of parallel-sided blades of the Upper Palaeolithic. Dark patinated chert nodules were used for the production of Upper Palaeolithic blades similar to those used by the Middle Palaeolithic chert knappers. The working floor R-5c was the only evidence of an independent Upper Palaeolithic presence at Rohri Hills (Allchin, 1994: 138).

The most clearly distinctive Upper Palaeolithic site was Chancha Baluch in the southern part of the Rohri Hills. It was spread over an area about 100 x 50m with Middle and Upper Palaeolithic artefacts and debris. Characteristic Upper Palaeolithic artefacts include blades and blade cores, burins, adzes, scrapers and chopping tools (*ibid*: 137). There was another site in the southern Rohri Hills which also yielded Middle and Upper Palaeolithic artefacts made on darker kind of chert similar to those found in the northern Rohri hills (*ibid*: 138).

Recently, intensive surveys and excavations have been undertaken by a team of archaeologists from the University of Khairpur, Sind, in collaboration with the Italian

researchers. These surveys and excavations resulted in the discoveries of some new Palaeolithic sites with artefacts of the Lower, Middle and Upper Palaeolithic (Biagi and Cresmaschi, 1988; Biagi et al., 1994-96; Negrino and Cresmaschi, 1996: 7-38).

3. 7. 4. The Upper Palaeolithic in Afghanistan: a transitional phase from the Middle Palaeolithic to the Upper Palaeolithic in Afghanistan is not easily traceable. As stratified sites with cultural deposits have not been found that may possess both the Middle and Upper Palaeolithic (Srivastava, 1982: 199-204). In the early fifties Coon had placed Kara Kamar cultural sequence in the range of Middle and Upper Palaeolithic (ibid: 248-250). However, recent researches on the Afghan Palaeolithic have excluded Kara Kamar II and IV as being Middle Palaeolithic in character. Other sites claimed to have Upper Palaeolithic do not have Middle Palaeolithic with them. Similarly, Aq Kupruk II, IIIA, IIIB, and Darra-i-Kalon did not yield material of the Middle Palaeolithic. Although a transitional phase is missing from the Palaeolithic profile in Afghanistan, but it has definite Upper Palaeolithic as evidenced at Kara Kamar III (Coon, 1957: 217-254).

Coon has identified certain Aurignacian or Aurignacian elements in the retouched artefacts of Kara Kamar III. The basis for this attribution is the resemblance between the carinated end scrapers from Kara Kamar III and those from the Levantine Aurignacian (Solecki, 1955: 425). However, Davis doubts the attribution because carinated end scrapers have wide distribution in time and space and that Afghanistan got the tradition from west Asia. It is reasonable to suggest that Kara Kamar Upper Palaeolithic is a unique find because nothing like that has been discovered so far from Soviet central Asia, India and Pakistan (Davis, 1978: 37-70). The closeness between Kara Kamar and Baradostian Upper Palaeolithic appears to be due to the similarity in environment and economies of both the areas. It is suggested that there may have been various centers for the origin of the Upper Palaeolithic ; west Asia and Afghanistan may be two such centers closely allied to each other due to similarities in environment and economies of these areas.

Kara Kamar Upper Palaeolithic economy continued to be hunting and gathering as in the Middle Palaeolithic but there was a trend towards the specialized hunting of large games such as the wild sheep and goat and these animals were subsequently domesticated in Afghanistan. Horse bone and tortoise shell have also been found from

Kara Kamar III. It appears that tortoise also formed part of the diet besides horse, sheep and goat (Dupree, 1978: 261, 262). A few samples from Kara Kamar have given dates older than 30,000 B.P. (Coon and Ralph, 1955: 921-922; Srivastava, *ibid*: 221).

3. 7. 5. The Upper Palaeolithic of Central Asia: The Upper Palaeolithic of Central Asia, as compared to Lower and Middle Palaeolithic, has not well documented. The Upper Palaeolithic, primarily a blade and end scraper industry that developed in the second half of the Wurm, is represented by excavations at two stratified sites in Shugnou, in the Yaksha river valley of Tajikistan and Samarkand in Uzbekistan. Both are open air sites and have several distinct occupation horizons. More than 30 other surface sites are scattered over much of Central Asia where small collections have been made, the tools rather conditionally assigned to the Upper Palaeolithic (Ranov and Davis, 1979: 257; Gupta, 1979). On the transition from Mousterian (Middle Palaeolithic), the authors opined, "In general there was no great technological leap forward to the upper Palaeolithic. Many Mousterian elements remain such as points, denticulates, side scrapers, and Levallois technique." However, they noted that at the very end of the Upper Palaeolithic the prismatic blade technique made its appearance at Khodza-Gor and Shugnou horizon (Davis and Ranov, 1999: 191-192). The Upper Palaeolithic site of Samarkand site also yielded choppers and chopping tools. Shugnou with five layers of cultural deposit, the uppermost layer is considered Epi-palaeolithic while the lower four are Upper Palaeolithic. The Epi-palaeolithic layer has a number of longitudinally curved blades, micro blades, tongue shaped end scrapers and a large number of carinated core tools or nucleoform scrapers with similar parallels at Samarkand. It has been dated to about 10,700 B.P. by C14 determination (Davis and Ranov, 1999: 192; Fig. 6). Horizon 2 is represented by a large number of prismatic blades struck from the cores by the crested blade technique. Ranov has provisionally dated this site to 25,000 B.P but Davis favours a date of 15,000 B.P. Faunal remains include horse, aurochs, sheep, goat and marmot. Horizons 4 and 5 were also assigned to Upper Palaeolithic. The Samarkand site is located in the centre of Samarkand city. Three occupational layers yielded over 7000 artefacts, which most probably belong to Upper Palaeolithic. There is a considerable similarity in the artefacts assemblages. The stone industries is characterized by the presence of Mousterian type tools- flakes, points, and notched tools with a high percentage of core

tools and coppers and chopping tools. The Upper Palaeolithic type includes bladelets and micro blades, and end scrapers. A large number of carinated scrapers, nosed shape scrapers and notched tools are also present. The age of the Samarkand site has generally attributed to between 20,000 and 15,000 years before now. Based on the small amount of Upper Palaeolithic material Ranov has concluded that there is no evidence to suggest that the Upper Palaeolithic sites reflect any significant diffusion from outside of Central Asia and can be understood as continuation of the Mousterian cultures. The Central Asian Upper Paleolithic sites are not in stratified caves or rock shelters but they are in open air, which is difficult to explain. According to some scholars there was generally a decrease or decline or total absence of Upper Palaeolithic sites during the main Wurm in many areas of southern Western Asia and Central Asia; they include Davis (1978), Copeland (1975) and Solecki (1963). But Ranov did not agree with them but opined that he believed that many late Wurm deposits either buried or eroded and that future work will demonstrate continuity of occupation throughout the Wurm (Ranov and Davis, 1979: 257-259).

3. 7. 6. The Upper Palaeolithic of India: The Upper Paleolithic, as compared to Lower and Middle Palaeolithic, is the most little known phase of Indian prehistory. Over the last few decades, a good number of upper palaeolithic localities with the industries of this phase have been found in stratified deposits in different parts of the country. Notable are the Andhra Pradesh group with sites such as Renigunta (Murty, 1968; 1970), Erragondpalem and Vemula (Reddy, 1970), Gundlakamma valley (Isaac, 1960) and the limestone caves in the Kurnool, (Murty, 1974; 1975; 1979; Murty and Reddy 1976; Raju, 1978), the Gambheeran valley in Visakhapatnam (Reddy and Prakash, 1978) and Paleru valley in Prakasam district (Rao, 1979). The Upper Paleolithic sites in Karnataka include Shorapur Doab (Paddy, 1979) and Salvadgi (Seshadri, 1962). The Maharashtra group includes Inamgaon in Pune district (Sali, 1979), Bhokar in Nanded district (Joshi and Pappu, 1979), and Patne in Jalgaon district (Sali, 1978). Other sites are the caves and rock shelters of Bhimbetka in the Raisen district of Madhya Pradesh (Misra et al., 1979). The Belan valley south of Allahabad in Uttar Pradesh (Sharma, 1973), Singhbhum in Bihar (Gosh, 1970) and few sand dunes sites in Gujarat and Rajasthan (Allchin et al., 1978). The Palaeolithic industries of the Thar and surrounding arid regions belong to the same humid phase as the Middle Palaeolithic. There were separate working floors of the Upper Palaeolithic

at Hokra and Pushkar. The Upper Palaeolithic Industries are based upon the production of parallel-sided blades from unidirectional cores which are also known as cylindrical (platform) or pyramidal cores. Middle Palaeolithic industries, as well as techniques, were persisted into the Upper Paleolithic. The Vishadi industry is another example of the overlap of Middle and Upper Palaeolithic techniques in a single industry. In the Thar region, B. Allchin discovered the site of Vishadi with a considerable quantity of Upper Palaeolithic material exposed by agricultural activities within a fossil sand dune. The artefacts and factory debris on the surface are all sand blasted suggesting a period of active building of the dune and assigned to the arid phase in the region (see Table 2.2). From the point of view of the above facts, the Vishadi dune was a factory site and a camping place of the Stone Age man corresponded to the Pleistocene arid phase. The stone industry comprises scrapers, burins, blade cores and flakes made on milky quartz (Allchin, et al., 1978: 223-231). The Upper Paleolithic industry of Pushkar is characterized by the presence of scrapers of the carinated variety, blades and blade cores, flakes and burins (ibid: Figs. 4. 8 and 4.9).

3. 7. 7. Upper Palaeolithic Southwestern Asia: the period of innovation marked by the appearance of various blade-tool industries following the Mousterian has traditionally been called the Upper Palaeolithic. It is representing food-collecting horizon (Braidwood and Howe, 1960). The Upper Paleolithic of Western Asia is characterized by the presence of keeled scrapers, nose scrapers, microlithic points and a special type of beaked burins (Garrod, 1938: 1-26). A single very important occurrence of such a blade-tool industry is Shanidar layer C. The Shanidar C industry is marked especially by a high proportion of burins and by perforators, fabricators, scrapers, points, notched blades and used blades and flakes. It is essentially a blade industry but is of comparatively poor quality; it has been named as Baradostian (Solecki, 1955: 415). The Baradostian has been dated to about 34,000.B.P by the C14 determination (Braidwood and Howe, 1960: 154; Fig. 8).

From the above review of some Palaeolithic sites, it is evident that the Upper Paleolithic of Western Asia shows a marked resemblance with that of the Bajaur-Mohmand area. Almost all principal tool types particularly blade and blades tools of this phase are present in both regions. Contrary to the European Upper Palaeolithic,

there are no subdivisions of this phase in South Asia. The distinctive Upper Palaeolithic tools of this region are comprised the carinated scrapers of the round and variety usually made on cores with lamellar retouch up to the top of the artefacts, elongated end scrapers, retouch on the distal ends, awls, burins, fabricators, microliths, points, a variety of burins which includes a special type of beaked form and oblique scrapers. The presence of the latter forms is the most dominant feature of this area. Similar tools have been found by Coon at Kara Kamar in Afghanistan, which were made on cores (Coon, 1957: 248; Srivastava, 1978: 58-63; Figs. 2-4). By contrast, the Upper Paleolithic in the Bajaur-Mohmand area is defined as the period in which the blade element is predominately associated with scrapers and flake tools of different kinds. In Pakistan, the initial Upper Palaeolithic made its appearance about 45,000 years ago as dated by the TL (Rendell et al., 1989: 151). The period is sometime is overlapping by the Middle Palaeolithic or Mousterian lithic industries as in the case of most of the Asian Palaeolithic industries.

Chapter Four

Mesolithic Cultures.

4. 1. Introduction

The Mesolithic (post-Pleistocene) industries are characterized by the presence of Microlithic tools. This period of the Stone Age is labelled variously in the Indo-Pak subcontinent as Late Stone Age, Mesolithic and Microlithic. However, Mesolithic is generally preferred and favoured for geometric and non-geometric lithic industries of this period. Microliths with the length of 1 to 8 cm are the main industry of the period. To judge from the size of the tools, it is obvious that such tools must have been used as composite tools hafted in wood, bone or antler.

The Mesolithic was generally the period when the glaciers were withdrawing to the higher altitudes in the north. The rest of the region in this period probably coincided with rise in temperature and precipitation. The pollen evidence from Rajistan also shows that around 8000 B.C. precipitation was much higher than today (Agrawal 198: 57). During this period, the artefacts of the stone industries markedly reduced in size and assumed the form of microlithic tools in Africa, Asia and Europe as cultures approached the Mesolithic phase. The food gatherers were migrating and adapting themselves to a changing environment of the Holocene period (Oakley, 1964).

4. 2. Survey of Mesolithic Period Sites in Pakistan

The Mesolithic period is poorly known in Pakistan, since no systematic study has been made so far to define clearly the characteristic features of the period .

4. 2. 1. Marwat Kundi and Sheikh Budin: Morris was the first to report some microlithic artefacts from the Marwat Kundi range and Sheikh Budin area (Morris 1938: 41-100). A second discovery was made by Gordon at the site of Jamalgarhi cave in Mardan district. The presence of microlithic tools implies that the site was used by Mesolithic people (Gordon, 1938 a).

4. 2. 2. Soan Valley: Microlithic artefacts were reported by De Terra and Paterson from Rawalpindi, Soan Valley. The microliths were made on brown jasper

or flint. These artefacts were collected from the surface of the loess in the Soan Valley (de Terra and Paterson, 1939: 277).

4. 2. 3. Sanghao Cave: the excavation at the Sanghao Cave also yielded microlithic tools, which Dani assigned to the Mesolithic based on comparison. Thus, period III of the Sanghao Cave contained Mesolithic period artefacts. In the stratified sequence layers 3 and 4 belong to the post-glacial or post- Pleistocene era or the Holocene period. Dani has found some geometrical tools in the stone industry of the Sanghao Cave (Dani, 1964: 15, 47). Tusa conducted excavation at the Sanghao Cave; he found two periods of Stone Age-Palaeolithic and Neolithic. He observed some microlithic tools at the late/upper levels, which he, on the basis of comparison, assigned to Mesolithic or Neolithic periods (Tusa, 1988: 76).

4. 2. 4. Jamalgarhi: Dr. Salim in 1974 investigated the site of Jamalgarhi cave and made a small collection of 45 artefacts. The artefacts were not inside the cave but lying in front of the site. For the lithic industry of this site milky quartz has been employed for all types of tools manufacturing. The collection comprised blades, retouched blades and blade cores (Salim, 1986: 33-34; Fig. 3). The blades show plain striking platforms and parallel ridges on the dorsal surface while the bulb of percussion is not prominent.

4. 2. 5 Khanpur caves: Elden Johnson discovered several caves and rock shelters near Khanpur village. He conducted a small-scale excavation in one of the rock shelters. It revealed a cultural deposit containing pottery of the historic period in association with microliths made on chalcedony. He could not continue the excavation and left a two meters cultural deposit untouched. There was another cave with stratified cultural material, which was not examined. However, he suggested that the second cave was not tested but it also contained depositional material on the floor (Johnson, 1972: 64)

Farid Khan from the Department of Archaeology University of Peshawar excavated Elden Johnson's Khanpur cave No. 1, but there is very scanty information about it. The only published information comes from a newspaper report 1974. The artefacts he recovered comprised small blades or retouched blades. As compared to

Jamalgarhi cave, the stone artefacts of Khanpur cave are made on chert and they are smaller in size (1974).

4. 2. 6. Chilas: more recently, Dani has reported microlithic tools at Chilas VII site near Gilgit. The stone tools included microlithic tools comprising flake cores, points and triangles made on quartz (Dani, 1983: 16-18). Farid Khan has tentatively dated these findings to post-glacial time or less than 10,000 B.P. It is curious that no Mesolithic tools have so far been reported from the Rohri Hills. As Allchin et al., reported "Lower, Middle and Upper palaeolithic working floors have been found in two of the three main groups of limestone hills outcropping from the main plains, which provide rich sources of chert for tool making, and the Harappans had large factory areas in the northern most group of the Rohri Hills but no Mesolithic material has been found" (Allchin et al., 1978: 270).

4. 2. 7. Las Bella: Mesolithic sites have been recorded in Las Bella on the northeast, where silt accumulation is more localized and in the Thar to the south-west on both sides of the valley (Khan, 1968).

4. 2. 8. Thar Desert: in 1995 a Mesolithic site (Sli) was discovered east of the town of Thari, in the Thar Desert. It is located in the western most sand dune system of the Thar Desert. It was described by Biagi and Kazi (1995). A total collection of 462 artefacts was made. It comprised both geometrical and non-geometrical microlithic implements. The raw material used is flint (Biagi and Kazi (1995: 7-12; Fig. 40).

Another Mesolithic site Duhbi was discovered by Qasid Mallah in 1983 in the Thar Desert (Sind, Pakistan). It is located within sand dunes of the Thar Desert system south of the Rohri Hills. The surface collection from the site comprises borers, triangles, notched bladelets, and isosceles trapeze, retouched blades and backed bladelets (Shar et al., 1996: 29-47; Fig. 5). Besides, a number of Mesolithic period sites have been recorded by Shaikh et al. along lake shores in the Thar Desert (Shaikh et al., 2002-2003: 36-37)

4. 2. 9. Takhti Khel area, Bannu: the Mesolithic in Bannu is represented by a number of sites discovered in the Kot Kashmir / Takhti Khel area: Gul Shah Top in the former region and Yarak/ Nekumshak and Tup Takhti Khel in the latter. All these

sites are found on dunes in areas where sand movement and formation of new dunes is active (Khan et al., 1991: 21-23). Numerous chert microliths and cores were found eroding out of the surface of the dunes and lying on deflated surfaces. The raw material of this industry is mainly cryptocrystalline silica – chert but also includes flint and chalcedony. These are the first reported Mesolithic sites of sand dunes in Pakistan and may be compared with dune sites well-known in Rajasthan (Allchin et al., 1978; Misra and Rajaguru, 1989). The precise dates of these sites are not clear as all the material is from surface collections. These Mesolithic industries have tentatively been dated to less than 10,000 B.P (Khan et al., 1991: 21).

Among these sites, Gul Shah Tup is the largest sand dune and it is about 300m in length by 180 m wide and some 6 m high. It is located on the right bank of the Gambila River. The site is a natural mound of wind blown sand. The largest site has now been affected by deflation and washed down, the principal agency of erosion at Gul Shah Tup being wind. Microliths were found all over the site, especially in the vicinity of a group of modern graves dug on the mound, suggesting that these stone tools included wastes, flakes and cores had been exhumed at the time of the graves were being dug. They were also found on leveled surfaces in the area of the mound, suggesting that they had been left lying on deflated surfaces. They are of the view that most likely the microliths are stratified in the dune deposit. The rough and gritty pottery on this site according to them most probably belongs to these modern graves. However, the presence of potsherds within the site makes its true character doubtful as a Mesolithic site. Tup Takhti Khel is a scatter of stone tools on the surface of an old sand dune some 130 m long and 80 m wide and about 10m high. It is located 2 km south of Takhti Khel village. The surface of the site is sandy, with few stones. The archaeological material consists of microliths, including flake tools and waste flakes. The presence of pottery sherds at site makes a close examination of the site necessary to establish its true character.

To the north east of Tup Takhti Khel are two further sand dunes bearing deposits of microlithic stone tools. These two sites are called locally as Yarak and Nekumshak; they yielded small quantities of microliths entirely reminiscent of the larger site nearby. The artefacts from all these sites are characterized by the presence of retouched and unretouched microliths. The lithic assemblages comprise scrapers of

different kinds, blades and bladelets, burins, awls and petit tranchets, lunates and cores (Farid khan et al., 1991: 21-23). The stone assemblages from all these Mesolithic sites are microliths made on blades. Both blades and flake tools are found in the collections in which bladelets predominate; small flakes tools are also present. Most of the blades and bladelets are snapped in the middle, at the tip, and at the bulbar end. Such blades have been snapped deliberately so that they could be made into tools. The assemblage from Gul Shah Tup contains many micro-burins suggestive of the notched technique of making microliths. The Gul shah Tup collections also contain lunates and petit tranchets; at Tup Takhti Khel there are no geometric microliths. All the blades and flakes are very small in size and contrast markedly with the larger blade and flakes from the Neolithic and Chalcolithic periods assemblages in the region.

4. 2. 10. Soan Camp PS-24 Rawalpindi: here Salim found traces of huts, hearths, microliths, axes and anvils (Salim, 1992: 45-56).

4. 3. Mesolithic sites in the Bajaur-Mohmand Area

4. 3. 1. Musa Kamar (Fig. 33, No.14): the site of Musa Kamar is located about 3 ½ km in the south from the main Bajaur highway. It can be approached by a paved road that diverts from the main road at Bagorai. It is on the eastern side of the spur, which projects in northeastern direction from the hill and demarcates Sherghato and Ghondo where the rock shelter is located. It faces east. The site measures 25 m in north south direction. The entire site is intact with remains of walls of modern construction on the surface in front of it. Here we collected microlithic tools with a few large scrapers and flakes. The site is commanding the main Bajaur valley. It has great potential as the pre-historic archaeology of the area is concerned. For thorough investigation of the site, excavation may be conducted to expose the cultural sequence in a systematic manner.

The Mesolithic industry of Musa Kamar is characterized by the use of microlithic tools. These tools include geometrical and non-geometrical implements. The non-geometrical microlithic predominate. There is evidence of the use of pressure technique, as small slivers have been removed from some tiny tools. We have microlithic bladelet cores and microlithic flake cores. Chert has been employed for

the manufacture of these tiny tools. It is found in a variety of forms, but blackish, brown, red, grey, light brown and deep dark is the principal colours of the chert raw material. Quartz has also been used on a small scale in the tool manufacturing. The technique of flaking seems to have been well-prepared core technique. Retouch or secondary trimming has also been applied to the tools. The stone tools include lunates, blades, bladelets, points, burins, saw, awls and a variety of different scrapers in which the more distinctive scrapers are carinated or core tools. The blades and bladelets show only single ridges on their dorsal surfaces. A big Levallois flake is also present in the assemblage with a number of flaking scars on its surface. Similarly, the site of Chinar also yielded various microlithic tools they include small end scrapers, carinated scrapers, thumbnail scrapers, burins, points, micro burin, here we found very few or no blades. Bladelet and flake cores are present. One large lunate is present in the collection. Raw material used is chert, brown, grey, and milky quartz. A total number of 48 tools include the following tools types: scrapers-13 (26%), points-2 (4%), blades and bladelets-18 (36%), tranchets-2(4%) and bores-2 (4%), burins-2 (4%), flakes-4 (8%), lunates-3(6%), core - 1(2%), burins-2 (4%) and awl-1(2%).

4. 3. 2. Kamar upper Chinarai Smast (Fig. 33, No.11): the site is located about 1 km to the west of Chinar Smast an upper palaeolithic site in the upper Chinarai locality. It is a small cave facing north. The stone artefacts were collected from the slope below the cave; there are no cultural remains within the cave as suggested by the bedrock. The roof of the cave is thickly coated with carbon or soot suggesting long occupation. Microlithic tools include blades, points, scraper, burins, beaked or flat nosed scrapers; raw material employed is quartz and chert in a variety of forms. Total tools are 44. They include scrapers-21 (47.72 %); burins-3 (6.81 %), flakes-5 (11.36 %); blades and bladelets-10 (22.72%) and points -8 (18 %).

4. 3. 3. Warsak Smast (Fig. 33, No.17): the site is located 1 km from Nawa pass road to the east in the Alingar valley. It can be approach through a *kachha* road that leads from *Gongat Johar* through a hill torrent. It is a small rock shelter, which also yielded stone tools but few in numbers. Tools types include points, bladelets, and lunate of geometrical and non-geometric microlithic forms. Quartz, chert and green stone have been employed for the manufacturing of these tools. Many flake and blade cores are present. The site yielded 45 artefacts, which include the following groups:

scrapers-12 (12.66%), points-3 (6.66%), flakes-11 (24.44%), burins-7 (15.55%), blades -5 (11.11%) lunates-3 (6.66%), trapezes-4 (8.88%), triangles-2 (4.44%) and flake cores-2 (4.44%).

4. 3. 4. Sara Smast (Fig. 33, No. 10): it is a factory or workshop site. The stone industry is comprised some microlithic tools, however, the collection is basically Upper Palaeolithic as far as the main industry is concerned. Microlithic tools include small-nosed scrapers, awls, burins, and points – a tendency towards microlithic or Mesolithic industries. There are also some microlithic burins and tanged points, and micro burins.

Since most of the collection forms tools of the Upper Palaeolithic, it has been described in the relevant chapter of the Upper Palaeolithic.

4. 3. 5. Tora Smast (Fig. 33, No. 9): it is located 50 m to the west of Sara Smast and is of the same size as the above. It also yielded a great number of artefacts found on the surface. The tools were collected from the terraced fields below the cave. The roof of the rock shelter shows a thick layer of carbon or soot suggesting long occupation. The site seems to be intact. Tools include lunate, microlithic tools, bladelets points, small burins, bladelet cores, awls. Green, brown, red and dark color chert and quartz have been used for the manufacture of these tools. The collected artefacts (141) from the site include the following principal types: scrapers-34 (24.11%), flakes-17 (12.05%), miscellaneous- 24 (17%), blade like flakes-8 (5.67%), Blades-32 (22.69%), point-1 (0.07%), trapezoidal-3 (2.12%), Knives-5 (3.54%), and burins-17 (12.05%).

4. 3. 6. Thapalkan (Fig. 33, No.16): the site is located about 200m to the east of the Lar Chamar Kand bazaar. There are several rock shelters and caves; it is not a single period site but a cluster of different sites ranging from Middle Paleolithic to Mesolithic. The western rock shelter has yielded many microlithic tools. A small rock shelter above the scout post produced many microlithic tools. There are a number of caves and rock shelters in the Lar Chamarkand. All the caves and rock shelters yielded microlithic tools. Main types of tools include points, burins, blades and bladelets, all are microlithic in character. Chert in brown, black and red color is used

for the tools. 26 collected artefacts include: points-6 (23 %), triangle-1 (3.84 %), lunate-1 (3.84 %); scrapers-5 (19.23 %), burins-1 (3.84 %), and cores-6 (23 %).

4. 3. 7. Nawagai Thanga (Fig. 33, No.15): this site is located just opposite the Mousterian site of Hisar Kot on the right bank of the Nawagai *khwar* (hill torrent). 16 artefacts from the site comprise scrapers-5 (31.25 %), points-2 (12.5 %), burins-3 (18.75 %), triangle-1 (6.25 %), and cores-3 (18.75 %).

4. 3. 8. Guloono Kamargai Kamangara Ambar (Fig. 33, No. 18): this site also yielded microlithic tools of geometrical form. It is just in the west of the Mousterian site of Guloono Kamar Kamangara. 12 artefacts from the site comprise scrapers -4 (33.33 %), trapezes -2 (16.66 %), points-3 (25 %) and lunates 3 (25 %).

4. 4. Mesolithic Cultures in the Light of Recent Research

While commenting upon the Mesolithic period of the subcontinent Allchin and Allchin (1982: 62) write, " In the Indian subcontinent distinct , self contained social groups at different levels of cultural and technological developed and survived right into this century; they include hunting and collecting tribes, pastoral nomads, shifting cultivators, traditional settled agriculturists, modern developed agriculturists and several levels of urban industrial society, all coexisting and economically interdependent". On the distribution pattern of these Mesolithic people in various parts of the subcontinent they write: "Already in almost every region there was existing population of hunters, fishers and collectors, among whom adaptation of local food growing or other plants or domestication of local species of birds or animal must have taken place, or less independently of movement of people without help from outside" (ibid: 62).

The Mesolithic of India shows a broad overlap in time range from region to region of this period. Mesolithic or microlithic industries are found throughout the subcontinent.

A considerable amount of microlithic material has been recorded from the arid Thar region of western India and Pakistan to the southeast of the Indus, particularly in the dry zone on the southeastern margins of the Desert. Almost all Mesolithic or microlithic material has been found on surface. However, the Mesolithic site of Bagor

on the Indian side is of greater importance. It was discovered by Misra in 1967 and later on was subjected to excavation. It is the most completely investigated and best studied Mesolithic site in the whole subcontinent so far.

The total thickness of the habitation deposit in various trenches is 1.5m. It revealed a regular occupation of the site over a period of five millennia immediately before the Christian era. To summarize V.N. Misra: during this period a culture based on stone technology hunting pastoral economy underwent continuous evolution as evidence by the appearance of new material traits and the decline or disappearance of others. The most abundant material, which continued throughout the occupation, was the very distinctive microlithic industry. No stratigraphical break was seen at any stage in the occupation, but on the basis of changes in material culture three phases of Bagor culture can be recognized. Phase I is characterized by the presence of extensive paved floors occurred with alignment of stone. Numerous bones many of them charred and split open, also stone pebbles used to break the bones and make microliths. Querns and rubbers indicate the use of plant food.

Stone industry is based on chert, chalcedony and quartz almost mainly geometric in nature, the main types being triangles, trapeze, and petit tranchets the last type is quite characteristic of Bagor. The Mesolithic industry shows a gradual decline from period I to III.

4. 5. Geographical Distribution: Mesolithic sites are now known from almost all over Indian subcontinent though their density is greater in some areas than others. However their presence or absence or sparseness of Mesolithic sites are in the region is mainly due to the ecological reasons or factors or environmental conditions that prevailed in the Holocene geological era. The absence or lack of Mesolithic in any region is merely due to the lack of raw material for their tools as well weapons and the insufficient availability of flora and fauna upon which their existence or survival depended. The Mesolithic people settled in very different kinds of environment and exploited a great variety of foods resources. They settled on the Bannu sand dunes (Khan et al., 1991); they occupied rock shelters and caves (Ali and Rahman, 2005) and the banks of rivers in the Thar region of Sind, Pakistan (Biagi and Kazi, 1995). Mesolithic industries of India present considerable regional diversity in terms of typology component and raw material and techniques used in the manufacturing of

tools. The major component of this cultural stage consisted of microliths- tiny tools from less than 1 to 5 cm in length. Coon (1957: 247) identified a Mesolithic at Kara Kamar which yielded 58 tools primarily microlithic cores, blades, but no geometric tools. According to Davis (1970), industries of Kara Kamar were manufactured using different techniques from those of the Upper Palaeolithic Kuprukian. The fauna included gazelle, wild sheep and mole vole, which were dietary favourite in the Mesolithic times (Dupree, 1978: 255).

4. 6. The Settlement Pattern

The Mesolithic people have occupied rock shelters and caves in the mountainous region such as the Bajaur- Mohmand area, the Sanghao Cave and Jamalgarhi rock shelter in Mardan district and the Khanpur caves in district Haripur. Similar sites are also found in the plain regions like the Mesolithic sites in the Bannu basin where the sites are located on elevated sand dunes and on high mounds. Mesolithic sites have also been reported from the Soan Valley in the Potwar region. The latter site is located on the surface of the Potwar loess (see Figs. 33 and 41). Similarly, the Mesolithic site of Duhbi is located within the sand dunes of the Thar Desert south of the Rohri Hills. The site is located on large sand dune facing a backwater lake. From the location of these sites, it can be assumed that the sites were occupied for short period of times mainly during high rains when the lakes fed by flood water or the fresh water ensured supply easy for long times (Shar, et al., 1996: 39-47).

4. 7. Summary

During the terminal Pleistocene and early Holocene, there occurred a considerable change in the global climate. The Palaeolithic cultures were approaching the Mesolithic phase; the stone industries were becoming microlithic in most parts of the world. As a result the food gatherers of the Paleolithic period started migrating and adapting themselves to changing environment. As the last glaciation withdrew to the high altitudes, it left behind lush green valleys to accommodate new fauna and flora that were the principal resources for subsistence of the Mesolithic peoples. To make a better use of the new environmental conditions, Mesolithic people began making blades and blade tools of considerably small size. The tools as suggested by these small artefacts people also introduced a new technique as generally known as

pressure technique. The stone tools of this period are characterized by both geometrical and non-geometrical tools. Often the geometrical tools include triangles, lunates and trapezes. Other non-geometrical tools comprise scrapers of various kinds, borers/ awls and burins. The small size of the tools suggests that they must have set in wood, bone or antler handles or shafts to form composite tools and weapons.

Chapter Five

Neolithic culture

5. 1. Introduction.

The last period of the Stone Age is generally known as Neolithic. The term Neolithic literally means 'new Stone Age'. It succeeded the Mesolithic period that in turn began after the considerably long Palaeolithic period. With the inception of this new era, there occurred marked changes in stone technology and typology. Hunting based economy partially changed to food production based economy. The pre-ceramic Neolithic economy depended upon hunting and food collecting and the habitats were still rock shelters and caves as the present evidence suggests. Man exploited both animal and plant food resources. Some 10,000 B.P., there occurred some marked changes in the stone technology and economy. In terms of not only stone technology and typology but there also occurred some basic changes in the economy and climate. Along with this, man also changed his previous living pattern that had been confined to caves and rock shelters. All these fundamental changes in man's living virtually led to well-urbanized centres. Owing to these dramatic changes, V.G. Childe called the new period as 'Neolithic revolution' as he writes, "The first revolution that transformed human economy gave man control over his own food supply. Man began to plant, cultivate and improve by selective edible grasses, roots and trees. And he succeeded in taming and firmly attached to his person certain species of animals in return for fodder he was able to offer, the protection he could afford, and the forethought he could exercise"(Childe, 1941: 66). Climatic changes in the very beginning of the Holocene period produced warmer, moister and almost similar conditions to those of the present day in western and south Asia. As a result, different ecological conditions provided prehistoric man with more reliable food supplies and led to population increase. Similarly, the regular collection of wild cereals led to the domestication of certain types of plants that might be grown artificially. Certain species of animals were also domesticated but the latter seems to be a subsequent phenomenon. The above two basic changes in man's economy and congenial climatic conditions provided the setting for man to make a number of important advances in his control of the environment. With the inception of new economy and technology,

the Neolithic people also occupied spacious settlements to accommodate the new way of life. Prior to this, he lived in small caves and rock shelters and perhaps in small huts in the open air (Ali and Rahman, 2005).

With the beginning of permanent settlements in the plain areas, there occurred some innovation in the technology like the advent and mass production of terra-cotta ceramics, which were used for a number of purposes by the Neolithic people (Allchin and Allchin, 1986; Seriandi, 1999: 109-126). In the early phase of the change to a production-based economy, it was essential that wild plants suitable for domestication should necessarily be available. In this context, Western Asia seems to have been the original place of such phenomenon. N. Valinov (1949-50) identified Western Asia as a main source of cultivation of plants where the advent of production based economy had taken place. The technique of the economy of food production did not exclude the gathering, hunting and fishing though their role became secondary to that of land and animal husbandry. This process heralded a crucial shift in the development of human beings. Several camps, caves rock shelters and grottos gave way to permanent settlement with human helmet of sun baked bricks or lumps is the first triumph of sedentary life style. There were several centres in Western Asia when the transition to a Neolithic economy is traceable and primarily in northern Iraq and western Iran where elements of the production based economy may be traced back to the Mesolithic cultures of the tenth and eighth millennium B.C. Parallel contemporary cultures have been identified in Asia mainly in Palestine and Jordan. The earliest evidence of these changes in South Asia comes from the site of Mehrgarh in Baluchistan. About the primary Neolithic Jarrige writes 'at Mehrgarh all the evidence suggests a primary Neolithic, whether it is a question of the domestication of plants and animals or of the evolution of life ways and craft activities. No element suggests the influence of technologically more advanced groups on the first Neolithic population at Mehrgarh neither in the craft sphere nor in agriculture'. The Neolithic at Mehrgarh has been dated to by C14 to ca. 7000-4000 B.C. (Jarrige, 1995: 52).

5. 2. Survey of the Neolithic Sites in Pakistan

5. 2.1. Kili Gul Muhammad: the mound of Kili Gul Muhammad is located about 3 km in the north east of Quetta city. It measures approximately 90 meter long and 55 m wide. It is about 8m high. Most of the mound is now occupied by graves of

the latest residents of the area. Here in 1950-51 Fairservis carried out a small scale excavation, only 3.5 m square reaching virgin soil at the depth of 11.14m. Four periods have been located; we are only concerned with period I. The lower levels of the four cultural phases revealed at the site produced radio carbon samples from a hearth in the upper most levels. These have given dates of 4400 and 4000 B.C. Below these is a further deposit of nearly 4 m in thickness. The earliest date indicates that the inhabitants had domesticated sheep goats and cattle . However, by the end of the period they had constructed houses of mud bricks or hard packed clay of wattle and daub. The stone industry includes blades of chert, jasper, chalcedony and rubbing and granite grinding stones. Awls or points of bone were also found. No potsherds were encountered. On this ground, the excavator called period I as aceramic or pre- pottery Neolithic (Fairservis, 1956: 169-402).

5. 2. 2. Gumla: the main mound is almost square, measuring 60, 49 m each side, with a 9.14 m extension on the south, and a further 11.-34 m extension on the north. Thus, the north-south axis actually measures 91.44 m. Today, the mound is cut up by the rain and the gullies at the four diagonal corners where much of the cultural deposit has been washed away. The excavation was conducted under the supervision of Dani by a team from the Department of archaeology University of Peshawar (Dani, 1970-71). The excavation has yielded a stratigraphical sequence of 6 main periods. But we are only concerned with period I which is, according to the excavator, aceramic or pre-pottery Neolithic. Period I is the earliest occupation, which is about two meter thick and directly lies on the virgin soil. This occupation is on a sandy clay deposit , most probably made by a stream which must have flowed in the neighborhood of the mound. No traces of structures or regular habitation have been found in this period. No potsherds were encountered in this period. The only evidence of human occupation was two large pits dug into the virgin soil and filled with charcoal and ash. These pits were called by Dani as community ovens in which unknown materials were roasted. Stone tools were very significant. These throw light on the life pattern of the Neolithic people. The stone industry is predominately microlithic. The microliths include parallel-sided blades, awls, burin, scrapers of different kinds, burins and one tranchet. Other unstruck stone implements comprise saddle quern, rubbing stones, stone balls and pestles. Animal bones were also reported. All this suggests that these people of the Neolithic period were primarily dependent on

hunting and they had no agricultural tools for cultivation of cereal foods. Commenting upon the period I Durrani writes "it is possible that the limited excavation area at Gumla has biased our ability to understand this initial occupation" (Durrani 1988: 15).

5. 2. 3. Mehrgarh: the site of Mehrgarh is located in the northern region of the Kachi plain at the foot of the Bolan Pass. There the Bolan River enters the plain and now cuts the ancient settlements. A French archaeological Mission has started excavations in 1974 and the work still continues (Jarrige, 1995: 51-67). The excavations were conducted at four different places, labelled as MRI, MRII, MRIII and MRIV. These diggings have brought to light a certain sequence of occupation ranging from seventh millennium B.C. to the middle of the 3rd millennium B.C. Period I is the oldest settlement which represents the pre-ceramic or aceramic Neolithic culture. It has been discovered in area MR3. The excavation has revealed that the area was occupied by permanent farming community who did not make use of pottery. The same period is labelled as pre-ceramic Neolithic stage. The radiocarbon dates allowed a date slightly prior to the seventh millennium B.C. for the beginning of this period. More than 70 sq m area has been exposed and this has shown that the settlement contained multiform units separated from one another by open spaces that held numerous human burials. Some of the structures were divided into small square compartments apparently used for storage purposes. The main building material was rectangular mud brick. A number of oven and circular hearths have been found in the excavation area. Some stone tools included grinding stones and small flint blades and flakes. Agriculture was practiced as evidenced from several sources first by the presence of or use of flint blades showing shin produced from cutting plants. Secondly, the finding of the impression of various cereal grains in the mud debris, like two row barley, six row barley, emmer bread wheat charred seeds of the plum like jujube fruit and stone of dates have equally been uncovered in these levels indicated that both plant or trees were food resources in the Neolithic times. The fauna and flora are another important source of information about the development of Neolithic phase at Mehrgarh. In the later assemblages, the remains of wild animals like gazelle, wild sheep, wild goat, swamp deer, large antelope and wild cattle could be seen in large numbers. However, in later periods, they are gradually replaced by the domesticated varieties, that also include goats and cattle. A few remains in the upper levels of period I show wild characteristic gazelles, wild pigs, onager; it is thus

clear that the Neolithic period at Mehrgarh witnessed domestication of animals and plants as early as it did in Western Asia (Meadow, 1981: 143-179, Meadow, 1984: 34-40).

There are some Bronze Age sites in the Bannu basin and the Gomal valley i.e., Sheri Khan Trakai, Jandi Babar and Gulkai Kot with characteristic features of the developed Bronze Age cultures. Following Farid Khan et al. the latter sites have also been attributed to Late Neolithic on the grounds that there occur stone artefacts especially blades and blade tools. By contrast, we are of the view that these sites apparently belong to Early and advanced Bronze Age cultures that emerged indigenously in this region (Khan et al., 1986: 13-34; Ali and Khan, 2001: 173-217; Zakirullah, 2004: 97-95). Thus the adopted term 'Late Neolithic' may be dropped in favour of developed Bronze Age culture or Chalcolithic culture.

5.3. Neolithic in the Bajaur-Mohmand Area

The Neolithic period in the Bajaur- Mohmand area is represented by the palaeolithic rock shelter of Ango Gatkai (see Fig. 33, No.2). This is the single Neolithic site in the area. The excavation conducted here in 2004 has revealed 7 cultural layers of three different periods of the Stone Age. The excavation exposed a two-meter (1.9m) thick cultural deposit containing seven stratified layers of which the three upper layers 1-3 in the profile are Neolithic or pre- pottery or aceramic. Hence, the excavation has brought to light three main period of the Stone Age. Period III directly succeeds period II that is Upper Palaeolithic. It should be mentioned here that the Mesolithic period that must have occupied space between period II and period III is missing by one reason or the other. For this we have no reason or explanation to why the Neolithic occupants took over the site without any apparent gap after the Palaeolithic. It should be noted that the Ango Gatkai is the only Neolithic site known so far in the area. It is found in a rock shelter previously inhabited by the Palaeolithic man. On the contrary, the Neolithic sites or settlements of this period are found in the plain areas. The period is Neolithic because it yielded characteristic type tools that are the criteria of the Neolithic period.

The principal raw material for tools manufacturing is chert in a variety of colours found in the area. Quartz and flint have also been employed by the Neolithic people of

Ango Gatkai in a limited quantity. The raw material used is numerous, however, chert is the principal material employed by the Neolithic people at the site. Apart from chert, other stone used by the people is granite, sand stone, limestone and green stone. In period III, we have found heavy duty tools like ground stone tools, pounders, rubbers hammers stone of various types, saddle quern, flat grinding stone and a great number of anvils with marks of use known as dimple scars either on one or both surfaces. All the material seems to have been collected from the nearby hill torrent or *Khwar*. The lithic industry at Ango Gatkai Neolithic period is comprised blades, burins, points, scrapers awls, flakes and numerous other tools were employed by the Neolithic people to accommodate the new way of life. Choppers and chopping tools are the characteristic of this site since they were first reported by Ranov from Central Asia (Ranov and Davis, 1979: 260). Several charcoal samples from different layers for C14 determination have been collected. They have yet to be processed for dating purposes. Having a very scanty record of the Neolithic period in adjacent areas, we cannot place our Neolithic Period III in a firm chronological order; however, a tentative date of 6000 B.C seems to be plausible for this period in the area.

5. 4. Analysis of the Stone Industry of the Neolithic Period of Ango Gatkai (layers 1, 2 and 3).

The stone industry of Ango Gatkai Neolithic period, particularly the chipped stones, includes scrapers, burins, points, awls, high-ridged blades, choppers and chopping tools. Flakes and flake cores, prismatic blades and blade cores, backed blades and tongue shaped scrapers. The technique employed for the manufacturing of tools by the Neolithic people is not much different from the preceding periods; however, here most of the tools are crude with less retouch or trimming on the working edges. Here the discoidal core technique can be observed but Levallois technique is also used by the people. There are a few Levallois points, which may be compared with those from the Middle palaeolithic tools despite very long time difference between them. We also observed that most of the tools show some of the original cortex on their surfaces. The evidence offered by the presence of Levallois technique gives the Neolithic of Ango Gatkai unique position as compared to the Neolithic sites elsewhere but here the tools are not microlithic in character. Here we may put forward the hypothesis that most of the Palaeolithic artefacts mentioned by

De Terra and Paterson fall in this category, they include Levallois flakes and some chopping tools assigned by them to Palaeolithic period. It may be noted that one of the excavated sites of the Soan Valley Riwat 55 has not yielded Levallois cores and tools.. Most of the uncovered tools are cortical (Rendell et al., 1989).

The stone industry is mainly comprises struck and unstruck stone tools which forms Period III of the Neolithic Age at Ango Gatkai rock shelter. The two main types are described as follow.

5. 4. 1. Struck Stone or Chipped Stone Tools

5. 4. 2 Points: there are few points, which have been made on the Levallois technique. The presence of such type of tools suggests that the Levallois technique was not the only feature of the Middle Palaeolithic industries but artefacts made on Levallois or prepared core technique are also found in the Neolithic industries. At the strength of the evidence found in this area, we may propose that some of the flakes and points from the Soan Valley attributed to the Paleolithic periods most probably fall in this category (Pls. 84, 86, 87 and 88). Apart from these points, there are other examples, which are thick at the bases and tapering towards the tips of the tools. They are crude as compared to the aforementioned points. (Fig. 8, Nos. 25, 26, 27)

5. 4. 3. Choppers and Chopping tools: there are a good number of choppers and chopping tools in the lithic industry of Ango Gatkai. All these tools are made on blackish chert nodules. The presence of such types of tools in the Neolithic period again casts doubts on those pebble tools that have been collected from surface without secure geological contexts in the Soan Valley (Fig. 5, Nos. 6, 8-12).

5. 4. 4. Scrapers: scrapers of various types are present in the Neolithic period III of Ango Gatkai. They are crude and show very marked difference to the preceding period of the area. A medium size tongue shaped scraper is the characteristic among the scrapers of the Neolithic period (Fig. 65, Nos. 10, 11 12, 13).

5. 4. 5. Flakes: among the flakes large Clactonian type flakes occur. Some show cortex on their surfaces as well. Parallel examples are found in the Samangan province of Afghanistan (Puglisi, 1963: Figs, 1-8). It should be mentioned here that

these tools are technologically resemble to the flakes from Clacton on sea rather than from the point of view of age-depth.

5. 4. 6. Blades: there are three kinds of blades; they are as backed blades, blades with curved working edges and parallel sides blades, their number is very small (Fig.6, No.15 and Pl. 89). A very well made example comes from layer 2. One unique blade made on blackish chert is found in layer 2.

5. 4. 7. Ground stone tools: the ground stone industry of the Neolithic period is characterized by the use of ground stone tools. They include hammer stone of different kinds, anvils with single and double dimples on their surfaces. The anvils with dimples made appearance in the Upper Palaeolithic layer 4 and continued through layer 2 (Fig. 4, Nos.7, 8, 10). These hammers or anvils are also reported from Sanghao Cave and from the Mesolithic sites of South Africa (Clark, 1959: 173). Plain and saddle querns with ground pestles are present in the Neolithic period, which made its appearance in layer 3 (Fig. 14, Nos. 1-4).

5. 5. 8. Bone tools: There are few worked bone and bone tools; they include anvils, chisels and polished awls along with a great number of unworked bone pieces.

5. 4. 9. Faunal remains: from almost all layers of the Ango Gatkai rock shelter a good number of bones have been collected. However, they have not been subjected to analytical study so far. In this context, we refer to the already identified animal remains from Afghanistan and Baluchistan as the climatic conditions seems to have been similar in both the regions during the Neolithic times.

Comparison

The Neolithic in the Bajaur-Mohmand area is completely aceramic; there are almost no microlithic tools as found in other Neolithic sites of the period in the region. The location of the site is different because it is found in a rock shelter as compared to the sites of the Bronze Age and Neolithic period, which are found in the plain areas.

Chapter Six

Conclusion

From the point of view of prehistory, the Bajaur–Mohmand area was a *terra incognita* until a decade ago. Just a few years ago, the Directorate of Archaeology and Museums Government of N.W.F.P. has conducted survey and exploration in the area under the supervision of the present author. An excavation at the rock shelter of Ango Gatkai was also a part of the exploratory work in the area. As a result of it, we discovered a large number of new archaeological sites. Most of them belong to the historic period ranging from the Bronze Age to the sites of the latter historic period, which throw light on the recent archaeological phases of Pakistan archaeology. Among these discoveries, the most significant was the finding of the prehistoric sites of the Pleistocene and Holocene periods. Most of these sites are located in caves and rock shelters of the limestone formation of the northwestern Bajaur–Mohmand area near the Pak–Afghan border. No open-air sites have been recorded except the Mesolithic huts of Kausar. We cannot apply the term Palaeolithic to all the sites because we have also sites of the Holocene period containing both Mesolithic and Neolithic sites. For the whole range of the Pleistocene and Holocene, the term ‘The Stone Age’ will be used to encompass both the periods. The Stone Age sites comprise the relics of the ancient people. Of the relics, we mean the crude stone artefacts manufactured in the sites by the Stone Age man for the daily use as weapons for hunting and implements for butchering large animals. The artefacts are buried in stratified caves deposits except those, which have been exposed by natural or human agencies. Almost all rock shelters are intact since no valuable antiquity can be obtained from them. Therefore, they are not attractive for the antique seekers in the area, who vandalized one of the world’s famous arts of the Gandhara region, since the Gandhara sculptures are sold on high prices and sent abroad to be displayed in various museums of the world. The artefacts were collected from the surfaces of the sites. The rock shelter of Ango Gatkai was excavated among them. It has produced a two-meter deep stratified cultural deposit encompassing the Middle, Upper and Neolithic periods of the Stone Age. Keeping in view the richness of the cultural material of the prehistoric times at the sites, we have selected them for the Ph.D dissertation. The study and analysis of these artefacts formed the topic of my Ph.D dissertation. The

first problem was which terminology should be adopted for the Palaeolithic of Pakistan. For a long time, all the leading pre-historians of India and Pakistan adhered to the old African terminology of the 'Early, Middle and Late Stone Age' used for the prehistoric archaeology. Due to lack of sufficient evidence for the Upper Palaeolithic all the prehistorians were perplexed to which terminology should be adopted for the Palaeolithic of India and Pakistan. As far as India was concerned, the problem was resolved because a number of Upper Palaeolithic sites were discovered and excavated over a half century ago. The Upper Palaeolithic in Pakistan remained a question to be solved by introducing definite material of the Upper Palaeolithic. In this context Salim (1986), a researcher on prehistory or Stone Age carried out a lot of research on the Palaeolithic of Pakistan. However, he could not report Upper Palaeolithic industries in the rich collection he made from the Soan Valley. He could not trace the Upper Palaeolithic material. Instead, he used the term Middle Stone Age for all assemblages from the Soan Valley and from the Sanghao Cave. He argued that there are not sufficient blade and blade tools to warrant the use of Upper Palaeolithic. Reference may be made to the Sanghao tool assemblages where an Upper Palaeolithic blade and flake industry dominates the Palaeolithic period. Dani (1964) used the old terminology of the African Stone Age.

