# Archaeological Investigations at Site IV-156 Saphar-Kharaba, KP 120, Tsalka District

**Prepared by:**
**Goderdzi Narimanishvili, Juansher Amiranashvili, Revaz Davlianidze, Bidzina Murvanidze, Nino Shanshashvili, Marine Kvachadze**
**Otar Lordkipanidze Centre of Archaeology of the Georgian National Museum**
**14, Uznadze Street**
**0102 Tbilisi, Georgia**

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**Abstract**

This report presents the results of archaeological investigations carried out in connection with the construction of the BTC and SCP Pipelines at Site IV-156 located within KP 119+350-120+600, in the vicinity of the village of Saphar-Kharaba, Tsalka District. A Late Bronze Age cemetery was found as the result of fieldwork and laboratory studies conducted by the Otar Lordkipanidze Centre of Archaeology of the Georgian National Museum in 2005-2007, under the supervision of Dr Goderdzi Narimanishvili. A total of 78 burials were excavated and 688 artefacts recovered.

Samples for anthropological, palaeozoological, palaeobotanical and pollen analysis were collected at the site and yielded important data for the reconstruction of the Late Bronze Age palaeoenvironment.

Further construction within and near the pipelines is not recommended since a number of burials remained unexcavated in and beyond the pipeline corridor. The cemetery extends further to both east and west. It is as much as 1500 m long and 700 m wide.

A number of research themes of great importance for the investigation of the way of life of the population of Trialeti in the Late Bronze Age arose in the course of the Saphar-Kharaba cemetery excavations, and after the finds had been processed in the laboratory. Some of these issues have already been were worked through, while others await further research.

The number of excavated burials provides a considerable insight into understanding Late Bronze Age burial practices. They also provide information about the economy, crafts, diet and clothing of the Late Bronze Age population. The information to hand, however, is only what we obtained from the cemetery excavations, and it would be very useful to obtain information from contemporary settlements as well in order to elucidate similarities or differences between the data derived from cemetery and settlement and eventually to fill out our picture of the Late Bronze Age way of life.

The further study of the larger picture, and the investigation of the settlement 400 metres to the north and contemporary with the Saphar-Kharaba cemetery, would be both significant and helpful.

## 1.0 Introduction

### Purpose of Excavations

The purpose of the excavations carried out by the Tsalka Archaeological Expedition under the supervision of Dr Goderdzi Narimanishvili was the investigation of a 15th-14th century BC cemetery found in connection with the construction of the BTC and SCP Pipelines. 78 burials and 688 artefacts were found in the course of fieldwork.

### Project Sponsor

Field investigations and post-excavation laboratory processing and analysis were funded by the BTC and SCP Pipeline Companies.

### Permits and Contracts

Permit No. 17, form No. 1, issued by the Archaeological Commission of the Georgian Academy of Sciences, licensed Goderdzi Narimanishvili to conduct archaeological excavations in the Tsalka District.

Contract references related the works: HL-112, HL-121, HL-139, HL-148, HL-150, HL-155, HL-163, HL-169, HL-176, HL-191, HL-195 (field work); HL-208, HL-220, HL-225, HL-237 (laboratory studies).

### Legal requirements

According to Georgian legislation the Archaeological Board of the Georgian Academy of Sciences was authorized to license any kind of archaeological work on Georgian territory. The archaeological work had to be carried out according to the requirements of the Archaeological Board.

### Dates of investigation

The archaeological investigation took place at the Saphar-Kharaba cemetery in 2003, 2004 and 2005.

Fieldwork was mainly carried out to the sides of the BTC and SCP pipelines. Since excavations were not permitted between the pipelines, the possibilities for gaining complete information were limited and had an impact on the results.

### Final disposition and repository address

The archaeological material obtained at the site IV-156 and reports of field and laboratory studies have been deposited with the Otar Lordkipanidze Centre for Archaeological Studies of the Georgian National Museum, 14 Uznadze Street, 0102 Tbilisi, Georgia,

Tel.: 995 32 952920.

The final repository of the archaeological collection will be the Depository of the Georgian National Museum; 3 Purtseladze Street, 0105 Tbilisi, Georgia, Tel.: 995 32 998541.

## 2.0 Environmental Background

Tsalka District is situated in the eastern part of the volcanic highland region of southern Georgia. Orographically, it presents a volcanic plateau. The geological structure is composed of the Neogene sedimental layers of volcanic provenance. Only the northernmost part of the area adjoining the Trialeti Ridge consists of Palaeogene and Upper Cretaceous layers of the Adjara-Trialeti system.