Of the Upper Palaeolithic, the earliest reference was given by De Terra and Paterson (1939) to artefacts in the Soan Valley where they found some artefacts, which they assigned to a localized industry, but later on Paterson named it as 'Final Soan'. However, Movius used the term 'Evolved Soan' and Upper Palaeolithic. Similar Upper Palaeolithic surface collections were made by B. Allchin (1976) who conducted survey in the Rohri Hill and Milestone 101 near Hyderabad in Sind, Pakistan.

As the Upper Palaeolithic of the Bajaur-Mohmand area is concerned, we have collected large number of tools of the same phase from various sites. In addition, we have also ample evidence of this phase in the stratified deposit of the Ango Gatkai rock shelter. In this well-recognized sequence, the Upper Palaeolithic occupies its specific position. Having recognized the upper Palaeolithic at the site of Ango Gatkai, we are now on firm footing to use the European terminology of the Palaeolithic—Lower, Middle and Upper Palaeolithic for the lithic assemblages at our disposal. All

these periods have distinctive types of tools like hand axes, flakes, blades, and blade tools. We have now rich data for the Upper Palaeolithic in the area. As the chronological sequence of the Palaeolithic is concerned, our collections do not exceeds the Middle Paleolithic which probably begun in the last interglacial and continued through the first half of the last glaciation. The last glaciation had begun in about 75,000 B.P. It is a worldwide sequence of the cold conditions phenomenon during the Pleistocene geological era or epoch, which witnessed four similar phases (glaciations) of intense cold with alternating warm phases known as interglacials. Within each glaciation occurred warm intervals known as interstadials, and the Middle and Upper Palaeolithic industries are found in them. Similar but different climatic conditions prevailed in warmer zones of the world like Africa and the southern Pakistan. The Palaeolithic history in our research area begins with the stone artefacts characterizing the Middle Palaeolithic industries. We have assigned the Middle Palaeolithic industries of the area to the Mousterian tradition. This attribution is based on some characteristic stone implements that mark the Mousterian cultures throughout the world. The excavation at Ango Gatkai has yielded a good number of useful organic materials for scientific dating. They include bones both charred and intact and charcoal samples that were collected from various stratified layers at the site. Once the dating materials are processed for C14 determinations, they will be helpful for providing specific dates for the chronological sequence of the Palaeolithic history of this region. The present chronological framework for the area is mainly based on the artefacts typology and technology. The Mousterian tool kit is basically made on the discoidal flaking and Levallois or prepared core techniques. Artefacts made on the discoidal flaking technique predominate. The stone industries made on the latter technique are referred to the Levallois-Mousterian in the Palaeolithic archaeology of the region.

There are six Mousterian sites in the area with characteristic Mousterian type tools. These tools closely resemble with the artefacts from Europe and Western Asia. Claims have also been made for the existence of such type of tools in India but from the study of the Middle Palaeolithic industries, the Mousterian tools or the formal types do not exist there while from Africa similar Mousterian Industries are known.

From typological study and analysis of the stone collection made in our research area, one can see almost all variants found in the Western Europe and the Levallois-Mousterian of Western Asia. The Russian archaeologists also formed a four-fold sequence for the Middle Paleolithic industries in Central Asia. However, recent researches have cast doubts on the existence of four facies or variants in Central Asia.

The presence of Mousterian artefacts in the Bajaur-Mohmand area added a new chapter to the existing Palaeolithic archaeology of the region. It also extended the Mousterian domain from the Western Europe to the southern slopes of the Hindu Kush. The presence of Mousterian culture in Afghanistan and Central Asia seems to be a later manifestation. As mentioned earlier, that the ancestral place of the Mousterian industries is most probably located in the Bajaur-Mohmand area. Then in due time, they diffused to other region of the world. It should be remembered that the Middle Palaeolithic or Mousterian industry is primarily flake industry without hand axes or late Acheulian that occur with some Mousterian industries elsewhere. A few bifaces or hand axes are found in the Mousterian tool kit but such type of tools predominates the Middle Palaeolithic industries in the region particularly Indian and the Soan Valley of northern Pakistan.

Based on the presence of formal type Middle Palaeolithic tools we chose to use the term 'Mousterian' for all Middle Palaeolithic industries in the area. All the Palaeolithic sites yielded the formal type tools- side scrapers with scalariform retouch, Mousterian points both bifacial and unifacial, and certain Levallois oval shaped flakes characterizing the Mousterian industries. Besides, we see a considerable amount of variability in the tool kit of the Mousterian in this region. But the Middle Palaeolithic (Mousterian) of Afghanistan and Central Asia shows uniformity as in the case of the Teshik Tash in Uzbekistan. The Mousterian artefacts from Afghanistan (Darra-i-Kur) show little formal type tools. The rest of the Middle Paleolithic sites in Afghanistan have been dropped from the list of being Middle Palaeolithic. The European Middle Palaeolithic cultural links with northern Pakistan seems to be stronger than the neighboring regions of Afghanistan, Soan Valley, Iran and Central Asia and even Western Asia. In this context, Iran and Afghanistan seem to have been used as passages for the diffusion of Palaeolithic cultures. Having these facts in view, we put forward the hypothesis that the southern slopes of the Hindu Kush including the

Peshawar valley, ancient Gandhara was the home of the Mousterian cultures and within it the original birthplace was the Bajaur-Mohmand area. We are again of the view that the Mousterian cultures containing distinct variants are autochthonous in character without any dominant influences from abroad. The Mousterian cultures seem to have diffused to other regions of the world in due time. The nearest region was the Peshawar valley with the Mousterian cave site of Sanghao. The next region that was influenced by the Mousterian cultures had been Afghanistan and Central Asia. The environmental conditions, as suggested by the meager presence of the Middle Paleolithic sites, were not congenial for the habitation of the Mousterian population. The same argument was also made by Davis when he remarked that the Middle Palaeolithic of Afghanistan lacked the dominant Mousterian type tools (1978).

The same is true of the Potwar region where formal type Mousterian tools are almost completely absent from the stone assemblages. Although attempts have been made by Dr. Salim to compare the artefacts from the Soan Valley for which he used the terms first applied by Francoise Bordes for Mousterian industries elsewhere. By contrast, there exists a considerable difference in the tool types between the two regions. Besides, comparison between the industries from the Soan Valley and our research is impossible since Dr. Salim has described all the assemblages under the Early and Middle Stone Age. His chronological order does not provide place for the industries of the Upper Palaeolithic (Salim, 1986; 1997). He described all the Palaeolithic surface collections under the terms 'Early and Middle Palaeolithic'.

At the present state of our knowledge the true Mousterian industries or formal type Mousterian /industries /cultures cannot be found beyond the Indus River or to its east, which provided a natural boundary between the two technologically different Middle Palaeolithic cultures. Middle Palaeolithic industries have been reported from various parts of the subcontinent with no true Mousterian type tools, though some prehistorians have made efforts to link the Middle Palaeolithic of India with Mousterian of Europe and Western Asia (Sankalia, 1970).

In this connection, the Sanghao Cave at the present state of our knowledge seems to be the eastern terminal point of true Mousterian cultures right from Western Europe. Future research may expose the hidden Mousterian industries further east of the Bajaur-Mohmand area. Thus, the river Indus seems to have been a natural

boundary that could not allow the Mousterian to penetrate the inner India. The Mousterian adapted themselves to severe environmental conditions and often inhabited the mountainous regions. To face the severe climatic conditions of the last glaciation they most probably made some necessary arrangements to protect themselves from cold conditions. The area most probably remained peripheral to the advancing glacial. The Mousterian industries of the Sanghao Cave seem to be later than those to the north-west or the Bajaur-Mohmand area. The artefacts of the lower levels at the Sanghao are comparable to layer 6 of the Ango Gatkai industry. The Sanghao lithic industries are characterized by the flake tools, which also include parallel-sided blades. At the Sanghao Cave, almost all formal types of the Mousterian artefacts are present in which scrapers of various kinds predominate. To judge from the presence of developed formal type Mousterian the lithic industries must have reached there in very advanced stage of its form. Favourable climatic conditions remained a dominant factor for the evolutions of the Mousterian cultures. The availability of raw material is also significant as there is abundance of raw material close to all Palaeolithic sites in the region. The principal raw material is cryptocrystalline silica in the form of chert, flint and quartz. All these raw materials are locally available. It should be noted that it was the Middle Palaeolithic man who first used the crypt-crystalline material such as chert and flint for his implements.

During the preceding period of the Lower Palaeolithic, man used material different from the Middle and Upper Palaeolithic. A few tools, all Acheulian and Abbevillian hand axes are made of different material like limestone and other local type of rocks for their tool kit. It is not easy to explain why the Lower Palaeolithic man used the latter rocks for the manufacturing of stone artefacts. However, it is significant that the Middle and Upper Palaeolithic man almost absolutely used chert of different colours. The principal sources of chert have been the beds of hill torrents and veins exposed in the hillsides. As far the author of these Middle Palaeolithic industries is concerned, nothing can be said with certainty and confidence that who was the maker of these stone industries. The author, of the Middle Palaeolithic or Mousterian industries does not appear to be much different from the modern man (*Homo sapiens*). We are of the view that there has been a considerable evolutionary trend in the tools rather than man's physical form. Again, it can be ruled out that the so-called Neanderthal was replaced by a more advanced human generally referred to

Homo sapiens sapiens. A few physical features are not the only criteria to class the human beings and link them with the animals' world. Low or high eye ridges cannot fix human groups. Instead, it was the knowledge of trial and error gained by the Palaeolithic man over thousands of years, which eventually led to the urban civilization. It was during the upper Pleistocene or last glaciation which caused fundamental changes in the stone technology and parallel development was also seen in other material like antler, bone and wood. Thus, increased progress in artefacts, technology and typology suggest man's mental maturity and skill; and not all these changes can be applied to his physical form only. That he was a tailed creature and became tailless in the course of thousands of years. Also the remains of some primitive people when exposed in stratified deposits, when not relevant; they are often disowned by the excavators claiming that they do not belong to this or that period as the same are not fitting into their established framework. Their presence is attributed to intrusion into the older deposits. Thus it was man's experience that he gained by continuous trial and error. That he virtually emerged as a civilized being. A few scattered discoveries of the so-called Neanderthal are not logical criteria to draw a line between archaic and modern. As compared to a wide range of Mousterian culture, the faunal remains are very scanty or fragmentary.

For dating the Middle stone assemblages from the area, we depend on both relative and absolute chronology. Most of the stone industries of the region have been assigned to different periods by studying and analyzing the typological and technological features of different artefact types. Generally, all the Stone Age cultures of different periods have characteristics of their own that distinguish them from each other. The true Mousterian industries include some artefact types, which present a considerable difference between the preceding period of Lower Palaeolithic with hand axes, pebble tools, and cleavers and flake tools; and the succeeding Upper Palaeolithic with blades and blade tools associated by the presence of bone tools. Similarly, the Mesolithic people had often manufactured and used microlithic implements of geometrical and non-geometrical forms. They were often hafted to wooden and bone handles suitable for hunting the Holocene fauna. We have compared the stone assemblages from Bajaur-Mohmand area with the Stone Age cultures of the surrounding regions and worked out a chronological framework for this region. As mentioned earlier, a good collection of samples of organic materials is at our disposal

to be processed for C14 determinations. For absolute dating, we have referred to Sanghao Cave in the Peshawar valley, Riwat 55 in the Soan Valley and Kara Kamar in Afghanistan. The lowest layer 13 has been dated to $42,500 \pm 4000$ B.P. by C14 (M6, Oxa-1068) determination. The same date may be applied to some of the Mousterian industries in the Bajaur-Mohmand area. Similarly, the Middle Palaeolithic site of Riwat has been dated by TL to ca.45,000 B.P. The latter date is also helpful for the dating of Palaeolithic cultures in the region. The nearest Upper Palaeolithic site is Kara Kamar in Afghanistan; it has a C14 date of $ca.34,000 \pm 3000$ B.P. Since, we have attributed layers 4 and 5 at the rock shelter of Ango Gatkai to the Aurignacian, and argued that the latter has its birthplace in the same area. Thus, a date of 35,000 B.P. is reasonable to be proposed for the Upper Palaeolithic industries of the Bajaur-Mohmand area.

The presence of the Upper Palaeolithic in Pakistan has been a question of discussion until recently. The main problem for this has been the insufficient proof of the Upper Palaeolithic tool types due to limited research. Although there were some indications of the Upper Palaeolithic such as the 'Final or Evolved Soan' which has later on been assigned to Upper Palaeolithic. Also some stone tool collections from Rohri Hills were graded into Upper Palaeolithic on the basis of typology and physical conditions of the artefacts. But all those evidences were rejected by some Palaeolithic experts (Salim, 1997) who argued that the evidence is not sufficient to warrant the use of the Upper Palaeolithic. Similarly, to include the term Upper Palaeolithic in the Palaeolithic history of Pakistan remained a problem. The recent researches in the Bajaur-Mohmand area have brought to light clear indication of the Upper Palaeolithic which was almost unknown so far.

The rock shelter of Ango Gatkai has yielded two stratified layers of the Upper Palaeolithic. Layer 6 shows both Mousterian and Upper Palaeolithic characteristic tools in which the former types predominate. Apart from the Upper Palaeolithic at Ango Gatkai, other sites have also produced a good number of the Upper Palaeolithic artefacts. For the same reason as mentioned above we used the terminology used for the Palaeolithic of Europe, Western and Central Asia, that is lower, Middle and Upper Palaeolithic. Similarly, this Palaeolithic sequence has provided space for Upper

Palaeolithic in the prehistory of Pakistan. Besides, the Upper Palaeolithic in this area is very close to the Aurignacian phase of Europe and Western Asia. For the same purpose we used the term Aurignacian for the Upper Palaeolithic in the Bajaur-Mohmand area. The Upper Paleolithic of the Bajaur-Mohmand shows all the characteristic features of the Aurignacian found elsewhere. The dominant tool types are carinated scrapers of round and end variety; particular blade types with thinned or narrow bases and wide distal ends.

The first Aurignacian type tool were recognized by Coon (1957) at the site of Kara Kamar in Afghanistan, the keeled shaped scrapers are the characteristic or the index or marker of the Upper Palaeolithic sites in the region. The Upper Palaeolithic of Central Asia does not exhibit the same features as known from this region. The necessary element of the blade tools such as burins are absent from Kara Kamar. However, it is suggested that the Kara Kamar lithic industry must have comprised the burins but the excavator seems to have not identified them in the first place. The identification of burins among different types of tools is perhaps the most difficult task to recognize. The same must have happened to Coon during the excavation of the site of Kara Kamar. Another Palaeolithic site is the Sanghao Cave, which lies very close to the Bajaur-Mohmand area. Previous researchers could not identify the Upper Palaeolithic in the sequence there. The excavated material now lies in Sir Sahibzada Abdul Qayyum Khan Museum of Archaeology and ethnology, University of Peshawar. The present author studied these materials and has come to the conclusion that there exists a definite Upper Palaeolithic industry in the Sanghao assemblages. Most prominent for our interest are the core tools, which Dani called fan shaped scrapers (Dani, 1964, Fig.11, No.2). For us these tools are marker of the Upper Palaeolithic industry particularly for the Aurignacian type tools. These tools are also used as index in other regions of the world.

Attempts have been made to trace the transitional phase between the Middle and Upper Palaeolithic. From technological point of view, there is considerable uniformity in the tool kit. It should be mentioned here that all basic Mousterian type tools also persisted into the Upper Palaeolithic of the region. A number of crescent type unretouched knives with almost curved cutting edges and humped and blunted backs which most probably mark the transitional phase as these knives are absent from the

preceding and succeeding periods. Secondly, there are a large number of points with trimmed bases. The secondary trimming is only confined to the bases of the tools; both unifacial and bifacial thinning of the butts are found. Small and large points are found in equal proportion. Sometimes the points are trimmed obliquely at the bases and made them into burins. Most of these types of points are from layer 6. A single example is from layer 5. Such types of tool or shouldered point are known among the French prehistorians as naviform or oval shaped points. Parallel examples from Western Asia are the Emiran points in the Levant, which mark the transitional phase between the Mousterian and the Upper Palaeolithic. The Western Asia examples are very symmetrical while those from our region are irregular in outlines and crude in shapes.

A few points show lateral projections in the central points of the tools with thinned bases; this is another characteristic feature of these points. These points have been manufactured by both Levallois and non-Levallois techniques. From typological and technological point of view, these points show close resemblance to each other. However, it cannot be fixed with certainty to which region the Upper Palaeolithic owes its origin or birthplace. Nevertheless, we have already mentioned that the Upper Palaeolithic industries in the area are purely autochthonous in character and they are not simply the result of any diffusionary mechanism. We have argued earlier that the occurrence of all Mousterian and Upper Palaeolithic tool types in this region and makes it the birthplace of Middle and Upper Palaeolithic industries. Besides, it must have played a significant role in the regional and extra-regional diffusionary mechanism. Another characteristic feature of the Upper Palaeolithic of this area is the co-occurrence of microlithic tools. This characteristic feature had already made its appearance in the Middle Palaeolithic (Mousterian), and persisted into layer 5 too. The presence of this element is also significant and attests to the skill and efficiency of the Palaeolithic man in the manufacturing of these microliths. The tiny tools or Micromousterian tools are the characteristic of this area. Parallel artefacts have also been reported from the Sanghao Cave where small tools in the later periods predominate. The continuation of these tiny tools also suggests that there seems no replacement of one human group by the other as proposed by anthropologists. We noticed little change in the stone industries of Middle and Upper Palaeolithic of this area. The occurrence of small and large tools in similar archaeological contexts

suggests enormous activities on the part of the Palaeolithic people in the field as well at home. These microliths were apparently hafted to wooden or bone hafts and used as composite tools. Similar existence of the small tools or microliths also implies that the Palaeolithic man had already used them before they could constitute an essential part of the Mesolithic cultures. It is now clear that even geometrical tools were shaped by the Palaeolithic man. Thus, microliths constituted a considerable part of the Palaeolithic culture in the area. It is obvious; that the prevailing environmental conditions or climatic changes pressed the Palaeolithic man to devise the typological innovation in the form of small tools, for one form of tools was not sufficient to cope with the prevailing circumstances. Again, the neighboring countries of Central Asia lack this particular feature of the Middle Palaeolithic. This lends support to the hypothesis proposed by us that the original home of the Mousterian culture have been in the southern slopes of the Hindu Kush - that is the Bajaur-Mohmand area.

The Upper Palaeolithic succeeded by the Mesolithic cultures of the Holocene period. The Palaeolithic cultures of the Pleistocene were followed by the Mesolithic cultures of the Holocene. There occurred marked changes in the climate of the world and the earth assumed the present state. There are some sites, which have yielded microlithic tools of both geometric and non-geometric forms. Musa Kamar is the important site of this period. Comparable sites are Kara Kamar in Afghanistan and Jamalgarhi in Mardan district and the Khanpur caves in the Haripur District. Mesolithic sites are also present in Bannu basin. By contrast, the Mesolithic tools are absent from the excavated site of Ango Gatkai where the Palaeolithic period is directly succeeded by the Neolithic or aceramic Neolithic. The absence of the Mesolithic from the chronological sequence of Ango Gatkai is surprising. At the present state of our knowledge, no plausible answer can be given to the question as to why the Mesolithic tools are absent from the site. The Mesolithic people used the chert for their tool kit. They occupied the caves and rock shelters for their living. The presence of serrated bladelets in the lithic assemblages of the Mesolithic culture in the area suggests that the Mesolithic people exploited both animal and plant resources to serve their daily needs.

The last phase of the Stone Age in the Bajaur-Mohmand area is the Neolithic. The same period has been described by Gordon (1951) as Neolithic revolution. This

attribution is mainly based on some certain changes that occurred during the Holocene in global climate and altered man's living. The Neolithic in the area is characterized by the use of struck and ground stone tools. Here again we found large ground stone tools with the parallel existence of chipped or struck stone tools. The former tools were picked up from the riverbeds and used with little modification. The struck stones are associated with bone tools like awls and chisels. The ground stone industry of the Neolithic is characterized by the use of ground stone tools of various forms. The economy remained dependant on animals and plants food resources. The Neolithic people of Ango Gatkai do not seem to have domesticated animals and plants. No evidence of domesticated species of animals and plants is available from the excavation. The Neolithic phase of Ango Gatkai is purely pre-pottery or aceramic in character. The faunal remains at the site suggest that the Neolithic people exploited the same fauna of the Palaeolithic times. The Neolithic people used querns to process vegetal food and to augment it with meat obtained from hunting. In brief, the economy of the Neolithic people at Ango Gatkai was based on hunting and food collecting. Due to the non-availability of absolute dating in the area, our dating of the site is based on cross references to other contemporary dated sites in the region.

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Appendix 1: List of figures showing details of the illustrated artefact types.

(All figures have scale in centimeters)

Figure 1 Tango Nao (Mousterian cave site).

1. A single concavo-convex side scraper with blunted back, utilized (6.2 x 4.3 x 2.9).
2. A side scraper with slightly prepared platform, bulb of percussion has been removed. A notch on the right margin makes it a double scraper with concavo-convex cutting edge. Cortex is present on the left side of the tool (6.6 x 3.9 x 1.5).
3. A very thick single side scraper, the thick backside bears some original cortex (7 x 4.9 x 2.7).
4. A convex side scraper retaining most of the cortex on the dorsal surface, it shows a small tiny striking platform but prominent bulb of percussion (7 x 4.4 x 1.8).
5. A thick side scraper, it shows a few flake scars on the dorsal surface while the ventral surface shows only a single flake scar.
6. A lunate type transversal convex scraper (6.8 x 4.1 x 1.7).
7. A concavo-convex single side scraper (6.4 x 3.4 x 1.4).
8. A thick tool with beaked distal end; it resembles a pointed hand axe, such type of tools is also found in layer 6 of Ango Gatkai (8.3 x 6.9 x 3.2).
9. As above but shows a few scars on the dorsal surface (7.3 x 6 x 3.6).
10. A Levallois flake struck from prepared core (9.2 x 7 x 3.8).
11. A Levallois flake struck from previously prepared core; its cutting edge is on the distal end and on the right side of the artefact, its parallel examples are found in Western Europe (10.1 x 5.2 x 2.3).
12. A Mousterian convex side scraper with scaled retouch, it has prepared striking platform. It is the best example of this type of tool (5.7 x 5.9 x 2.9).

13. A good example of the canted type of convex side scraper, it is like the previous one. It is encrusted with lime and clay (5.2 x 4.4 x 1.2).
14. A limace or double ended point with very sharp margins. It has been struck from prepared core; the shallow scars suggest the use of soft hammer. Also, the thinning of the base by the removal of two flakes suggest to make home for thumb. It is a rare example (7.5 x 3.1 x 1.4).
15. A blade struck from prepared core. It is heavily encrusted with lime and clay on the right side. It seems to have been resulted from bipolar technique (5.4 x 2.6 x 1.1).
16. A blade with a flake removed near the distal end, utilized. (6.6 x 2.7 x 1.7).
17. A blade with high central ridge (5.2 x 2.7 x 1.2).
18. A comparatively high ridged blade with broad distal end. It is also the result of bipolar technique as two bulbar scars can be seen on the butt and distal ends (4.8 x 2.3 x 0.6).
19. A flat flake blade struck from prepared core, the retouch is carried out on the ventral surface. Six flakes have been removed from the dorsal surface (4.8 x 2.3 x 0.6).
20. A backed blade with faceted striking platform, the bulb of percussion has been removed, utilized (5 x 2.8 x 1.3).
21. A Levallois type triangular flake, it is like a beaked point (6.4 x 3.4 x 1.3).
22. A side struck flake, it is like a point as both ends show working edges (6.1 x 4.8 x 1).
23. Ventral surface of No.22.
- 24a. A Mousterian point, it retains a large portion of the original cortex on the dorsal surface (6.3 x 4 x 1).
- 24b. A naviform type of flake blade (6.4 x 3.2 x 2).
25. A triangular flake struck from prepared core (4.7 x 3.7 x 1.2).

26. A naviform type end-cum-side scraper. It is biconvex in section (5.4 x 2.9 x 1.4).
27. A short flake blade on prepared core (2.8 x 1.8 x 0.6).
28. A Mousterian point.
29. A Mousterian point with thinned base; very fine retouch on the left shoulder near the distal end (3.6 x 2.7 x 1.2).
30. A Mousterian point with retouch on the right side and distal end, it is slightly beaked at the tip (5.4 x 3.3 x 0.5).
31. Mousterian point struck from prepared core with faceted striking platform, with sharp cutting edges (3.9 x 2.5 x 1.3).
32. A single convex side scraper struck from prepared core (4.3 x 2.8 x 0.8).
33. A thin Mousterian point with slightly retouch on the cutting edge at the right side (4.9 x 3.1 x 1.6).
34. A double burin struck from prepared core with prominent bulbar scar, the basal end has been thinned by the removal of flakes, utilized (3.7 x 1.9 x 0.4).
35. A backed knife; the back is blunted by the removal of tiny flakes; it resembles the Mousterian point as nos. 27, 28, 29 and 20 but it has blunted tip (3.9 x 1.9 x 0.6).
36. A very thin blade on flake with very sharp edges now broken (4.8 x 2.6 x 1.4).
37. A single convex side scraper, the back of which is shaped by the removal of two flakes, partially retouch along the cutting edge, two large notches in the margins (5.5 x 3.1 x 1.8).
38. A convex side scraper with inverse retouch (4.9 x 3.2 x 0.9).
39. A single convex scraper with partial retouch, it has very thick back, the ventral surface shows very shallow flake scar removed by soft hammer (3.9 x 2.7 x 1.5).
40. A thick convex side scraper with minor retouch on the ventral surface near the distal end (4.3 x 2.3 x 2.1).

41. A Limace broken at the tip; struck from prepared core, it resembles a prismatic blade (4.9 x 2.3 x 1.2).
42. A fine knife with faceted striking platform and broader step-retouch (4.2 x 3.2 x 1.1).
43. It is micro form of Figure 18, No.11; it is retouched on the dorsal surface with oblique cutting edge (3.5 x 1.8 x 0.6)
44. A prismatic blade which is called by Ranov as proto-Levallois blade (Ranov, 1995: Fig.5.2, No.3). It is truncated at both ends, and triangular in section. It shows very minute retouch along the margins (6.7 x 2.2 x 2.2).
45. A typical burin (4.6 x 2.5 x 0.8).
46. Double convex side scraper with retouch. It shows double platforms and has been made by bipolar technique; the dorsal surface retains the original cortex (2.7 x 2.5 x 1.3).
47. It is like the above but in this case the cutting edge is formed by the converging of the two beveled edges (2.5 x 2.5 x 2).
48. It is a burin dejet (3.7 x 1.4 x 0.7).
49. A side scraper with thick back while the side is beveling to the cutting edge (3.6 x 2.1 x 1.5).
50. A double convex scraper (3 x 2.4 x 1).
51. A side struck double ended scraper, it shows raised bulbar scar on the ventral surface (3.8 x 3.2 x 1.6).
52. A triangular flake with plain striking platform and the bulbar scar has been removed (4.8 x 4 x 1.7).
53. A burin (5.3 x 4.2 x 1.2).
54. A well made burin (5.3 x 4 x 1.7).

Figure 2 Tango Nao (Mousterian cave site)

1. A Mousterian point; it has snapped striking platform. It retains the original cortex on the dorsal surface. The bulb of percussion has been removed (6.7 x 4.1 x 2.2).
2. A side scraper struck from prepared core. The bulb of percussion has been removed by taking a burin spall from the opposite of the bulb of percussion (7.7 x 4.5 x 1.3).
3. A broken blade flake with prominent bulb of percussion and sharp cutting edges (5.5 x 4 x 1.5).
4. A thick convex side scraper; it shows a plain striking platform (6 x 6 x 3.4).
5. End-cum-convex side scraper; it has plain striking platform; the butt end has been thinned down by the removal of a few small flakes; it is utilized (6.2 x 4.7 x .4).
6. A concavo-convex side scraper with the tip retouched which seems to have been used as a burin-cum-scraper; the bulb of percussion on the left side has completely been removed (5.8 x 4.3 x 2.1).
7. A flake blade with dihedral platform. It is encrusted with lime and clay (4.2 x 2.1 x 1).
8. A limace like tool with bifacial flaking (6.4 x 2.9 x .3).
9. A double burin-cum-scraper; the burin is on the butt end and it is utilized (6.6 x 3.6 x 1.5).
10. A Levallois triangular flake what is called by the French authors as denticulate (4.8 x 3.8 x 1).
11. A double convex side scraper; retouched on the dorsal surface along the margins; very shallow flake scars on the tool suggest the use of soft hammer (5.1 x 4 x 1.4).
12. A short flake blade with broad retouch on the right edge and two thin slivers have been removed from the dorsal surface; the striking platform is faceted. It resembles a prismatic core but it is a blade (3.7 x 3.9 x 1.1).
13. A transversal convex scraper with fine retouch along the working edge (4.6 x 3.5 x 1.3).
14. A short blade with the distal end broken (3.9 x 3.7 x 1.4).
15. A transverse end scraper followed by a convex side cutting edge. The beveled surface near the tip retains the original cortex; the butt end on the dorsal surface is thinned by taking three flakes (3.9 x 4.1 x 1.2).
16. A double burin-scraper; it is a complex tool; the butt end has been thinned (4.5 x 4.5 x 1.1).

17. A naturally backed blade; most of the back side retains the cortex; utilized (4.7 x 2.9 x 1.5).
18. A broken convex side scraper retouched along both sides (3.9 x 3.2 x 1).
19. A convergent scraper; retouched along the margins, utilized (4.2 x 2.7 x 1.1).
20. A short thick transversal scraper (3.4 x 2.2 x 1.5).
21. A Levallois flake with transversal cutting edge at the distal end (3.3 x 3.2 x 0.9).
22. A D-shaped small convex side scraper, retouched on the dorsal surface; plain wide straight striking platform, heavily encrusted on the ventral surface (8 x 2.8 x 1.4).
23. A complete round scraper (3.2 x 3.2 x 0.8).
24. A very fine blade with convex sides; the working edges are very sharp, slightly damaged at the distal end, such pieces are also found in layer 5 of Ango Gatkai (4.3 x 2.6 x 1.2).
25. An oblique side scraper like a Mousterian point with blunted back (5.2 x 3 x 1.1).
26. A burin produced on a Levallois flake (3.5 x 2.4 x 0.7).
27. A double convex side scraper damaged at the cutting edge, retouched or used (3.9 x 2.8 x 0.9).
28. A very thin transversal scraper struck from prepared core, very fresh, the faceted striking platform is bulging out, the bulb is removed by taking a sliver, and it must have resulted by using a punch (3.5 x 2.6 x 0.6).
29. A small triangular Levallois flake struck from a prepared core, about 8 flakes have been removed from the dorsal surface, it shows prepared striking platform (2.9 x 2 x 0.8).
30. A convex side scraper, the working edge curves up to the top of the tool, shaped by bipolar technique (3.8 x 2.4 x 1).
31. A lunate like convex side scraper with irregular retouch along the margins, utilized (3.4 x 2.2 x 0.9).
32. A Levallois flake; it exhibits partial retouch along the working edge (2.8 x 2.4 x 1.2).
33. A backed blade (3.2 x 1.7 x 0.9).
34. A knife blade made on a flake with one side is blunted by taking slivers from the right side while the left one is the working edge (3.6 x 1.9 x 0.7).
35. A blade flake with a flat minute striking platform; utilized (3.4 x 1.8 x 0.5).

36. A double convergent scraper broken at the shoulder near the distal end; the butt end is thinned by taking a flake from the upper surface with raised bulbar scar (2.9 x 1.1 x 0.5).
37. A triangular pointed tool with plain striking platform (3 x 1.5 x 0.7).
38. A point struck from prepared core, the bulb of percussion has been thinned down for a wooden haft (3 x 2 x 0.8).
39. A convex side scraper or thumbnail scraper detached from prepared core, retouched along the margins. It shows plain striking platform with bulging bulbar scar (2.9 x 2.1 x 0.5).
40. A thin flake struck from prepared core, faceted dihedral striking platform, utilized (9 x 2.1 x 0.5).
41. A microlithic lunate with faceted striking platform inversely retouched (2.2 x 1.5 x 0.4).
42. A backed blade (2.5 x 1.1 x 0.5).
43. A small point retouched on the right side (2.4 x 1.5 x 0.7).
44. A transversal scraper-cum-burin dejet (3.2 x 2.1 x 0.7).
45. A small convex side scraper (2.1 x 1.1 x 0.6).

Figure 3 Guloono Kamar (Mousterian rock shelter).

1. A point (6.3x5x1.6).
2. A bifacial point with marginal retouch (6.2 x 4.8 x 2.1).
3. A Mousterian type point (5 x 3.7 x 1.9).
4. A burin-cum-side scraper (5 x 2.5 x 1.4).
5. A Mousterian scraper-point (3.9 x 2.8 x 1.2).
6. Double burin (4.8 x 1.7 x 1.4).
7. A retouched point (4.4 x 2 x 1.5).
8. An awl (3.9 x 1.4 x 1.1).
9. A burin (4.3 x 2.4 x 1.3).
10. A retouched point (2.7 x 2.5 x 0.9).
11. A Levallois blade (4.2 x 3.4 x 1).
12. A bifacial point (3.8 x 2.4 x 1.1).
13. A short convex side scraper (4.13.2x1.2).
14. A pointed flake (4.4 x 3.2 x 1.4).
15. A point (2.5 x 1.6 x 0.6).

16. A Mousterian point (4.3 x 3.1 x 1.3).
17. A broken blade (6.1 x 4.3 x 1.5).
18. Broken blade (4.2 x 2.7 x 1.3).
19. A side scraper (4.8 x 3.1 x 1.4).
20. A utilized backed knife (5.5 x 2.8 x 1.7).
21. A naturally backed blade/ knife (4.8 x 2.9 x 1.8).
22. A convex side scraper (4.4 x 2.3 x 1.5).
23. A Levallois flake (4.7 x 2.8 x 1.3).
24. Levallois flake (4 x 3 x 0.8).
25. A blade flake (4.1 x 2 x 0.8).
26. A burin (3.8 x 2.2 x 0.5).
27. A burin (3.8 x 2.7 x 1.2).
28. An awl (3.3 x 1.8 x 0.6).
29. A rectangular flake blade with the base truncated by retouch (2.7 x 2.2 x 0.7).
30. A short flake blade (2.9 x 2.9 x 0.8).
31. A double sided scraper, truncated at both ends (3 x 2.7 x 1.2).
32. A thick backed blade (4 x 4 x 1.8).
33. A retouched end scraper of the canted type (2.7 x 2 x 1.9).
34. A Levallois blade like flake (3.1 x 1.5 x 0.9).
35. A triangular flake (2.3 x 2 x 1).
36. A blade like flake (3.4 x 1.8 x 0.7).
37. A cleaver with zigzag cutting edge (8.3 x 7 x 4).
38. A typical Levallois flake (7.3 x 6 x 1.8).
39. End scraper (4.4 x 3.4 x 1.8).
40. A transversal convex scraper with step regular retouch (4.8 x 4.1 x 2).
41. A cleaver (8.6 x 5 x 3).
42. A Mousterian convex side scraper with scalariform retouch.
43. A convex side scraper (5 x 3.7 x 2.1).
44. A concavo-convex scraper.
45. A tranchet retouched (2.8 x 2.3 x 0.9).
46. A knife with thinned base (2.9 x 2.2 x 0.7).
47. A triangular double convex side scraper (2.6 x 2.2 x 0.6).
48. An elongated tranchet (3.9 x 2 x 0.9).

Figure. 25

A: Hisar Kot (Mousterian rock shelter).

1. A core tool.
2. A Levallois flake struck from prepared core. The striking platform is faceted; it is encrusted on the ventral surface; utilized (7.1 x 4.9 x 1.1).
3. A thick convex side scraper with prominent bulbar scar; retouched on the dorsal surface along the margins. It is utilized (6.4 x 5 x 2.6).
4. An oval shaped round scraper struck from prepared core showing several flaking scars; it shows irregular marginal retouch; the bulb of percussion is very smooth and evenly diffused on the ventral surface (4.5 x 2.7 x 1.2).
5. A blade with sharp transversal distal end; the proximal end has been thinned down by taking out 8 flakes from the dorsal surface (4.7 x 2.3 x 0.6).
6. A side struck transversal convex scraper with irregular marginal retouch. It is utilized (4.2 x 3.8 x 0.9)
7. A point broken at the tip; it recalls the point Soyons of the French authors. It is also found in layer 7 of Ango Gatkai (3.4 x 3 x 0.8).
8. A convex side scraper (5.1 x 2.9 x 1.1).
9. A pointed bifacial tool with prepared platform and inverse retouch (7.6 x 4.9 x 1.9).
10. A Mousterian point with prepared striking platform and diffused tiny bulbar scar (5.8 x 3.4 x 1.2).
11. A burin like pointed tool (6.2 x 4.1 x 1.5).
12. A Levallois flake with convex distal end; faceted striking platform; with very tiny bulbar scar; the proximal end has thinned down by taking minute flake slivers from the dorsal surface, with inverse retouch (7.4 x 5.2 x 0.6).
13. A shouldered point/awl struck from prepared core, retouched on the right edge; a sliver has been taken across the bulb of percussion (5.5 x 3.2 x 1.4).
14. A straight convex side scraper. struck from prepared core (5.2 x 3.2 x 1.2)
15. A double convex side scraper struck from prepared core the butt end is thinned down by slightly bifacial working (4.3 x 2.8 x 0.6).
16. A retouch point (7.1 x 3.7 x 1.5).
17. A Levallois flake-blade (6 x 3.8 x 2.1).
18. A concavo-convex side scraper; it resembles the canted type scraper (2.4 x 3.8 x 1.1)

19. A convex side scraper (3.8 x 2.7 x 1.1)

B: Smasto Arkhai (Mousterian caves and rock shelters)

1. A large carinated beaked scraper (7.6 x 6.3 x 2.8).
2. A concavo-convex side scraper made on a triangular flake struck from prepared core, notched at the proximal end, utilized (6.5 x 4.5 x 2.6).
3. A single concave side scraper, the platform is slightly faceted; the back retains the original cortex, utilized (7.5 x 4.6 x 2.5).
4. A denticulate tool, with a prominent notch (6.2 x 3.7 x 1.5).
5. A double convex side scraper; utilized (5.1 x 3.9 x 1.7).
6. A thick double convex side scraper retouched on the margins; utilized (4.9x4x 1.6).
7. A convergent scraper; it is retouched along the margins, utilized (4.3 x 3.4 x 1.5).
8. A retouched side struck convex scraper (5 x 3.2 x 1.2).
9. A concavo-convex side scraper with very wide faceted striking platform; utilized (5.2 x 3.5 x 1.9)
10. A typical Mousterian convex side scraper with inverse retouch.
11. A triangular oblique scraper or convex scraper with dihedral proximal end (4.4 x 3.6 x 1.1).
12. A double convex scraper or thick convex scraper or core with bifacial extensive flaking (3.8 x 3.2 x 1.8).
13. A single convex side scraper (4.5 x 2.7 x 1.3).
14. A small Mousterian point (3.1x 2.4 x 0.7).
15. A small point with the striking platform and bulb of percussion has been removed, very thin at the butt end.
16. A convex side scraper.
17. An elongated Mousterian point but its right side is blunted; with a notch on the dorsal surface (7.1 x 3.2 x 1.2).
18. A retouched flake point, utilized (3.3 x 1.8 x 0.5).
19. An oval type single convex side scraper, it is side struck (5.1 x 3 x 1.2).
20. A transversal convex side scraper made on a river pebble as the dorsal surface still retains the original cortex (4.2 x 4.4 x 1.3).
21. A straighto-convex side scraper (4.6 x 2.6 x 0.9).
22. A transverse convex scraper; struck from prepared core (4.2 x 3.9 x 0.9).

23. A naturally backed knife with convex cutting edge such examples are also reported by the French authors (4.1 x 3.2 x 1.7).
24. A blade struck from a Levallois core; it is oval, the bulbar scar at the proximal end has been removed (5.7 x 3.5 x 1.2).
25. A burin made on a triangular flake (5.5 x 2.5 x 1.5).
26. A thick tool like Mousterian tranchet of which the distal end is formed by two beveled sides (4.4 x 2.7 x 2.1).
27. A single convex side scraper with backed side (4.8 x 3.1 x 1.10).
28. A notched end scraper (4.9 x 3.4 x 0.8).
29. A short convex side scraper with the proximal keel partially retouched. The striking platform is snapped by taking sliver along the width of the tool (2.6 x 2.9 x 1.3).
30. A borer or awl with retouched sides; used (3.4 x 2.4 x 0.5).
31. A convergent scraper, it is very flat along the margins (3.2 x 2.2 x 0.5).
32. A small backed blade, the back is blunted by the removing of flakes along the sides (3 x 1.4 x 1.1).
33. A thin convex side scraper (2.8 x 2.3 x 0.6).
34. A burin-cum-scraper (4.3 x 2.3 x 1.6).
35. Irregular backed blade (3.3 x 1.5 x 0.7).

Figure 4 (Ango Gatkai: layer 7).

1. A discoidal core with multidirectional flaking scars, it seems to be a biface. Deep flaking scars on both surfaces suggest the use of hard hammer (8.8 x 6.5 x 4.2).
2. A chopping tool; the dorsal surface retains the original cortex; the ventral surface is completely flaked; used as chopper (9.5 x 7 x 3.9).
3. A cleaver like tool with irregular cutting edge (10.2 x 5.7 x 4.3).
4. A convex canted scraper with marginal retouch (5.6 x 4.7 x 1.3).
5. Discoidal bifacial core (5.3 x 5.2 x 1.7).
6. A pyramidal type core with irregular flakes struck from different directions (5.7 x 4.3 x 3.2).
7. A disc shaped core.
8. A typical point or Levallois flake with edge trimming (6.2 x 5.3 x 1.4)
9. An oblique scraper.
10. A side blow cleaver with thick butt end and beveled cutting edge (7.7 x 6.9 x 4.2).

11. A concave convex end scraper struck from prepared core (4.2 x 1.8 x 1.6).
12. A cleaver like flake with convex end (7.2 x 5.4 x 2.6).
13. A flake with convex cutting edge and backed side (5.6 x 2.9 x 1.3).
14. A Mousterian point or point Soyons, it is Levallois with prepared striking platform. Rare example (4.8 x 3.4 x 1.3).
15. A tanged shape double convex side scraper, the bulb of percussion has been removed (4.6 x 3.4 x 1.3).
16. A carinated end scraper.(5.7 x 3.6 x 2.4)
17. A hammer stone with worn ends (6.1 x 4.4 x 2.7).
18. A large convex scraper (8.8 x 8.6 x 2).
19. A transversal convex end scraper with retouch on the dorsal surface, it shows thinned base (7.6 x 4.7 x 2.5).
20. End-cum-side scraper with high crest on the dorsal surface; with thinned butt (6 x 3.2 x 2.4).
21. A side struck transversal scraper (4.9 x 3.5 x 1.2).
22. Unstuck prepared tortoise core (6 x 4.3 x 3 x 2).
23. An end scraper with cortical portion on the right side (6.8 x 2.9 x 2.3).
24. A side scraper (6.7 x 5.6 x 2.4).
25. A domical Levallois flake.
26. A side scraper with straight cutting edge and beaked end (7.5 x 4.6 x 1.4).

Figure 5 (Ango Gatkai: layer 7)

1. A convex side scraper retouched on the dorsal surface, it is comparable to canted type scraper (3.7 x 3.6 x 1.8).
2. A convex scraper made on quartz (2.3 x 2 x 2).
3. A round scraper struck from prepared core (4.6 x 4.1 x 1.2).
4. A typical Levallois point with dihedral proximal end (5 x 1.2).
5. End-cum-side scraper with the butt end thinned and trimmed along the margins (4.6 x 3 x 6 x 1.1).
6. An umbrella type carinated core scraper with partial retouch; cortex on the side, with upward retouch (3.7 x 3.6 x 1.3).
7. A convex side scraper with snapped retouch; with a deep negative flake scar on the dorsal surface (4.4 x 3 x 1.1).

8. A convex side scraper with upward retouch, it is a core tool and retains cortex (5.1 x 4 x 1.1).
9. A transversal convex side scraper (4 x 3.5 x 2.2).
10.
 - a. A carinated end scraper made on core; finely retouched (4.4 x 2.3 x 0.8)
 - b. A convex side scraper with double edges (3.3 x 2.2 x 2.2).
11. A keel shaped end scraper, retouched on the dorsal surface (5.7 x 4.6 x 2.1).
12. End-cum-side scraper with hollow ventral surface (4.2 x 3.2 x 1.3).
13. A knife with transversal convex cutting edge and prepared striking platform (3.1 x 2.1 x 0.8).
14. A burin (4.9 x 1.3 x 1.3).
15. A burin (4.3 x 2.7 x 2.1).
16. A primary blade or lame a ccrete (5.1 x 1.9 x 2.2).
17. A blade (3.6 x 2 x 0.8).
18. A blade (3.6 x 2.1 x 0.6).
19. End scraper with convex cutting edge (5.7 x 3 x 2.9).
20. A blade with minute bulb of percussion, trimmed at both sides (5 x 1.6 x 0.4).
21. A blade (3.2 x 1.5 x 0.4).
22. Tranchet with beveled cutting edge and snapped side, thick butt end (4.2 x 3.4 x 1.7).
23. An awl (5.1 x 2.9 x 1.6).
24. A convex scraper.
25. A double convex side scraper with trimmed retouch along the margin on the dorsal surface (3.7 x 3.2 x 0.8).
26. A canted scraper (3.8 x 3.7 x 1.5).
27. A burin on oblique flake (4 x 2 x 0.8).
28. A microlithic transversal convex side scraper with prepared dihedral striking platform (2.5 x 1.7 x 0.6).
29. A tranchet with snapped oblique cutting edge.
30. A nosed shape end scraper or proto nose shaped scraper (4.3 x 2.3 x 1.3).

Figure 6 (Ango Gatkai: layer 7)

1. A point on core; the proximal end has been reduced to the left side (7.3 x 5.9 x .8).
2. A triangular flake with beveled cutting edge at the distal end and retouched on the ventral surface (8 x 6.1 x 1.8).

3. A triangular Levallois flake (8.3 x 4.4 x 0.8).
4. A limace type double ended convex scraper; one side is naturally backed (7.9 x 2.4 x 1.4).
5. A beaked biface, the only example of backed side hand axe (5.8 x 4.9 x 3.1).
6. A characteristic Middle Palaeolithic or Mousterian flake of the area struck from prepared core with concavo-convex working edge (7.7 x 4.9 x 2).
7. A cleaver like transversal convex end scraper with blunted sides; the bulbar end is snapped; perfect formal type tool (6.3 x 4.9 x 2.8).
8. A denticulate tool with little cortical portion on the dorsal surface (7.3 x 5.5 x 2.2).
9. A Levallois flake with double working edges (5 x 2.21.3).
10. End-cum-side scraper with partial retouch; the side is blunted by retouch; cortical platform (5 x 3.1 x 1.3).
11. A side scraper with low platform shows cortex on the distal end (6.1 x 3.6 x 1.8).
12. A thick nosed scraper or Levallois flake (5 x 4.9 x 2.2)
13. A Mousterian point with bone fragment on the ventral surface suggesting the working of bone at the site (5.4 x 4.9 x 1.6).
14. A traditional Mousterian convex scraper, retouched on both sides (5.1 x 4.2 x 1.8).
15. A Mousterian point struck from prepared core with pointed ends; it bears the original cortex on the side of the tool (7.3 x 3.7 x 1.8).
16. A Mousterian point struck from prepared core, the proximal end is upwardly snapped, both edges are very sharp (5.2 x 2.9 x 1.7).
17. A spoke shave-cum-burin (4 x 4 x 1.2).
18. An end struck canted scraper, retouched on the dorsal surface (4.7 x 3.4 x 1.7).
19. A well made awl-cum-side scraper (5.3 x 2.3 x 1.3).
20. End-cum-double convex side scraper (4.3 x 3 x 0.9).
21. A well made backed knife, the cutting edge is curving to the tip of the tool.
22. A cortical flake, the base is thinned down (4.1 x 2.6 x 0.9)
23. A convex side Mousterian scraper comparable to canted scraper (3.4 x 2.7 x 1.4).
24. A retouched convex side scraper (3.7 x 2.8 0.8).
25. End-cum-convex side scraper with straight trimmed sides (4.3 x 2.7 x 1.3).
26. A shouldered awl (4.7 x 3.9 x 2).
27. A double scraper (4.1 x .4 x 2).
28. An oblique scraper with thinned base (3.8 x 2 x 1).