The hydrographic net is rather well developed. The Tsalka reservoir occupies 30-31,000 sq. m in those years when precipitation is high. The absolute benchmark for the level of this artificial lake is 1510 m. The River Ktsia flows into it from the west and the River Korsu from the east. Water drains from the reservoir through the Khrami hydroelectric station, as well as by underground arrangements for water filtering. There are many small lakes of volcanic or tectonic origin, most of which are now covered by the Tsalka reservoir. At present the largest natural lake is Bareti Lake (Bashkoi Lake), and among the smaller ones Aligeli and Imera Lakes are worth noting. The climate is mild. The average annual temperature is $6^{o}$ C. In January the temperature falls to -6-$5^{o}$ C. In July it reaches 15-$16^{o}$ C. The amplitude of temperature variability per month is 21-$21.5^{o}$ C. Annual precipitation is between 538 and 662 mm. The greatest precipitation is in May and June. Air humidity does not vary during the year and is 72-76 % on average.

The main soil type in this district is black earth. Moderately alkalized black earth spreads from the mountains to the southern slopes of the Tsalka highland region. The alpine meadow soils cover the marginal northern foothills of the Trialeti Ridge. At the bottom of the basin, near the lakes and on the banks of the River Ktsia the swamps and meadows have moist clayey soil.

Steppe fields with an abundance of cereals are a principal feature of Tsalka District. On the eastern slopes of Mount Tavkvetili sparse patches of forests survive. Oak, beech, maple, hornbeam and elm grow in these forests. Bilberry, willow and other components of highland forests occur at the edges of the forests. An artificial coniferous forest was planted in the 1960s. In Trialeti one can meet deer, jackal, wolf, badger, as well as the solitary forest cat and Caucasian lynx. Numbers of wild boar have declined considerably. Rodents such as mouse, bush vole, and hamster abound. The species of Trialeti birds include: hawk, falcon, eagle, and isolated colonies of Caucasian grouse and snowcock should be mentioned. The great quantity of rivers and lakes facilitated the spread of water-birds in this area. These include several species of duck, gull, and crane.

### 2.1 Site Location and Description

Site IV-156, the Saphar-Kharaba cemetery, is located at KP 120, 300-400 m north of the village of Saphar-Kharaba, in Tsalka District, Kvemo Kartli, on the southern slope of the Trialeti Ridge, at an altitude of 1579-1590 m above sea level (Pl. I). To the SE of the Saphar-Kharaba cemetery runs the River Chil-Chili, and the eastern part of the cemetery lies on the left bank. The terrain where the necropolis is located consists mainly of a flat field on a slight slope

### 2.2 Past Environment

The physical and geographical features of modern Georgia were established after the Palaeogene of the Cainozoic Era. The fauna, flora, climate and environment of that period differed substantially from environmental conditions that prevailed during the following Quaternary Period. For then the climate became warmer throughout the whole

of the Caucasus and particularly in Georgia. As a result, thermophilic tropical and subtropical plants grew there. The fauna was different too. Both the landscape and climatic conditions of Georgia substantially changed at the turn of the Tertiary to Quaternary Period. Changes in nature that occurred in the course of the glaciation and transglaciation periods had a serious impact on the fauna and flora. At the turn of the Middle and Upper Pliocene, the tropical climate gave way to a milder one. After the glaciation of the Wurm Epoch, the climate of Trialeti gradually changed. The climate 15,000 years ago was, however, still rather cold as was proved by the pollen spectrum in soil samples obtained from the bottom of Aligeli Lake (Tsalka District). The Tsalka plateau vegetation belonged to the Upper Alpine type, which consisted of Subnival zone components, such as lichen, lycopodium and various species of moss.

Two thousand years later the landscape became Subalpine, grains were prevalent in the vegetation, and willow appeared in the gorges. Nine thousand years ago the climate became warmer than before. In Trialeti the mountains were covered with forests, where *Quercus marcanthera* dominated. The peak of the first global warming of the Atlantic Period occurred between 6,500 and 6,000 thousand years ago. Hornbeam, maple, Georgian oak, zelkova, lime and fir grew in the Tsalka forests. Humans were actively occupied in farming, cattle-breeding and viticulture. The climate began to turn cold 5,300 years ago. The areas covered with deciduous trees grew smaller. The importance of arable farming lessened, while areas for pastures increased. Viticulture disappeared.