29. A small convex side scraper, retouched on the dorsal surface (3.1 x .5 x 1.2).
30. A scraper.
31. 34. A burin on flake (3.9 x 2.6 x 1.9).
32. 35. A pointed scraper (3.8 x .3 x 0.8).

Figure 7 (Ango Gatkai: layer 7).

1. A point (3.8 x 2.2 x 0.8).
2. A Levallois point (3.6 x 2.5 x 0.6).
3. A point (1.7 x 1.5 x 0.4).
4. A thin point (3.1 x 1.8 x 0.4).
5. A point (1.5 x 1.3 x 0.3).
6. -----
7. A point.
8. A thick point (3 x 2 x 0.9).
9. A very thin point (2.4 x 1.3 x 0.2).
10. A point (1.8 x 1.5 x 0.3).
11. A small pointed tool (2.2 x 1.2 x 0.3).
12. A side scraper (1.4 x 1 x 0.3).
13. A small pointed tool (1.7 x 1.1 x 0.3).
14. A pointed tool with right side truncated near the base (2.8 x 1.5 x 0.5).
15. A crescent like side scraper made on fragment of a pebble (3.1 x 1.8 x 0.3).
16. A pointed tool made on quartz (3.8 x 2 x 0.7).
17. A very small burin made on milky quartz (1.7 x 1.5 x 1.5).
18. A burin made on quartz (1.6 x 1.7 x 0.8).
19. A thick dihedral burin made on thick flake (3.8 x 2.8 x 1.2).
20. A micro burin made on quartz (2 x 1.3 x 0.6).
21. A double scraper with intermediary end scraper (3 x 2.7 x 0.5).
22. A multiple burin made on flake (3.7 x 3.2 x 0.9).
23. A small thick oblique burin (2.6 x 1.7 x 1).
24. A short burin with dihedral cutting edge (2.4 x 1.8 x 0.4).
25. A burin with pointed cutting edge and scraper edge on the proximal end (3.3 x 1.6 x 0.5).
26. Burin made on flake (2.8 x 2.2 x 0.5).
27. A burin with oblique cutting edge (2.7 x 1.5 x 0.7).

28. A short burin with broad transversal cutting edge (1.1 x 1.7 x 1).
29. A burin with slenderical oblique cutting edge (2.8 x 1.5 x 0.8).
30. Burin made on quartz (2.1 x 1.8 x 0.5).
31. A burin with burin spall extended to a notch (2.4 x 1.5 x 0.7).
32. Burin-cum-end scraper.
33. A best example of the canted type scraper (3.4 x 2.7 x 1.4).
34. It is like the previous one but it is trimmed at the base tiny bulb of percussion
these are like points (3.3 x 2.9 x 0.6)
35. A side scraper made on flake.
36. -----
37. A convex side scraper with bold retouch, it shows cortex on the dorsal surface
with straight convex side.
38. Double convex side scraper; the striking platform has been removed by oblique
truncation with bulging bulbar scar (2.3 x 1.9 x 0.7).
39. As no. 41 but in this case it shows high central ridge, faceted striking platform
with bulb of percussion has been removed (4 x 1.9 x 0.6)
40. A convex side scraper, the retouch is extended by taking slivers from the cutting
edge upward to the top of the dorsal surface (1.9 x 2.3 x 1.3).
41. A flat nosed scraper struck from prepared core (2.6 x 2.1 x 0.6).
42. A characteristic Mousterian tool (scraper) of the Middle Palaeolithic with
transversal convex cutting edge (2.7 x 2 x 0.9).
43. As no. 45, but it is retouched along the whole circumference of the tool,
unprepared striking platform, domical on the dorsal surface (2.2 x 2 x 0.9).
44. The smallest canted scraper in layer 7 with partial retouch on the dorsal surface.
The striking platform has been thinned by oblique truncation. It is the smallest
tool in the whole series of the Middle Palaeolithic (1.3 x 1.2 x 0.5)
45. A rectangular convex side scraper struck from prepared core, a characteristic
Mousterian scraper made on milky quartz (1.7 x 1.7 x 0.4).
46. A convergent scraper, the bulb of percussion and striking platform have been
removed by oblique truncation, it shows fine inverse retouch (2.3 x 1.7 x 0.9)..
47. A very fine transversal convex side scraper (1.9 x 1.2 x 0.5).
48. A convex side scraper (1.8 x 1.2 x 0.7).
49. A small side scraper (2.1 x 1.4 x 0.3).

50. A typical awl retouched on either side of the distal end (2.7 x 2.3 x 0.8).
51. A convex side micro lithic transversal scraper (1.3 x 1.3 x 0.5).
52. An awl on a previously prepared core, it is also formed by taking burin sliver from the left side parallel to the main axis (3.5 x 2.1 x 0.7)
53. A borer on a flake (3.3 x 8 x 0.7).
54. A small pointed flake.
55. Very fine microlithic awl (2.8 x 1.3 x 0.8).
56. An awl-cum-burin made on blade, the distal end has tiny transverse cutting edge as a burin (3 x 1.1 x 0.6).
57. A point with most of the original cortex on the dorsal surface (3 x 1.9 x 0.7).
58. A blade of which the bulb of percussion and bulbar scar have been removed (3.4 x 1.7 x 0.6).
59. A shouldered bladelet with very delicate retouch on both edges of the tool and with straight convex truncation at the base (2.9 x 1.3 x 0.3).
60. An elongated blade with irregular outline (4 x 2 x 0.5).
61. A blade with oblique truncation at the distal end and trimmed along the edges (3.4 x 2 x 0.8).
62. A flat blade with faceted striking platform, it is retouched on the distal end (3.8 x 1.5 x 0.4).
63. A blade with irregular inverse retouch, the dorsal surface exhibits trimming retouch (4.1 x 2 x 0.5).
64. A blade with straight convex sides (3.7 x 2.2 x 0.6).
65. A flake like blade trimmed on the margins (2.3 x 1.5 x 1.2).
66. A multipurpose microlithic tool-convex side scraper, spoke shave and a burin edge on the distal end, the base has been thinned by fine retouch (1.7 x 1.2 x 0.3).
67. A specialized tool on a blade with retouch at the cutting edge and double burin at the distal end (2 x 0.7 x 0.3).
68. A thin bladelet.
68. A micro bladelet with angular outline, retouched at the left side randomly (2.8 x 1.7 x 0.4).
69. A micro bladelet with angular outline, retouched at the left side.
70. A backed blade with notched cutting edge (2.2 x 1.3 x 0.4).
71. A micro bladelet made on milky quartz (1.5 x 1 x 0.2).
72. A blade flake (3.4 x 1.9 x 0.5).
73. A flake struck from prepared core (2.8 x 2.6 x 0.5).

74. Ventral surface of no.74.
75. A short flake blade with retouched margins; utilized (2 x 1.8 x 0.6).
76. A complex tool (8 x 2.1 x 0.7).
77. A T-shaped scraper with concave convex sides and trimmed at the base (3 x 2 x 1).
78. An elongated blade with both sides randomly retouched (3.8 x 1.6 x 0.5)
79. A convex side scraper with nose shaped beak at the distal end and finely retouched on the dorsal surface (3.8 x 1 x 0.8)
80. A flake struck from prepared core (2.4 x 1.6 x 0.4).
81. A thin blade obliquely truncated at the base; utilized (3 x 1.4 x 0.3).
82. An obliquely transverse burin on elongated flake (3.7 x 1.1 x 0.8).
83. A micro backed bladelet made on milky quartz with convex cutting edge (1.7 x 0.6 x 0.5).
84. A flake with broad distal end (4.1 x 2.1 x 0.9).
85. An elongated blade with almost straight cutting edge; the back side has been blunted by secondary retouch (4.4 x 1.9 x 1).
86. A micro backed knife with straight cutting edge (2 x 1 x 0.5).
87. A thick backed knife with retouch cutting it has sharp curve cutting edge (6 x 1.5 x 1).
88. A complete crescent /lunate knife with straight blunted back side; retouched and with curved cutting edge (4.1 x 1.8 x 0.7).
89. A very thin flake knife with curved cutting edge with running retouch on the dorsal surface; it is called by the French writers as raclette (3.2 x 1.7 x 0.4).
90. 91. A backed knife the back side is retouched on the dorsal surface/ (3.3 x 1.9 x 1.1).

Figure 8 (Ango Gatkai: layer 6).

1. A carinated scraper made on core with lamellar retouch (5.7 x 3.6 x 2.5).
2. A flake (5.1 x 3.6 x 2.5).
3. A denticulate tool with bifacial work (6.8 x 4.3 x 2.2).
4. Unstruck prepared core (5.2 x 5 x 1.6).
5. A thick side blow scraper also found in layer 7 with dented cutting edge; the butt is thinned down and snapped (6.3 x 6.2 x 5).
6. A double convex side scraper (5.8 x 3.9 x 1.3).

7. A convex side scraper retouched on the ventral surface; snapped at the striking platform, with trimmed retouch on the dorsal surface (7.1 x 5.4 x 2.5).
8. A convex side scraper with beak at the centre of the cutting edge (6.8 x 5.2 x 2).
9. A round scraper already illustrated in layer 7 (4.5 x 4.1 x 1.2).
10. Retouched round scraper (2.9 x 2.5 x 0.6).
11. A Levallois blade (3.6 x 2.2 x 0.8).
12. A Levallois point, the base is thinned for hafting (8.2 x 5.5 x 2).
13. A Levallois point with faceted striking platform, with snapped bulb of percussion (6.1 x 4.3 x 0.8).
14. A Levallois point (5.9 x 3.9 x 0.9).
15. A side struck Levallois flake with trimmed irregular concavo-convex cutting edge (9.7 x 6.3 x 1.7).
16. A hammer stone.
17. An awl with tip broken (5.4 x 3.3 x 1.8).
18. An elongated pointed tool with straight cutting edge, curved at the tip (7.2 x 4.2 x 1.7).
19. An awl (3.7 x 2.3 x 1.1).
20. A Levallois point (7 x 4.1 x 4.1).
21. A flake with convex cutting edge (6.5 x 2.5 x 2.1).
22. A beautiful Levallois flake with faceted striking platform; utilized (8.2 x 5.6 x 1.5).
23. End scraper on core (7.2 x 5.2 x 2.8).
24. A heavy convex side scraper with snapped striking platform; it may be termed as chopping tool with wide retouch on the dorsal surface, the butt end has been thinned (8.7 x 6.6 x 4.2).
25. A double end-cum-convex scraper with snapped distal end (6.9 x 4.6 x 3.5).
26. End scraper (7.2 x 4.8 x 2.1).
27. A flake chopper or heavy side scraper retouch on the dorsal surface made on core, the butt end has been removed (6.9 x 5.9 x 2.6).
28. Side blow scraper like no. 24 as above (8.2 x 6.2 x 4.1).
29. An end scraper with transversal cutting edge, thinned at the base on the dorsal surface (5.4 x 3.5 x 1.2).

Figure 9 (Ango Gatkai: layer 6).

1. A thick short nose shaped core tool or hand axe with retouched on either sides of the beak; a deep flake scar on the dorsal surface (6.4 x 5.2 x 3.1).
2. Transversal end scraper struck from prepared core (5.5 x 4.4 x 2).
3. A convex side scraper.
4. A discoidal core with centrally directed flaking scars (5.9 x 4.8 x 2.3).
5. A point with thinned base (4.4 x 2.4 x 1.2).
6. Non-Levallois point with bifacially thinned butt, it retains some of the original cortex, and a bone splinter is also attached to the ventral surface suggesting bone working at the site.
7. A Levallois point (5.8 x 4.7 x 1.5).
8. A Levallois flake (5.5 x 3.6 x 1).
9. A Levallois flake (5.5 x 3.6 x 1).
10. A point with unifacial working of the butt, it is like the Emiran point (5.2 x 2.6 x 0.8)
11. A leaf shaped point (5 x 2 x 1).
12. A Levallois point now broken (5.4 x 2.7 x 0.9).
13. A Levallois point with tinned of the butt, retouched by trimming (4.3 x 3.5x 0.7).
14. A beaked end scraper.
15. A point with a basal thinning of the butt like the Emiran, edge trimmed (4.8 x 3.1 x 1.2).
16. A flake struck from prepared core.
17. A triangular beaked core scraper, retouched (5.7 x 3.4 x 1.4).
18. A point.
19. A Mousterian point with thinned base; retouched on the left side, it retains some of the cortex on the right side. (6.4 x 3 x 1.6).
20. A backed blade made on a core; the back is blunted by snapping, it has curved cutting edge extending to the tip, entirely cortical on the ventral surface, used but not retouched (6.2 x 2.4 x 1.3).
21. Backed blade/ knife with blunted back by irregular flaking (5.2 x 3 x 2.4).
22. Backed knife (5.6 x 2.9 x 1.2).
23. A thin backed blade with curved cutting edge, with trimmed retouch (5 x 2 x 1.4)
24. A backed knife with curved edge (5.3 x 3 x 0.8).
25. A high ridged blade (4.2 x 1.6 x 0.6).

26. A flake blade (3.4 x 7 x 0.7)
27. End-cum-double convex side scraper struck from prepared core (4.3 x 2.9 x 0.7).
28. Double burin-cum-angle blade (3.7 x 8 x 0.6).
29. A round scraper with marginal retouch bulging bulbar of percussion (2.9 x 2.5 x 0.6).
30. A carinated scraper (4.2 x 3.1 x 1.4)
31. A burin (4.5 x 3.3 x 2.2.).
32. A burin.
33. A blade with (3 x 1.7 x 1.5).
34. A convergent scraper struck from prepared (3.8 x 2.2 x 0.7).
35. A very fine beaked burin (4 x 3.3 x 1.3).
36. A backed blade with cutting edge curving to the tip, notched at the base (6 x 2.2 x 0.9).
37. A carinated scraper with steep keel; a bone splinter still adheres to the ventral surface suggesting bone working at the site.
38. A carinated round scraper with retouch to the top of the tool (4.1 x 3.7 x 1.7).
39. It is a carinated end scraper with denticulate retouch on the frontal portion of the tool.
40. A canted end scraper (2.7 x 2.8 x 2.2).
41. A nosed shaped end scraper on core (6 x 2.8 x 2.3).
42. A burin scraper.
43. A convex side scraper intensively retouched on the dorsal surface (4 x 3 x 1)
44. A canted scraper (3.4 x 2.7 x 1.7).
45. A small convex side scraper.
46. An oval shaped scraper with bulb of percussion removed; partially retouched
47. A Levallois flake (3 x 2 x 0.5).
48. A typical discoidal core, bifacially worked. This is the largest core in the Mousterian industry of the area.
49. A triangular multiple burin. (7.4 x 6.3 x 1.7).

Figure 10 (Ango Gatkai: layer 6).

1. A large oblique Levallois flake struck from prepared core; it has prepared unfaceted striking platform, the butt end has been thinned above the bulb of

- percussion, it has trimmed retouch along the margins, the bulbar scar is intact (11.8 x 8.3 x 1.9).
2. A single convex side scraper struck from prepared core; it has dihedral back side with partial retouch on the ventral surface along the working edge (8.9 x 6.4 x 2.1).
 3. A single convex side scraper made on core with the removal of two large flakes from the dorsal surface; the ventral surface retains the original cortex, it shows retouch along the margins ((8.6 x 5.5 x 1.9).
 4. A single convex side scraper struck from prepared core; the platform along the bulb of percussion have been snapped by taking an elongated flake across the main axis of the artefact, it is partially retouched (10.1 x 5.7 x 1.8).
 5. A side scraper with straight and oblique cutting edge; it has very thick back, the bulb of percussion and the striking platform have been removed (8.1 x 3.9 x 2.7).
 6. A convex side scraper struck from prepared core; the bulb of percussion on the back has been removed, the back is snapped (7.4 x 5.4 x 1.9)
 7. A thick end scraper made on core; it is like the carinated scraper with beaked working edge, retouched on the beaked front, the keel has been blunted by taking a large spall from the distal end (9 x 5.9 x 3.5).
 8. A beaked / backed hand axe type tool; it must have been used as a hand axe as well as awl; it retains the original cortex on the ventral surface (6.7 x 8 x 3.2).
 9. Same as above but in this case the back retains the original cortex (5.2 x 6.6 x 3.2).
 10. A burin like large tool with transversal cutting edge (6.9 x 5.4 x 2.2).
 11. A convex side scraper (6.4x5.4 2.2)
 12. A transversal end scraper with beaked sides; it is like the Clactonian tool which is also reported from Tango Nao (7 x 5.5 x 1.8).
 13. A convex side scraper made on thick core; it is retouched, it is like the D- shaped Mousterian scraper of the Western Europe (6.5 x 4.2 x 3.4).
 14. A convex side scraper made on a bifacial core; it shows bold retouch on the ventral surface (7.2 x 5 x 2.5).
 15. Nosed scraper made on core (4.5 x 5.3 x 2.1).
 16. A convergent scraper with marginal retouch; it retains major portion of the original cortex (6.4 x 4.4 x 1.7).

17. A double convex side scraper with plain striking; snapped prepared striking platform bifacially worked; it is rather a thick example but very flat type is also found in this variety (2.5 x 3 x 1.4).
18. End-cum-convex side scraper struck from prepared core (7.6 x 3.8 x 1.5).
19. A canted scraper with beaked cutting edge, bifacially worked, found in most Western Asia Middle palaeolithic industries (4.7 x 4 x 2.1).
20. A fine convex end scraper (5.2 x 4 x 1.3).
21. A convex side scraper (5.3 x 3.6 x 2.1).
22. A convex side scraper made on core, the ventral surface is cortical.
23. A canted type scraper with snapped beak; secondary retouch on the dorsal surface (3.2 x 3.1 x 1).
24. A transversal end scraper.
25. End-cum-side scraper with transversal convex cutting edge; struck from prepared core with irregular platform (3.2 x 2.7 x 1.4).
26. A very fine flake with concavo-convex sides struck, from prepared core with plain striking platform (4.9 x 4.6 x 1).
27. A backed hand axe / chopping tool the cutting edge is formed by bifacially working; milky quartz (6.8 x 5.5 x 3.8).
28. A convex scraper with partial retouch; struck from prepared core (6.2 x 4 x 3.9).
29. A convex side scraper with fine retouch on the dorsal surface; it has snapped platform.
30. A convex side scraper.
31. A Levallois flake struck from prepared core, it may be termed flake blade (5.3 x 3.4 x 1.1).
32. A transversal convex scraper; the dorsal surface retains cortex (3.7 x 3.5 x 1.1).
33. A carinated end scraper (4.9 x 3.4 x 1.4).
34. A carinated scraper with retouch, made on core (3.7 x 3.5 x 2.1).
35. A carinated nosed scraper made on core, the retouch is on the left side (5.7 x 4.3 x 2.5).
36. A canted scraper with bifacial working; shows very low striking platform (3.7 x 3.2 x 1.4).
37. A complete transversal scraper struck from prepared core (4 x 3.2 x 1.2).
38. A fine transversal scraper struck from prepared core with prepared striking platform (3.5 x 2.9 x 1).

39. A fine example of transversal convex side scraper, it may be termed as a Levallois flake (4 x 3.1 x 0.9).
40. A double convex side scraper.
41. A convex side scraper, it seems like backed knife (3.9 x 2.9 x 0.9).
42. Side scraper with retouch on the dorsal surface (3.5 x 3.1 x 1.5)
43. A double convex side scraper with marginal retouch or convergent scraper. (4.4 x 3.1 x 1.2).
44. Double convex side scraper struck from prepared core (5 x 2.8 x 0.9).
45. A convex side scraper (5.7 x 3.4 x 2.2).
46. A triangular multiple burin (3.4 x 3.4 x 0.4).
47. A Gravettian type borer with thinned base (5.9 x 2.4 x 1.1).
48. End scraper with shoulder (5.6 x 3.1 x 1.4).
49. A carinated end scraper (4.9 x 3.7 x 2).

Figure 11 (Ango Gatkai: layer 6).

1. A blade with trimmed cutting edges. The striking platform and bulb of percussion have been removed by oblique truncation from the base (7.3 x 3.2 x 1.1).
2. A triangular thick backed blade (6.9 x 2.7 x 1.2).
3. A flake blade (4.6 x 2.6 x 1.3).
4. An elongated and high ridged prismatic blade (5.1 x 1.2 x 1.3).
5. A characteristic Middle Palaeolithic flake struck from prepared core; the butt end has been blunted by retouch; it has incurved cutting edge (6.4 x 3 x 1.6).
6. A transversal convex end scraper. The bulb of percussion has been removed; the butt end has been thinned down (6 x 5.5 x 1.4).
7. A side notched tool or spoke-shave, it has curved back (5.8 x 2.1 x 1.8).
8. A backed blade (4.8 x 2.2 x 0.8).
9. A convex side scraper with central notch at the cutting edge; partially retouched, the back has been blunted by faceted flaking (4.5 x 3.2 x 1.3).
10. A pointed convex side scraper with broken distal end (4 x 4.7 x 0.6).
11. A backed blade or knife with cutting edge curving to the tip of the tool, blunted by retouch (4 x 2.5 x 0.8).
12. A canted type scraper with the striking platform snapped and the dorsal surface thinned down; retouched on both sides (4.4 x 3.2 x 1).

13. A burin-cum-side scraper made on a Levallois flake (5.5 x 4.1 x 1.6).
14. Burin made on prepared core; it retains most of the cortex (5 x 3.4 x 0.6).
15. A side scraper struck from prepared core with prepared faceted striking platform; it has irregular cutting edges (4.9 x 3.2 x 0.6).
16. A convex side scraper (3.5 x 2.1 x 0.9).
17. A fine convex side scraper with pronounced basal notch or it is a spoke shave retouched on the dorsal surface (3.4 x 3.1 x 0.8).
18. A tongue shaped end-cum- side scraper (4.5 x 3.2 x 1.2).
19. A convex side scraper retouched with prominent bulb of percussion.
20. A side struck scraper (4.2 x 3.1 x 1.9).
21. A burin dejet (3.5 x 2 x 0.9).
22. A flake struck from prepared core.
23. A canted type tool (3.5 x 3.5 x 1.3).
24. A fine backed knife (4.1 x 2.8 x 0.9).
25. A bifacial tanged point (2.7 x 2 x 0.8)
26. A tanged point or special burin (4.6 x 2.7 x 2).
27. A convex side scraper with burin edge at the base of the striking platform (2 x 2.9 x 0.6).
28. A side scraper with broken end (4.5 x 1.3 x 1.3).
29. A transversal end scraper like tranchet (4.2 x 3 x 1.5).
30. A backed knife already found in layer 5 (4.8 x 2.7 x 0.7).
31. A multiple tool or awl-burin (5.4 x 5.2 x 1.7).
32. A side scraper with thick end, retouched on the dorsal surface (5.5 x 3.5 x 2.2).
33. A steep retouched convex side scraper (4.3 x 3.3 x 1.5).
34. A Levallois flake (4.5 x 3 x 1.1).
35. A round scraper struck from prepared core (3.9 x 3.5 x 1.1).
36. A pointed tool (9 x 3.5 x 0.6)
37. End-cum-side scraper (4.3 x 2.6 x 1.5).
38. A convex side scraper (3.5 x 2.3 x 0.7).
39. A single convex side scraper (3.3 x 1.8 x 0.9).
40. A double convex side scraper.
41. A convergent scraper
42. A transversal convex side scraper.

Figure 12 (Ango Gatkai layer 6: microliths).

1. Levallois point struck from prepared core with prominent bulb of percussion, trimmed roughly along the margins (2.4 x 3 x 0.5).
2. A leaf shaped point struck from prepared core; it shows prepared striking platform and small bulb of percussion, the central ridge on the dorsal surface is snapped to make it flatter, well made (2.9 x 1.6 x 0.5).
3. It is also a point but the left side has been removed, the butt end is thinned for hafting (2.7 x 1.6 x 0.5).
4. A small or micro point with prepared striking platform, partially retouched on the dorsal surface (1.9 x 1.4 x 0.4).
5. A Levallois point, the bulb of percussion has been snapped horizontally across the axis; trimmed on the dorsal surface (2.5 x 2.2 x 0.5).
6. A tiny tool with the working edge on the distal end making it almost a burin, retouched on the ventral surface near the tip; central ridge snapped. (1.8 x 0.9 x 0.5).
7. Microlithic point, end struck it is burin cum-point. (1.7 x 1 x 0.4)
8. Ventral surface of the above.
9. A small blade (2.3 x 1.1 x 0.5).
10. A point with low striking platform, utilized (2.5 x 1.7 x 0.7).
11. A short flake blade partially retouch on the left edge (2.2 x 1.8 x 0.5).
12. A blade with naturally oblique truncation at the distal end, plain striking platform, the bulb of percussion has slightly been removed (3.4 x 1.9 x 0.5).
13. A blade with trimmed edge and thinned base (4.3 x 1.5 x 0.5).
14. A micro blade with thin basal end and wide distal end, obliquely truncated at the base (2.4 x 0.9 x 0.2).
15. A microlithic convex scraper.
16. A blade with pointed proximal end and one of the sides has been notched at the waist of the tool; retouched on the working edge (3.3 x 1.1 x 0.7).
17. A flat blade.
18. A flake blade struck from prepared core; trimmed along the edges, obliquely truncated on the proximal end, plain striking platform (3.2 x 1.7 x 0.5).
19. A small backed blade (2.2 x 0.8 x 0.3).
20. A small pointed flake blade.

21. A pointed flake blade (2.1 x 0.9 x 0.2).
22. A triangular blade (2.8 x 1.4 x 0.5).
23. A blade made on crystal quartz (3 x 1.8 x 0.7).
24. A flake blade (2.9 x 1.7 x 2.6).
25. A flake (2.4 x 1.5 x 0.5).
26. A backed blade; the butt end has been thinned on the dorsal surface (2.6 x 1.5 x 0.5).
27. A triangular backed knife made on milky quartz (3 x 2.2 x 0.7).
28. A short backed blade with concave convex cutting edge, with straight truncation at the proximal end, made on milky quartz (2.2 x 1.5 x 0.7).
29. An angular blade (3 x 1.2 x 0.5).
30. A side struck naturally backed blade; it retains the original cortex, the right side is snapped to reduce the thickness of the tool (3.4 x 1.7 x 0.9).
31. A backed blade (3.3 x 0.9 x 0.5).
32. A trapezoidal artefact made on milky quartz. (1.6 x 2.2 x 0.7).
33. A short blade on milky quartz. (2 x 1.6 x 0.6).
34. A thin pointed flake struck from prepared core; it resembles the point Soyons (2.8 x 2 x 0.5).
35. A tranchet like tool with working edge obliquely to the axis of the artefact (3 x 1.8 x 0.7).
36. A blade like tool with concave working edge and burin edge at the other end (3.1 x 1.9 x 0.6).
37. A blade like tool with convex cutting edge (2.4 x 1.5 x 0.6).
38. A round scraper (2.6 x 2.7 x 0.6).
39. A blade with dihedral prepared striking platform and thin dorsal surface above, it shows high ridge on the dorsal surface (3.2 x 1.8 x 0.3).
40. A blade struck from prepared core (3 x 1.7 x 0.5).
41. A knife with convex side cutting edge and slightly blunted back, it may be called a bifacial tool because of the flaked dorsal surface (4.2 x 2.6 x 1.1).
42. A point like tool with prepared striking platform; it shows very short working edge on the right side (2.6 x 1.4 x 0.7).
43. A double convex side scraper with cortical dorsal surface and the ventral surface is flaked (2.6 x 1.7 x 0.5).
44. A broken blade (1.9 x 0.8 x 0.3).

45. A double convex side scraper with trimmed retouch (2.8 x 1.1 x 0.9).
46. A short blade (1.9 x 1.6 x 0.6).
47. A backed blade with notch in the working edge (2.5 x 1.5 x 0.4).
48. A point struck from prepared core with delicate edge trimming (2.4 x 2 x 0.5).
49. End-cum-single convex side scraper made on triangular flake, the non-cutting edge at the right side shows cortex (3.2 x 1.9 x 0.5).
50. Oblique-cum-side scraper 2.3 x 1.8 x 0.7 (2.6 x 1.5 x 0.4).
51. Obliquely truncated blade (2.6 x 1.5 x 0.5).
52. A double convex side scraper trimmed along the edges (2.9 x 1.9 x 0.4)
53. -----
54. -----
55. An oblique end scraper; retouched on the dorsal surface with a burin spall trimmed on the left side. It can be compared with no. 30 as above (3.3 x 1.9 x 0.8).
56. A denticulate flake struck from prepared core (2.6 x 1.9 x 0.2).
57. A point on milky quartz (2.6 x 1 x 0.7).
58. A convex side scraper with steeply blunted back (4.1 x 2.5 x 1.7).
59. A convex side scraper (5.1 x 2.3 x 1.7).
60. A tranchet made on flake, it shows two-beveled cutting edge oblique to the main axis (3.1 x 2.3 x 0.8).
61. -----
62. A tranchet (2.2 x 1.4 x 0.5).
63. An elongated bore/awl (3.6 x 0.9 x 0.7).
64. An elongated tool with oblique cutting edge at the distal end (3.7 x 2 x 1.9).
65. An angular burin made on a blade like flake (3.4 x 1.6 x 1.1).
66. A side struck end-cum-side scraper (4 x 2.3 x 0.9).
67. A fine backed knife (4 x 2.1 x 1.3)
68. A flake tool (3.9 x 2.4 x 0.7).
69. A very fine tranchet (2.7 x 2.3 x 0.7).
70. A humped burin on the proximal end (3.3 x 1.4 x 1.4).
71. A burin-cum-side scraper on a Levallois flake (3.1 x 2 x 0.5).
72. A burin made on milky quartz (2.3 x 1.5 x 0.7).
73. A denticulate (3.1 x 2.6 x 0.8).
74. A fine knife (4.2 x 2.6 x 1.9).
75. A retouched backed knife (1.8 x 2.4 x 1).

Figure 13 (Ango Gatkai: layer 5 Upper Palaeolithic).

1. Oblique scraper trimmed; the bulb of percussion and striking platform have been removed (9 x 4 x 6 x 2).
2. A concavo-convex scraper retouched along the margins (9.5 x 5.9 x 2).
3. A cleaver (10.3 x 7.9 x 2).
4. A retouched burin-cum-end scraper (6.8 x 4.5 x 1.5).
5. A primary flake scraper.
6. A leaf shaped point with retouch on both sides. It has thinned base (6.3 x 3.4 x 2.1).
7. A thick flake struck from prepared core (8.1 x 4.5 x 1.8).
8. A backed knife with irregular cutting edge (8.8 x 2.7 x 1.8).
9. A primary flake (5 x 2.7 x 2).
10. A bladelet core or double sided scraper (3.3 x 2.5 x 1.2).
11. Awl-cum-double sided scraper (2.6 x 2.4 x 1.5).
12. A thick convex side scraper.
13. A concave side scraper.
14. A flake struck from prepared core. (5.5 x 4.5 x 1.4).
15. A side scraper (6.1 x 4.5 x 2).
16. A denticulate side scraper or flake chopping tool with wide retouch (8.5 x 6.4 x 3.5).
17. A concavo-convex side scraper (8.6 x 5 x 2.3).
18. A round backed chopper (7.5 x 6.8 x 2.9).
19. A chopping tool with bifacial working, it is a large convex side scraper (7.3 x 6.6 x 3.4).
20. A keel shaped end scraper with marginal retouch.
21. A pointed flake tool.
22. A round scraper or discoidal flake scraper (6 x 5.5 x 1.8).
23. A Levallois flake (4.4 x 3.7 x 1.6).
24. A backed knife (7.1 x 2.5 x 1.5).
25. A pointed tool.
26. An awl-cum-burin.

27. A broad knife (5.2 x 3.5 x 1.3).
28. Burin-cum-awl (3.9 x 3.3 x 0.9).
29. A convex side scraper (4.6 x 3.3 x 0.8).
30. A blade.

Figure 14 (Ango Gatkai: layer 5 Upper Palaeolithic).

1. A retouched flake with straight convex cutting edge (6 x 2.2 x 0.7).
2. A burin scraper (8.1 x 3.5 x 1.2).
3. A scraper struck from prepared core.
4. A flake core (6.2 x 4.4 x 2.9).
5. A canted scraper (6.1 x 5.1 x 3.6).
6. A beaked scraper.
7. A denticulate.
8. A beaked burin-scraper, the largest piece in the whole series (8.4 x 7 x 2.5).
9. A round Levallois flake scarper (4.7 x 4.3 x 0.9).
10. A flake.
11. A cleaver (12.9 x 9.9 x 4.5).
12. Unstruck prepared Levallois core (10.9 x 10.2 x 4.7).
13. A flake blade truncated at the base (6.4 x 2.1 x 0.6).
14. A Mousterian type point with thinned base (8.6 x 4.6 x 1.9).
15. A point with thinned butt end (5 9.5 x 5.3 x 2.6).
16. A blade with retouched on the margins (10.1 x 3.8 x 2.1).
17. A double convex side scraper (8.5 x 4.6 x 0.7).
18. A blade like Levallois point (6.2 x 2.6 x 1.2).
19. A blade (6.4 x 2.3 x 1.3).
20. A blade with concavo-convex cutting edges (6.6 x 3.1 x 1.2).
21. A fabricator (8.5 x 3.6 x 2.4).
22. A broad flake blade (6.5 x 3.8 x 1.6).
23. An awl with broken tip (5 x 3.5 x 1.3).
24. A tanged point (11.4 x 4.7 x 1.3).
25. A characteristic well-shaped point (Taqaian) with thinned base (5.4 x 1.7 x 0.5).
26. A blade obliquely truncated at the distal end (7.6 x 2.7 x 1.4).
27. The largest blade in the whole series of the Upper Palaeolithic industry (11.4 x 5 x 2.4).

Figure 15 (Ango Gatkai: layer 5 Upper Palaeolithic).

1. A Levallois flake (9.9 x 5.1 x 1.3).
2. A carinated umbrella type scraper (6.1 x 5.9 x 3.1).
3. A carinated end scraper (4.6 x 3.4 x 2).
4. A beaked burin characteristic of the Upper Palaeolithic tool in this part of the world (6.7 x 4.6 x 1.7).
5. A carinated end scraper (4.2 x 4.1 x 1.1).
6. An awl (4.1 x 3.4 x 1.1).
7. End scraper (3.5 x 3.2 x 0.6).
8. An awl (5.9 x 4.6 x 1.1).
9. A Levallois flake (3.7 x 3.1 x 1.1).
9. An awl (4.8 x 3.9 x 2.7).
10. A carinated scraper (5 x 3.2 x 2.4).
11. A side scraper with the original cortex on the dorsal surface (3.6 x 2.3 x 0.6).
12. A scraper (3.6 x 2.3 x 0.6).
13. A point (3.8 x 2.8 x 1.1).
14. A cortical flake (6 x 3.9 x 1.1).
15. End scraper (3.2 x 2.8 x 1.1).
16. A burin (2.5 x 2.4 x 1.1).
17. A blade (4.6 x 1.3 x 0.4).
18. A carinated scraper (5.5 x 4.6 x 2.8).
19. A point like blade (4.1 x 2.1 x 1).
20. A burin (3.5 x 2.7 x 0.7).
21. A knife (4.3 x 3.2 x 0.8).
22. A scraper.
23. End scraper (5.7 x 3.6 x 1.3).
24. A beaked burin (8.9 x 6.9 x 2.5).
25. A burin (8 x 3.4 x 1.3).
26. A naviform type point.

Figure 16 (Ango Gatkai: layer 5 Upper Palaeolithic).

1. A large flake struck from prepared core. (8.3 x 7.8 x 1.6).
2. A thick convex side scraper made on quartz. (8.3 x 7.3 x 3.9).
3. A bifacially worked flake with irregular outline (10.6 x 7.4 x 2.7).
4. Chopping tool made on reddish chert stone. It has bifacially worked cutting edge (6.4 x 7.4 x 3).
5. A scraper.
6. A short stout convex side scraper (3.7 x 4.8 x 2.7).
7. A round scraper struck from core by bipolar technique as it shows two bulbar scars on the distal and butt ends; partially retouched along the margins (3.2 x 2.8 x 1.2).
8. A typical burin (4 x 3.2 x 0.9).
9. A flake struck from prepared core.
10. A side struck convex side scraper with partial retouch along the working edge (7.1 x 4.9 x 1.8).
11. A backed knife retouched along the working edge (4.8 x 2.5 x 1.5).
12. A backed knife with longitudinally curved cutting edge, retouched and marks of use are visible (4.2 x 2.1 x 0.8).
13. A retouched knife or straight side scraper (5.2 x 3.5 x 1.2).
14. A convex side scraper with step retouch (5.5 x 3.5 x 1.2).
15. This tool resembles the Mousterian point; it is retouched on the margins (4.5 x 3 x 1).
16. -----.
17. A bifacially worked flake struck from prepared core. It may be called a denticulate scraper with snapped striking platform (4.7 x 3.5 x 1.1).
18. A broad end scraper struck from prepared core with bold retouch (3.4 x 3.9 x 0.9).
19. A triangular flake with rather concave cutting edge (5.7 x 3.8 x 1.4).
20. A beaked flake struck from prepared core; such type is also found in the Tango Nao collection. It is side struck with prominent bulb of percussion, it shows straight and concave cutting edge.
21. A very steep flake with narrow distal end or it is nosed scraper with retouch carried out along the high ridge of the keel (5.1 x 2.8 x 1.3).

22. A convex side scraper made on a core of greenish chert with a central keel crossing the centre. The tool is irregularly retouched. The bulb of percussion has been removed by snapping (5 x 5.1 x 1.9).
23. A nosed end-cum-side scraper made on greenish chert (4 x 3.6 x 1.3).
24. End-cum-convex side scraper (4 x 3.4 x 1.2).
25. A thick carinated scraper with convex cutting edge and irregular wide retouch (4.9 x 4.3 x 2.3).
26. A wide blade with backed side and slightly convex cutting edge; it is struck on the distal end with prominent bulb of percussion.
- 26b. A flat nosed scraper made on prepared Levallois core (7 x 5.2 x 1.2).
27. A canted type scraper (3.6 x 2.9 x 1.1).
28. A double convex side scraper (3.5 x 2.2 x 0.7).
29. End scraper with irregular cutting edge, struck from prepared core (3.3 x 2.9 x 0.7).
30. A carinated scraper.
31. Nosed scraper made on core. It is partially retouched by taking burin spalls to the keel of the tool, very fresh (3.3 x 2.7 x 1.6).
32. A round carinated scraper with bold retouch toward the top of the tool (4.6 x 3.9 x 2.5).
33. A very steep keel shaped carinated tool with upward retouch, umbrella type, found in the Aurignacian of Western Europe (3.8 x 3.6 x 2.5).
34. A convex side scraper with frontal end retouch by bold technique (4.4 x 4.7 x 2.2).
35. A thick flake scraper with bold retouch; the striking platform and bulb of percussion has been removed (4.3 x 3.4 x 1.3).
36. A borer/awl-cum-end scraper on milky quartz. (4.6 x 3.5 x 1.3)
37. A straight-o-convex side scraper struck from a very crude chert with bold retouch (5.9 x 4.4 x 1.6).
38. A burin (4 x 3 x 1).
39. A thick scraper with bold retouch (6.2 x 4.7 x 1.7).
40. A characteristic Upper Palaeolithic blade with very tiny bulb of percussion and striking platform. It shows very smooth ventral surface. It is obliquely truncated at the distal end (6.3 x 2.5 x 0.5).
41. A *lame a crete* (7.3 x 3.1 x 1).

42. A backed blade (5.x.5 x 0.6).
43. A broad transversal burin or end scraper with very sharp cutting edge. It is like the Mousterian tranchet (3.6 x .2 x 0.7).
44. A burin (4.1 x 3.2 x 1.3).
45. A multiple scraper with straight, concave and convex cutting edge (7 x 4.4 x 1.5).
46. A scraper with straight and convex cutting edge (6.9 x 5.1 x 1.5).
47. An end scraper made on blade like Levallois flake, it has obliquely transversal cutting edge with retouch on the dorsal surface (4.3 x 2.1 x 0.7).
48. A double ended tranchet (5.8 x 2.7 x 1.5).
49. A carinated beaked scraper (5 x 3.4 x 2.2).
50. A thick backed knife with convex cutting edge and notched at the centre (5 x 3.4 x 2.2).
51. An end-cum-side scraper (4.1 x 2.8 x 1.4).
52. An oval shaped scraper with prominent bulb of percussion; it seems to have formed by bipolar technique (4.7 x 3.5 x 0.7).

Figure 17 (Ango Gatkai: layer 5 Upper Palaeolithic).

1. A burin (5.7 x 2.4 x 1.2).
2. A specialized form of burin perhaps noted for the first time at Ango Gatkai layer 5; the burin is formed by the beveling of the two sides to oblique burin edge (4.6 x 2.1 x 1.5).
3. A typical burin (5 x 2.6 x 1.5).
4. A burin with transversal cutting edge formed by tapering the two sides to the cutting edge (4.6 x 2 x 1.1).
5. Another burin oblique to the main axis of the tool; it is a double burin on the same distal end (3.7 x 2 x 1.5).
6. A curved burin with very narrow burin cutting edge at the remote distal end (3.9 x 1.4 x 1.5).
7. A typical burin with beaked distal end (3.4 x 1.5 x 1.0).
8. A burin made on a slenderical flake (4.2 x 1.3 x 2.1).
9. Burin-cum-straight side scraper (4.8 x 1.5 x 1.0).
10. A multiple burin (2.8 x 2.2 x 0.7).
11. A burin (4.8 x 1.3 x 0.9).

12. A burin simple dihedral (3.5 x 2.2 x 0.6).
13. Oblique burin (3.6 x 1.8 x 1.6).
14. A beaked burin like end scraper made on Levallois flake with faceted striking platform (3.1 x 3.4 x 0.8).
15. A double burin (3.2 x 3.6 x 0.8).
16. A fine double burin ((4.2 x 3.5 x 0.7).
17. A convex side scraper (4.5 x 3.3 x 0.6).
18. A burin broken at the tip (4.2 x 2.2 x 0.5).
19. A burin on a triangular Levallois flake.
20. A small double straight scraper, dihedral proximal end (2.7 x 1.6 x 0.7).
21. An oblique scraper with short cutting edge resembling a burin; it is retouched inversely.
22. A trapezoidal type of thin flake, utilized (3 x 2.7 x 0.5).
23. A side struck end-cum-side scraper retouched along the margins (2.3 x 1.8 x 0.5).
24. End-cum-convex side scraper (3.2 x 1.9 x 0.5).
25. A tiny straight and transversal scraper (2.1 x 1.5 x 0.4).
26. A small retouched side scraper (2.2 x 1.4 x 0.4).
27. A knife with straight blunted back; the cutting edge is curving toward the tip at the distal end, trimmed at the margin (5.5 x 2.5 x 1.3).
28. A transversal end scraper (3.7 x 2.9 x 1.3).
29. Busque-cum-scraper (3.2 x 1.7 x 0.9).
30. A denticulate flake with an awl end (4.2 x 2.2 x 0.6).
31. An awl with broken tip (3.3 x 1.9 x 0.7).
32. An awl with thick backed body (2.6 x 1.8 x 1.2).
33. An awl-cum-convex side scraper with trimmed retouch at the shoulder (3.3 x 2.2 x 0.7).
34. Bifacially worked awl (3.8 x 2.5 x 1.3).
35. An elongated awl (4.7 x 2.4 x 0.7).
36. A double convex scraper.
37. Burin on milky quartz (2.3 x 2 x 1.2).
38. An elongated burin on milky quartz with transverse working edge (4.2 x 3 x 1.2).
39. An umbrella type round or keeled scraper (2.5 x 2.2 x 0.2).
40. A specialized type of blade tool (3.5 x 1.7 x 0.6).
41. A bifacially worked point, the left side is very sharp (3.3 x 1.8 x 0.9).

42. A multiple burin-cum-convex side scraper (2.8 x 2.4 x 1.2).
43. no. is not available.
44. A beaked blade (4.2 x 2.2 x 1.0).
45. A flake struck from prepared core with half of the platform is removed (4 x 3.2 x 0.4).
46. A knife (4.8 x 2.4 x 0.8).
47. End struck backed knife prepared by the removal of seven flakes along the side; small bulbar scar with diffused ripples (3.6 x 2.3 x 0.9).
48. A pointed backed knife retouched along the working edge (3.4 x 2.3 x 1.1).
49. A single convex side scraper with a notch on the ventral surface in the working edge; it resembles the D-shaped Mousterian of the Western Europe (5.8 x 3.5 x 1.9).
50. A single convex side scraper with a small concavity in the middle of the working edge (5.1 x 2.6 x 2).
51. Similar to no. 27; it bears trimmed retouch; the back is formed by the removal of small flakes (5.7 x 2.9 x 1.3).
52. An end-cum-double convex side scraper, retouched all along the margin (5.5 x 3.6 x 1.8).
53. A Levallois blade; partially retouched on the margins; broken at the tip, snapped striking platform (6.8 x 3.7 x 1.2).
54. A convex side scraper (5.8 x 4.3 x 2.0).
55. A convex side scraper struck from prepared core (6.5 x 4.2 x 1.3).
56. A convex side scraper, with a dimple on the dorsal surface or deep negative scar to hold the thumb, snapped platform a characteristic of the Mousterian scraper (6 x 4.4 x 1.4).
57. A concave side scraper with step retouch (4.6 x 3.2 x 0.9).
58. A rectangular transversal scraper also found in layers 6 and 7 with sharp cutting edge (3 x 3.2 x 1.7).
59. -----
60. A point Soyons type broken, with faceted striking platform (4.4 x 3.2 x 1.0).
61. 61 A double convex side scraper, retouched along the margins (4.4 x 2.4 x 0.9).
62. Ventral view of the above.
63. Straight side scraper with a notch at the distal end, utilized.

- 64 and 65. A pointed tool with convergent marginal working edge, the proximal end has thinned down (4.3 x 3.1 x 0.9).
- 66-67. A canted scraper struck from discoidal core with snapped dihedral platform (4.9 x 4.1 x 2.2).
69. A canted scraper with convex cutting edge, retouched along the margins (4.5 x 3.8 x 1).
70. A convex side scraper with prepared striking platform. 4.7 x 3.5 x 0.9).
71. A sub-triangular scraper with bold retouch on the distal end (3.8 x 2.8 x 1.0).
72. Almost round scraper/or convex side scraper made on thin blade flake such type of tools are referred to as raclettes by the French in literature (5.2 x 4.2 x 1.8).
73. A canted scraper broken at the tip, it has thick back with beveled side tapering towards the edge, marginal retouch (3.2 x 3.4 x 1.7).
74. A blade retouched, obliquely truncated at the distal and proximal ends (5.5 x 2.4 x 1.1).
75. A tanged point, the butt has been thinned down (3.8 x 2.4 x 1.4)
76. A fan shaped or round denticulate scraper (3.8 x 3.3 x 1.0).

Figure. 18 (Ango Gatkai: layer 5 Upper Palaeolithic).

1. A blade with fine retouch along the margins. The central high ridge has been smooth by taking snapped slivers prepared striking platform, broken at the tip (3.9 x 2.5 x 0.7).
2. A double convex side scraper with very fine trimming of the margins (4.9 x 2.4 x 1.1).
3. A wide blade with marginal trimming (3.2 x 2.4 x 0.6).
4. A blade flake with straight and curved cutting edge (3.6 x 1.9 x 0.4).
5. A blade with broken tip (4.4 x 1.8 x 0.6).
6. A blade flake with thinned base (3.9 x 2.1 x 0.5).
7. A blade flake with irregular outline and trimmed cutting edge; a small bulbar scar at the proximal end (3.4 x 1.8 x 0.5).
8. A backed blade with the cutting edge is slightly curving to the tip of the tool (3.7 x 1.7 x 0.5).
9. A blade flake (3.6 x 2.4 x 0.6).

10. A blade; obliquely truncated at the proximal end with the removal of the bulbar scar (4.8 x 1.8 x 0.5).
11. A scraper with straight and convex sides; the bulb of percussion has been removed (3.8 x 2.2 x 0.9).
12. A very thin blade with edge trimmed (4.2 x 2.1 x 0.3).
13. A short T-shaped blade (2.2 x 1.7 x 0.2).
14. A blade with concave cutting edge (2.7 x 2.1 x 0.4).
15. A backed blade with concavo-convex cutting edge, the back is blunted by trimming (3.9 x 2 x 0.6).
16. A Levallois blade flake (3.6 x 2.1 x 1).
17. A sharp backed blade (4.3 x 2.2 x 0.7).
18. A knife.
19. A knife (3.5 x 2.2 x 5.2).
20. A triangular or convergent point with slight notch at the base (3.4 x 1.8 x 0.8).
21. A short knife (3.6 x 2.3 x 0.6).
22. A convex side scraper (2.9 x 2.7 x 0.7).
23. A short knife (3.2 x 2 x 0.5).
24. A convex side scraper (3.2 x 1.6 x 0.8).
25. A backed knife with very sharp cutting edge, the back has been blunted by trimming two flakes.
26. A blade with trimmed edges; the bulb of percussion has been removed; it shows ripples on the ventral surface (3.8 x 1.3 x 0.5).
27. A blade with pointed distal end it has steep central ridge on the dorsal surface (2.4 x 1.3 x 0.3).
28. A blade (2.3 x 1.7 x 0.8).
29. A blade truncated obliquely at the distal end (3.3 x 1.6 x 0.8).
30. A blade with concave convex edge (3.3 x 1.6 x 0.4)
31. A blade (3 x 1.5 x 0.8).
32. A blade (2.8 x 2 x 0.4).
33. A blade.
34. A blade knife the striking platform is obliquely truncated; it resembles the Mousterian point (3.5 x 2.2 x 0.8).
35. A blade with broad convex distal end and narrow butt end (3.1 x 1.7 x 0.5).

36. An ovate type of double convex side scraper with irregular bold retouch and edge trimmed (2.6 x 1.8 x 0.5).
37. A short broad blade with a domical dorsal surface struck from prepared core, the bulb of percussion has been removed (3.2 x 2.2 x 0.9).
38. An elongated blade with straight sides, it can be used an end scraper and burin (4 x 2.1 x 0.8).
39. A tranchet like tool with transversal cutting end, both sides of the tool are blunted by trimming (3.2 x 1.7 x 0.9).
40. A burin with notch at the left side (3.3 x 1.4 x 0.6).
41. A concave blade with the back curving to the tip of the tool (3.3 x 1.4 x 0.6).
42. End-cum-double convex side scraper, the butt end is thinned (4.1 x 2.4 x 0.5).
43. A thin blade (3.7 x 1.8 x 0.5).
44. A convex side scraper struck from prepared platform (3.3 x 2.2 x 0.30).
45. A thick transversal end scraper with fine frontal retouch (3.8 x 2.7 x 0.9).
46. A point with round base and trimmed edges (3.5 x 2.6 x 1).
47. A point with thinned base (3 x 2.3 x 0.6).
48. A point with thinned butt end (4.2 x 2.3 x 0.8).
49. -----
50. It is similar to no.47 (3.2 x 2.2 x 0.6).
51. A short Levallois flake (3.2 x 2.9 x 0.9).
52. A Levallois point with edge trimmed (4.4 x 1.3 x 1).
53. A Levallois point with the butt end thinned down on the dorsal surface (3.7 x 3.5 x 0.9).
54. With the same description as the above (4.1 x 2.9 x 0.8).
55. A double convex side scraper (4.4 x 2.4 x 0.9).
56. A characteristic Upper Palaeolithic tool with concavo-convex sides, the tool is broader at the distal end (4.5 x 2.5 x 0.7).
57. A blade with trimmed butt end (4.2 x 2.2 x 0.7).
58. A small Mousterian point made on milky quartz with prominent bulb of percussion (2.7 x 1.7 x 0.8).
59. A double narrow ended scraper (4 x 1.8 x 0.8).
60. A backed blade (3.1 x 1.8 x 0.9).
61. A broken blade (3.6 x 2.9x0.8).
62. A small blade with obliquely truncated end (2.7 x 2.1 x 0.7).

63. A small thin flake struck from prepared core (2.3 x 1.6 x 0.4).
64. As above (2.6 x 1.5 x 0.8).
65. A point with very sharp sides, thick at the butt end and thin at the tip (4 x 1.8 x 0.6).
66. A point with thinned base (3.1 x 1.4 x 0.6).
67. A double convex sided scraper broken at the tip (4.4 x 3 x 1.1).
68. A pointed tool with basal thinning of the butt (4 x 2.4 x 0.6).
69. A tanged point (4.7 x 2.9 x 0.8).
70. A pointed tool with wide beaked narrow distal end (5 x 2.9 x 0.8).
71. A concavo-convex side scraper, retains the original cortex on the right side (3 x 2.4 x 0.6)
72. A characteristic Upper Palaeolithic knife.
73. A characteristic Upper Palaeolithic nosed type scraper with marks of use (3.5 x 1.1 x 0.6).
74. As above (3.6 x 2.9 x 0.7).
75. A thick flake with notched end scraper and burin ends (4.1 x 2.6 x 1).
76. A blade flake (3.5 x 2.6 x 0.6).
77. As above (3.3 x 2.4 x 0.8).
78. A knife (3.4 x 1.8 x 0.8).
79. End scraper with transversal cutting edge (3.3 x 3.1 x 0.6).
80. A backed knife (3.7 x 2.2 x 1.2).

Figure 19 (Ango Gatkai: layer 4 Upper Palaeolithic).

1. End-cum-side scraper on a blade like flake (9.8 x 3.5 x 2.4).
2. A flat nosed Levallois flake (8.4 x 4.9 x 1.8).
3. A convex side scraper (6.7 x 3.7 x 1).
4. A concave side backed blade (8.4 x 4.2 x 1.9).
5. A thick flake (7.7 x 5.6 x 1.7).
6. A convex side scraper (5.6 x 3.9 x 1.3).
7. A bifacial naviform type point (6.9 x 3.5 x 2.2).
8. A thick scraper (6 x 4.6 x 2).
9. A round type of scraper (6.6 x 4.8 x 2.1).
10. End-cum-side scraper (7.5 x 5.1 x 1.9).
11. A thick scraper (6.7 x 4.8 x 2.6).

12. A flake (7.3 x 5.8 x 3.2).
13. A cortical side scraper (8.3 x 4.8 x 1.8).
14. A carinated scraper (6.5 x 4.6 x 2.2).
15. A burin (4.2 x 2.3 x 1.9).
16. An end notched scraper (7.1 x 3.9 x 7).
17. A burin blade (5.7 x 2.7 x 2).
18. A Levallois flake (5.1 x 2.7 x 0.4).
19. A fan shaped scraper.
20. A side scraper (6.3 x 4.1 x 2.2).
21. A notched scraper (5.6 x 4.3 x 1.5).
22. A best example of leaf shaped point (7.6 x 3.8 x 1.4).
23. A point (6.2 x 3.7 x 1.4).
24. A point (5.9 x 3.3 x 0.9).
25. A beaked scraper (5.5 x 3.7 x 1.4).
26. A knife (4.2 x 2.4 x 1.1).
27. A thick tool (6.8 x 5.2 x 2.5).
28. A flat nose shaped scraper (4.1 x 2.9 x 0.8).
29. A blade (6.7 x 2.7 x 1.7).
30. A thick scraper (4.5 x 4.6 x 2).

Figure 20 (Ango Gatkai: layer 4 Upper Palaeolithic).

1. A big chopper made on chert nodule (11.2 x 7.3 x 4.3).
2. A flake chopper, it means that the tool shows a large flake scar on the ventral surface. It shows large number of flake scars on the dorsal surface near the margins, it is like a biface tool or hand axe (11 x 8.2 x 4.9).
3. A trapezoidal type of hand axe with transversal convex cutting edge. The cutting edge is formed by converging of the two beveled surfaces with thick back (10.5 x 6.2 x 4.6).
4. This tool resembles a tortoise core but; it exhibit marks of use; it is plano-convex in cross section (9 x 6.2 x 3.2)
5. A heavy cleaver with bifacial flaking along the cutting edge; still retains most of the original cortex (10.2 x 9.7 x 5).

- 6a. The largest flake which may be termed as Clactonian flake; the dorsal surface shows one negative scar with great portion of cortex and the ventral surface is formed by the removal of a large flake (12.9 x 6.9 x 3.3).
- 6b. A canted scraper encrusted with lime and clay (8.2 x 6.7 x 5).
- 6c. A flake struck from prepared core (8.1 x 5.8 x 1.7).
7. A blade like flake with oblique distal end and left side working edge (3.6 x 2.3 x 0.5).
8. A pointed blade flake with distal tip broken; both sides form the working edge (3.7 x 2.3 x 0.5).
9. A pointed flake blade with prepared striking platform ((7 x 2.6 x 0.9).
10. A backed prismatic type blade with tiny bulb of percussion (4.8 x 1.5 x 0.7).
11. A tool resembling a small hand axe with bifacial flaking and pointed distal end, it is encrusted with lime and clay (8.4 x 5.3 x 4.2).
12. A triangular flake struck from unprepared core (8.8 x 6 x 2.6).
13. A large crescent type or lunate type of scraper with convex cutting edge. The platform is at right angle to the axis of the tool, cortex is found on the dorsal surface.
14. A triangular flake struck from prepared core (8.5 x 4.2 x 1.9).
15. Oblique triangular scraper (8.2 x 9 x 1.7).
16. A flake struck from prepared core with prepared platform; the basal end has been thinned by removing or snapping a single flake, it shows irregular margins (6.7 x 5.7 x 1.5).
17. Flake struck from prepared core (6.7 x .7 x 1.5).
18. A convex side scraper struck from prepared (6.5 x 3.9 x 1.3).
19. A naturally straight backed blade or knife (5 x 5.2 x 1.3).
20. A single convex side scraper (6.3 x 3.4 x 2).
21. A convergent scraper (5.4 x 3.6 x 1.1).
22. A sub-triangular transversal convex scraper struck from prepared core; it shows prepared striking platform (2.8 x 2.7 x 0.8).
24. A prismatic blade with naturally blunted back and concave working edge, the basal end has been thinned down (5.7 x 2 x 0.9).
25. A convex side scraper struck from prepared core; the back is formed by the removal of two flakes, utilized (4.6 x 2.6 x 1.3).
26. A pointed tool; the butt end has thinned by down, utilized (4.3 x 1.9 x 1).

27. An end-cum-side scraper (4.2 x 4 x 1.5)
28. A blade flake struck from prepared core (5 x 3.8 x 0.7 x 2).
29. A blade like flake struck from prepared core.
30. A blade like flake (3.8 x 1.8 x 1.2).
31. A small blade flake (2.9 x 2.3 x 0.5).
32. A burin (3.6 x 2.4 x 1.1).

Figure 21 (Qulgai Mitai rock shelters Upper Palaeolithic)

1. A convex side scraper made on primary flake; retains most of the cortex on the dorsal surface, only the ventral surface is flaked (7.5 x 4.4 x 2.2).
2. A concavo-convex side scraper (5.4 x 2.6 x 1.3).
3. A blade flake.
4. A Levallois flake turned into end-cum-side scraper with snapped striking platform (5.1 x 4.2 x 2).
5. A retouched convex side scraper; it resembles the Mousterian side scraper struck from discoidal core (4.1 x 3.8 x 1.5).
6. A nose shaped scraper (5.8 x 3.4 x 1.8).
7. A carinated scraper with steep retouch culminating on the top of the keel (4.9 x 3.1 x 2.8).
8. A retouched round scraper, notched at the base (3.5 x 3.5 x 0.9).
9. A semicircular flat convex side scraper (3.6 x 3 x 0.9).
10. A canted scrape struck from discoidal core (3.9 x 3.1 x 1.2).
11. A bifacially worked Mousterian discoidal core with centrally directed flaking scars; all flakes are chipped towards the centre (6.7 x 5.1 x 2.4)
12. A flat nosed end scraper with keel in the middle across the main axis (4.9 x 2.9 x 1.8).
13. A flat blade (4.2 x 2.4 x 0.6).
14. A blade retouched round the distal end (4.7 x 2.5 x 1.0).
15. End-cum-side scraper with deep flaking scar on the dorsal surface (5.5 x 2.9 x 1.1).
16. A broken blade, trimmed at the distal end (4 x 2.2 x 0.7).
17. A flake with domical surface (4.7 x 2.4 x 0.9).
18. A wide blade (5.3 x 3.6 x 0.6).
19. A pointed tool.

20. A prismatic blade with deep notch at the base (6.2 x 2.8 x 2.5).
21. A retouched flat blade broken at the distal end (4.5 x 2.5 x 0.7).
22. A backed knife (5.7 x 3 x 1.5).
23. A backed knife (4.1 x 3 x 0.7).
24. A flake blade (4.1 x 3 x 0.7).
25. A retouched point with the butt end has thinned down (3.9 x 2.2 x 0.6).
26. A high ridged prismatic blade with bevel truncation; used (4.1 x 1.8 x 1).
27. A broken blade (3.3 x 1.7 x 0.8).
28. A blade with thinned base (3.2 x 1.7 x 0.6).
29. A limace with the butt end has thinned down (6.6 x 1.8 x 1.2).
30. A Levallois point (5.8 x 3.8 x 1.6).
31. A point (5.1 x 4 x 1.8).
32. A slightly tanged point (4.7 x 3.5 x 1.4).
33. A point with base thinned down (4.5 x 2 x 1.1).
34. A Mousterian point (4 x 2.6 x 1.2).
35. A retouched point (2.8 x 2.2 x 2.1).
36. A double burin (5.3 x 1.9 x 2).
37. A Mousterian type point (3.7 x 2.8 x 1.3).
38. A backed knife (3.6 x 2.7 x 0.9).
39. A backed retouched knife (3.5 x 1.8 x 1).
40. A retouched convex side scraper (3.5 x 3 x 1).
41. A bladelet core or round scraper (2.6 x 2.6 x 0.8).
42. A lunate (3 x 1.9 x 0.8).
43. A triangular geometric Levallois flake.
44. A scraper (2.7 x 1.4 x 0.7).
45. A point (.4 x 1.4 x 0.7).
46. A double burin (5.4 x 2.7 x 1.6).

Figure 22 (Lower Chagai Inzarai Smast: rock shelter Upper Palaeolithic)

1. A nosed shape scraper on milky quartz (3.9 x 2.2 x 1.7).
2. End scraper on core of quartz (4.4 x 2.3 x 2).
3. A carinated end scraper (4.1 x 2.6 x 1.7).
4. A bifacial end scraper (4.8 x 3 x 2.2).
5. A parrot beak scraper (4.8 x 4 x 1).
6. A transversal scraper (3.6 x 3.9 x 0.7).

7. A burin (4.4 x 2.2 x 0.7)
8. A double convex or convergent scraper (3.9 x 3 x 0.6).
9. A thick scraper (4.5 x 3.2 x 1.9).
10. A point.
11. A broken Levallois flake (6.2 x 5.8 x 1.0).
12. A scraper (5.1 x 3.6 x 1.2).
13. A scraper (3.9 x 2.2 x 1.1).
14. A burin (5.3 x 4.1 x 1.5).
15. A point. 2.8 x 2 x 0.4
16. A tranchet.
17. A blade on flint (3.6 x 1.2 x 0.5).
18. A convex side scraper on quartz also found in layer 5 Ango Gatkai.
19. An exhausted bladelet core.

20. A transversal convex side scraper (4.5 x 3.3 x 1.2).

(Chinar Smast: rock shelter Upper Palaeolithic).

21. End carinated scraper (4.8 x 2.5 x 2.2).
22. A canted scraper (4.3 x 3.4 x 1.3).
23. A burin-cum-scraper (4.5 x 3.4 x 1.3).
24. A burin-cum-side scraper (4.5 x 3 x 1.8).
25. A point (3.5 x 1.9 x 0.8).
26. A beaked flake (4.7 x 2.3 x 1.1).
27. End-cum-convex side scraper (4.5 x 2.4 x 1.6).
28. A Levallois flake (4.1 x 2.9 x 2.5).
29. A point (6 x 2.9 x 2.5).
30. A scraper (2.5 x 2.3 x 1.1).
31. A flake core.
32. A flake (3.2 x 2.7 x 1.2).
33. A side struck flake.
34. A flake scraper (2.9 x 2.3 x 0.8).
35. A blade with burin distal end.
36. A double scraper (2.8 x 1.9 x 0.5).
37. A scraper.
38. A point (3.4 x 2.2 x 0.7).
39. A Levallois flake (3.1 x 2.4 x 1.1).

40. A backed blade trimmed along the working edge (5.2 x 3.9 x 1).
41. A Levallois type of flake (6.3 x 5.2 x 1.4).
42. A notched blade like tool (4.9 x 2.7 x 1.2).
43. A flat nosed end scraper (5.9 x 4.4 x 1.2).
44. A point (3 x 2 x 0.6).
45. A Levallois type flake scraper (3.2 x 2.9 x 0.6).
46. As above (3.2 x 2.8 x 0.7).
47. A side struck scraper (2.2 x 1.7 x 0.5).
48. A transversal convex scraper (1.8 x 1.9 x 0.6).
49. End-cum-transversal scraper (4.4 x 2.5 x 1.1).
50. End-cum-side scraper (3.6 x 2.4 x 1.3).
51. A Levallois burin broken at the tip (3.2 x 2.8 x 0.9).
52. A point on quartz (2.9 x 2.4 x 0.9).
53. A convex scraper (2.7 x 2.1 x 0.7).
54. A double burin (4.4 x 1.8 x 0.7).
55. A flake scraper (3.2 x 2.5 x 0.8).
56. A thick side scraper on quartz (3.4 x 2.5 x 1.3).
57. A burin-cum-side scraper (4.6 x 2.2 x 1.3).
58. A thin blade (3.9 x 1 x 0.5).
59. A burin (2.4 x 1.8 x 0.5).
60. A point (2.6 x 1.2 x 0.7).
61. A flat blade (2.3 x 1.4 x 0.4).
62. A thin point
63. A short bladelet.

Figure 23 (Sara Smast: rock shelter Upper Palaeolithic)

1. A Levallois type flake made into convex sides scraper; trimmed along the cutting edge (5.9 x 3.7 x 1).
2. A single convex side scraper trimmed at the cutting edge. The back is blunted by retouch (4.9 x 3 x 1.5).
3. A burin point struck from prepared core with the butt thinned (3.9 x 2.2 x 0.8).
4. A point with unifacial trimming at the butt end; retouched along the margins on the dorsal surface (3.7 x 2.2 x 1).
5. A backed point finely retouched at the working edge (3.1 x 1.9 x 1).

6. A scraper with concave convex cutting edges (3.9 x 2.1 x 0.9).
7. A small point with retouch on the left side; the base has been thinned (3.1 x 1.6 x 0.9).
8. A backed knife with convex cutting working edge (3.3 x .1 x 0.5).
9. Retouched convex side scraper (4.7 x 2.5 x 1.7).
10. A point with bifacially thinned butt and burin edge at the distal end (5.2 x 3.5 x 1.5).
11. A multiple tool—burin, spoke shave and side scraper. It is finely retouched (4.4 x 3.6 x 1.5).
12. A nosed scraper (5.9 x 4.4 x 2.8).
13. A flat nosed scraper (6.3 x 4.7 x 2).
14. A bifacially worked scraper with irregular cutting edge and naturally backed side (6.1 x 3.9 x 1.8).
15. A carinated nosed scraper (3.5 x 2.5 x 2).
16. A bifacially worked round or umbrella type scraper (3.2 x 2.9 x 1.7).
17. A convex side scraper (3 x 3.1 x 1.3).
18. A carinated end scraper with lamellar retouched to the keel (3.9 x 2.9 x 2.1).
19. Tongue shaped end scraper (4.1 x 3.8 x 1).
20. Double convex side scraper (3.7 x 2.5 x 0.7).
21. Double convex scraper (3.3 x 3.5 x 1.5).
22. Retouched convergent scraper (3.8 x 3 x 1.3).
23. End scraper on a cortical flake (4.3 x 3.5 x 1.7).
24. A flake blade with marginal retouched (4 x 2.4 x 1).
25. A flat flake blade (4.2 x 2.9 x 0.7).
26. A blade (4.5 x 2.1 x 0.8).
27. Angle burin (2.9 x 1.3 x 1).
28. Notched tool.
29. A notched flake.
30. A thick scraper (3.8 x 3 x 1.3).
31. Burin (3.1 x .4 x 0.9).
32. Burin on the distal end (3.2 x 1.7 x 1.9).
33. Double convex side scraper (3.2 x 2.6 x 0.3).
34. A nosed end scraper (2.1 x 1.5 x 0.7).
35. Double convex side scraper. (2.4 x 1.3 x 0.7).

36. A point with thin base (2.4 x 1.3 x 0.7).
37. Lunate side struck (3.1 x 1.5 x 0.7).
38. A small convex side scraper (2.1 x 1.3 x 0.5)
39. A tranchet (1.8 x 1.1 x 1.1).
40. A side struck lunate (2 x 1.6 x 0.4).

Figure 24 (Musa Kamar: Mesolithic).

1. A double oblique scraper (5.6 x 3.4 x 1.4).
2. An elongated end scraper (5.8 x 3 x 1).
3. An oval shaped convergent scraper (4.5 x 2.9 x 1.2).
4. A carinated scraper (4.5 x 2.4 x 2).
5. A point retouched on the ventral surface (3.6 x 3.2 x 1.3).
6. A flake blade broken at the tip (3.6 x 2.8 x 0.8).
7. A blade with round distal end and ridged at the centre (3.8 x 1.6 x 1).
8. As above (2.8 x 1.4 x 0.6).
9. A blade with double convex sides (3 x 1.4 x 0.6).
10. A blade (2.5 x 1 x 0.8).
11. A point with thinned butt (2 x 1.3 x 0.5).
12. A blade (2.6 x 1.4 x 0.6).
13. A bladelet.
14. A trapeze (2.5 x 2.6 x 1.1).
15. A bladelet (2.3 x 1.3 x 0.5).
16. End scraper with thick front.
17. The smallest nosed scraper (2.1 x 1.3 x 0.8).
18. A rough triangular scraper (1.9 x 1.7 x 0.6).
19. A lunate (1.9 x 1.5 x 0.5).
20. A short blade.
21. A side scraper
22. A convex side scraper.
23. A bladelet truncated at the distal end (1.7 x 1.3 x 0.6).

24. A burin (2.6 x 1.3 x 0.7).
25. A lunate (2.5 x 1.4 x 0.6).
26. A tranchet (2.5 x 1.9 x 1.3).
27. A flake (2 x 1.5 x 1.2)
28. A burin-cum-awl with wide back body (3.3 x 2.5 x 0.9).
29. A small double scraper (2 x 1.5 x 0.7).
30. A convex side scraper (1.7 x 1.6 x 0.8).
31. A flake with thinned base (3.4 x 1.8 x 0.7).
32. A blade flake (2.2 x 1.7 x 0.8).
33. A small serrated bladelet (1.6 x 0.7 x 0.5).
34. Obliquely truncated bladelet flake (2 x 1.5 x 1.2).
35. An obliquely truncated blade at the basal end (1.6 x 1.2 x 0.4).
36. A bladelet (2.2 x 1 x 0.3).
37. A thick blade flake burin (2.7 x 2 x 1.1).
38. A short blade flake of quartz (2.1 x 1.7 x 0.6).
39. A notched bladelet (1.6 x 1.2 x 0.3).
40. A double convex scraper.
41. A flake blade (2.1 x 1.5 x 0.6).
42. A flake with beaked side (2.3 x 1.8 x 0.6).
43. A double convex side scraper 2.6 x 2 x 0.7).
44. Thick end-cum-side scraper with retouch on the working edge.
45. An awl (1.8 x 1.4 x 0.3).
46. A lunate (1.8 x 2 x 0.6).
47. A point (1.8 x 2 x 0.3).
48. A bladelet (1.6 x 1.3 x 0.4).
49. A small Levallois point (2.4 x 1.9 x 0.9).
50. End scraper (2.3 x 1.8 x 0.7).
51. A small side scraper.
52. A broken bladelet.
53. A bladelet.
54. End-cum-side scraper (2.2 x 1.4 x 0.5).
55. Rectangular scraper (2 x 1.4 x 0.6).
56. Convergent scraper.
57. Retouched side scraper.

58. A convex side double scraper (1.5 x 1.2 x 0.4).
59. A trapeze (2 x 1.8 x 0.5).
60. A wide blade (1.9 x 2 x 0.5).
61. Transversal convex side scraper (3.9 x 2.2 x 1).
62. A convex side scraper (2 x 1.5 x 0.4).
63. A trapeze (1.5 x 1.2 x 0.3).
64. A retouched triangular scraper (1.7 x 1.4 x 0.3).
65. A side scraper (2.6 x 1.9 x 0.8).
66. A point (1.6 x 1 x 0.5).
67. A small point (1.4 x 1 x 0.3).

Figure 26 (Ango Gatkai: layers 2 and 3).

1. A ground stone tool with flat sides and convex ends and edges (15 x 8.5 x 3.5)
2. A ground stone tool with flat sides, convex ends and notch in the right edge (12.2 x 9.2 x 4.7)
3. A broken hammer stone (13.7 x 6.9 x 4.7).
4. An anvil with dimple scar on one of the faces and extensive marks of use (11.6 x 7.2 x 4.5)
5. A pebble tool with flat and convex sides (11.1 x 7.1 x 7.1 x 2).
6. A hammer stone with marks of use (12.7 x 9.8 x 5.6).
7. An anvil with dimple scars on both faces (12.2 x 9.4 x 4.8)
8. A used ground stone tool (11.7 x 11.2 x 11.2).
9. A grinder with both ends truncated (11.8 x 10.1 x 5.6).
10. A hammer stone with one side flat and the other convex (12.2 x 7.2 x 5.6).

Figure 27 (Ango Gatkai: layer 3 and 4).

1. A ground stone tool broken at the broader end with light encrustation (9.2 x 5.8 x 3).
2. A smooth ground stone tool made on a flat pebble (7.7 x 6.1 x 3.2).
3. A hammer or anvil rectangular in section (8.4 x 4.4 x 3.8).
4. A chert hammer with both ends used (9.2 x 5.6 x 4.9).
5. An anvil with three dimple scars one each on the sides and other on the edge (8.2 x 7.2 x 5.2).
6. Anvil with double dimples on the sides or faces, encrusted (8.6 x 6.8 x 3.9).

7. A ground stone with flat convex sides (8.6 x 6.8 x 3.9).
8. A small hammer stone (6.7 x 5.2 x 2.9).
9. A hammer with flat convex sides (6.5 x 5.2 x 3.6).
10. A hammer with dimple scar (7.4 x 6 x 3.1).
11. Disc shaped hammer stone (6.2 x 6.2 x 2.8).
12. A hammer with sharp edges (6.4 x 6.2 x 2.8).
13. A large hammer with both faces convex, also the ends (15.1 x 12 x 4.6).
14. A hammer (8.7 x 7.2 x 3.4).
15. A hammer (11.2 x 8.9 x 5.9).
16. A ground stone with flat sides (8.8 x 6.7 x 3).
17. An anvil with double dimple scars (12.4 x 9.1 x 4.8).

Figure 28 (Ango Gatkai: layers 1, 2 and 3).

1. A flaked hammer stone (6.7 x 5.8 x 4.8).
2. A globular hammer stone (7.4 x 6.6 x 5.7).
3. A disc shaped hammer stone (7.4 x 6.9 x 3.3).
4. A discoidal hammer on chert (6.5 x 6.5 x 3.2).
5. A pointed hand axe with plano-convex sides (8.2 x 7 x 5.2).
6. A thick chopping tool (9.2 x 6.7 x 3.5).
7. A convex side chopper/chopping tool (9.5 x 8 x 3.1).
8. A chopper with flaked dorsal surface (7.8 x 6.4 x 3.7).
9. A chopper (7.4 x 6.8 x 2.7).
10. A chopping tool.
11. An oval type chopping tool (6.6 x 5.7 x 3.3).
12. A chopping tool (9.3 x 8 x 3.7).
13. A thick pointed chopping tool (9.3 x 6.4 x 3.2).
14. A hand axe type hammer stone (7.9 x 6.8 x 4.5).
15. A core tool. (6.4 x 6.4 x 3.2).
16. A greenish chert core turned into a chopper (5.3 x 5.1 x 4.7).
17. A chopping tool.

Figure 29 (Ango Gatkai: layers 1, 2 and 3).

1. End scraper made on core with grooves on the ventral surface (7.3 x 4.8 x 2.2).

2. An end scraper with broad convex working edge, struck from prepared core, bulb of percussion has been removed, with thinned butt end (7.8 x 6.2 x 1.7).
3. A blade core slenderical in shape (6.5 x 3.4 x 2.3).
4. A side scraper with working edge on the left side, the right side is naturally backed (6.2 x 3.4 x 1.5).
5. A core with a flake removed from the under side (7.2 x 4.3 x 2.5).
6. A Levallois flake with double working edges (6.9 x 5.6 x 1.3).
7. End scraper with high ridge in the middle (5.9 x 2.9 x 1.5).
8. A blade (8.2 x 2.4 x 1.3).
9. A side scraper.
10. End scraper (3.9 x 2.9 x 1.1).
11. A transversal convex scraper.
12. A convex side scraper (5.3 x 4.8 x 1.5).
13. A cleaver type flake tool.
14. A point with prepared platform (3.9 x 3.3 x 1.2).
15. A blade (7 x 3.3 x 0.9).
16. A knife (6.6 x 4 x 1.2).
17. End scraper with transversal working edge (5.1 x 2.7 x 1.3).
18. A burin notched at the distal end (5.4 x 3.9 x 1.5).
19. A point (4.7 x 2.2 x 1.2).
20. A point (4.4 x 2.6 x 1.3).
21. A point (5.1 x 2.8 x 1.5).
22. End scraper (5.1 x 1.4 x 0.7).

Figure 30 (Ango Gatkai: layers 1, 2 and 3).

1. A ground stone tool with both end bevels (18.5 x 10.9 x 5.2).
2. Anvil with dimples or pitting on both sides (12.2 x 8.6 x 5.6).
3. A ground stone tool (12.2 x 9.7 x 5.6).
4. A disc shaped anvil (12.7 x 11.7 x 6.1).
5. A ground stone tool (10.4 x 10.1 x 6).
6. A ground stone, biconvex at the cross section (12.2 x 0.1 x 5.1).
7. A ground stone tool with marks of use (11.2 x 8 x 5).
8. A hammer stone (7.6 x 6.6 x 3.3).
9. A celt type tool (11.7 x 6.9 x 3.7).

10. Anvil with dimples scars (7.3 x 6.9 x 3.9).
11. Ovate type hammer stone with round section (6.3 x 3.6 x 3.2).
12. A small hammer stone in layer 4 (5.7 x 4.4 x 2.2).
13. A small hammer with butt end crescent (4.9 x 3.1 x 2.4).
14. A small anvil or hammer stone (4.4 x 3.1 x 2.1).

Figure 31 (Ango Gatkai: layers 1, 2 and 3).

1. A flake core probably used as choppers in the later periods (7.5 x 6.9 x 4.3).
2. A disc shaped core with many flakes removed (6.2 x 6.2 x 4.9).
3. A biface or hand axe (8.8 x 5.3 x 3.1).
4. A thick end scraper (5 x 4.2 x 2.5).
5. A double convex scraper (7 x 4.9 x 1.4).
6. A retouched round scraper (3.9 x 3.3 x 0.5).
7. A flake.
8. A flake.
9. A double convex scraper (7.4 x 3.8 x 1.9).
10. A flake blade (6 x 3.3 x 0.7).
11. A flake blade (5.8 x 3.1 x 0.7).
12. A point (6.3 x 2.9 x 0.9).
13. End scraper (6.1 x 3.9 x 1.6).
14. A double convex side scraper (3.8 x 2.2 x 0.8).
15. A flake with backed side.
16. End-cum-side scraper (5.3 x 4.7 x 1.2).
17. A convex side scraper (4.9 x 2.7 x 1.1).
18. A thick scraper.
19. A thick side scraper (6.3 x 4.2 x 2.1).
20. A backed scraper (4.3 x 2.7 x 1.3).
21. Double convex side scraper (5.6 x 3.5 x 1.4).
22. A pointed tool (8.5 x 4.7 x 2.3).
23. An elongated tool (8 x 5.5 x 1.6).
24. A double crested blade (7.6 x 4.6 x 1.1).
25. A pointed tool (6.7 x 3.3 x 1.5).
26. A point with faceted striking platform (6.3 x 3.6 x 1.6).
27. A point (5 x 2.9 x 1.6).

28. A pointed tool (6.7 x 1.8 x 1.2).

Figure 32 (Ango Gatkai: layer 3).

1. A saddle quern found in the western section of layer 3 (32 x 32 x 15).
2. A broken grinding stone (19 x 13 x 6).
3. A flat grinding stone (17 x 22 x 22).
4. A flat grinding stone (21 x 18 x 11).

Appendix 2: Plates showing various artefact types.

Fig. 1

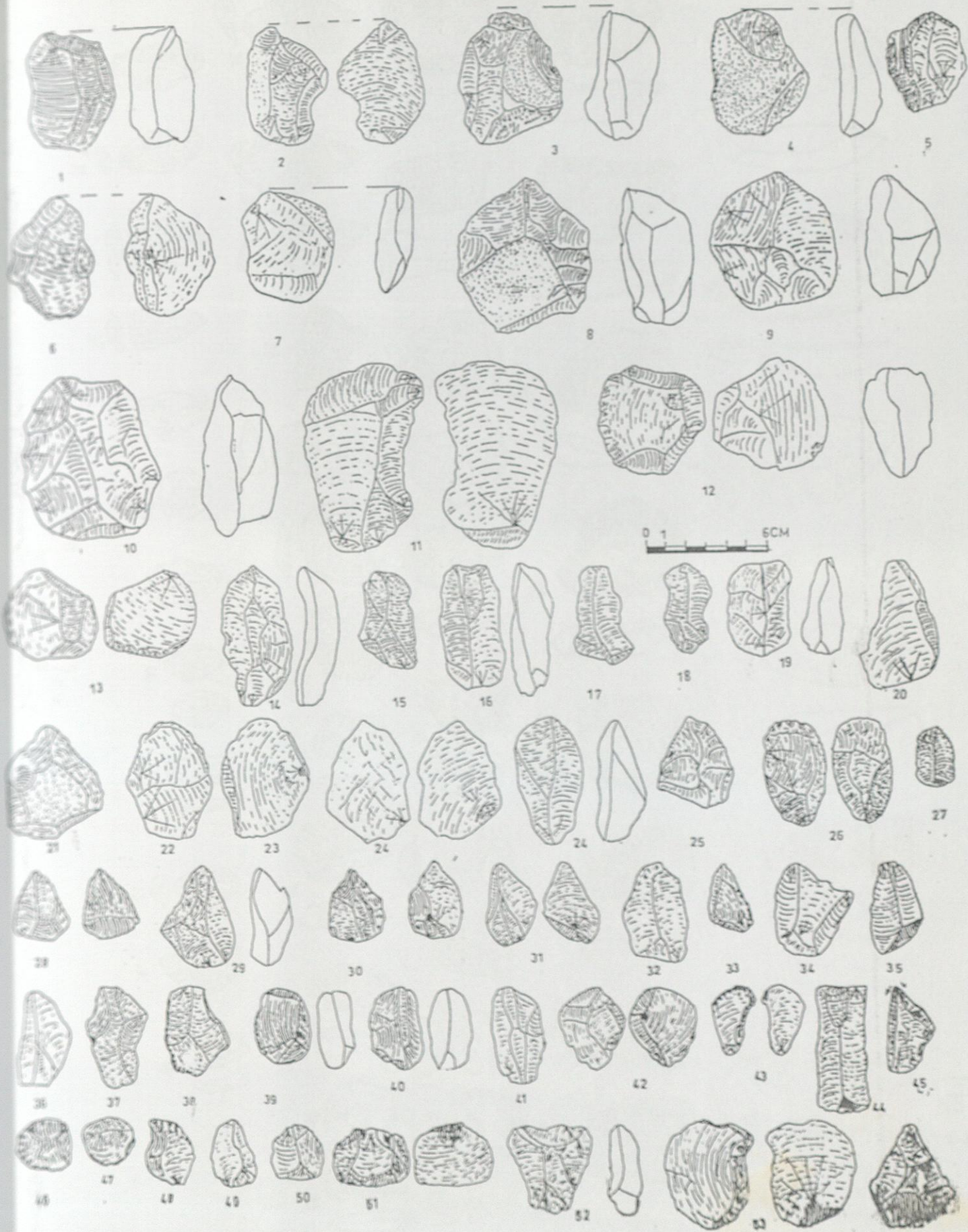


Fig. 2

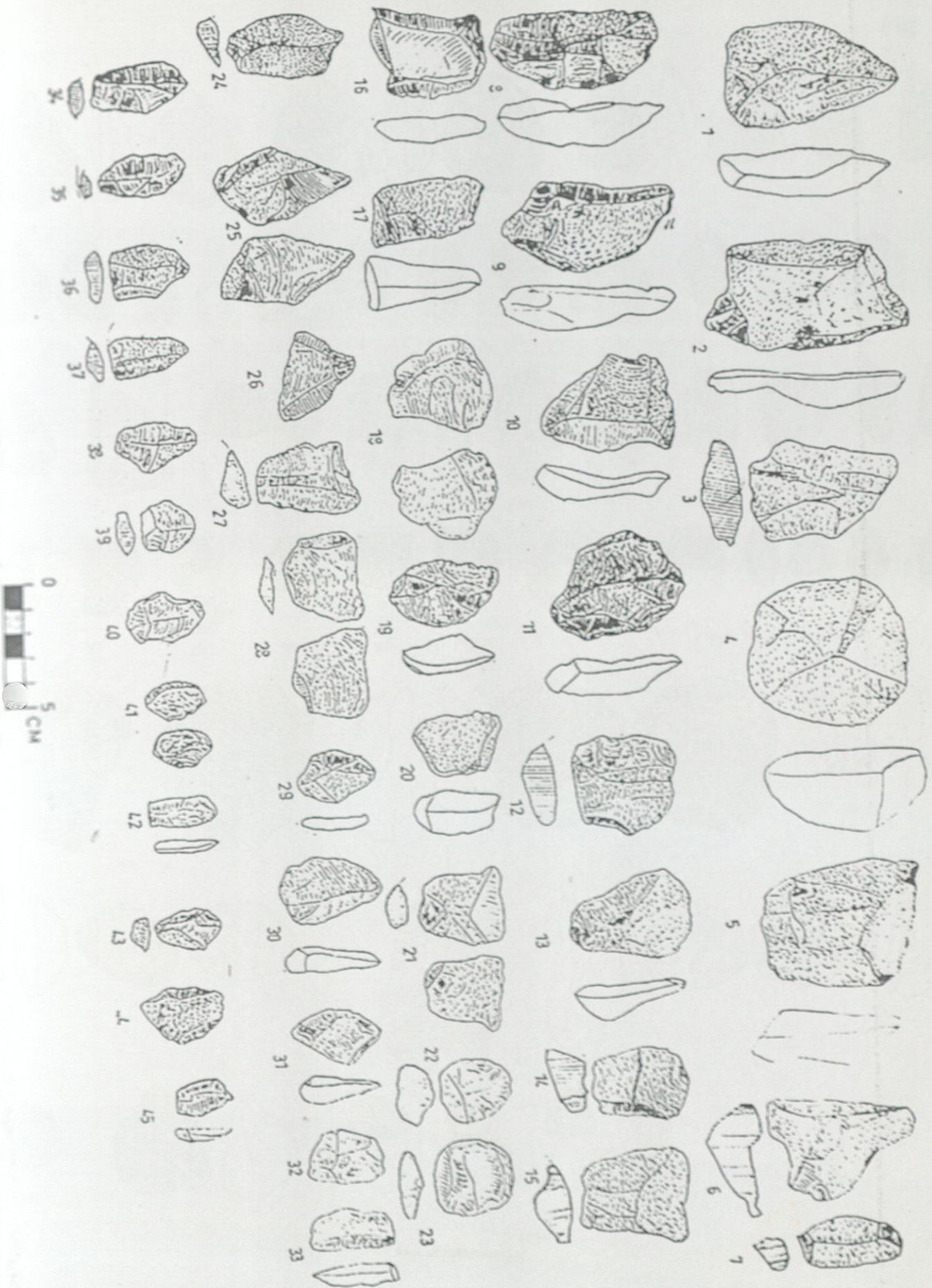
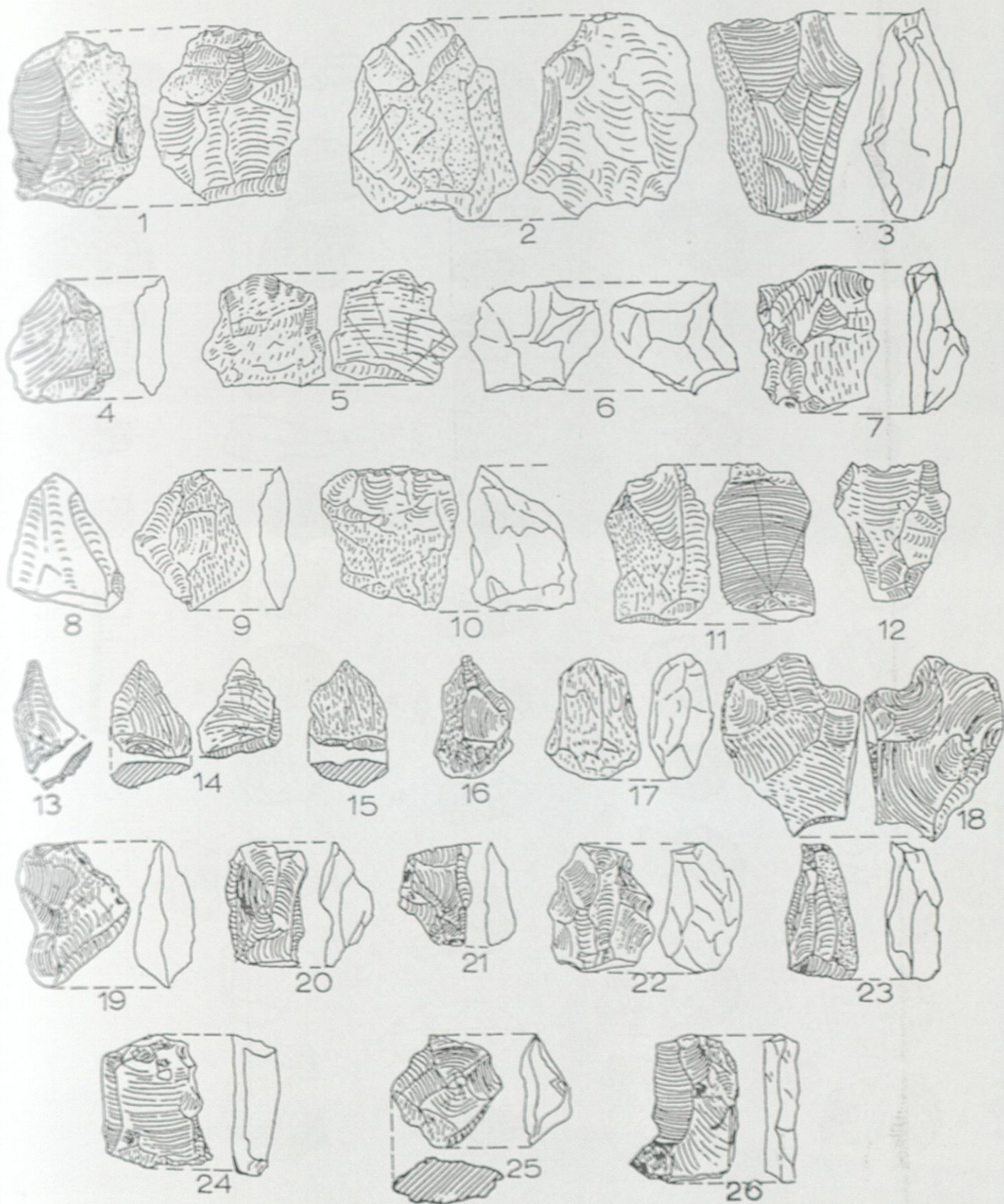