The second climax of the Atlantic warming took place between 5,000 and 4,600 years ago (the Early Bronze Age). The land covered with broad-leaved forests, especially with Georgian oak, again increased in area. Agriculture, horticulture and viticulture were intensively developed. This period was characterized by a great warming, which had an impact in the highland zone of southern Georgia.

The climate turned cold again 4,000-3,700 years ago, when mountain oak, birch and pine spread again. Subalpine elements appeared among the vegetation, and arable farming was completely supplanted by cattle-breeding.

There was a period of marked climate warming 3,500-3,400 years ago (the $15^{th}$-$14^{th}$ centuries BC). Oak and hornbeam forests grew mixed with lime. The development of arable farming was more intensive compared with the previous age. Horticulture and viticulture developed. This was confirmed by the palynological spectrum of the Saphar-Kharaba and Imera cemeteries.

There was a marked fall in temperature again 2,500 years ago, as is clearly indicated by the palynological spectrum of Ai-Ilia settlement. Heat-loving trees such as lime vanished, cereals were very scarce, and grapes completely disappeared. A prominent place was occupied by cattle-breeding.

The Middle Ages witnessed a significant warming of the climate. Cattle- and stock-breeding, and viticulture were intensively developed. An abundant growth of weed pollen on habitation sites indicates a great population density, and this is attested by both archaeological and historical evidence as well. Massive deforestation began at this time.

The period of the lesser glaciation, 300 years ago, was marked by growth of pine and spruce forests. Both cultivated and wild heat-loving plants became extinct from this period. It seems that it was not only enemy invasions that compelled the population to abandon this region in the $17^{th}$ century. The complete deforestation at the Tsalka plateau began from the $19^{th}$ century, when the territory in question was settled again.

## 2.3 Land Use History

In the $15^{th}$-$14^{th}$ centuries BC the area we investigated was used as a cemetery. Its history before or after is unknown. For the last hundred years the territory of Saphar-Kharaba was used as arable land. At present there are only hay meadows.

## 3.0 Cultural Background
## 3.1 Prehistoric and Historic Contexts
### Palaeolithic

Numerous Palaeolithic sites and places where relevant material has been found are known in Georgia. One zone, often termed the lower Palaeolithic habitation dissemination zone, has been recognized in eastern Georgia. The earliest lower Palaeolithic site in Kvemo Kartli, dated to the Olduvan period, or two million years ago, appears to be Dmanisi. *Homo erectus* is thought to have lived in the Olduvan period, and Dmanisi site is recognized as the earliest *Homo erectus* habitation in Europe.

Fossilized lower Palaeolithic faunal remains of the sabre-toothed tiger, the southern elephant, and horse were discovered in the villages of Imera, Beshtasheni, and Darakov in Tsalka District, and probably date to 1.5 million years ago. The discoveries at Imera and Darakov were made in connection with the BTC pipeline construction.

Lower Palaeolithic tools were made from of raw materials like andesite, basalt, flint, and obsidian. Hand axes, choppers, and scrapers made from thick flakes are diagnostic tools for this period. Some basalt Acheulean hand-axes have been identified in the village of Avranlo, Tsalka District.

The approximate time range for the Lower Palaeolithic period is between 2,000,000 and 100,000 years ago.

Around seventy-five Middle Palaeolithic (100,000-35,000 BP) and forty Upper Palaeolithic (35,000-12,000 BP) sites are known in western Georgia. Sites of this period have not been found in eastern Georgia, presumably because the environmental conditions for human habitation in this stage of the Pleistocene were inadequate. Nevertheless, tools that are diagnostic of Mousterian (Middle Palaeolithic) industry have been found distributed among several villages of Tsalka District. Some were found in places related to BTC pipeline construction such as Imera KP 110, Eli-Baba KP 116, Ai-Ilia KP123, and Santa KP129. Mousterian tools display greater variety and are more finely worked. The Mousterian is generally associated with the Neanderthals

Upper Palaeolithic habitations have produced archaeological and anthropological evidence for the appearance of a new species, namely *Homo sapiens sapiens* or Cro-Magnon, similar to modern humans. The emergence of verbal communication is also attributed to this stage of evolution. The activities of Upper Palaeolithic people took place in caves and also in open spaces. Hunting and gathering were their way of life. The variety of worked Upper Palaeolithic stone tools suggests stylistic diversity, which might indicate the presence of culturally distinct human groups.