Fig. 3



0 1 5 CM

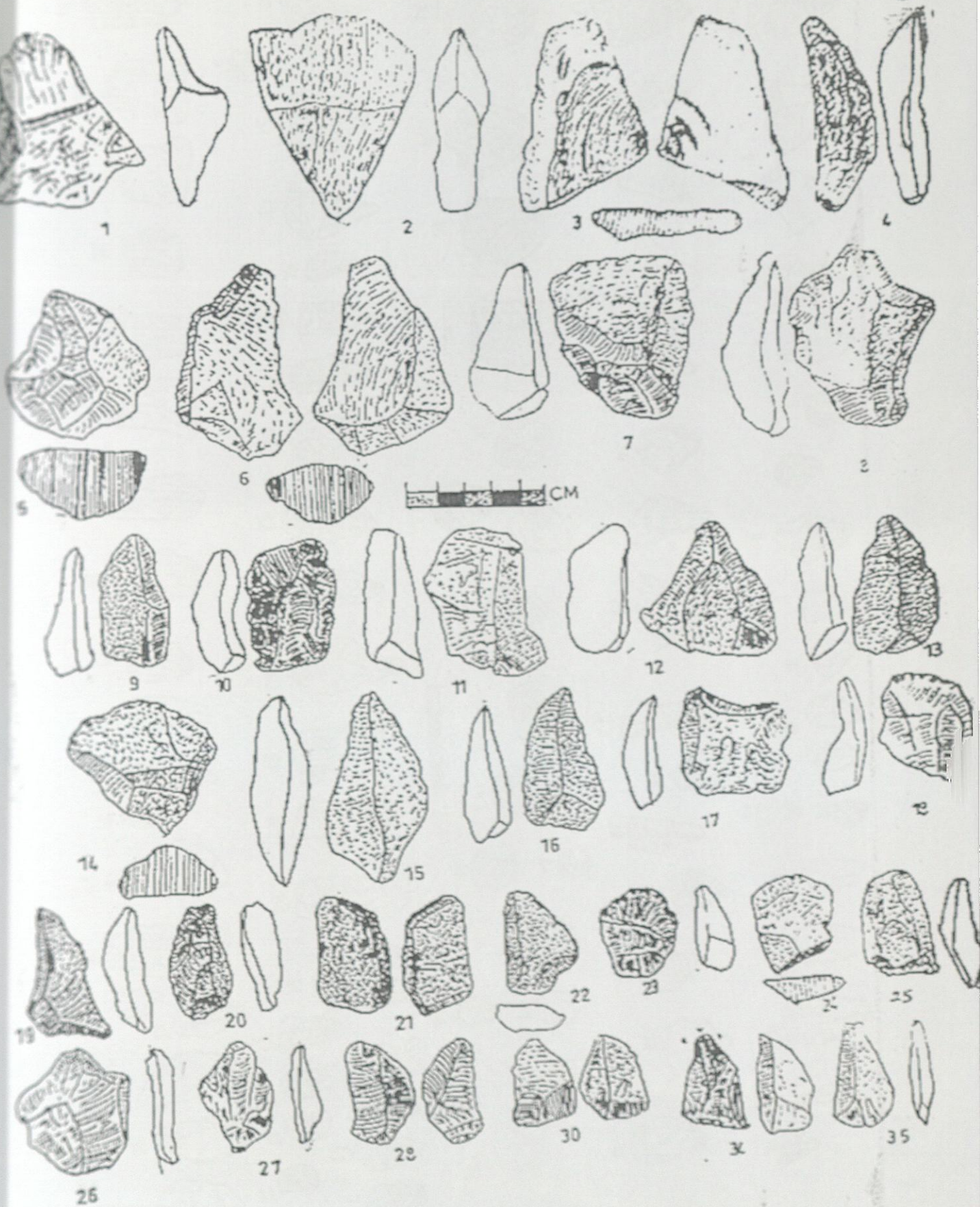
Fig. 4



0 1 5CM



Fig. 6



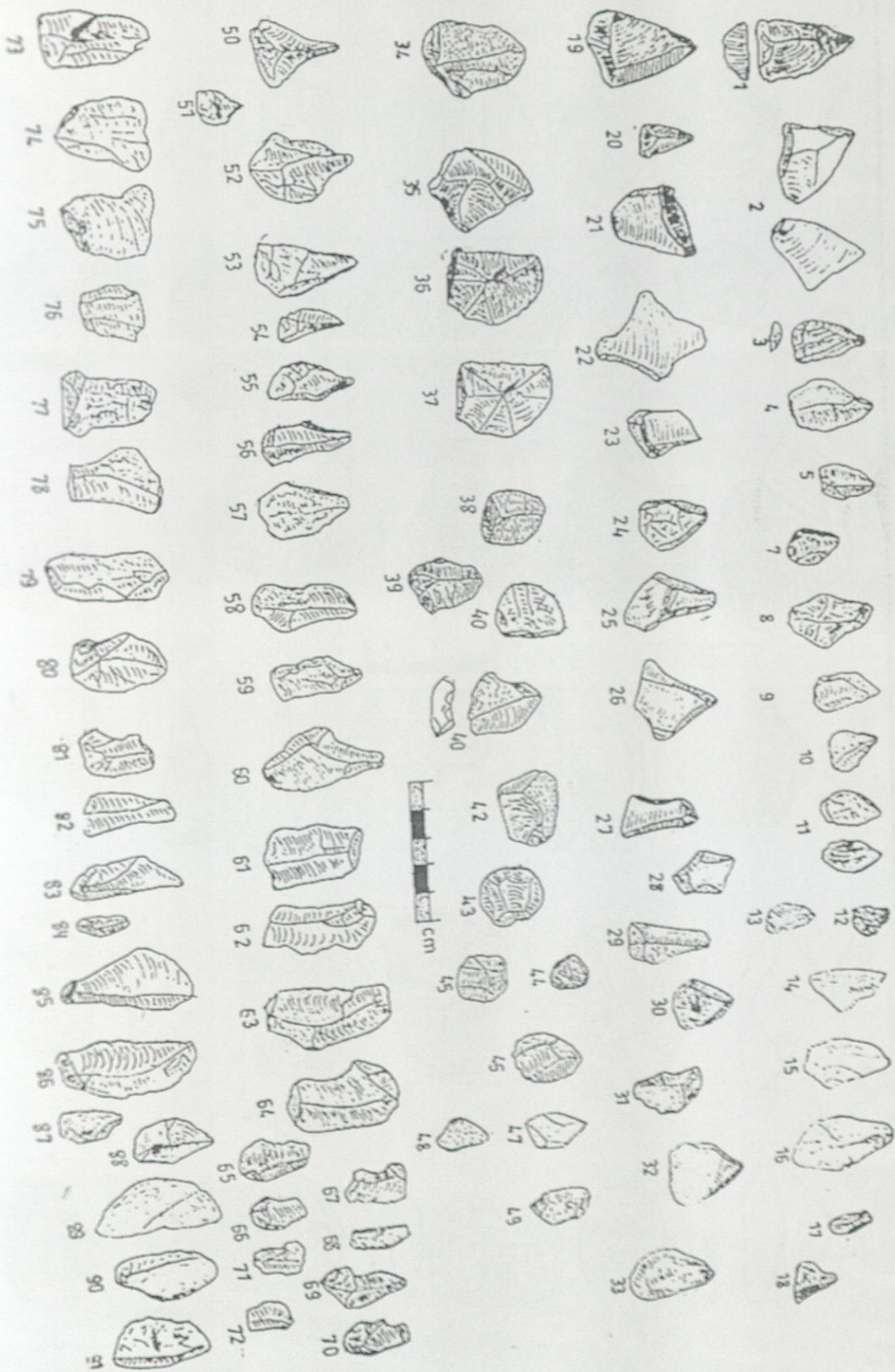


Fig. 7

Fig. 8

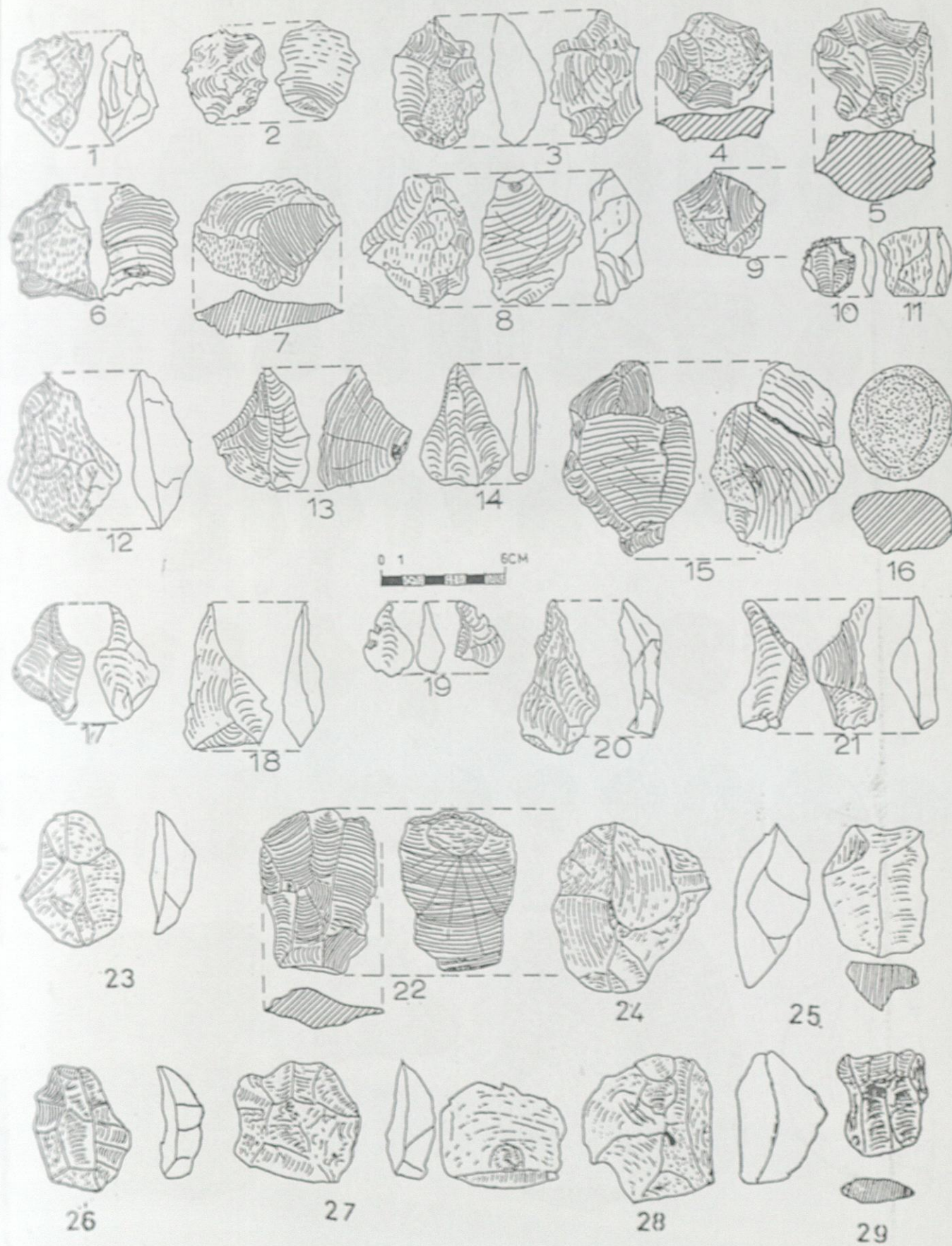


Fig. 9

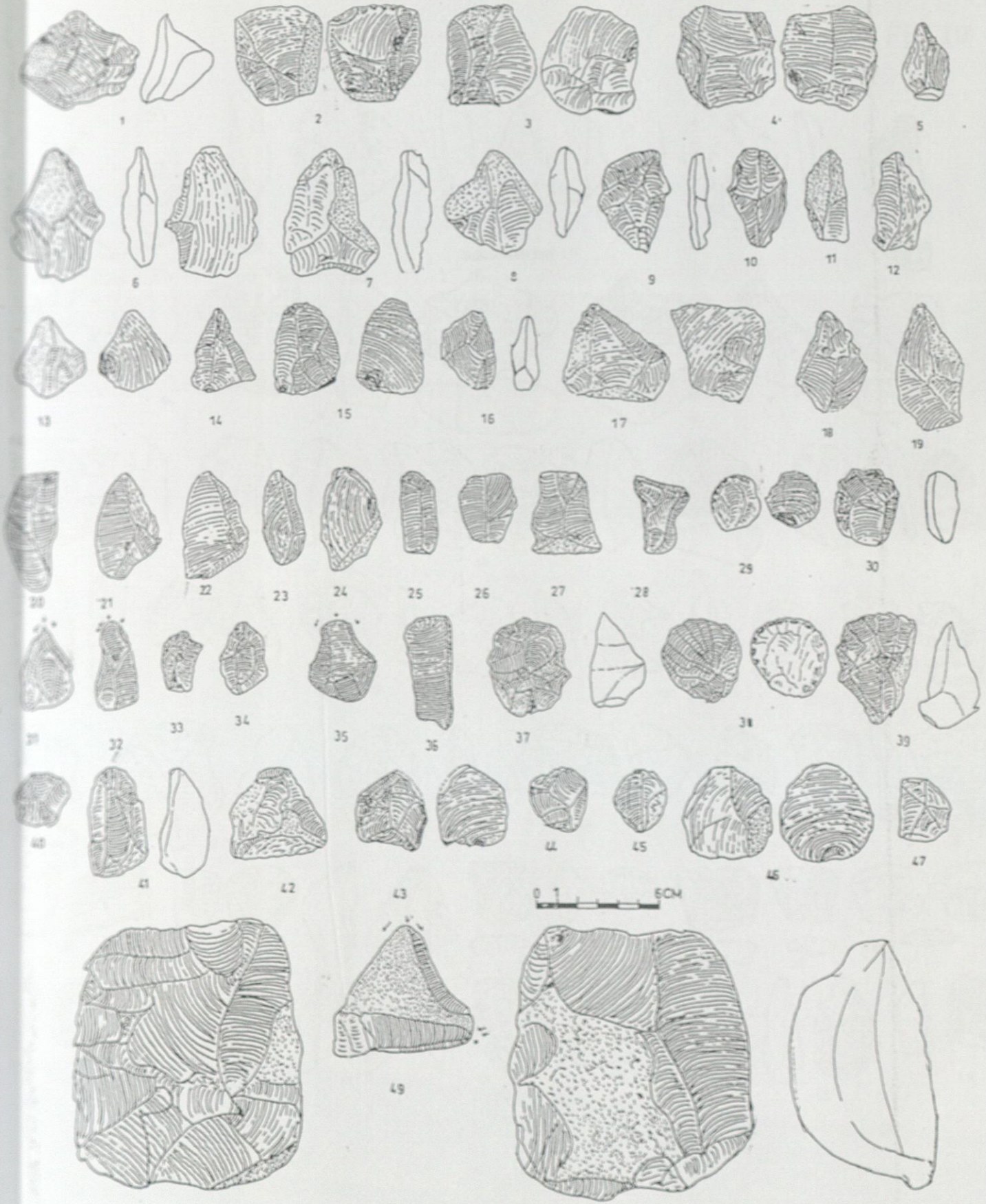


Fig. 10



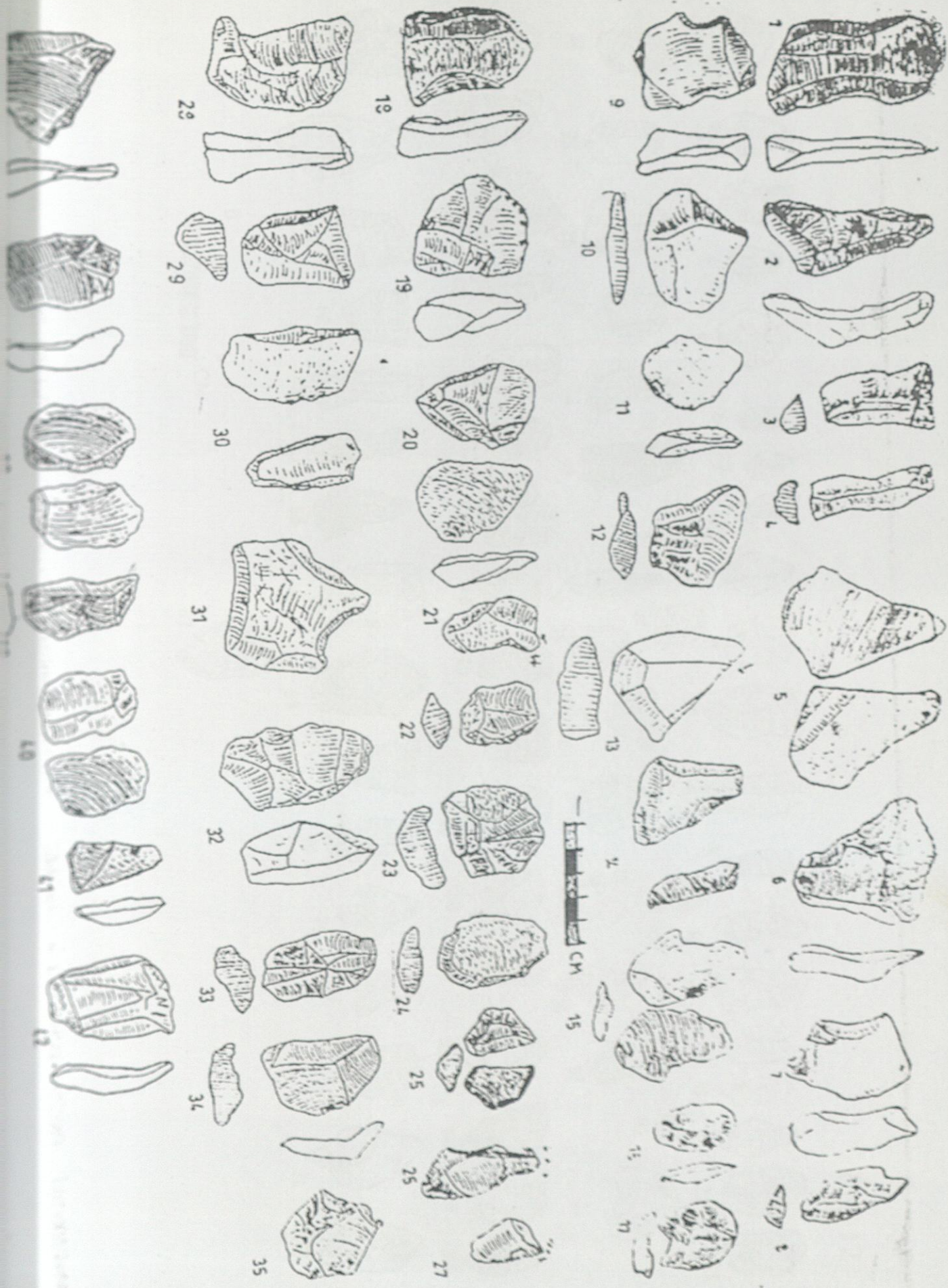


Fig. 12

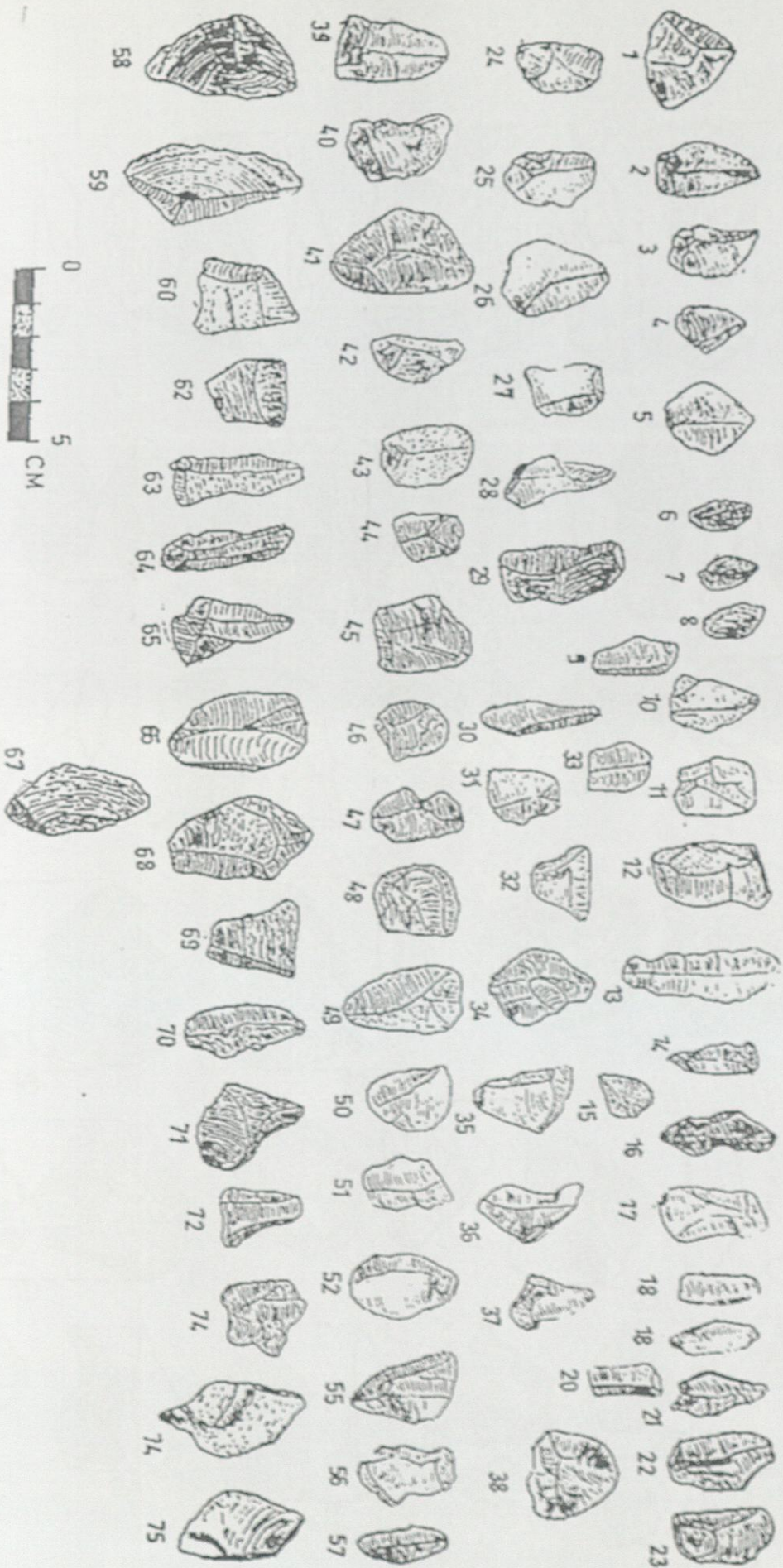


Fig. 13

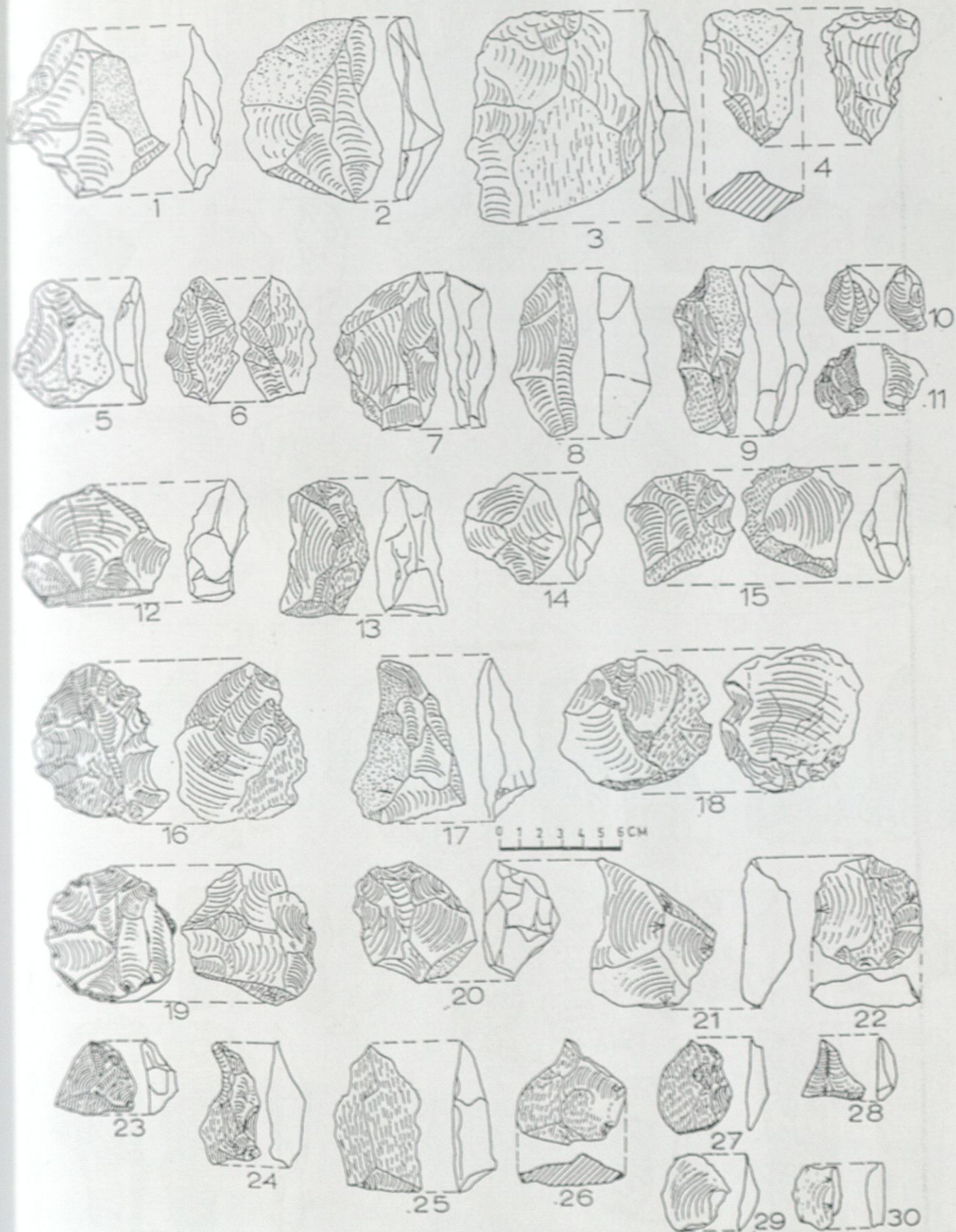
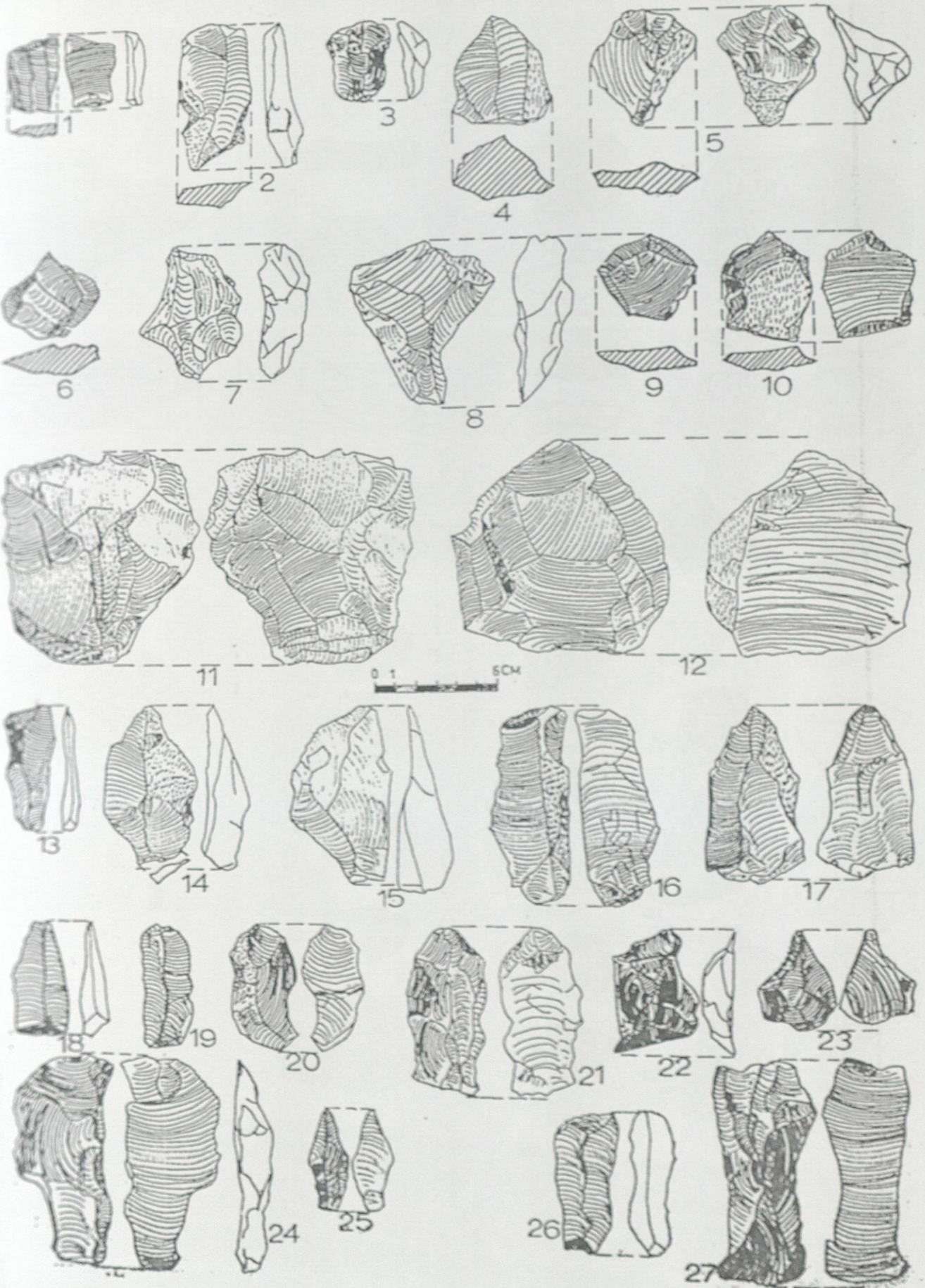


Fig. 14



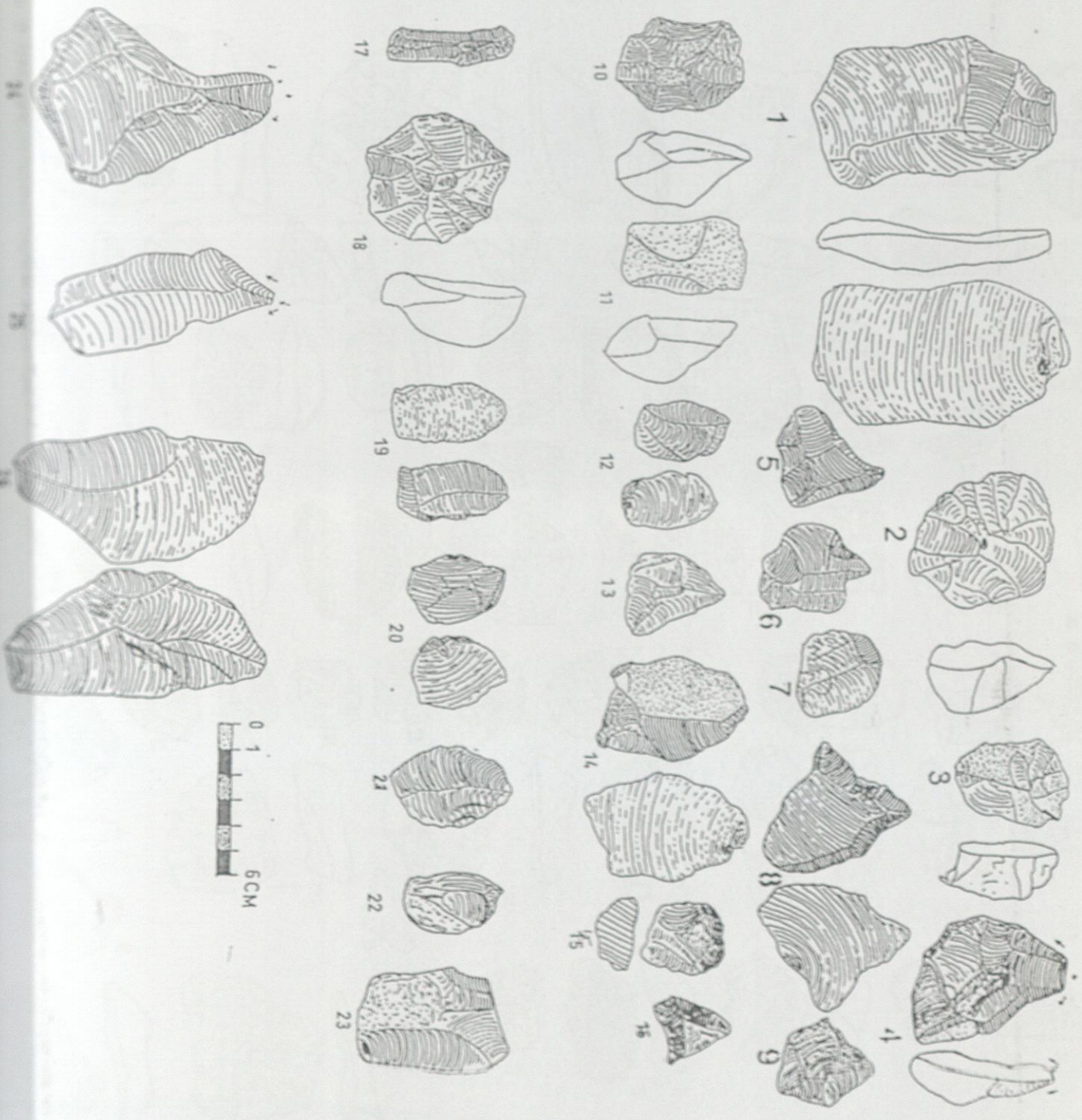


Fig. 16



Fig. 17



Fig. 18

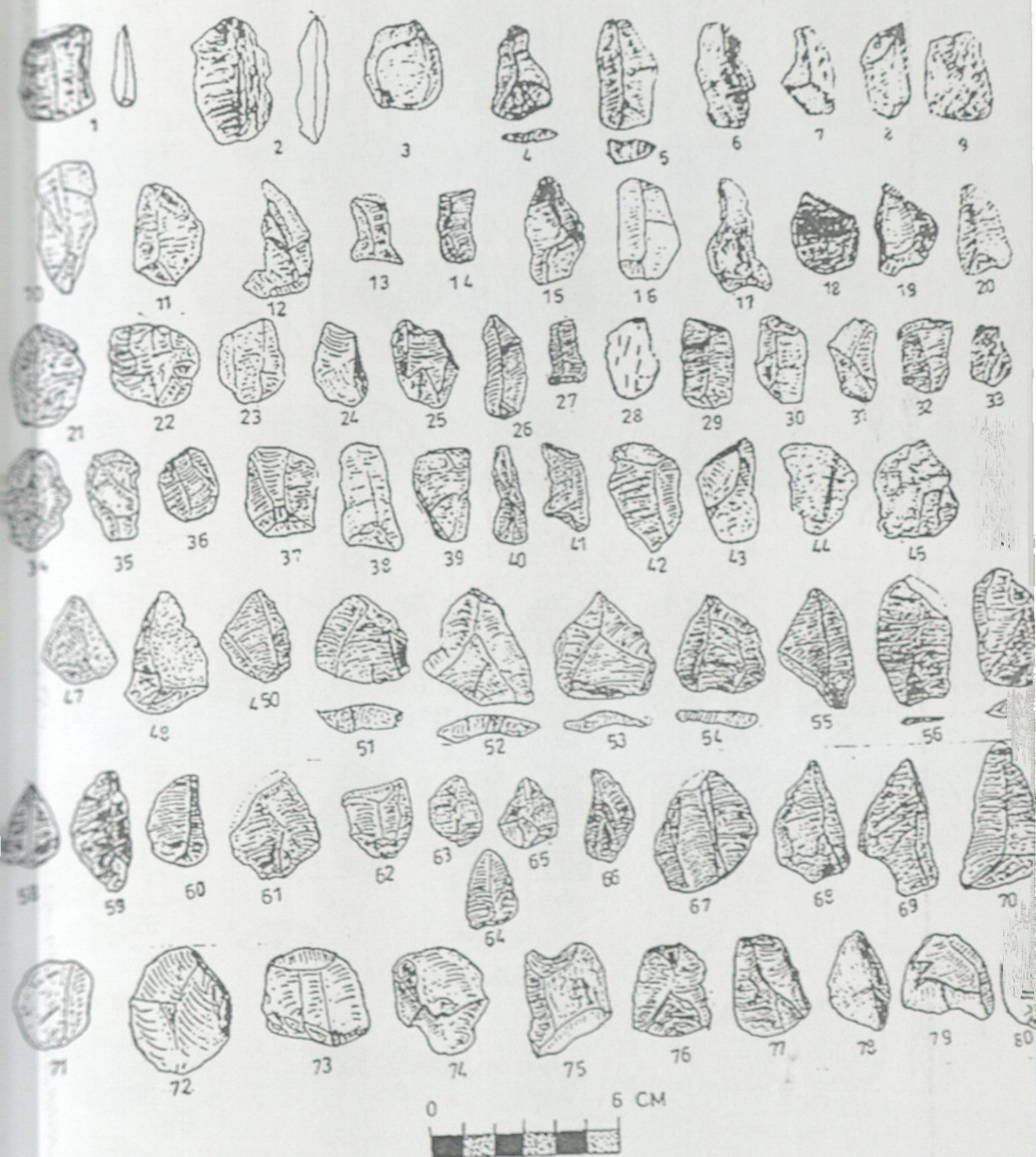


Fig. 19

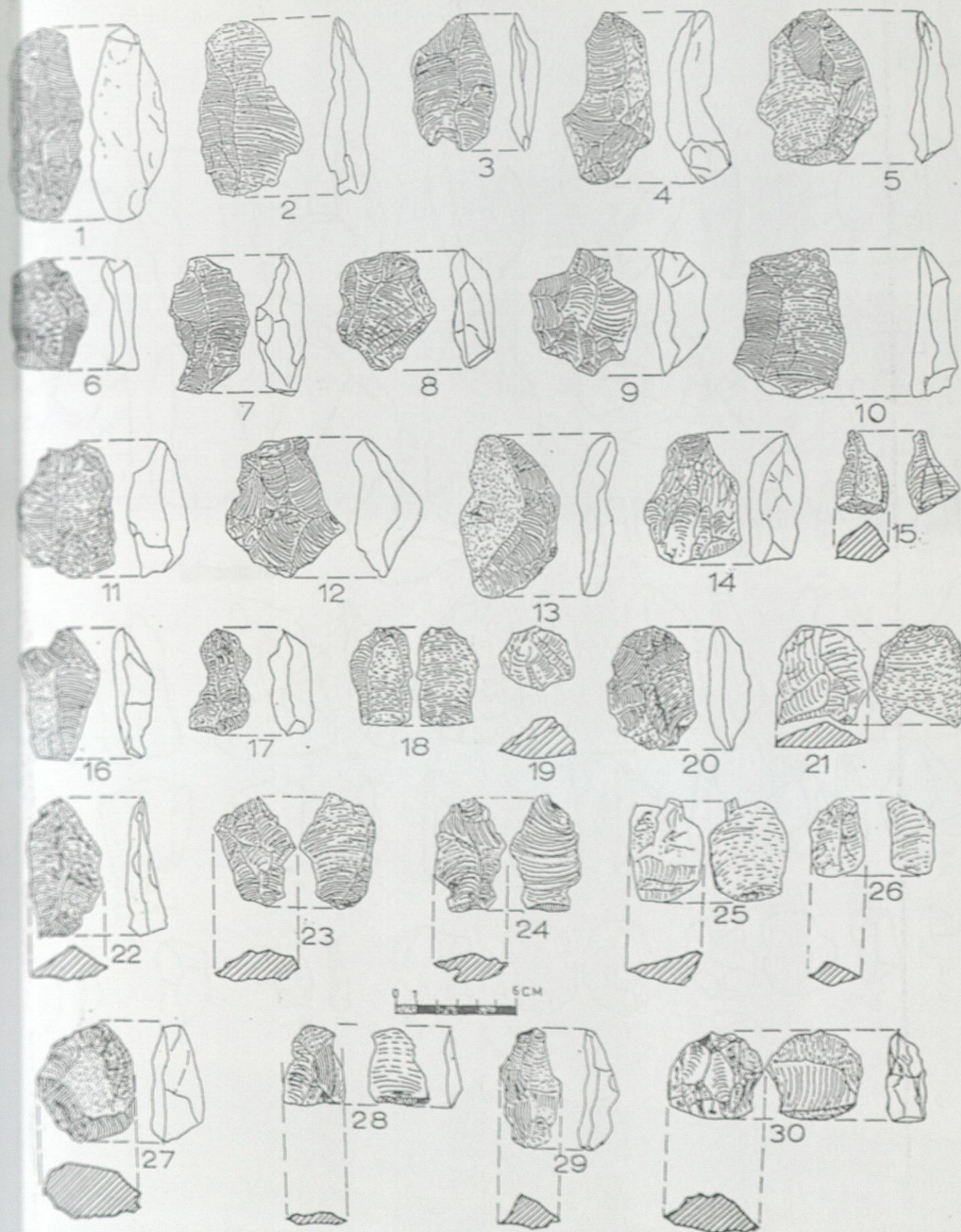


Fig. 20

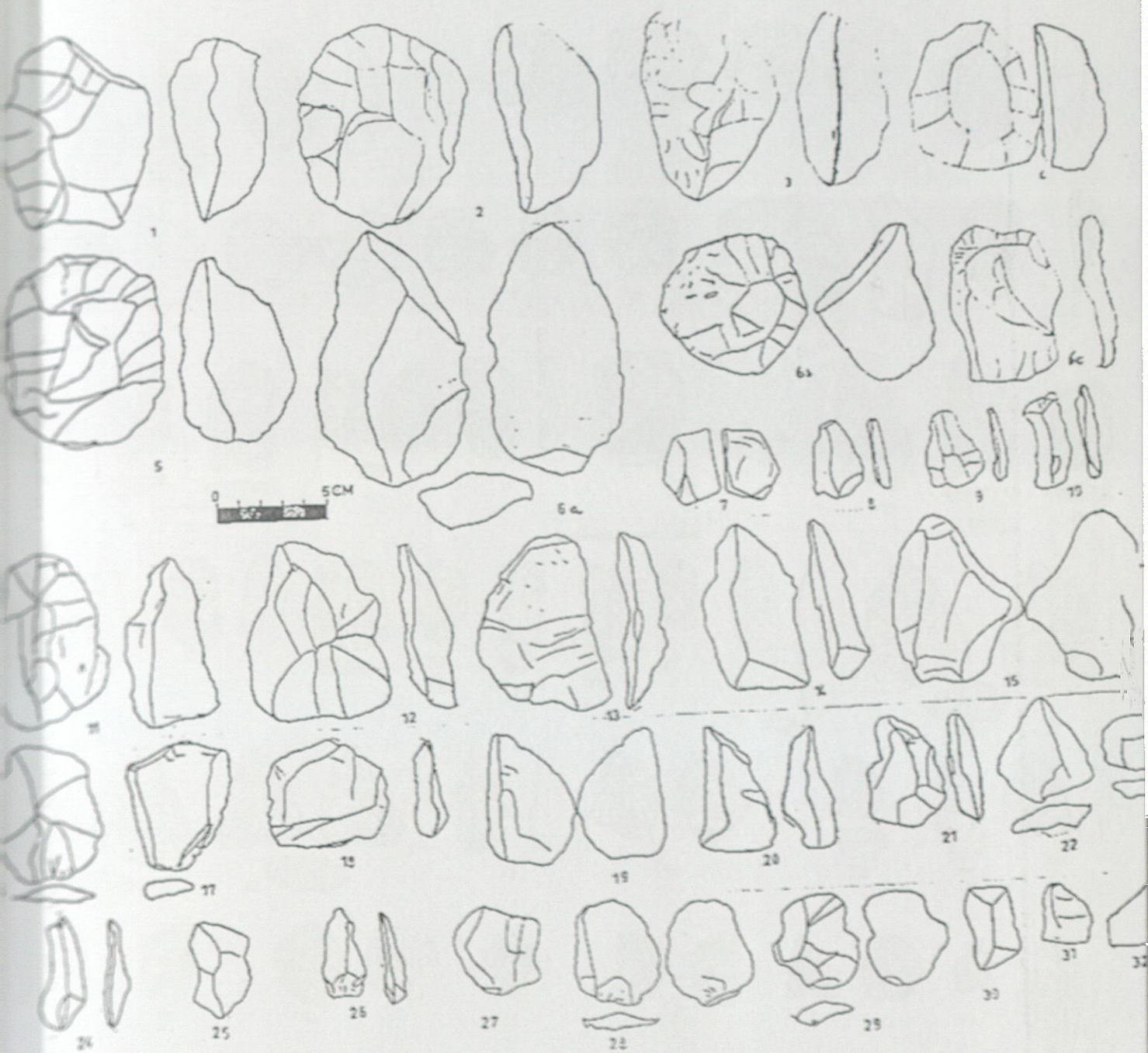
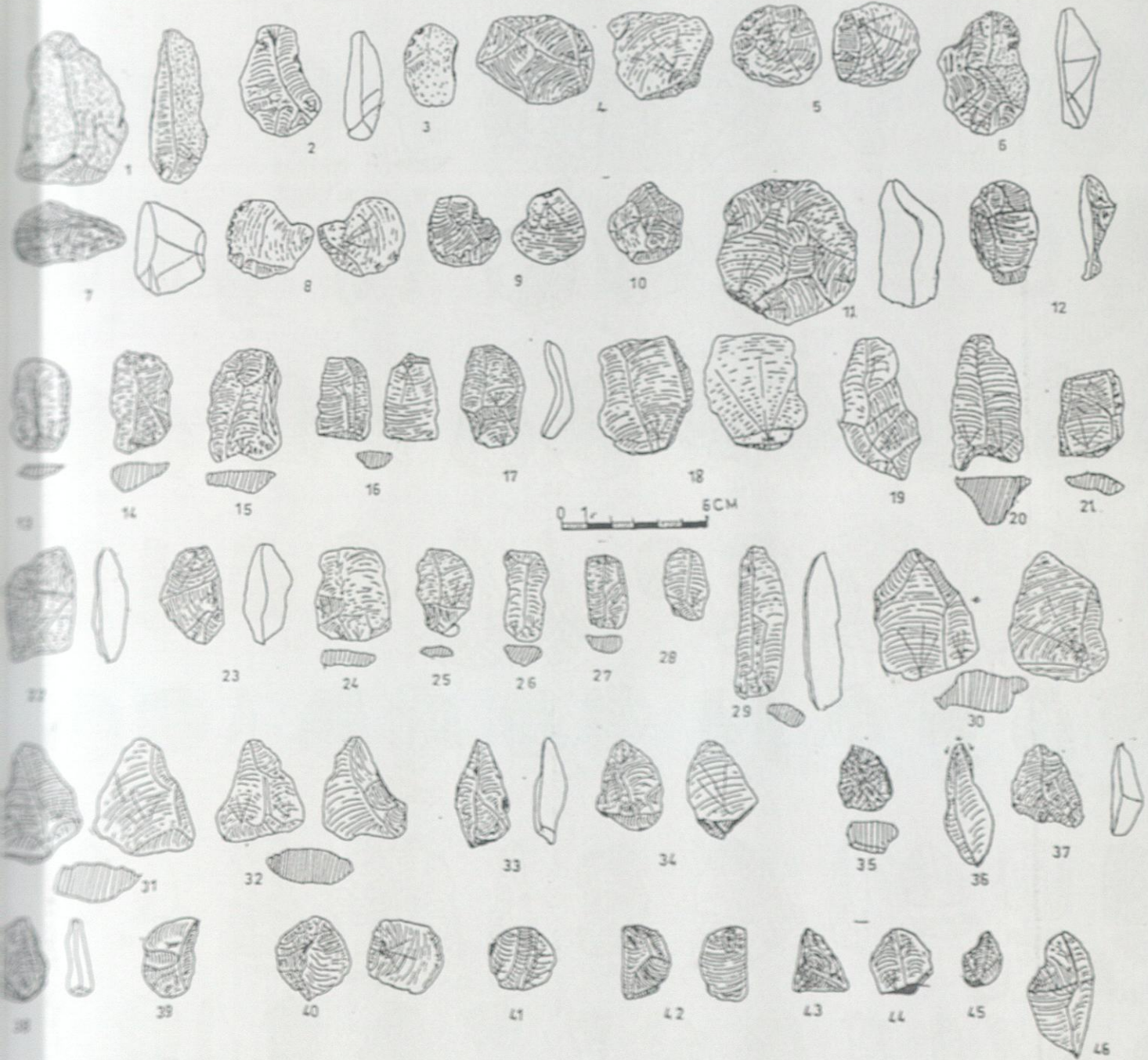


Fig. 21



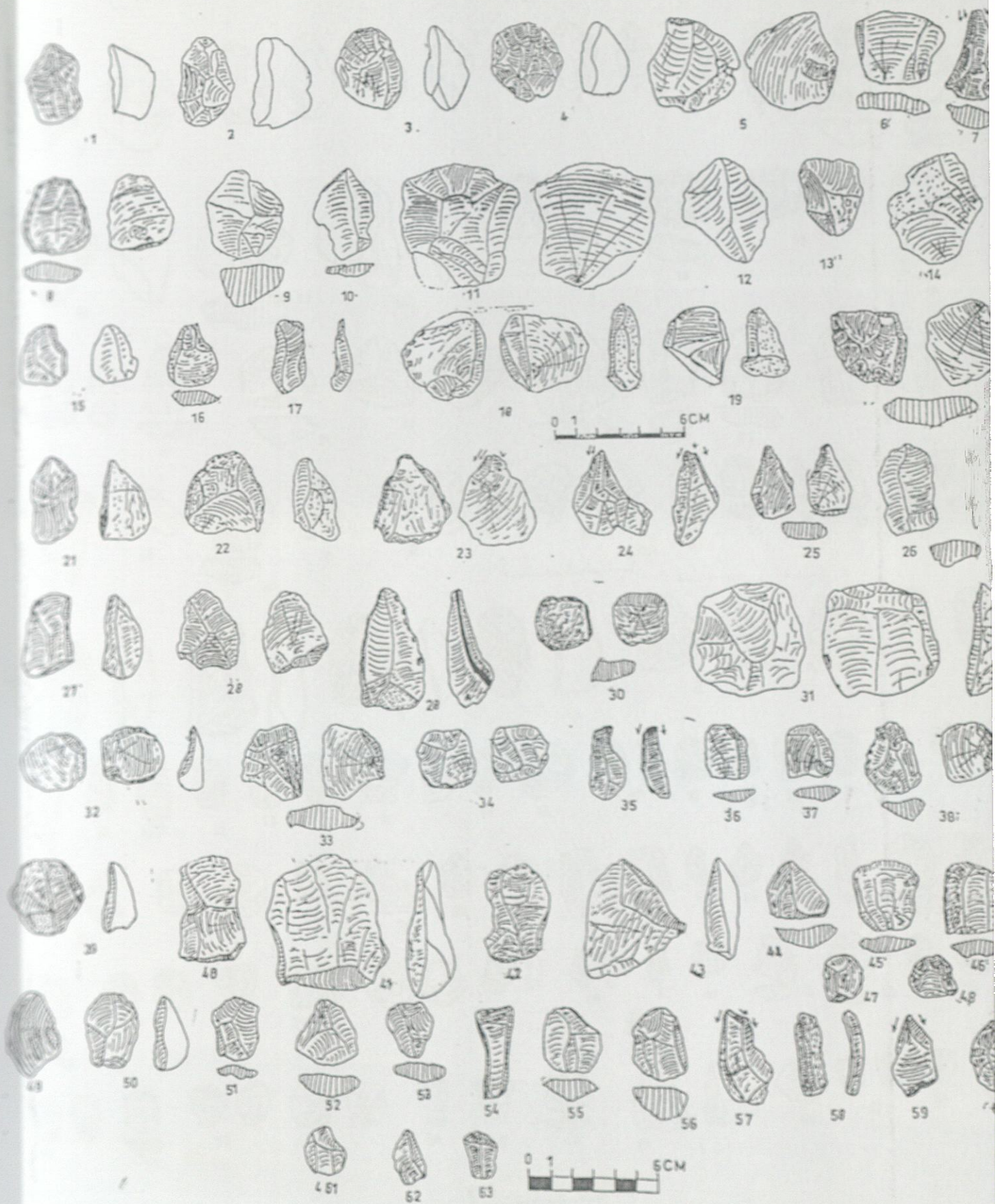


Fig. 23

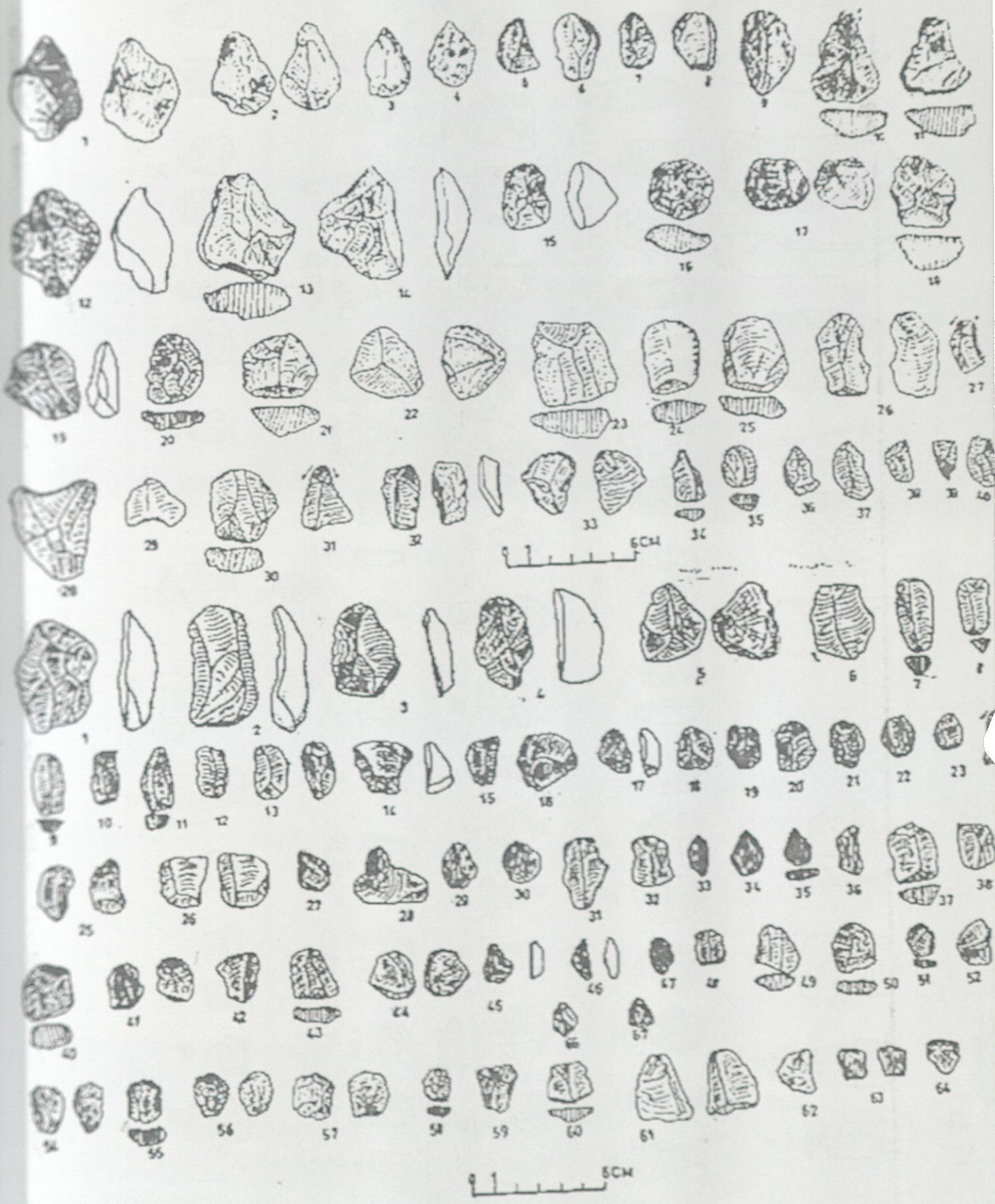
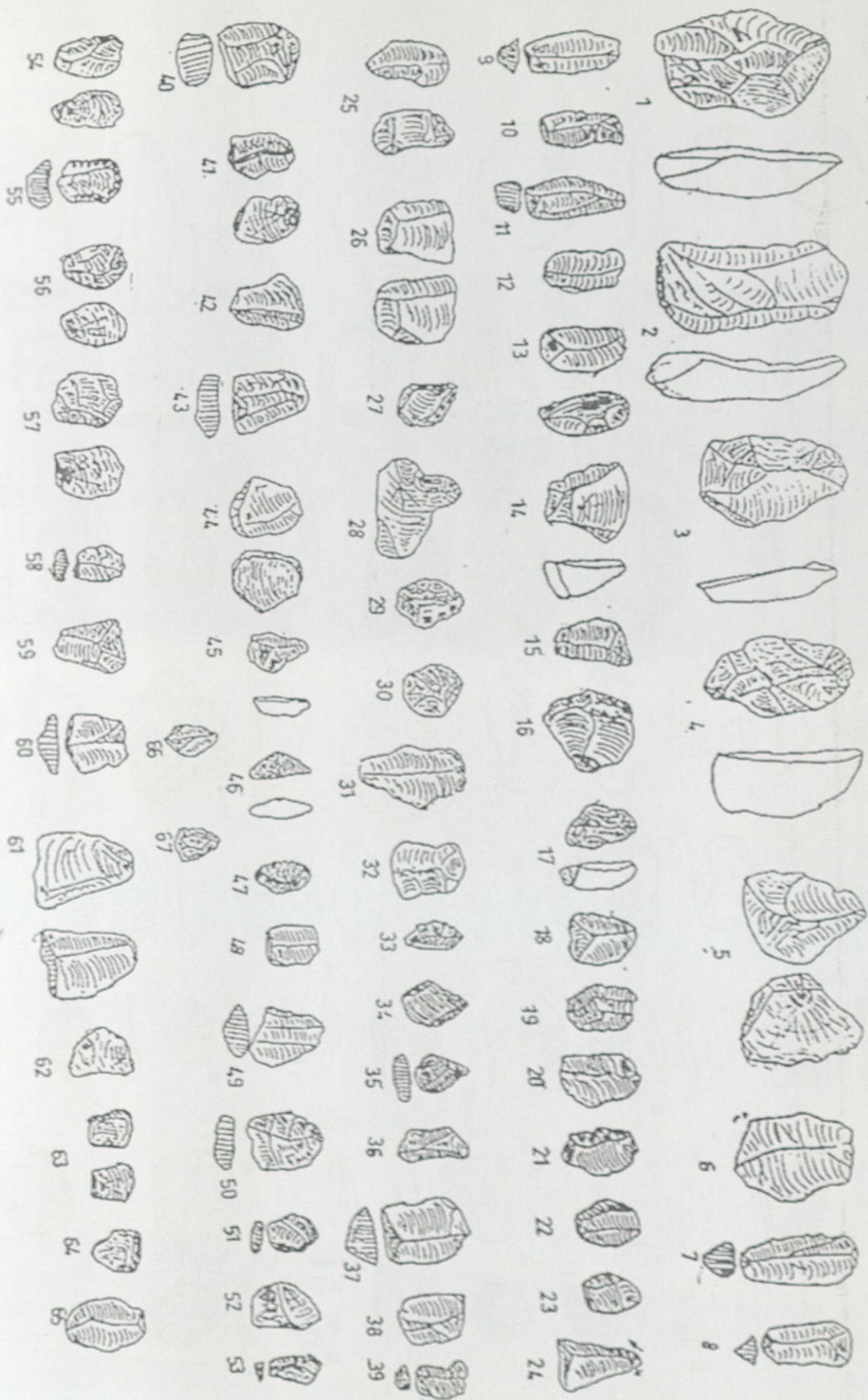


Fig. 24



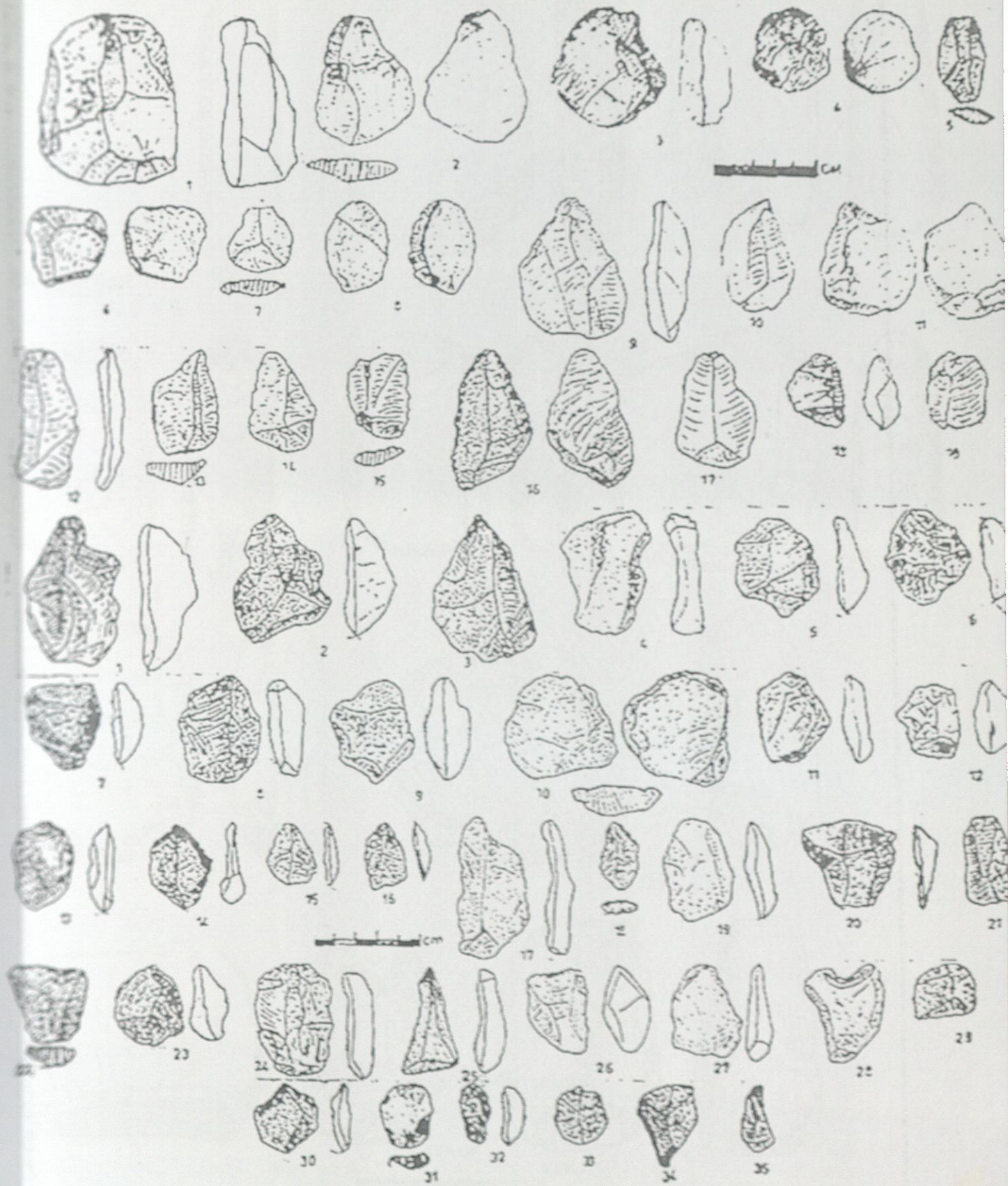


Fig. 26



Fig. 27



SCALE
1 0 2 4 6 8 CM.