### Mesolithic

The Mesolithic period marks the transition between Palaeolithic and Neolithic. There are around twenty Mesolithic sites in Georgia, for which dates between 12,000 and 8,000 BC have been proposed. There is more evidence for human habitation in open areas rather than in caves, a fact that is thought to be the consequence of climatic change that occurred in the final stage of the Pleistocene. Mesolithic stone industries are often distinguished by an abundance of flint and obsidian microliths; burins and fish hooks appear, but hunting and gathering is still the only life style. Mesolithic tools were recovered from all over the Ai-Ilia settlement site within ROW, at KP123.

## Neolithic

The Neolithic (8,000-6,000 BC) way of life seems to have been based on farming and livestock breeding. The cultivation of crops and the domestication of animals allowed man to settle permanently in one place, which led to the appearance of buildings and cemeteries. We see the first use of pottery and the grindstone at this period. The pottery is coarse, with a convex body and a flat base, without handles, and with applied or incised decoration. Stone was still exclusively used as a material for tools and weapons. These, however, were becoming more sophisticated and rivet holes are found on the shafts. It is usually thought that Neolithic sites are unknown in eastern Georgia, although they are known in the western part of the country. The remains of one Neolithic site have, however, been found in the village of Abelia in Kvemo Kartli (Gabunia 1981) and stone tools of a Neolithic type have been found at the Early Farming Culture settlement at KP 85. Neolithic occupation in western Georgia coincides with the beginning of Eneolithic habitations in eastern Georgia.

## Eneolithic

Eneolithic is thought of as the transitional period between the Neolithic and Bronze Age, separated from each by breaks in cultural development, within which copper came into use; hence, alternative names are the Copper Age or Chalcolithic.

Two different types of Eneolithic sites are distinguished among those found within the borders of modern Georgia. One known as west Transcaucasian is mostly to be observed in western Georgia, while the other, known as east Transcaucasian, is found in eastern Georgia as well as in Azerbaijan and Dagestan.

Some scholars distinguish two different types among east Transcaucasian Eneolithic sites, such as Shulaveri-Shomutepe (the names of sites in eastern Georgia) and Kültepe Nakhichevan-Mugani (the names of sites in Azerbaijan). Most scholars, however, believe that these sites are local variations of Eneolithic culture.

The dating of these sites has also been open to question. Some attributed the sites to the Neolithic period, others to the Eneolithic. Therefore more general term Early Farming Culture has been suggested. The Central Transcaucasian group is considered to be the earliest among them. The area of their concentration mainly lies along the middle part of the river Kura that includes southeast Georgia and west Azerbaijan.

Early Farming Cultures sites are mostly to be found in Kvemo Kartli, in the valleys of Khrami and Debeda rivers.

Habitations in Early Farming Culture settlements were densely disposed around a circular open place. Houses were circular in plan. They were built immediately on the ground without foundations. The diameter of the walls gradually decreased the higher they got, so that the shape of building was essentially ellipsoid with a dome at the top. Separate buildings were built for ceremonial purposes.

The manufacturing of household tools became a vital consideration. These were mostly made of stone, obsidian, bone, horn, or wood. Tools made of horn were used for ploughing. Obsidian tools were common. The raw materials were available locally in the quarries in the Trialeti mountains. Microliths were also made from obsidian or flint, and they are thought to be sickle blades that were once mounted in wooden or bone hafts.

A notable fact is that pollen analysis has shown that there was a wide variety of wheat, thought to be the result of the cultivation of wild cereals. Grape pips have also been recovered from some settlements, which, it as been suggested, represent a transitional stage between the wild and domesticated grape.

Eneolithic evidence such as fossil soil samples collected from the site of Arukhlo (eastern Georgia), pollen analysis, land formation, and two kinds of channels excavated in settlements suggest that the Early Farming Culture folk employed primitive irrigation techniques.

Eneolithic activity included both livestock breeding and agriculture. Pottery manufacture was also developed; vessels were handmade, and some have burnished and ornamented decoration. Early Farming Culture sites have also produced figurines of unfired clay that represent naked seated females. The purpose of such figurines is thought to be religious: that they were either objects of worship in themselves, or were votive offerings to a deity. These statuettes find parallels in figurines discovered at the north Mesopotamian sites Hasuna and Halaf.

Early Farming Culture settlements were widespread in eastern Georgia in the sixth and fifth millennia BC. They can be tied into the Mesopotamian sequence by means of similar diagnostic elements.

Late Neolithic or Eneolithic stone tools were recovered from the Ai-Ilia settlement at KP123.

**Kura-Araxis Culture**

The Early Bronze Age Kura-Araxis Culture existed in the fourth millennium BC, and came after the Eneolithic. Kura-Araxis settlements were extensive in the Kura (the Greek name for the river Mtkvari) and Araxis valleys in SE Anatolia and Transcaucasia. The earliest stages of Kura-Araxis development are characterized by a correlation of Eneolithic and Early Bronze Age activities, as is well demonstrated in pottery manufacture.