Fig. 28

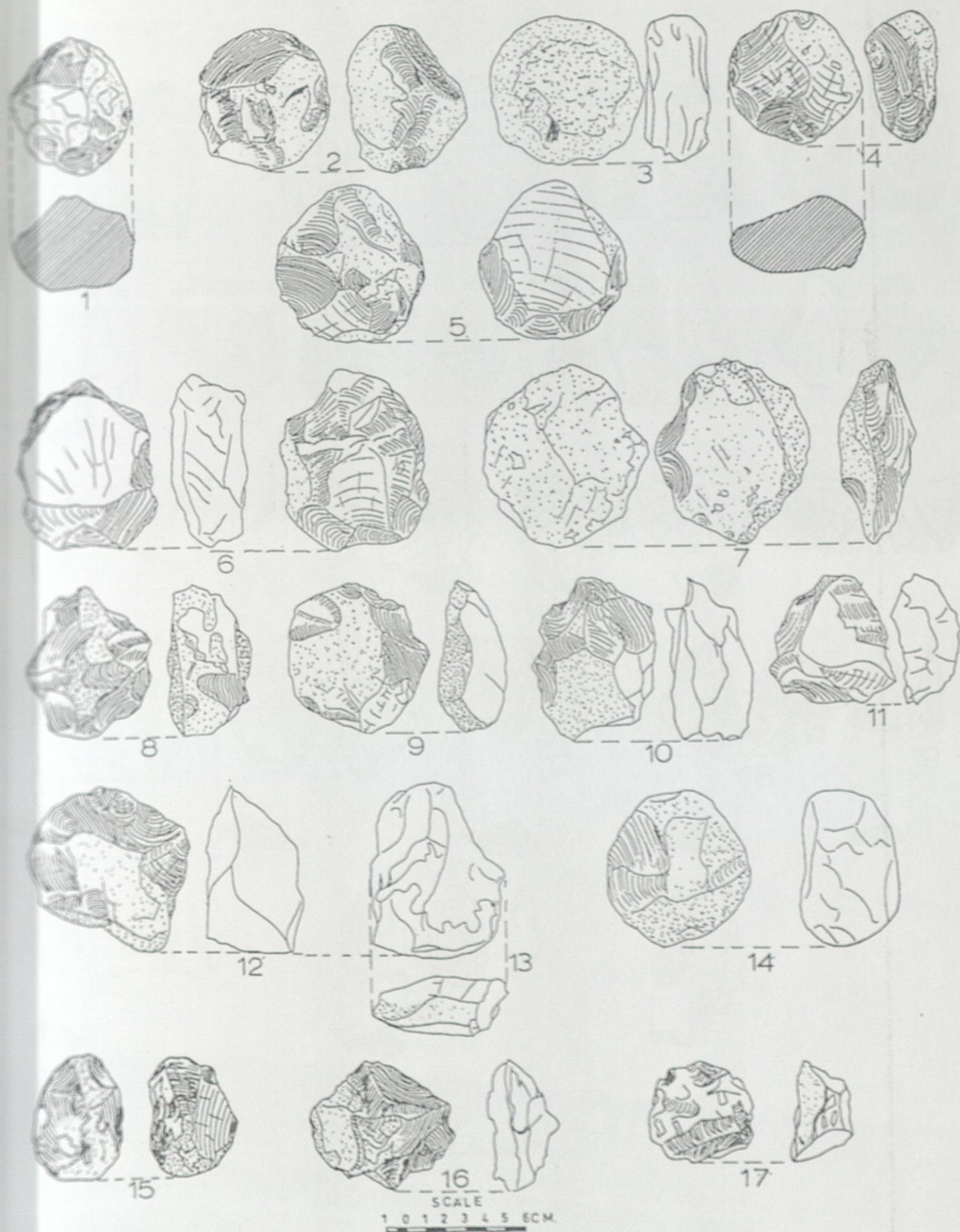
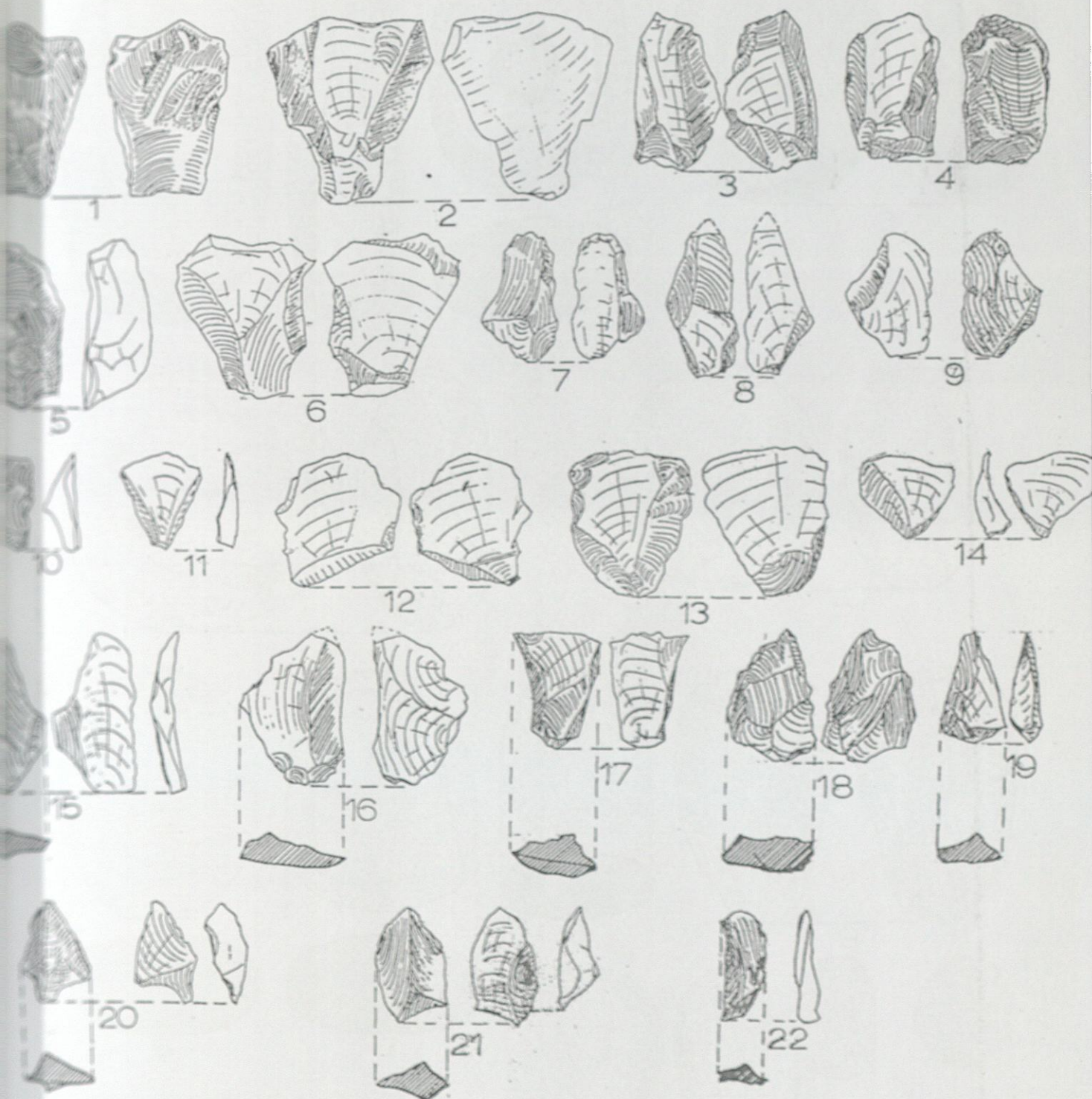


Fig. 29



SCALE
1 0 1 2 3 4 5 6 CM

Fig. 30



Fig. 31

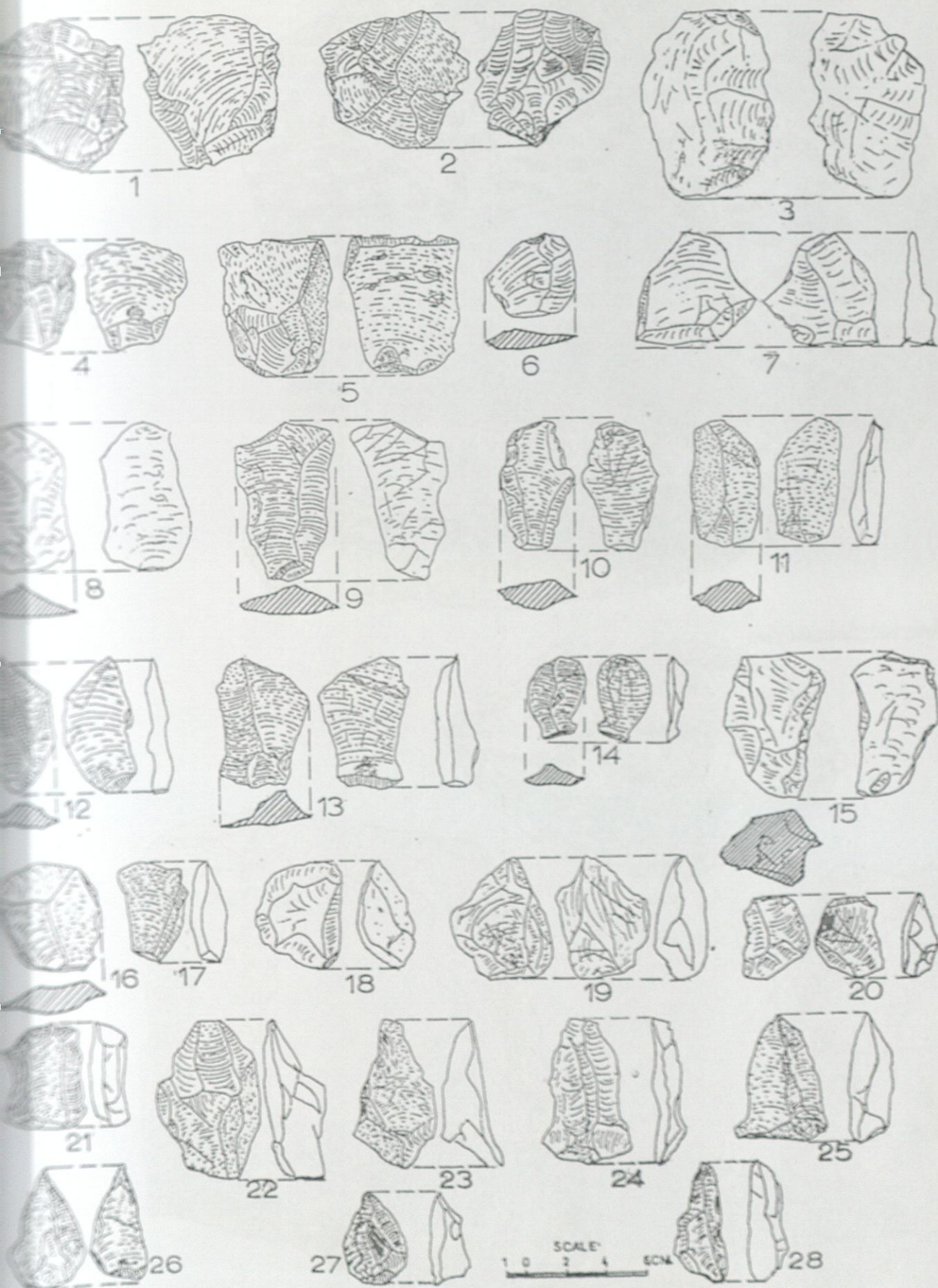


Fig. 32

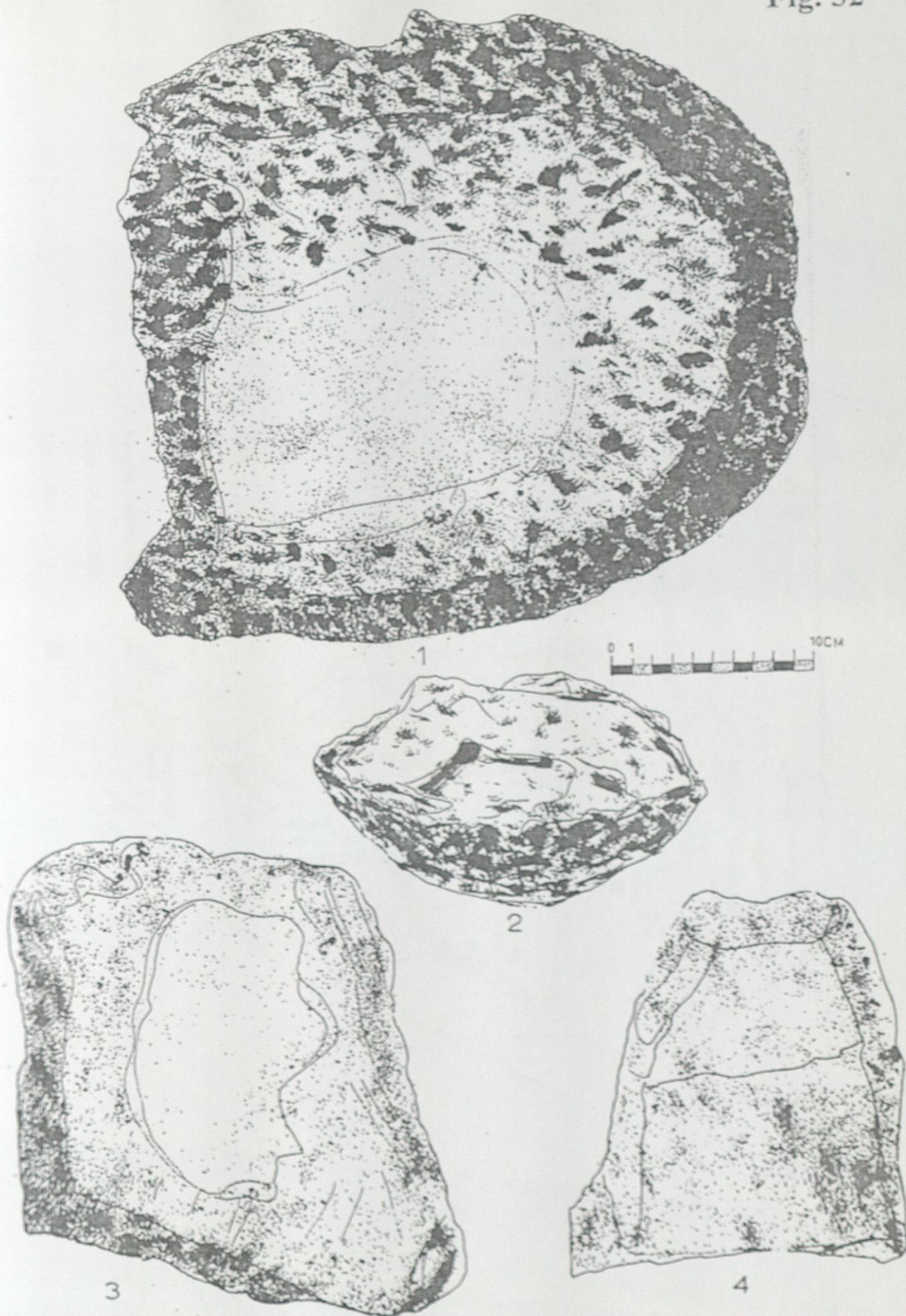


Fig. 33

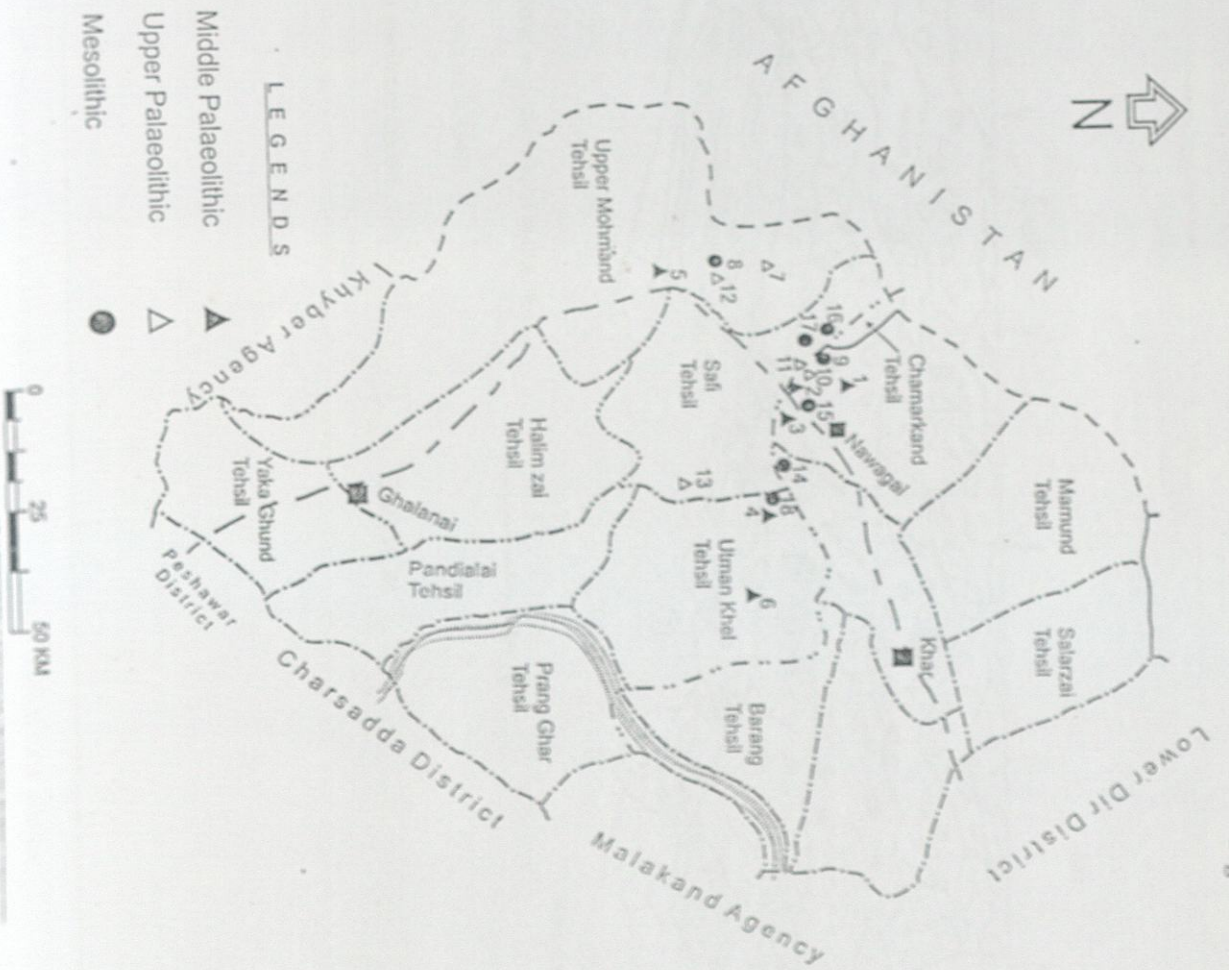


Fig. 33. Map showing the Stone Age sites in the Bajaur-Mohmand Area.

Fig. 34

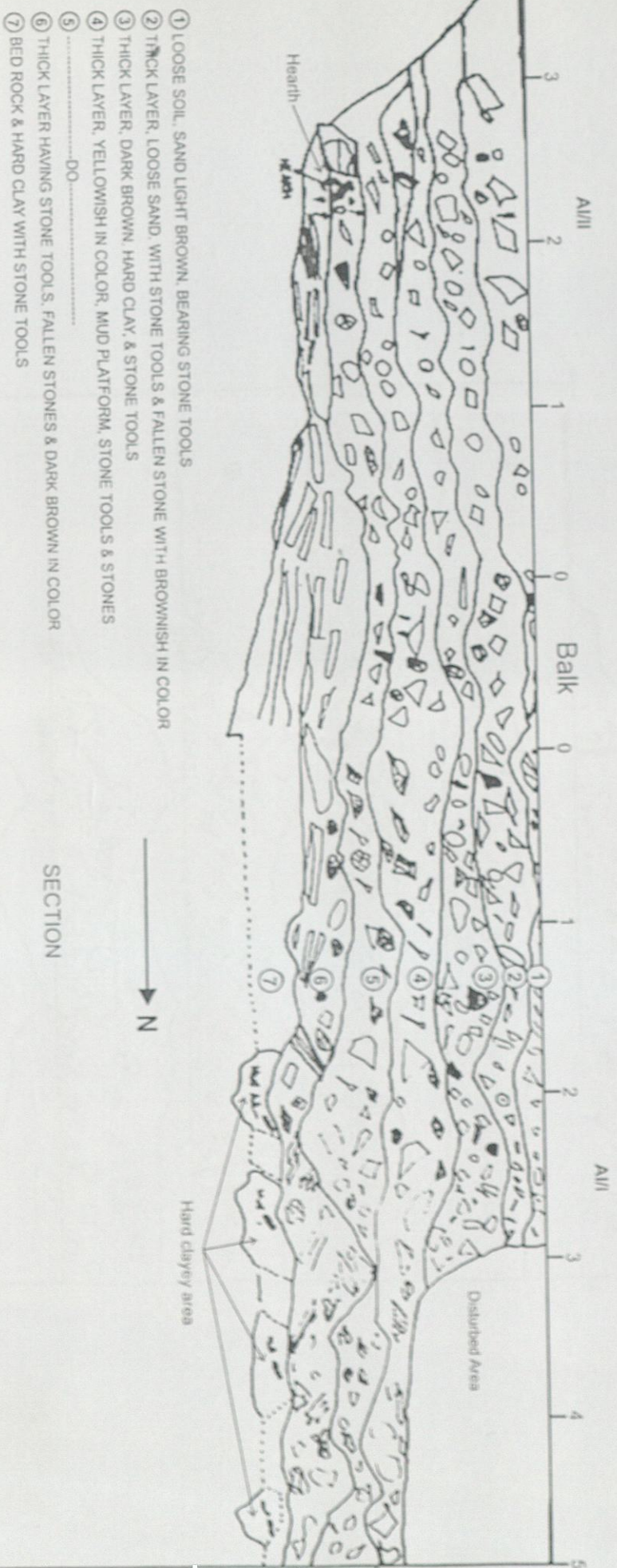


Fig 34. Section showing the stratigraphical sequence of Ango Galkai rock shelter

Fig. 35

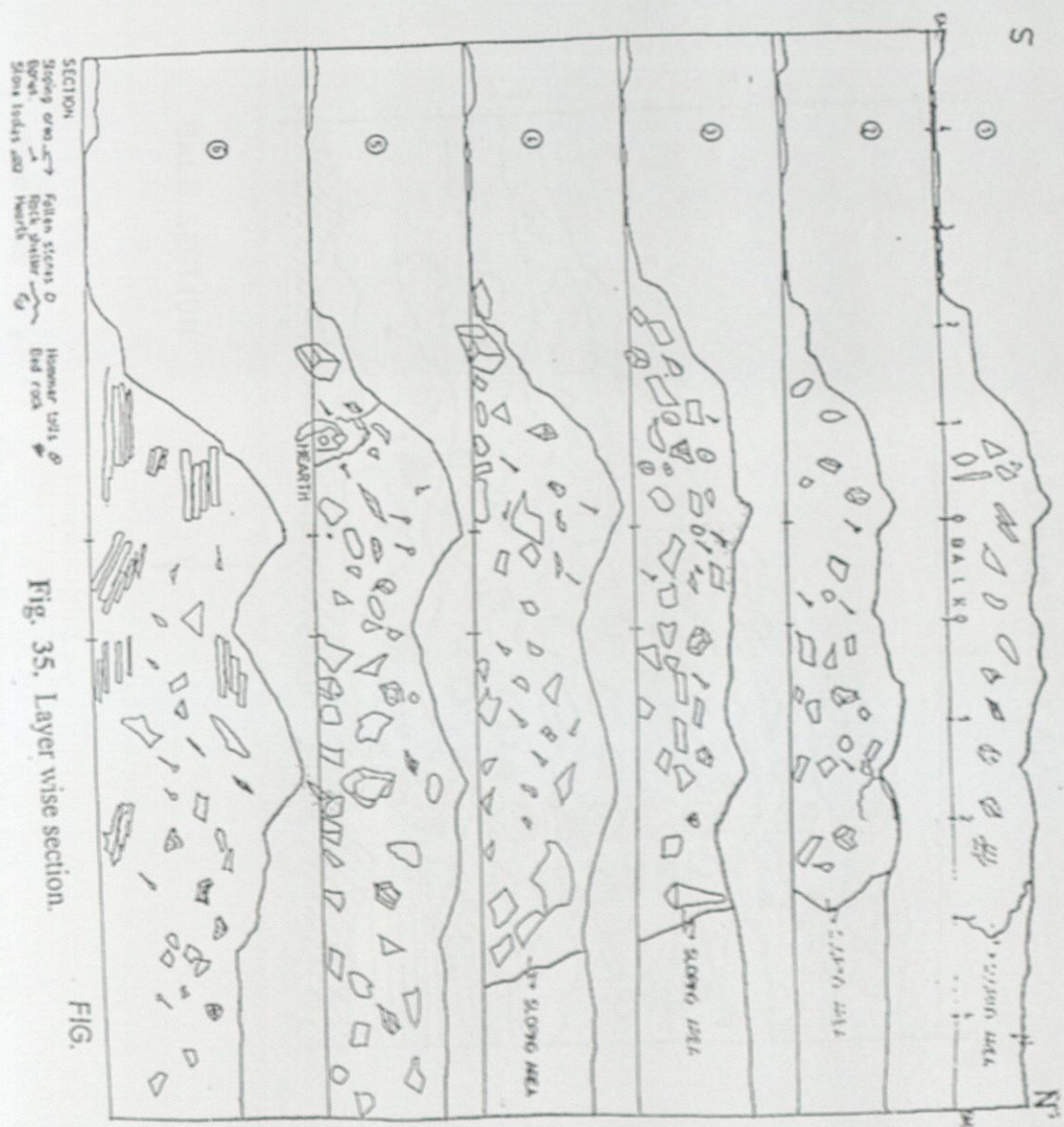


Fig. 36

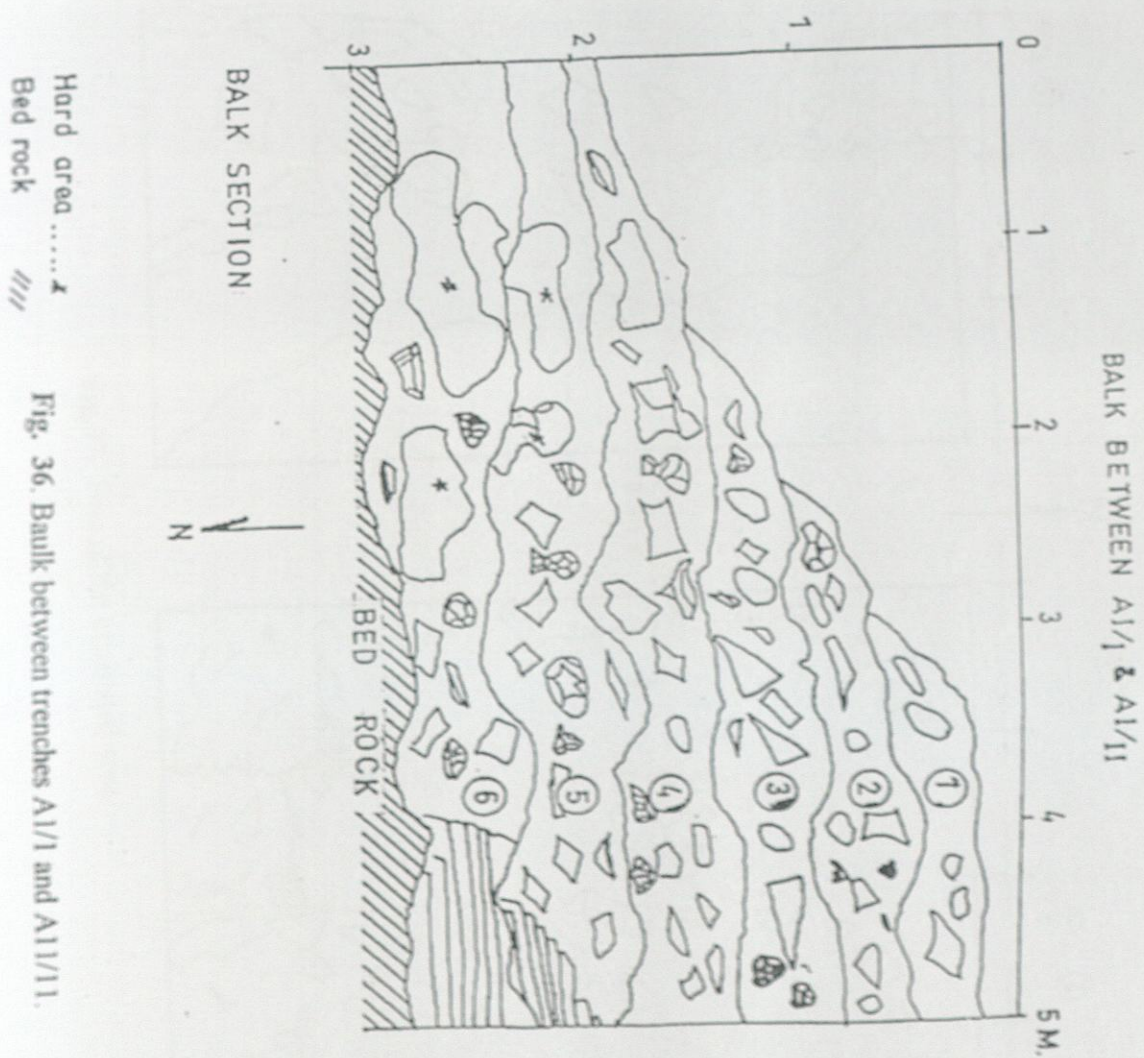


Fig. 36. Balk between trenches A1/I and A1/II.

Fig. 37

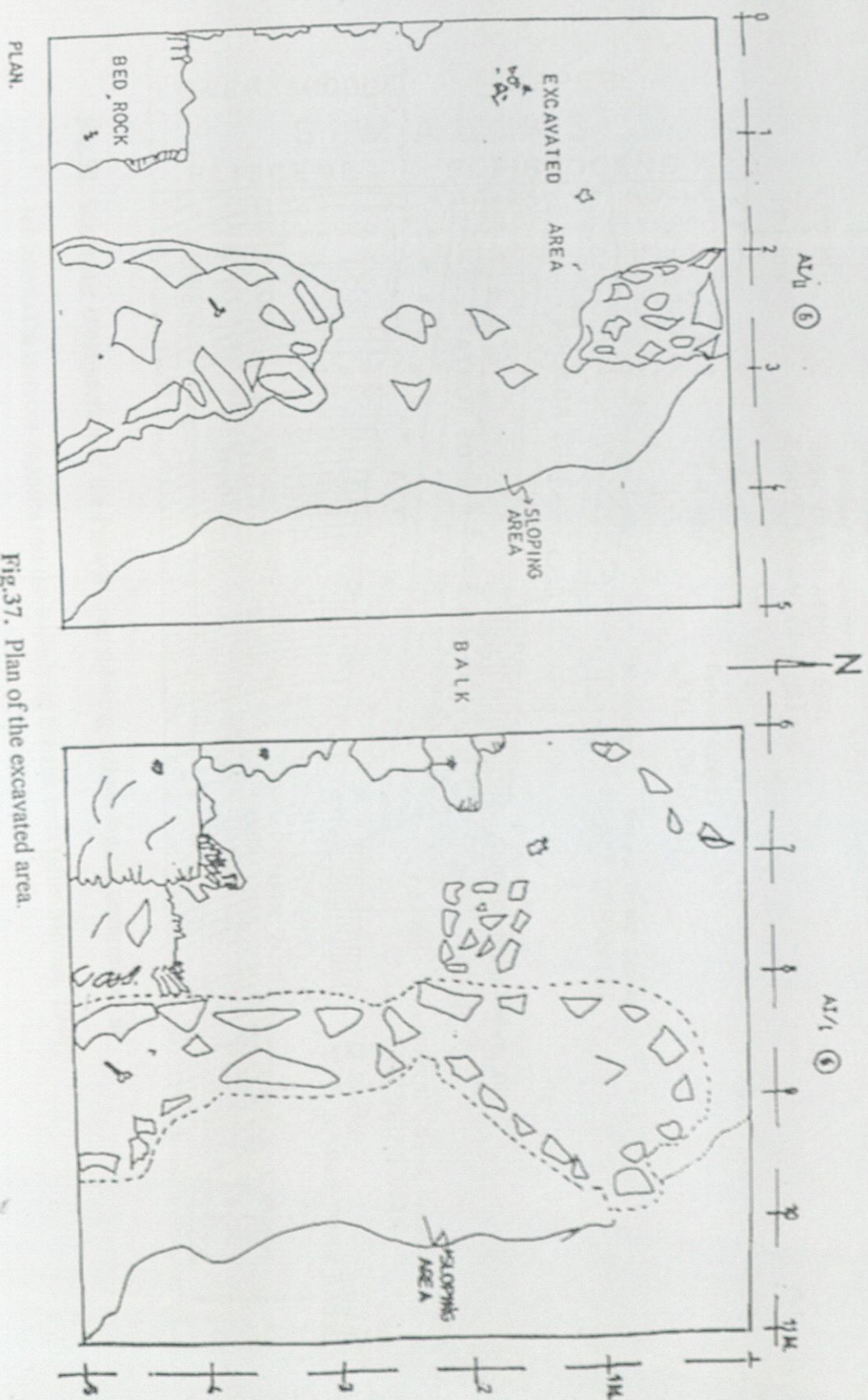


Fig.37. Plan of the excavated area.

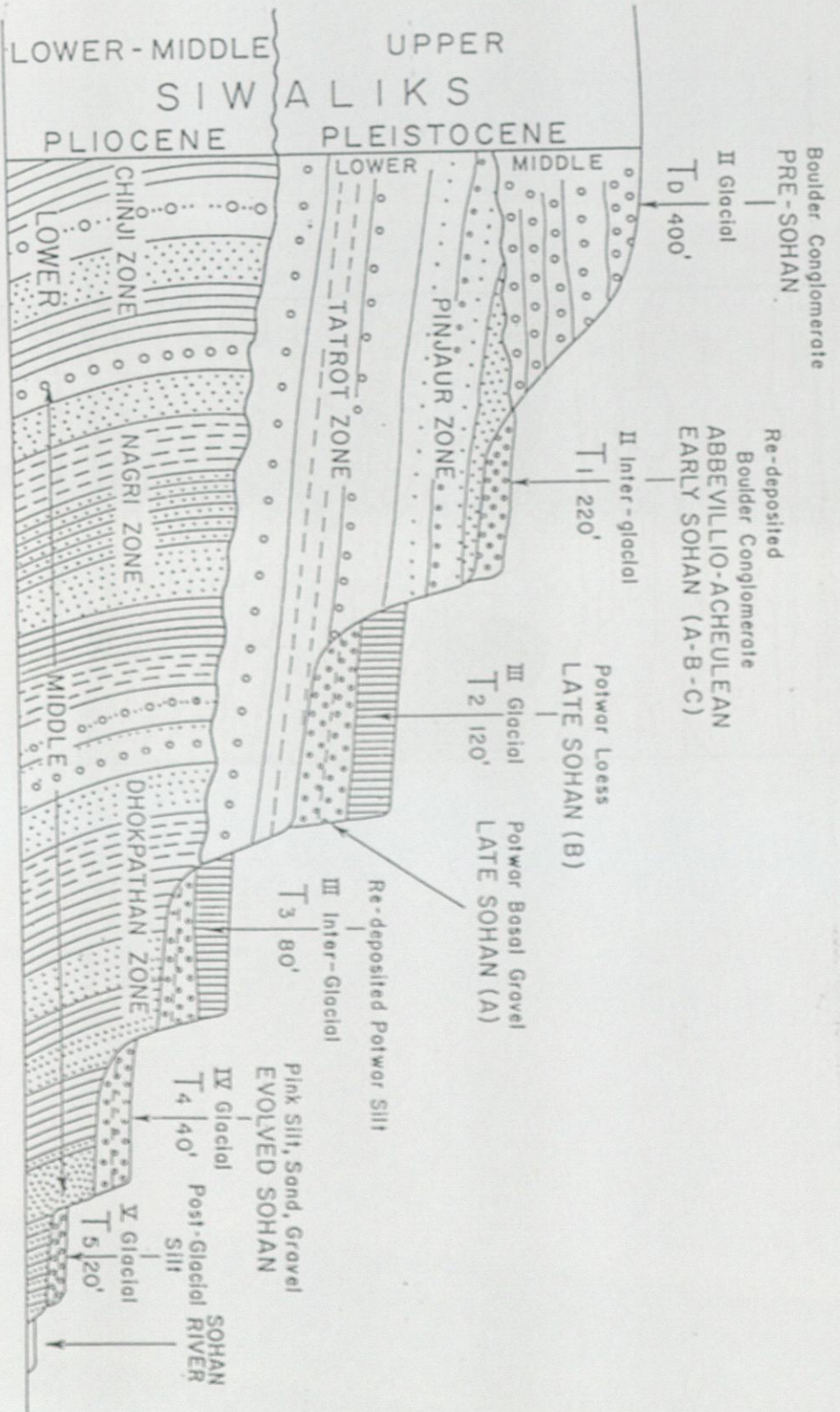


Fig.38. Schematic cross-section of the Potwar area showing archaeological occurrences in relation to the terraces deposits and the underlying Siwalik beds (after Movius, 1944).

Fig. 39

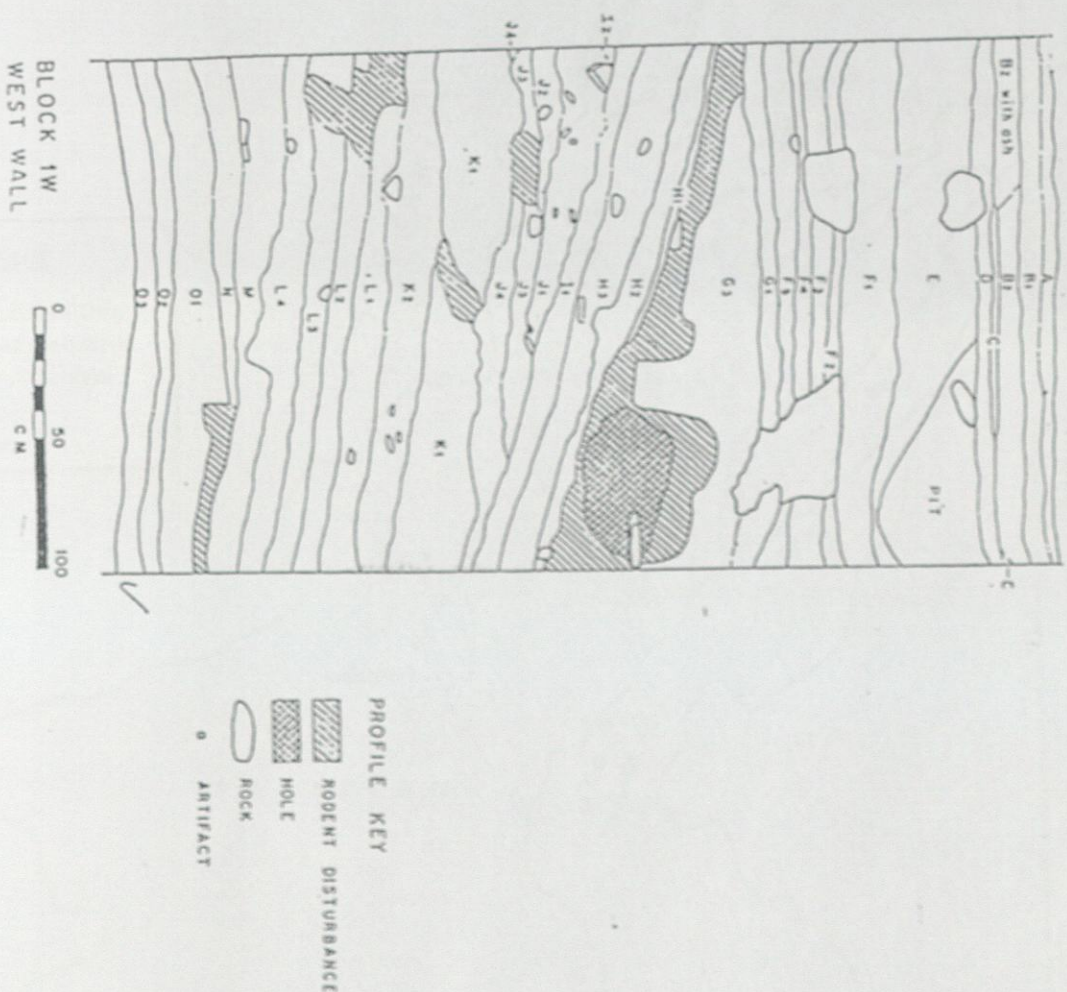


Fig. 39. Sanghao Cave Mousterian site: west section showing the stratigraphical sequence
(after Ranere, 1982.)

Fig. 40

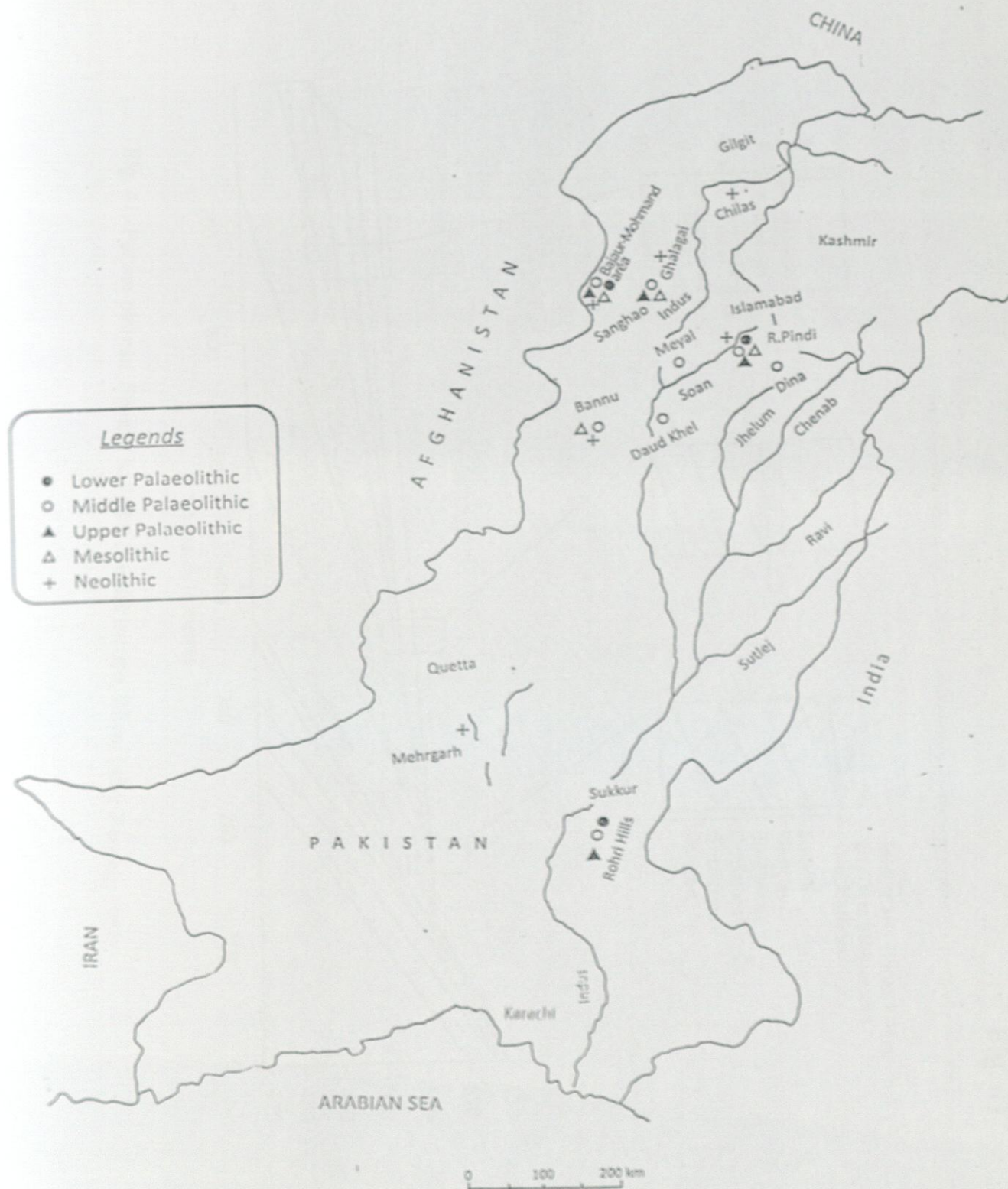


Fig. 40. Map showing the distribution of Stone Age sites in Pakistan.

Fig. 41

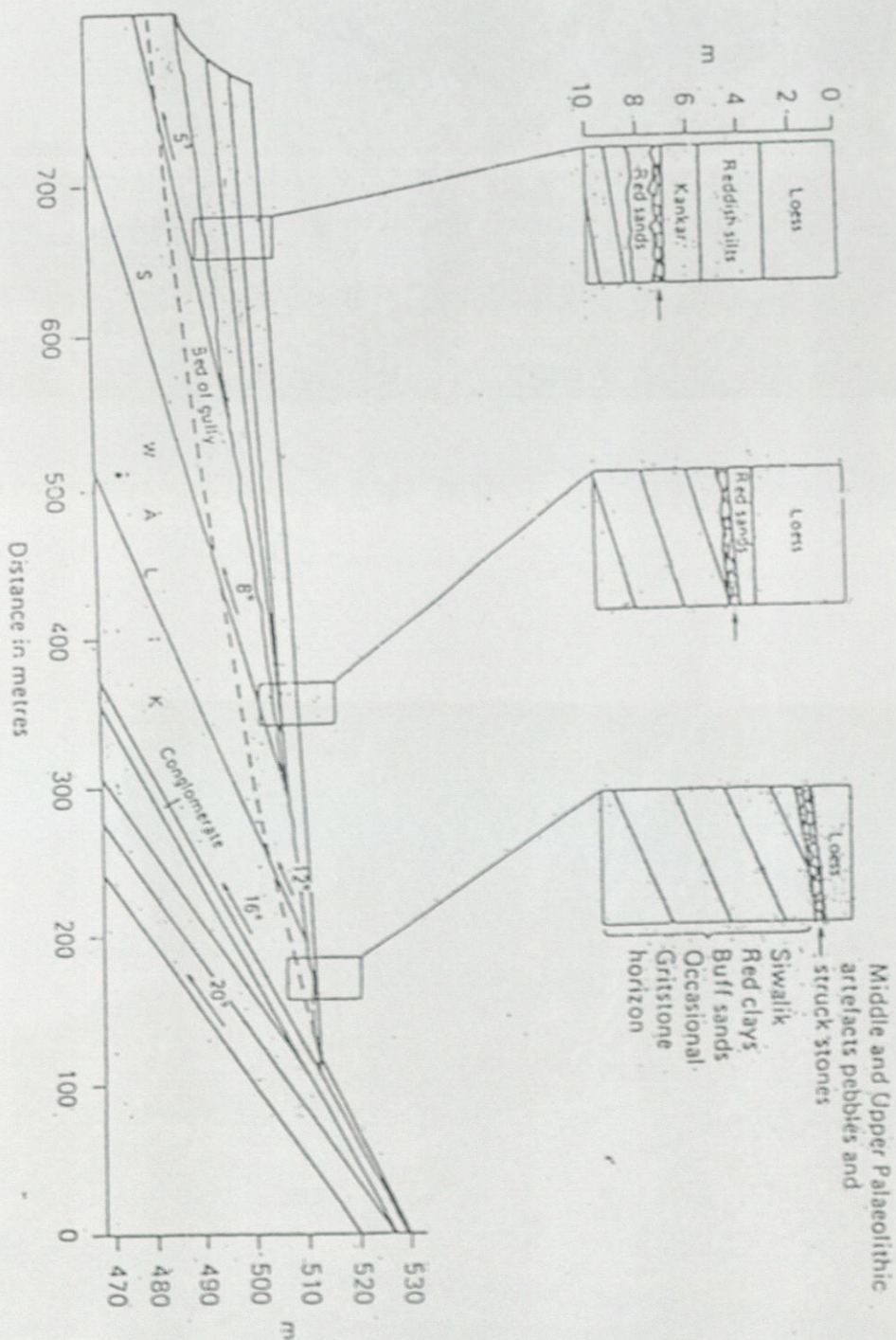
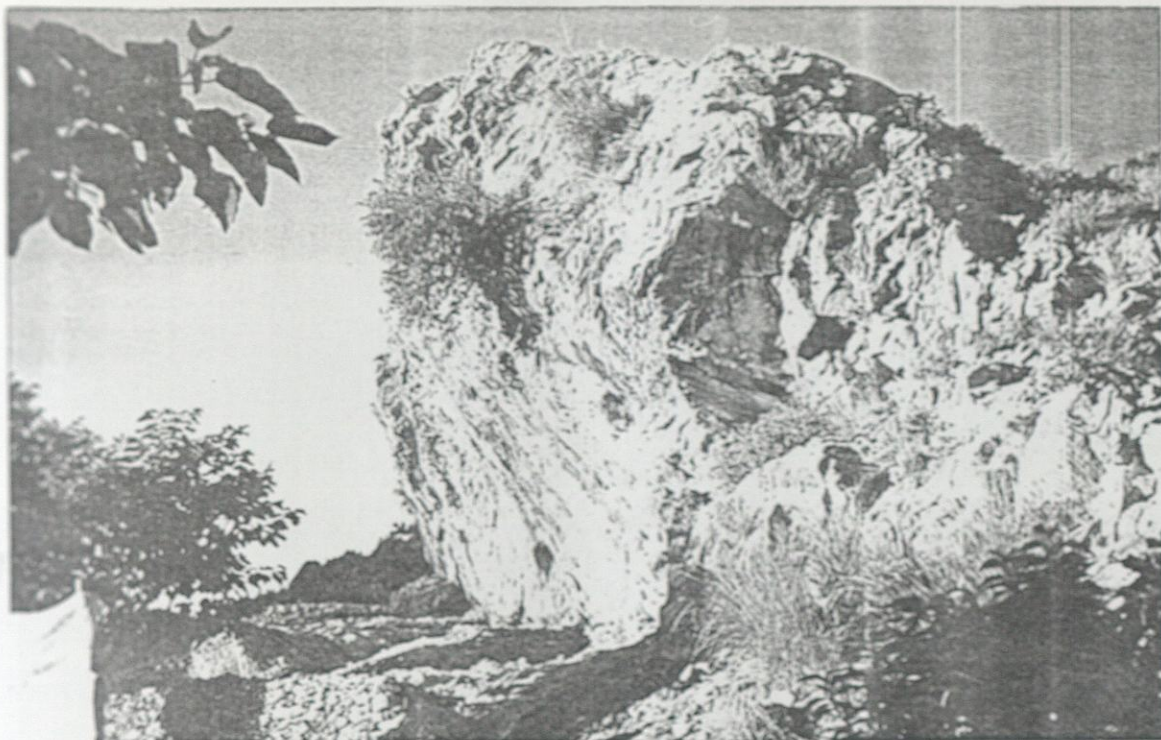


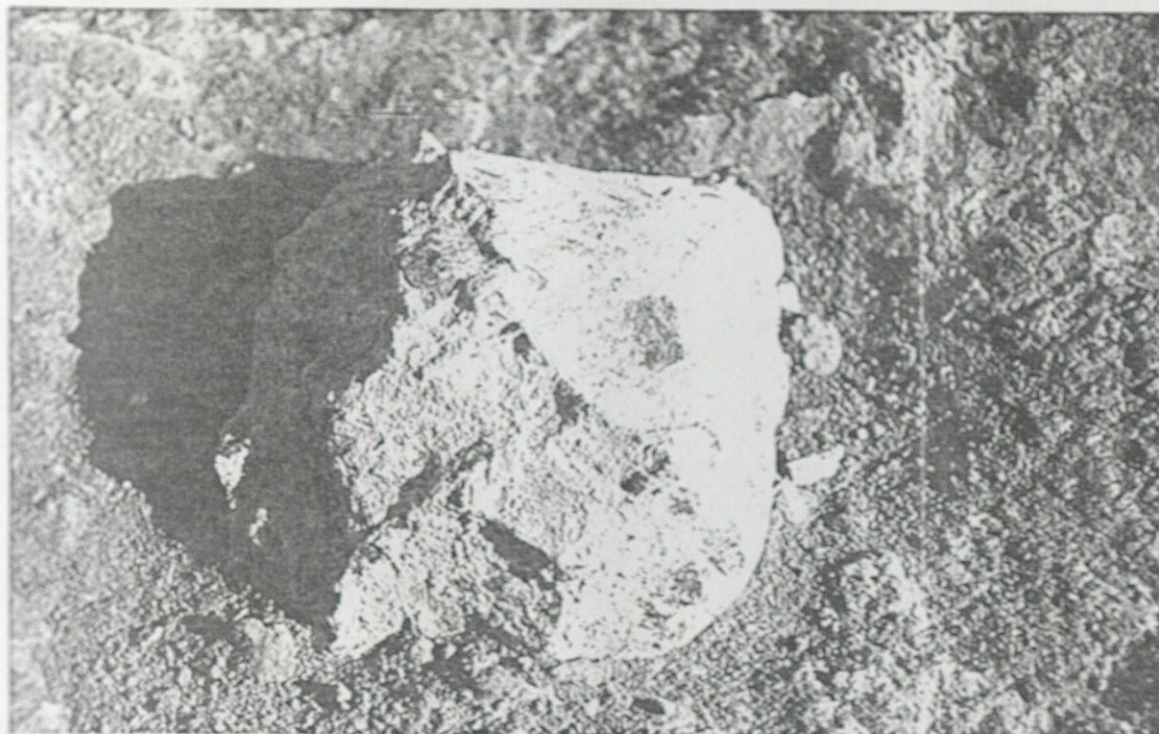
Fig. 41. Potwar plateau: Siwalik and post Siwalik section, Riwat (after Rendell, 1984)



Pl. 1. The Palaeolithic rock shelter of Ango Gatkai.



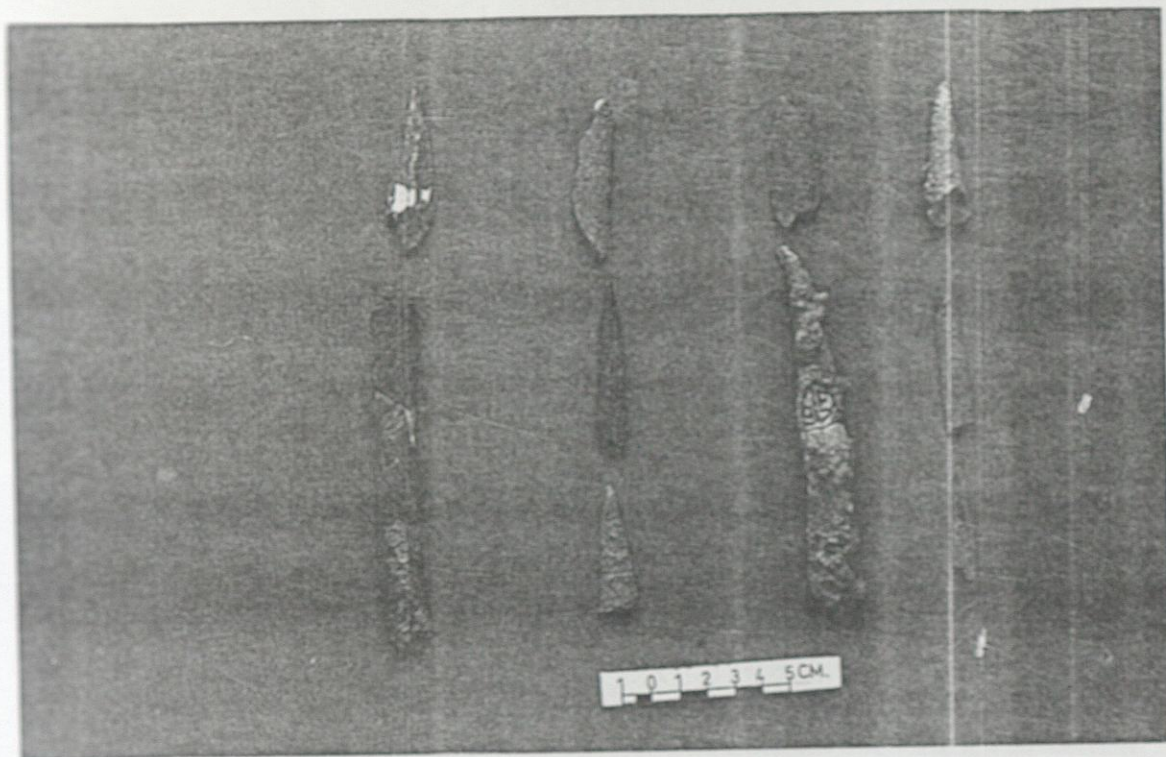
Pl. 2. General view of the site from the north.



Pl. 3. Ango Gatkai layer 6: in situ large discoidal core with prominent flake scars.



Pl. 4. Ango Gatkai layer 5: Palaeolithic hearth and Upper Paleolithic tools.



Pl. 5. Ango Gatkai layers 4-7: bone tools.



Pl. 6. Ango Gatkai layer 7: a simple Palaeolithic art piece, a perforated soft stone for an unidentified purpose.



Pl. 7. Ango Gatkai layer 7: different types of cores.



Pl. 8. Ango Gatkai layer 7: cleaver and scrapers.



Pl. 9. Ango Gatkai layer 7: Levallois and non-Levallois Mousterian points.



Pl. 10. Ango Gatkai layer 7: points and awls.



Pl. 11. Ango Gatkai layer 7: various types of scrapers.



Pl. 12. Ango Gatkai layer 7: a tanged point, blades both backed and prismatic and flat nosed end scraper.



PL. 13. Ango Gatkai layer 7: microlithic points.



PL. 14. Ango Gatkai layer 7: various microlithic scrapers.



Pl. 15. Ango Gatkai layer 7: microliths.



Pl. 16. Ango Gatkai layer 7: Levallois and non-Levallois flake scrapers.



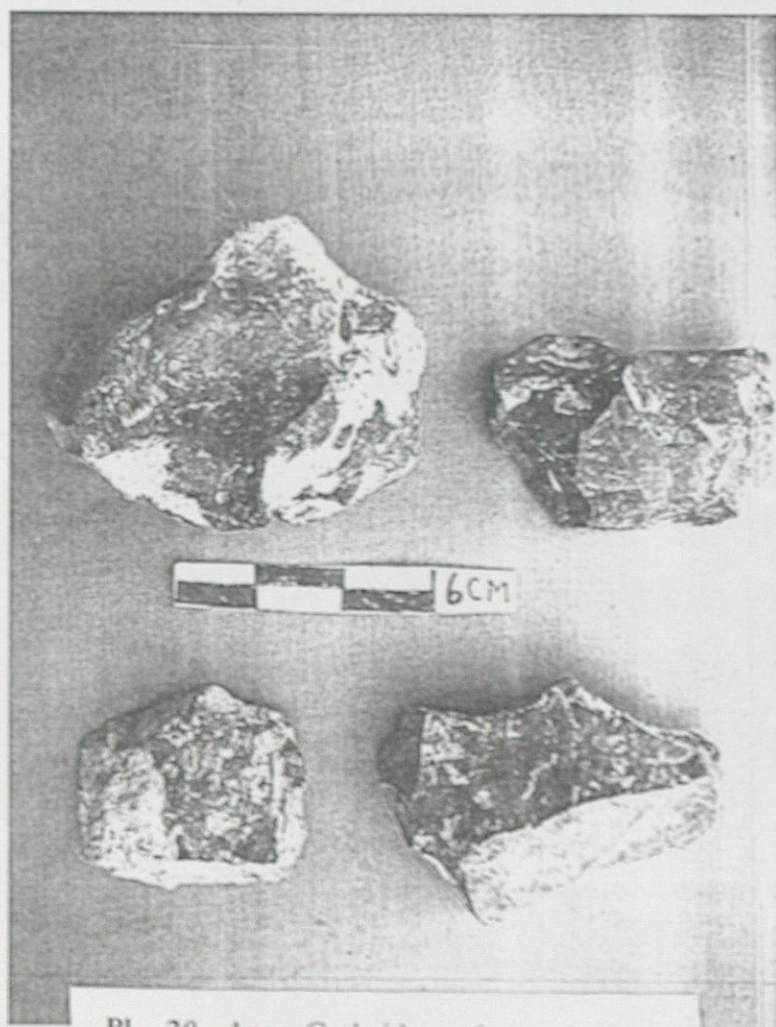
Pl. 17. Ango Gatkai layer 7: microliths.



Pl. 18. Ango Gatkai layer 6: the largest discoidal core.



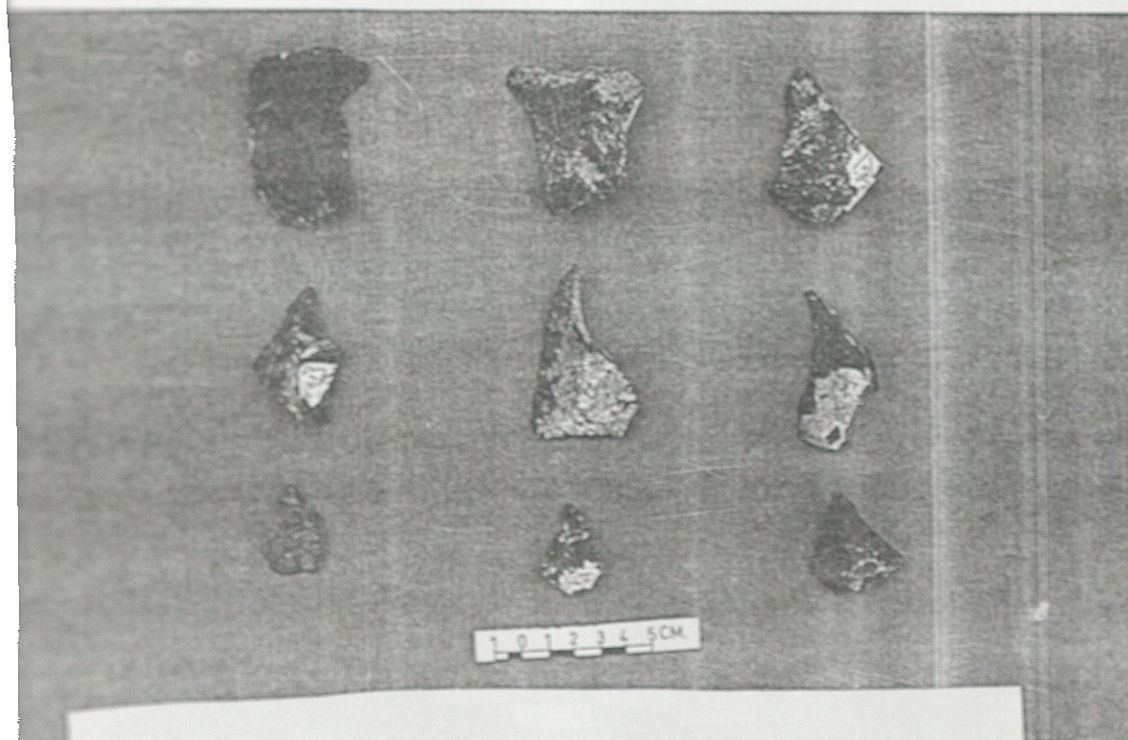
Pl. 19. Ango Gatkai layer 6: struck Levallois cores.



Pl. 20. Ango Gatkai layer 6: struck cores.



Pl. 21. Ango Gatkai layer 6: points, elongated flakes and carinated core tools.



Pl. 22. Ango Gatkai layer 6: beaked and elongated flake tools.



Pl. 23. Ango Gatkai layer 6: Levallois and non-Levallois flake scrapers.



Pl. 24. Ango Gatkai layer 6: Levallois flake and beaked burin.



PL. 25. Ango Gatkai layer 6: large Mousterian side scraper (no. 1, top row).



PL. 26. Ango Gatkai layer 6: retouched Mousterian convex side scrapers (nos. 1 and 2, top row), tranchet (no. 1) and knife (no. 3, bottom row).



Pl. 27. Ango Gatkai layer 6: a special type of beaked burin (no.3, middle row) and



Pl. 28. Ango Gatkai layer 6: two canted scrapers row 1 and convex side scrapers row 2.



Pl. 29. Ango Gatkai layer 6: points with thinned bases.



Pl. 30. Ango Gatkai layer 6: prismatic and backed blades (Nos. 2, 3, 5, 6) and special transverse scrapers (1, 4).



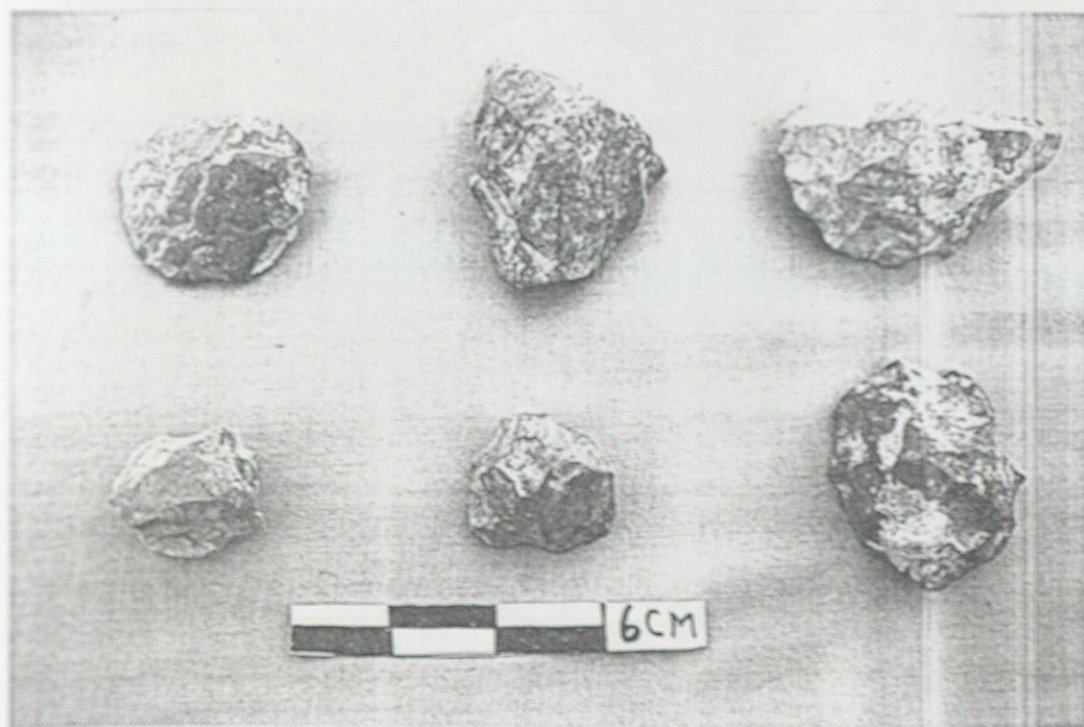
Pl. 31. Ango Gatkai layer 6: denticulate, cleaver, hand axe and a carinated end scraper.



Pl. 32. Ango Gatkai layer 6: elongated flakes (1, 4, and 5) and backed knives (2, 3,



Pl. 33. Ango Gatkai layer 6: points.



Pl. 34. Ango Gatkai layer 6: different forms of carinated scrapers.



Pl. 35. Ango Gatkai layer 6:: microliths-burins, awls and backed knives.



Pl. 36. Ango Gatkai layer 6: D-shaped convex side scrapers special type.



Pl. 37. Ango Gatkai layer 6: microlithic points and side scrapers.



Pl. 38. Ango Gatkai layer 6: points.



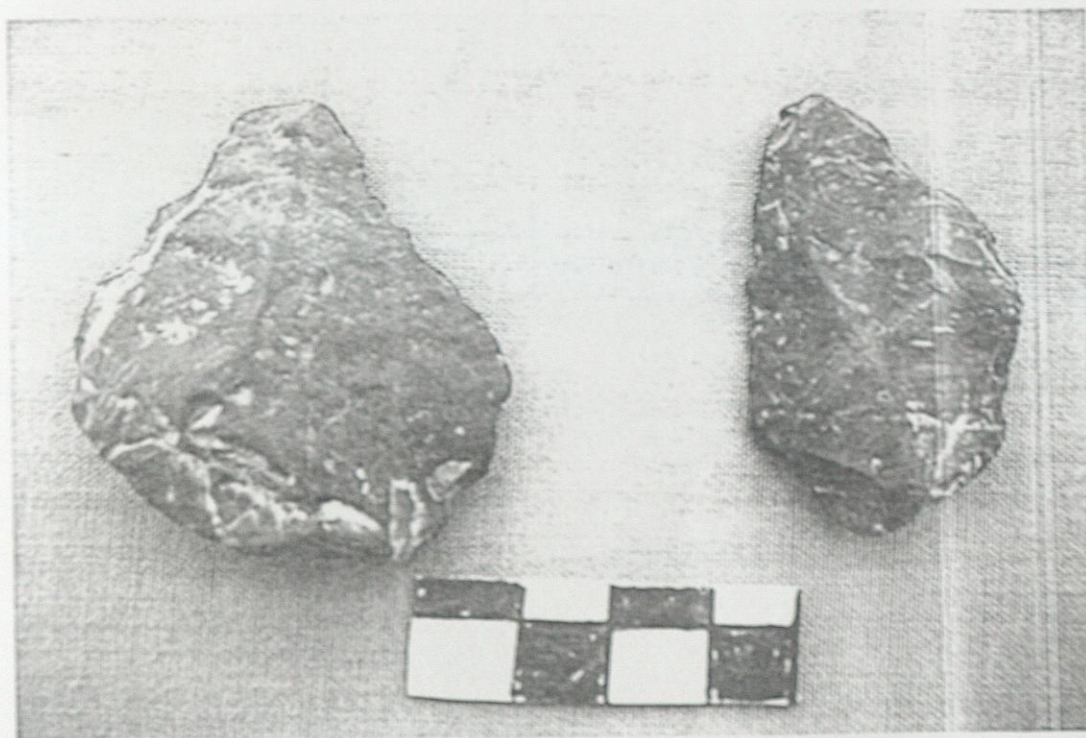
Pl. 39. Ango Gatkai layer 6: microliths.



Pl. 40. Ango Gatkai layer 6: microliths with a quartz trapeze.



Pl. 41. Ango Gatkai layer 6: a parrot beak scraper, with thick end scraper. r.



Pl. 42. Ango Gatkai layer 6: two Mousterian points - point Soyons rare type, surface collection.



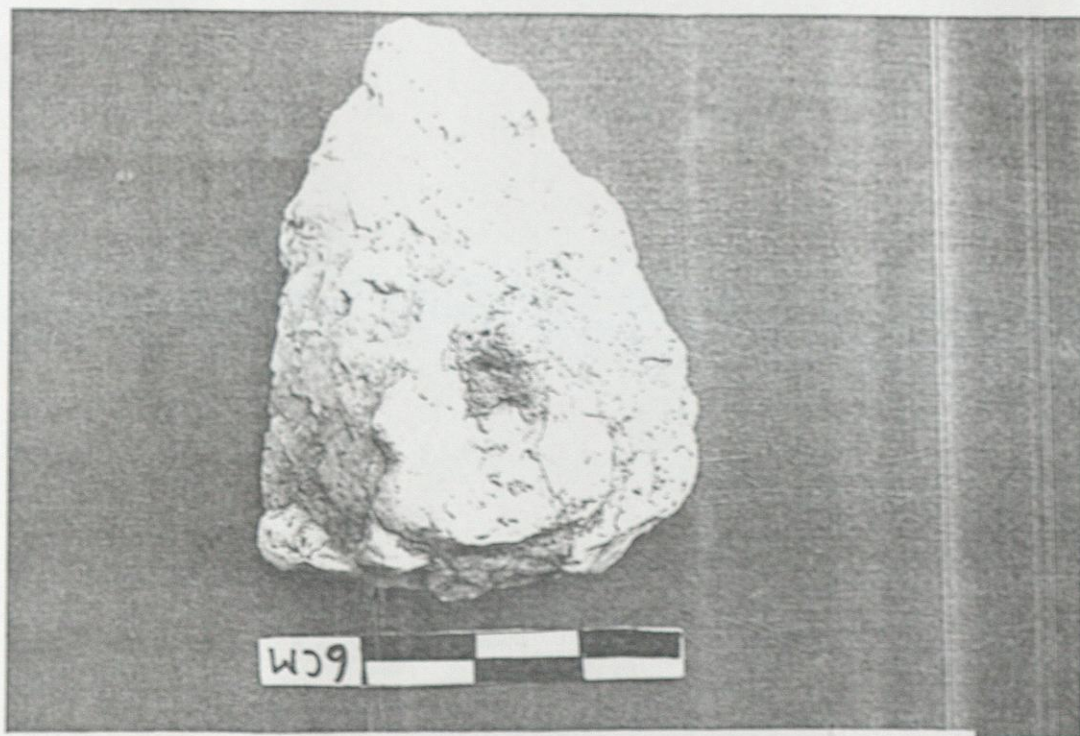
Pl. 43. Ango Gatkai layer 5: Levallois points.



Pl. 44. Ango Gatkai layer 5: awls, a burin and special type of knife.



Pl. 45. Ango Gatkai layer 5: a special type Upper Palaeolithic point (Taqarian point).



Pl. 46. Ango Gatkai layer 5: an Acheulian type bifacial hand axe.



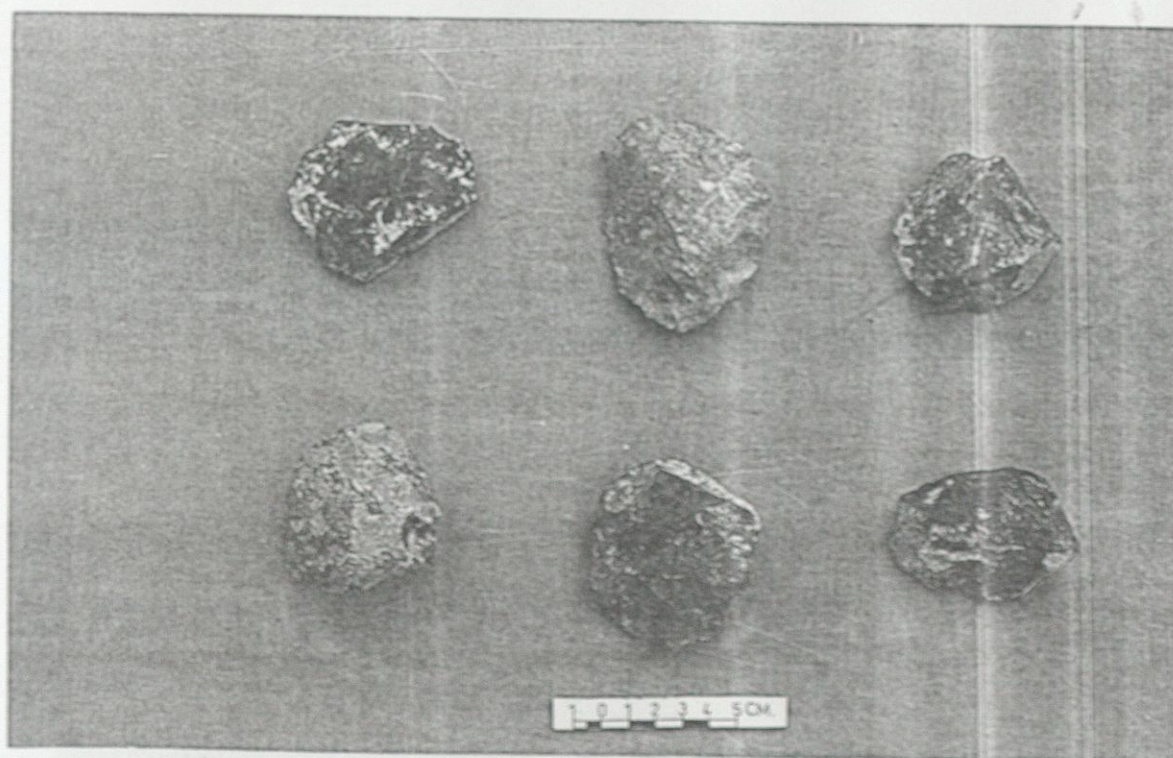
Pl. 47. Ango Gatkai layer 5: an unstruck prepared tortoise core and a cleaver. r.



Pl. 48. Ango Gatkai layer 5: flake cores.



Pl. 49. Ango Gatkai layer 5: flake, scrapers and blades.



Pl. 50. Ango Gatkai layer 5: large scrapers or chopping tools.



Pl. 51. Ango Gatkai layer 5: chopping tools.



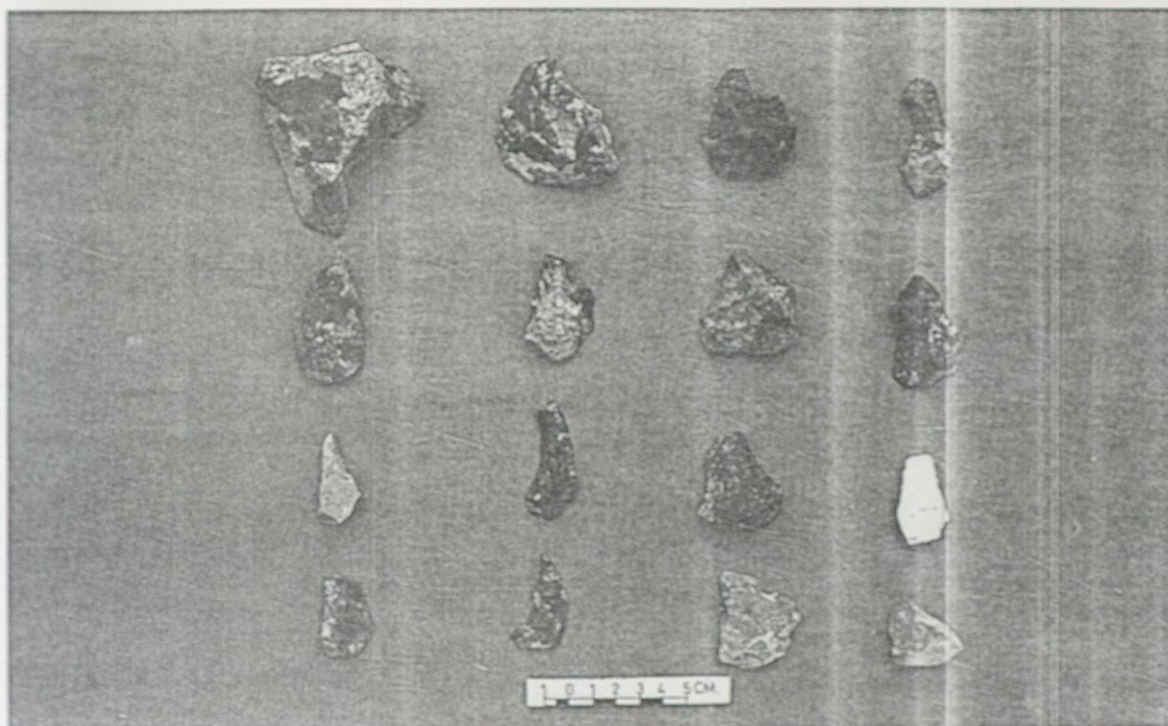
Pl. 52. Ango Gatkai layer 5: Upper Palaeolithic blades and a point.



Pl. 53. Ango Gatkai layer 5: Upper Palaeolithic blades.



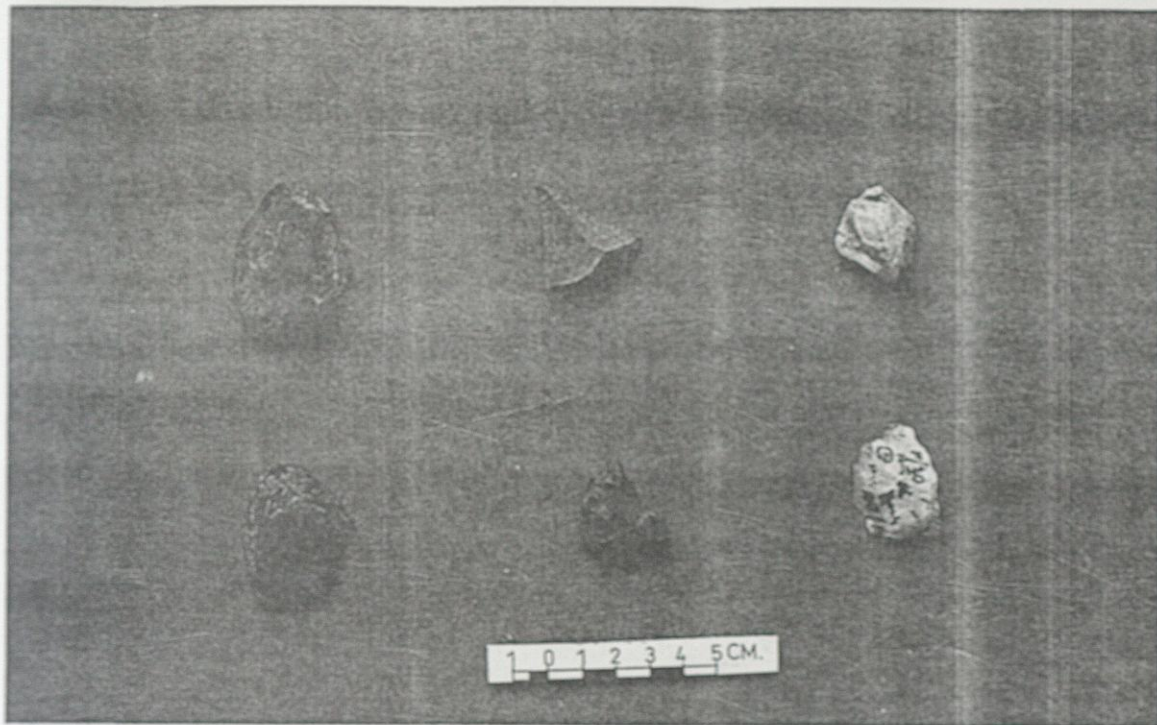
Pl. 54. Ango Gatkai layer 5: points, beaked burin, awls and denticulates.



Pl. 55. Ango Gatkai layer 5: burins and blades.



Pl. 56. Ango Gatkai layer 5: blades, burin and fabricator.



Pl. 57. Ango Gatkai layer 5: a bladelet core no.3 and a knife no.1.



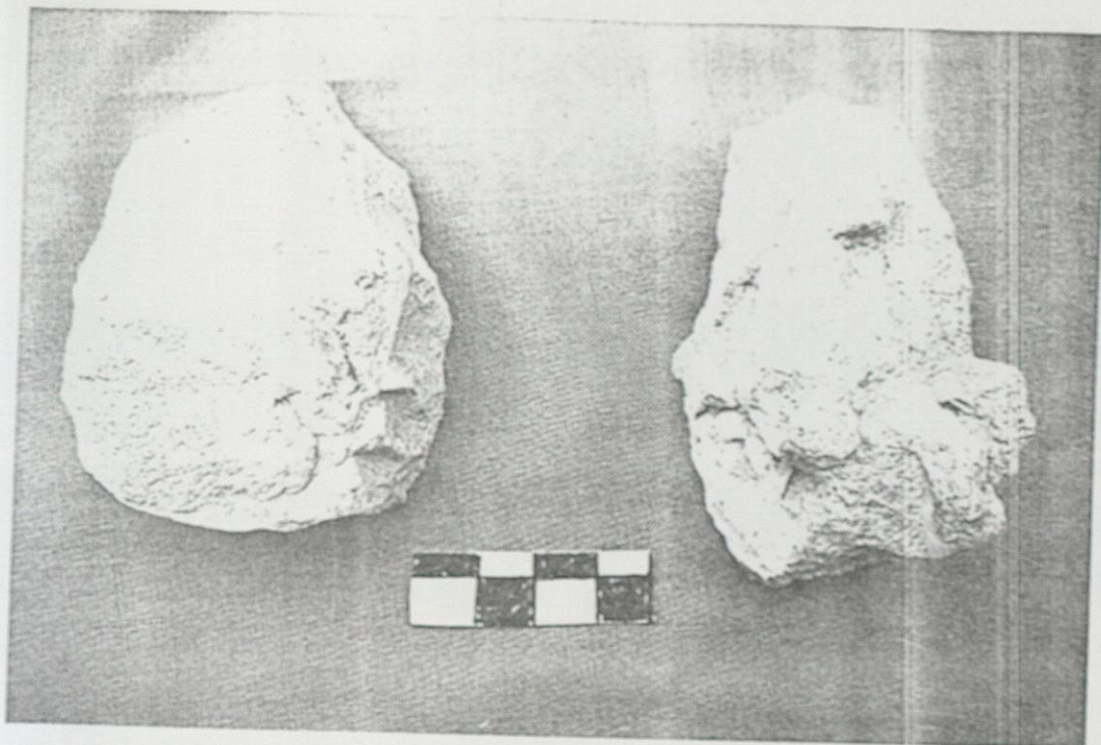
Pl. 58. Ango Gatkai layer 5: microliths.



Pl. 59. Ango Gatkai layer 5: a big Levallois flake with scrapers.



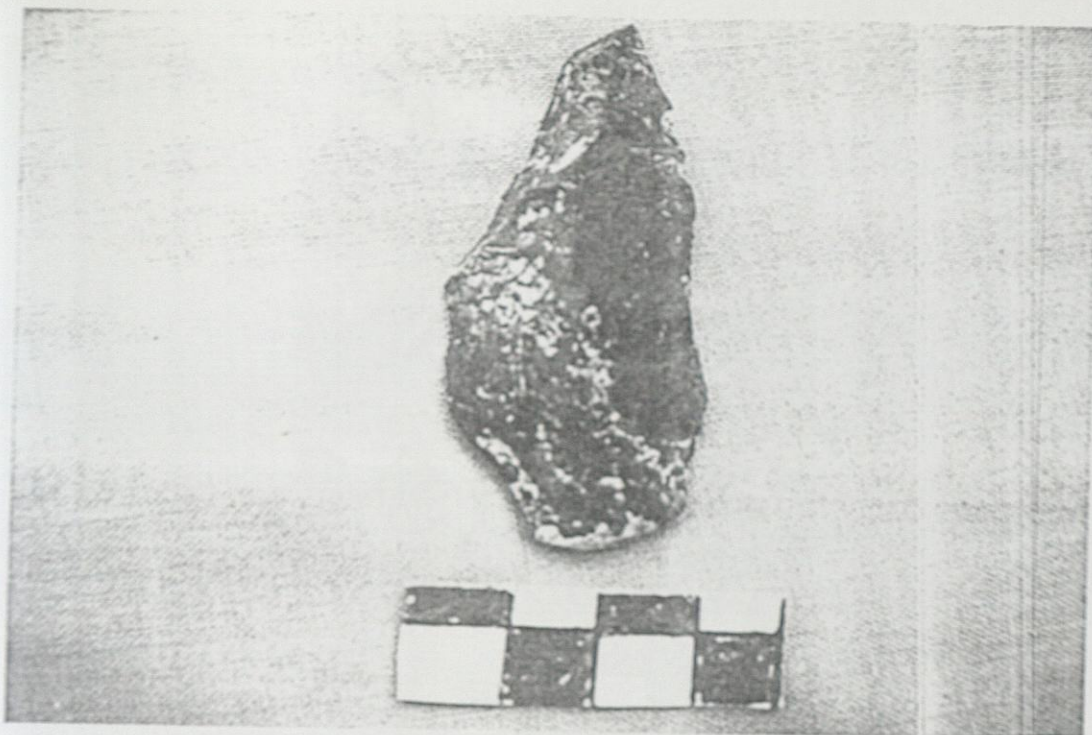
Pl. 60. Ango Gatkai layer 5: cores.



Pl. 61. Ango Gatkai layer 4: quartz unstruck prepared core and a hand axe.



Pl. 62. Ango Gatkai layer 4: a tanged bifacial point, a backed blade, flat-nose scraper and



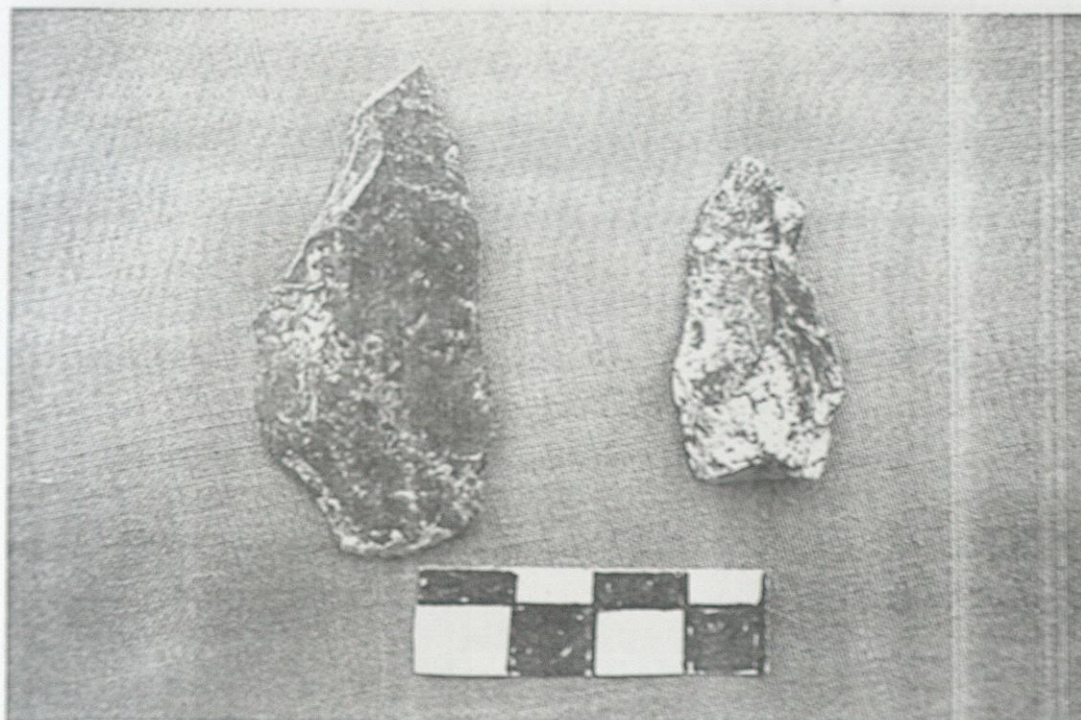
Pl. 63. Ango Gatkai layer 4: a point with thinned basal end, fresh.



Pl. 64. Ango Gatkai layer 4: flat blades and unique type burins.



Pl. 65. Ango Gatkai layer 4: three points and a multiple burin.



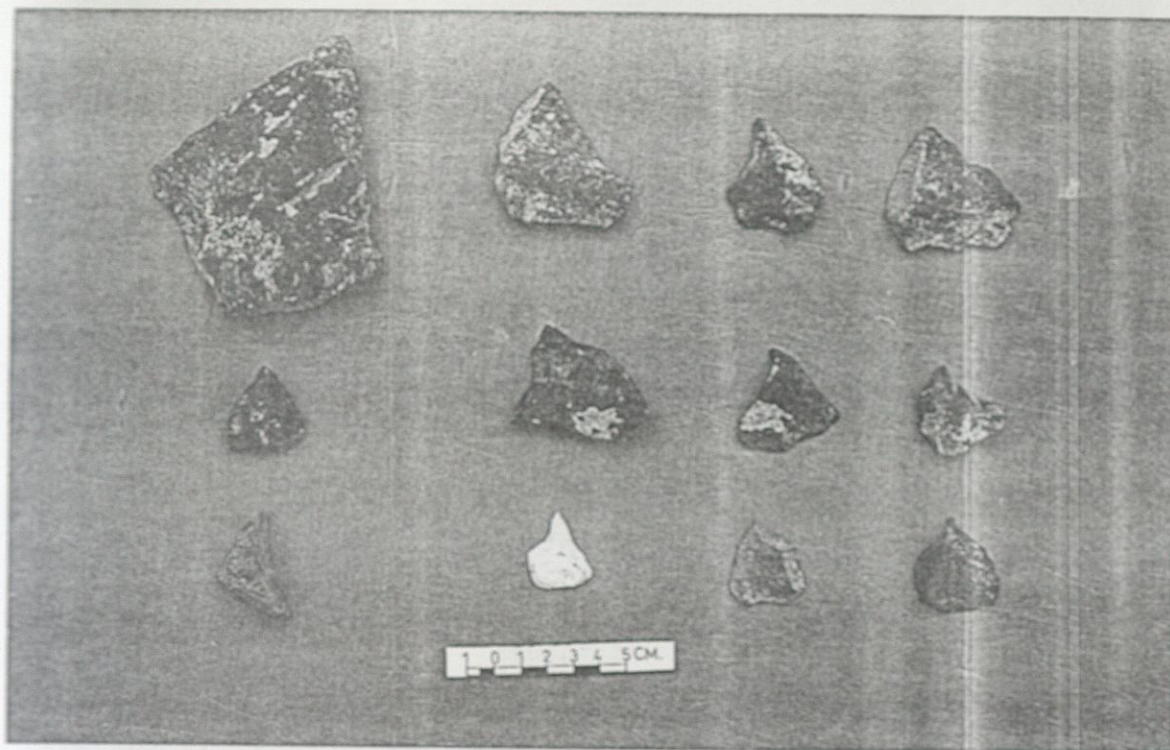
Pl. 66. Ango Gatkai layer 4: points with thinned butt ends.



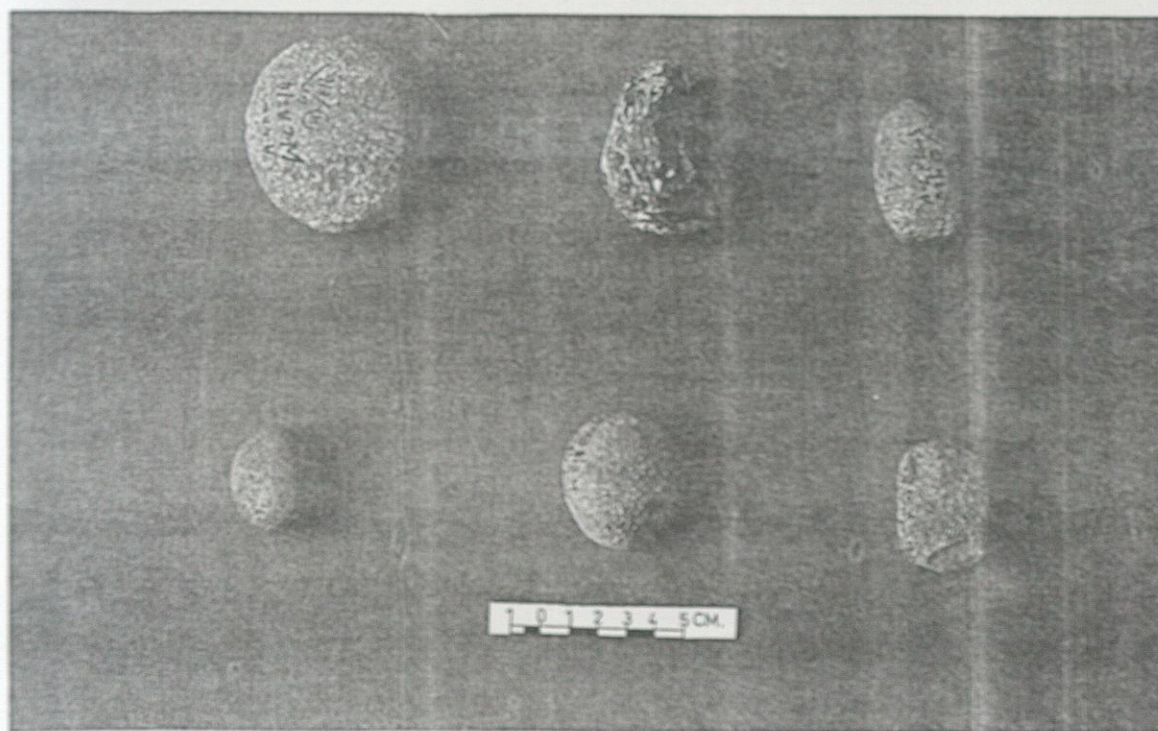
Pl. 67. Ango Gatkai layer 4: pointed flake tools.



Pl. 68. Ango Gatkai layer 4: Levallois points and scrapers.



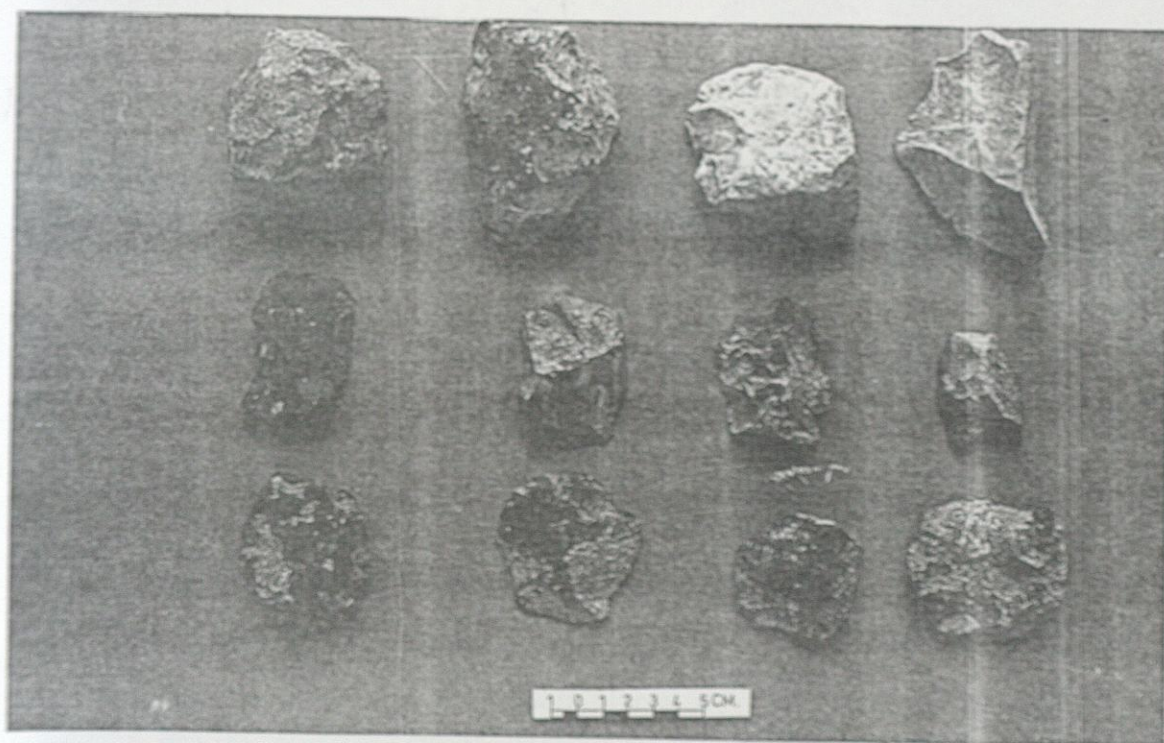
Pl. 69. Ango Gatkai layer 4: oblique scrapers with microliths.



Pl. 70. Ango Gatkai layer 4: anvils and hammer stones.



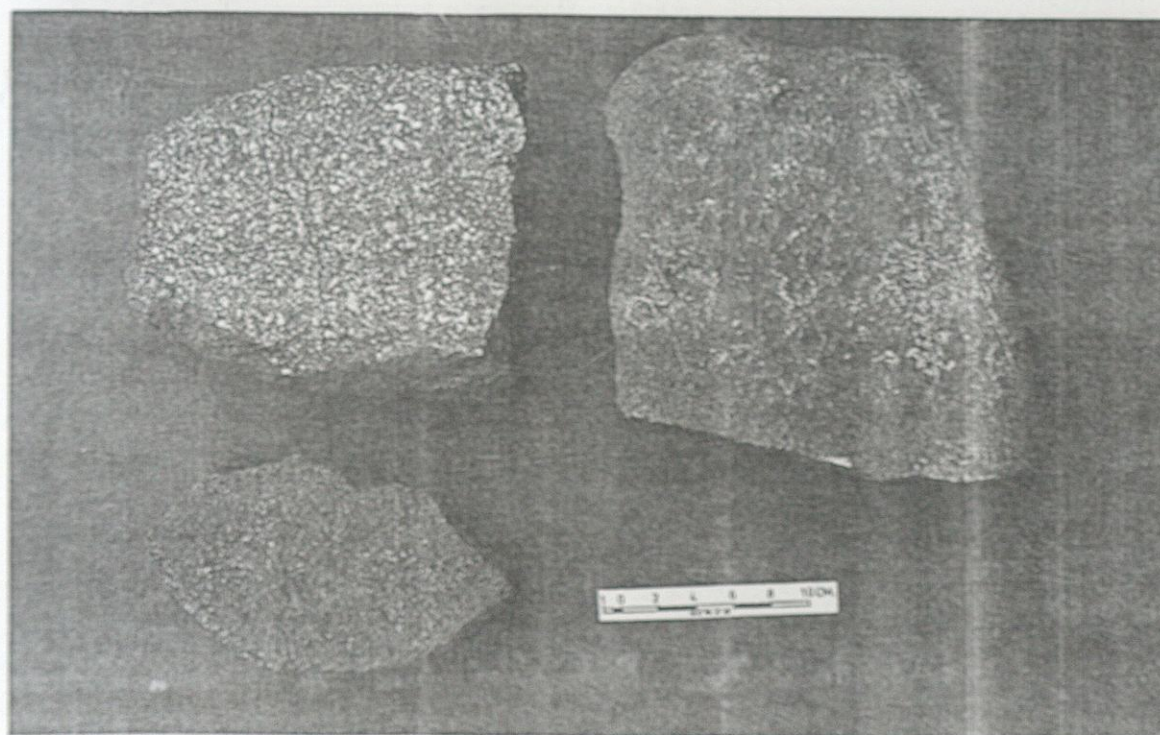
Pl. 71. Ango Gatkai layer 4: a fine awl struck from a prepared core.



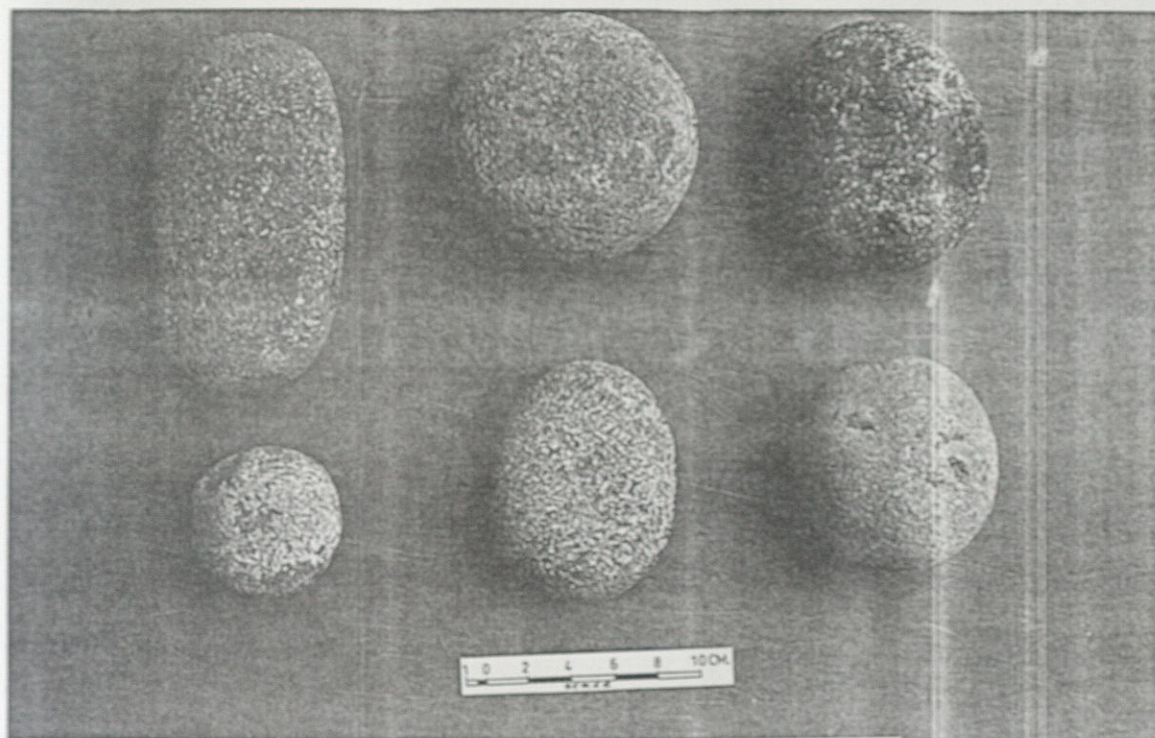
Pl. 72. Ango Gatkai layer 4: convex side scrapers, and chopping tools.



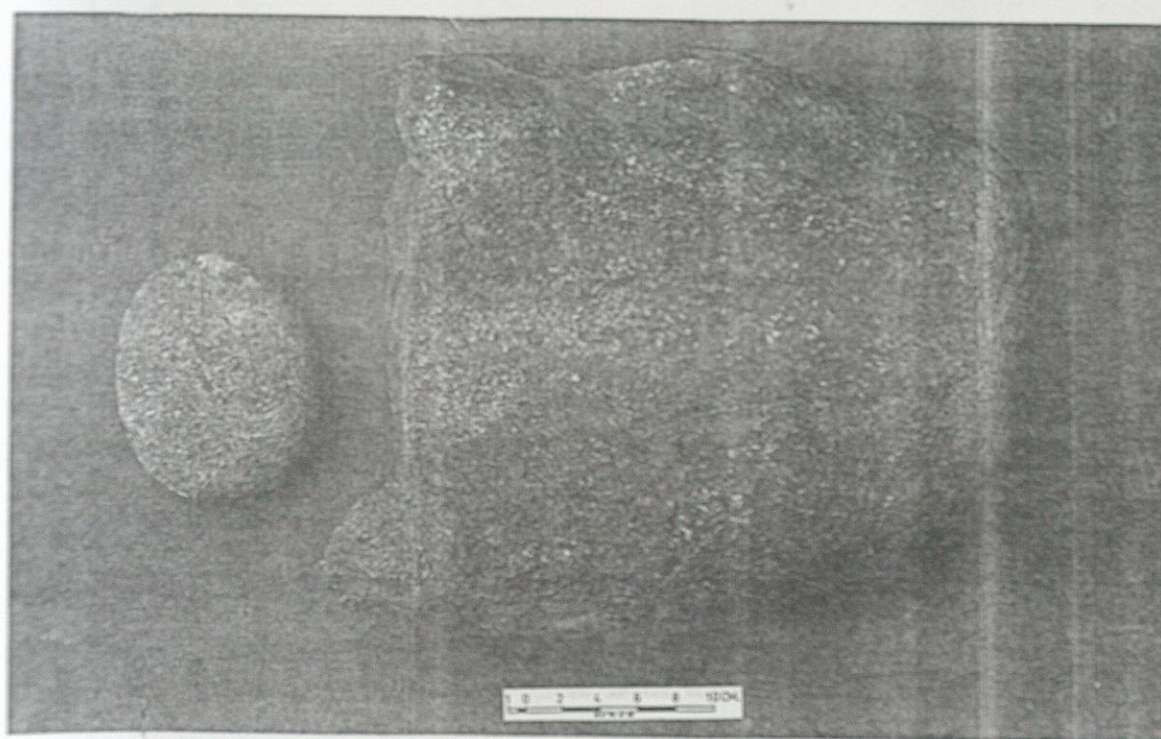
Pl. 73. Ango Gatkai layer 4: Levallois points and flakes.



Pl. 74. Ango Gatkai layer 4: anvils.



Pl. 75. Ango Gatkai layer 3: ground stone tools.



Pl. 76. Ango Gatkai layer 3: saddle quern.



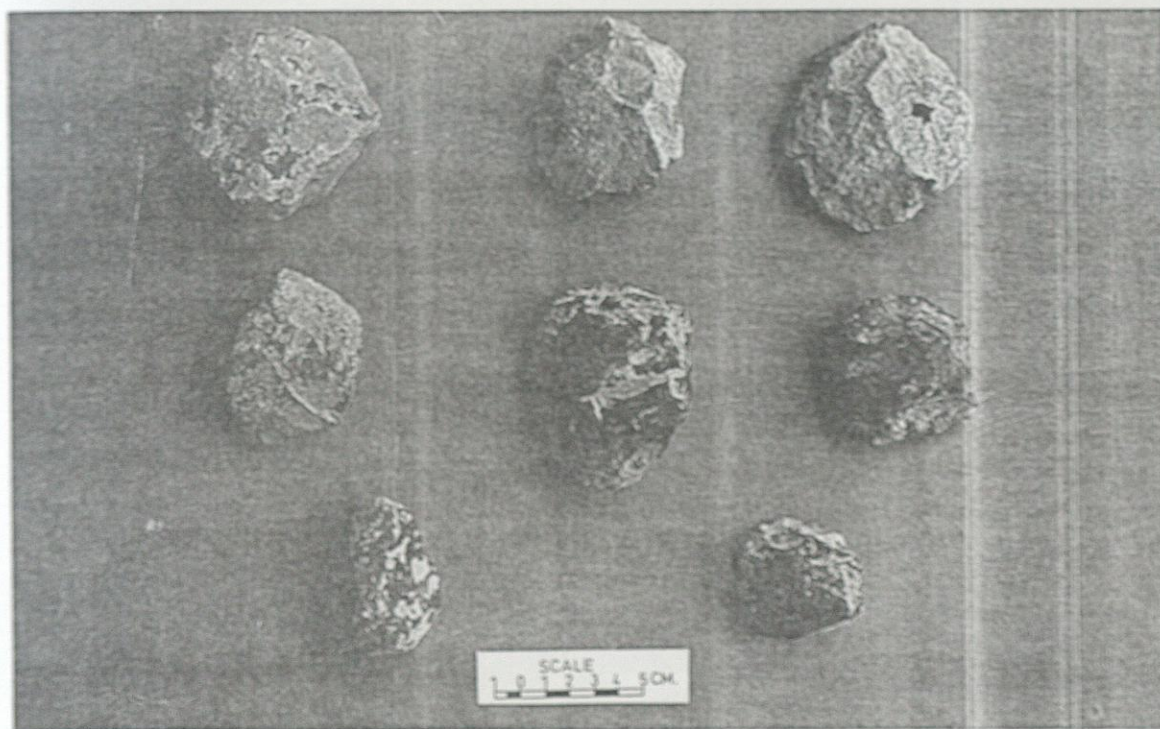
Pl. 77. Ango Gatkai layer 2: struck stones.



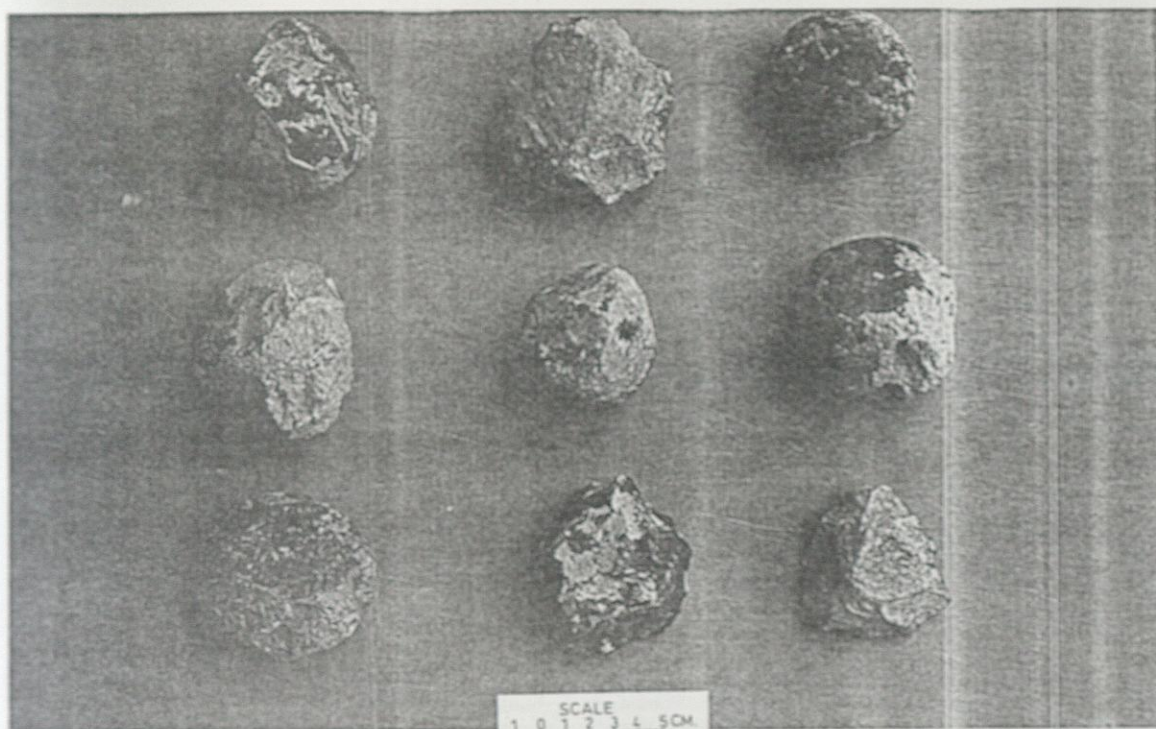
Pl. 78. Ango Gatkai layer 2: crude struck stone.



Pl. 79. Ango Gatkai layer 2: anvils with dimples.



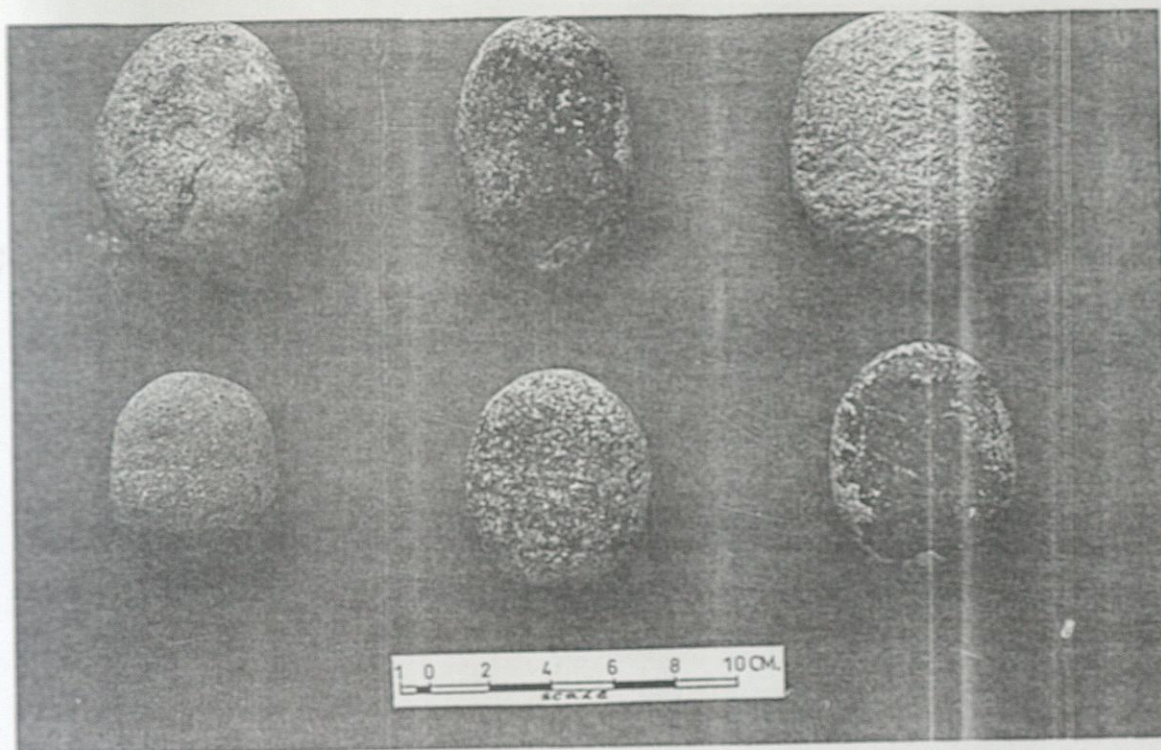
Pl. 80. Ango Gatkai layer 2: chopping tools



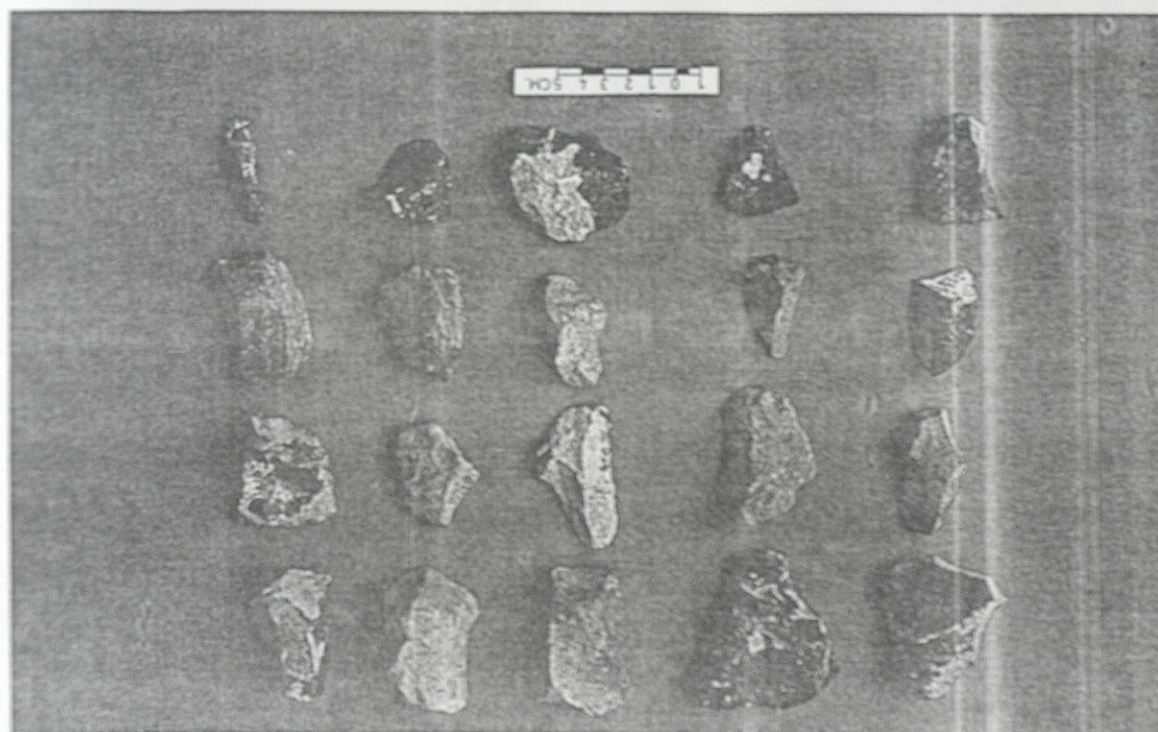
Pl. 81. Ango Gatkai layer 2: hand axes and disc type hammers.



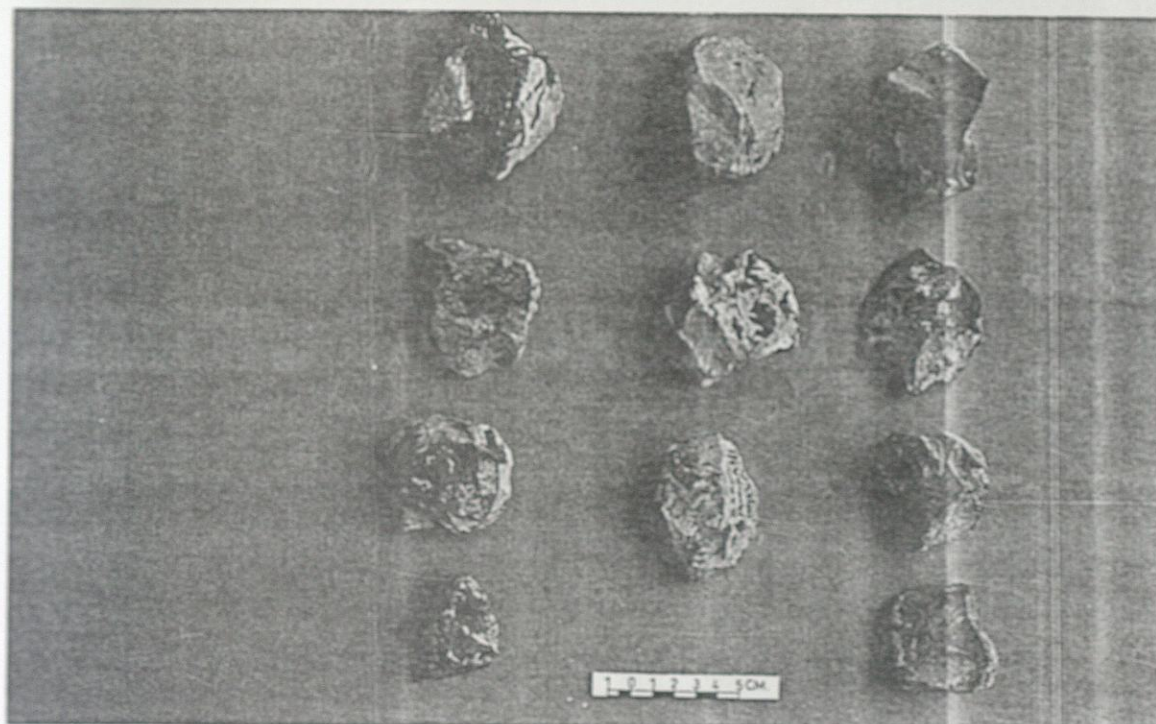
Pl. 82. Ango Gatkai layer 2: anvils with dimples scars.



Pl. 83. Ango Gatkai layer 2: ground stone.



Pl. 84. Ango Gatkai layers 1 and 2: struck stone flakes.



Pl. 85. Ango Gatkai layer 1: struck stones.



Pl. 86. Ango Gatkai layer 3: Levallois point.



Pl. 87. Ango Gatkai layer 3: Levallois points.



Pl. 88. Ango Gatkai layer 3: Levallois flake and side scrapers.



Pl. 89. Ango Gatkai layer 2: blade.



Pl. 90. Ango Gatkai layer 2: Clactonian type flake and chopper.



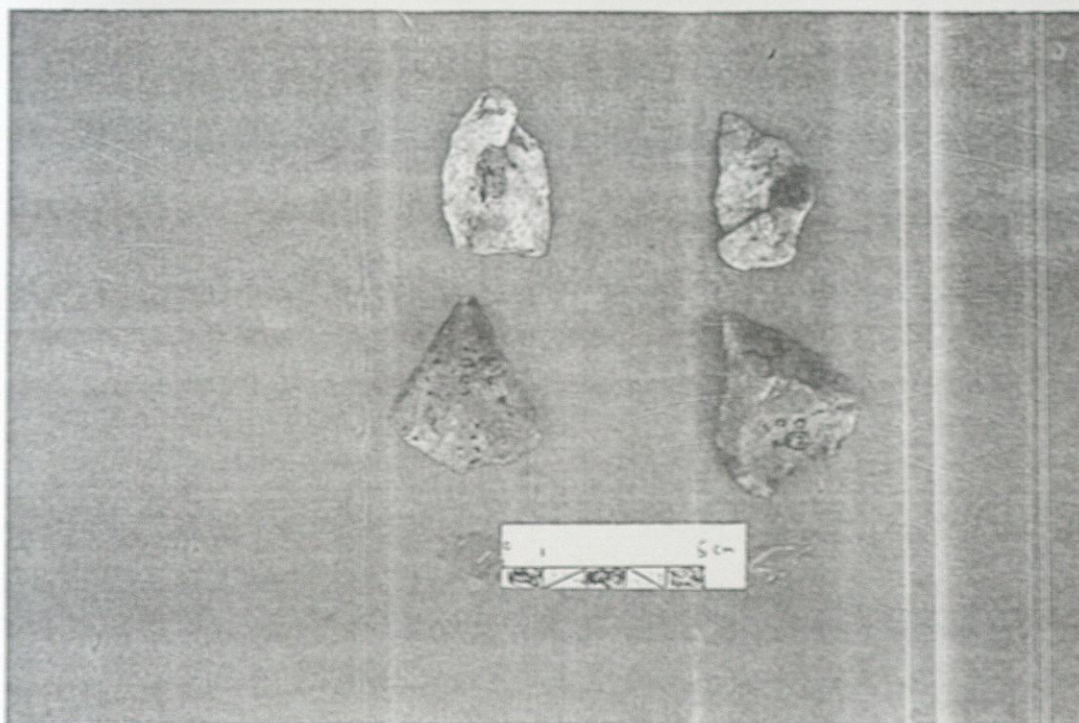
Pl. 91. Sanghao cave layer12: backed and flat blades.



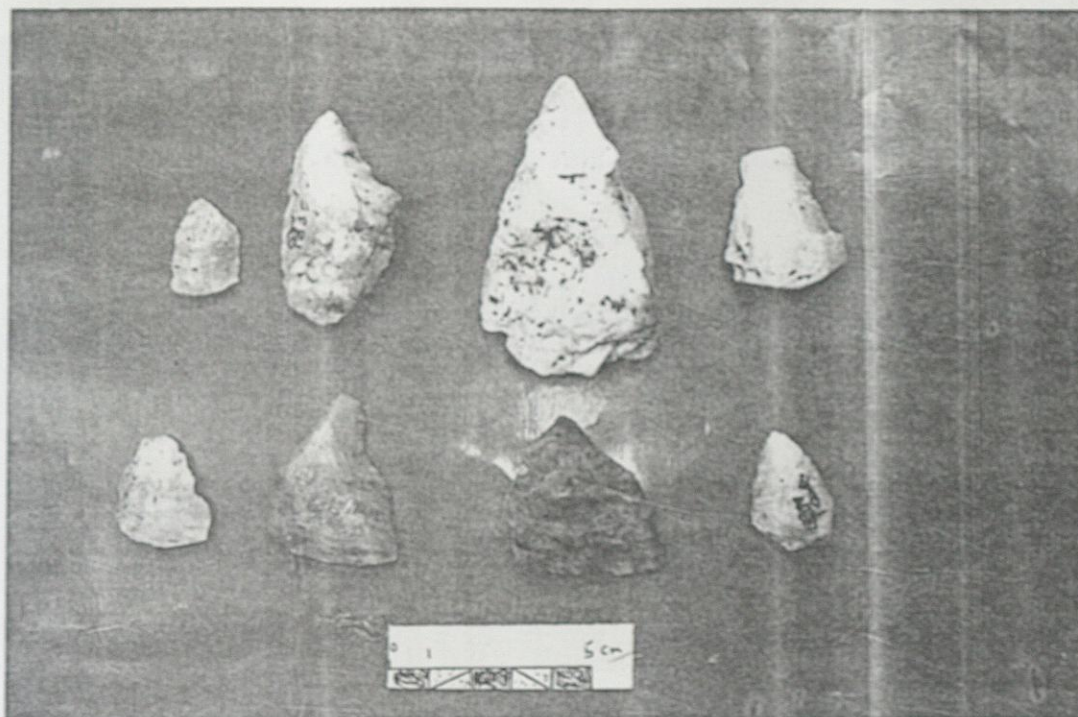
Pl. 92. Sanghao cave layer10: a hand axe, convex side scraper and 8 backed blades



Pl. 93. Sanghao cave layer 11: scrapers, points and backed blades.



Pl. 94. Sanghao cave layer 12: points and scrapers.



Pl. 95. Sanghao cavelayer12: points.



Pl. 96. Sanghao cave layer12: flake tools and canted scrapers



Pl. 97. Sanghao cave layer I I: various types of scrapers.



Pl. 98. Sanghao cave layers: a wedge, a flake and flat blades.



Pl. 99. Sanghao cave layer O3 (114): point, canted scraper, tranche, special type of



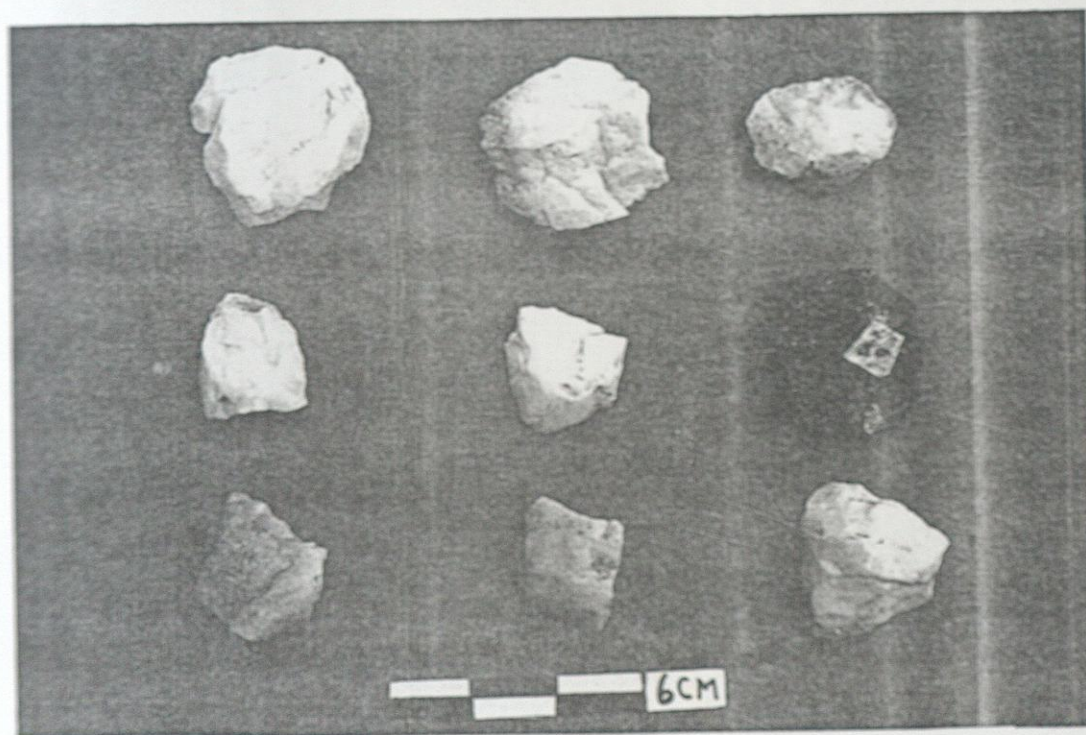
Pl. 100. Sanghao cave layer I1: points, transverse scrapers, a point with tinned base.



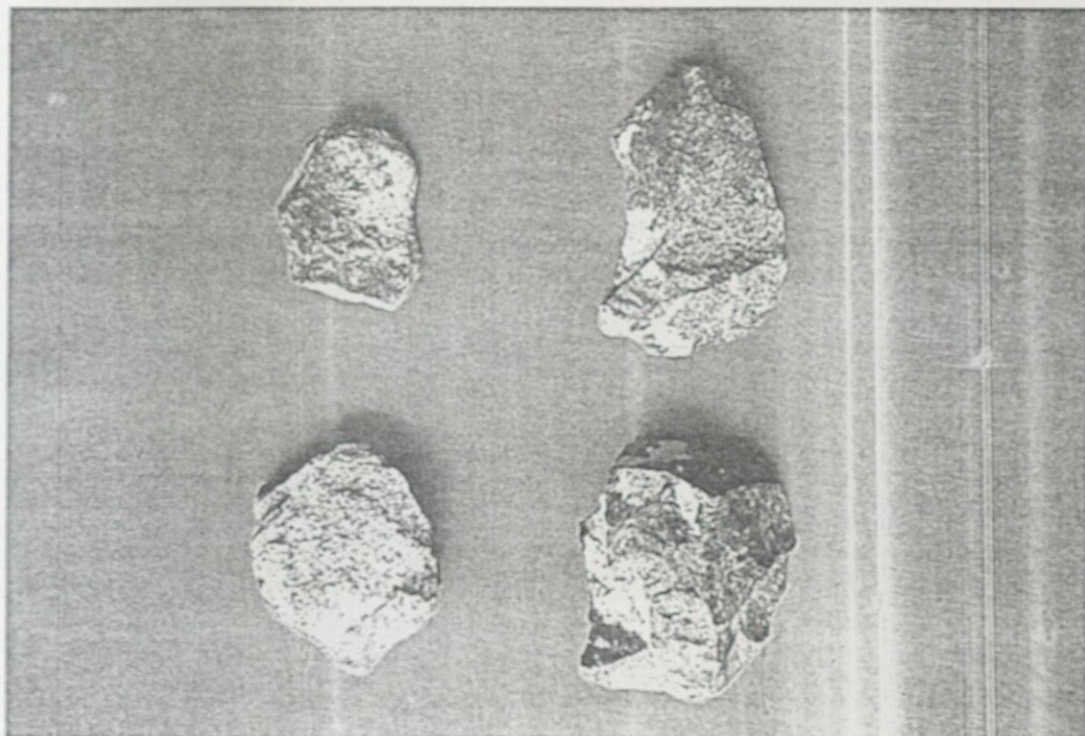
Pl. 101. Sanghao cave layer O3 (115): points, backed blades, canted scrapers, very flat blade (Ranere, 1982)



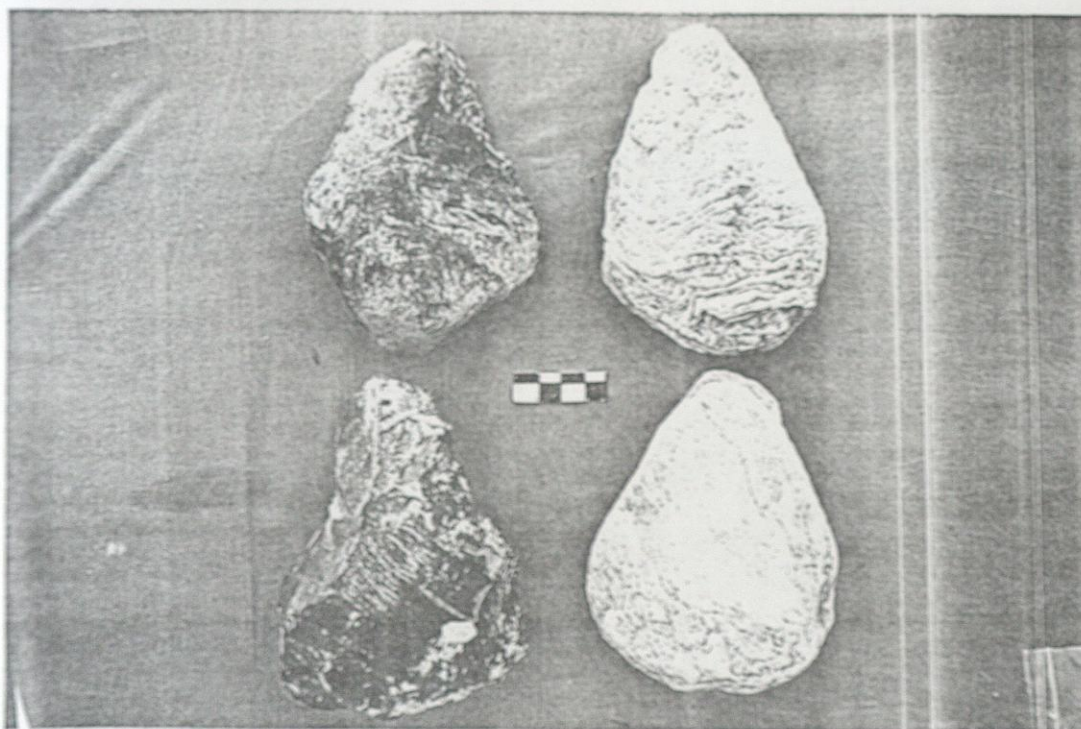
Pl. 102. Shahidano Kamar: Mousterian points, flakes and backed blades.



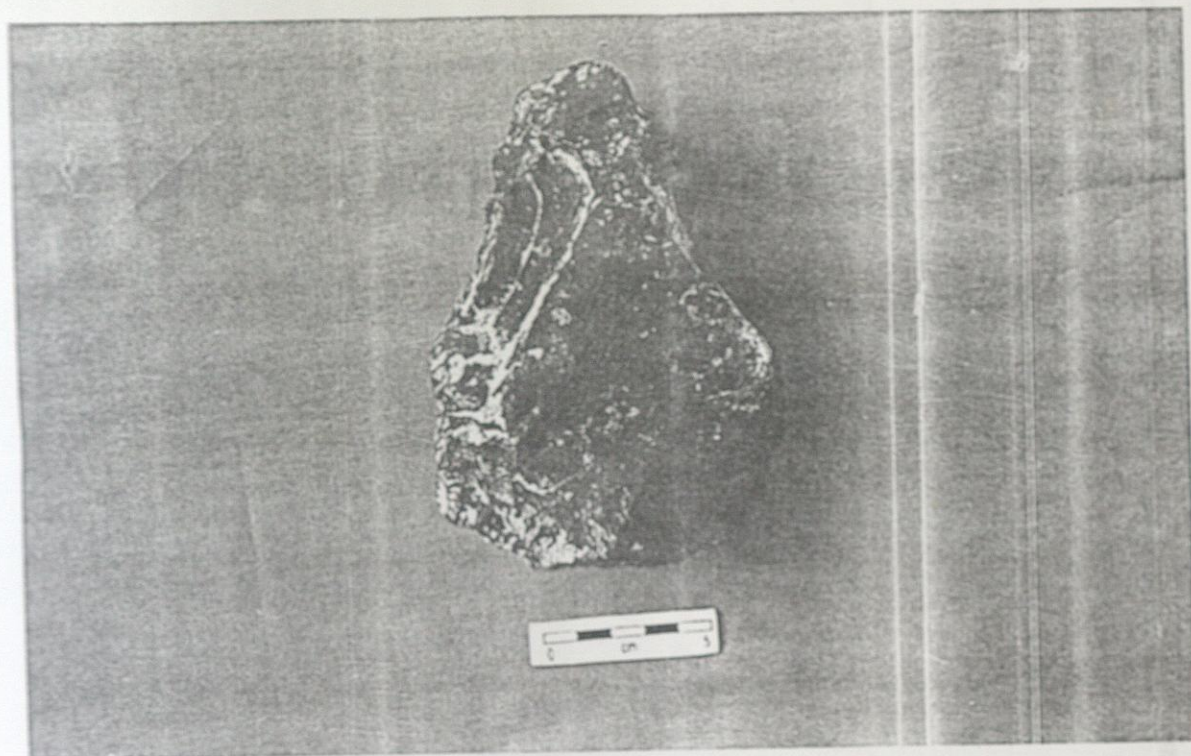
Pl. 103. Shahidano Kamar: Mousterian side scrapers made on milky quartz.



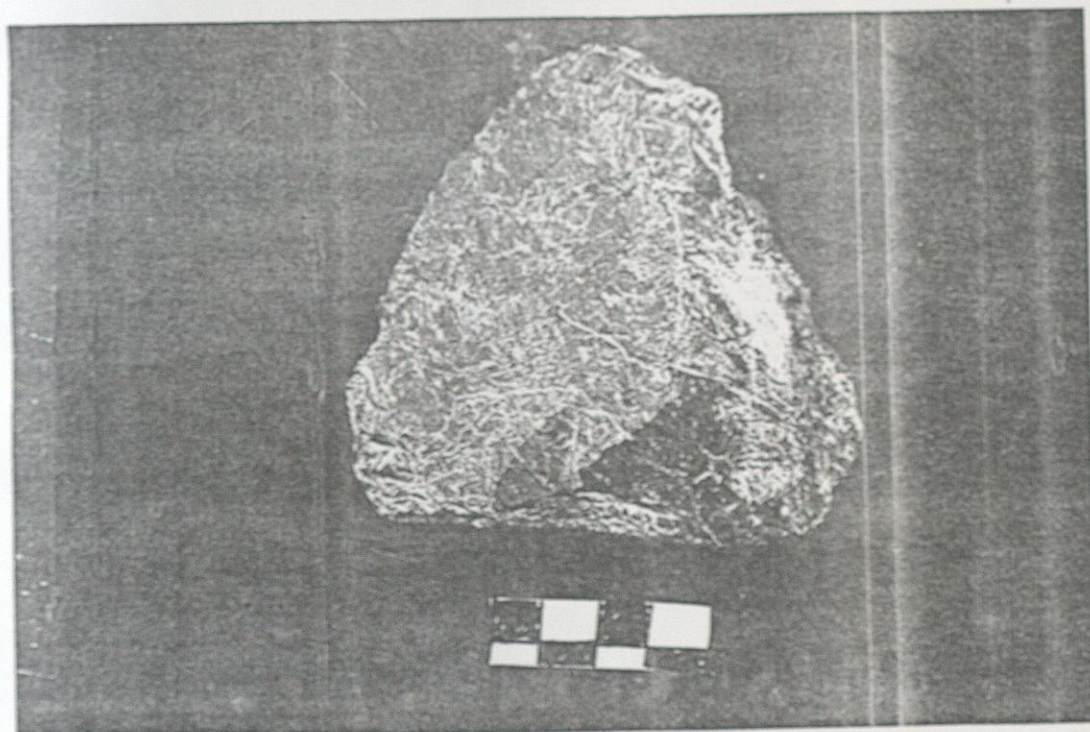
Pl. 104. Tango Nao Mousterian site: a flake chopper, beaked hand axe, and side scrapers.



Pl. 105. Acheulian type hand axes surface collection.



Pl. 106. Baba Kamar: An Acheulian hand axe



Pl. 107. Tango Nao: a large flake with inverse retouch and cortex on the dorsal surface