Storage pits seem to be the most prominent feature of Early Bronze Age sites in Kvemo Kartli region. Houses are rare, are poorly preserved, and are often cut into by later occupation layers. Clay and plaster fragments with impressions of wood that have been found at these sites are, however, thought to be the parts of house walls.

The later stages of this phase of cultural development are characterized by Kura-Araxis Culture settlements spread wide throughout a vast territory that included Transcaucasia, the NE Caucasus, NW Iran, and eastern Anatolia. Some of these sites appear to reflect local variants of the Kura-Araxis Culture, recognizable through building styles, burial practices, and artefact assemblages. Diagnostic Kura-Araxis pottery and the horseshoe shape hearth also reached Syria and Palestine.

Natural elevations or places next to watercourses were usually chosen for habitation purposes. In the plains, settlements were built on artificial barrows of earth or were surrounded by artificial ditches. In both cases, sites were chosen or built with safety in mind.

The style of houses is more complex. Buildings became rectangular in plan and wooden building materials were widely used. Walls and roofs were thus built of wood. In some regions stone was also used. The interior was divided into work and living sections and had earthen floors. The flat roofs were plastered on the exterior with clay, and had a

central hole for lighting and ventilation. In the middle of the living room a central column was erected. Next to it was a circular hearth.

Burials were either placed very close to settlements or they might be located some distance away, either singly or grouped together. Three types of burial can be distinguished: horseshoe-shaped tombs, pit graves and cists. The burials were both individual and collective. Most are inhumation burials, with individuals buried either prone or crouched.

The frequent recovery of agricultural tools and domesticated animal bones indicate how intense were the farming and livestock breeding activities.

The pottery has such diagnostic elements as a dark burnished exterior that is mostly black and which has a lighter, mostly pink, interior.

Technological improvement was the hallmark of the Early Bronze Age. Bronze succeeded pure copper as the principal material for tools and weapons, and at the beginning of the third millennium BC metalwork emerged as a separate branch of industry.

Early Bronze Age sites have been excavated in a number of villages in Tsalka District such as Beshtasheni, Avranlo, Bashkoi, Santa.

The Middle Bronze Age that corresponds to the third millennium BC witnessed the decay of the Kura-Araxis Culture. People moved to the highlands, with a corresponding decline in the population of the plains. This period coincides with the emergence of what is termed the Trialeti Kurgan Culture.

**Trialeti Culture**

As the name suggests, the Trialeti Culture is a term derived from the Trialeti area, where Trialeti Culture kurgans have mostly been discovered. The diagnostic elements of the culture were, however, widespread throughout eastern Georgia. The kurgans were mainly constructed in the highlands. They consisted of huge single inhumation burials beneath a barrow. A timber burial chamber might typically contain a skeleton lying on a wooden chariot accompanied by rich grave goods.

Later in the first half of the second millennium BC burials might be arranged beneath massive heaps of stone. The burial chambers too might be built from huge pieces of stone. Wooden chariots and luxury gold- and silverware would still accompany the dead. Ceremonial roads paved with cobblestones led to some of these kurgans.

Kurgans also contained a large amount of domestic animal bone, which together with the rich grave goods demonstrated the prosperity of the people who created the Trialeti Kurgan Culture.

Apart from grave goods of high artistic value made from precious metal, the kurgans also yielded stone and obsidian tools. Well-worked obsidian arrowheads and bronze weapons, mainly ceremonial axes, were recovered from earlier kurgans. Household tools were not present among the grave goods. Some diagnostic elements of the Kura-Araxis Culture were still apparent in pottery manufacturing techniques: features such as handmade black-burnished vessels. New decorative styles and shapes were, however, adopted during this period. Characteristic techniques of Trialeti Culture pottery are combing, and incised and painted herring-bone decoration. Pottery with a light slip and painted brown appears in kurgans dated to the 17th–18th centuries BC, while for kurgans of a later period painted and black ornamented pottery became the norm.

The greatest contribution of Trialeti Culture was the art of the jeweller. The gold and silver wares inlaid with coloured stones still rank as masterpieces of metalwork.
The decline of the Trialeti Culture set in at the end of the first half of the second millennium BC. Kurgans decrease in size and rich grave goods are not found any more.
Of the society that created this wealth, very little can said little, since no settlements related to these burials have come to light. This accounts for the name Trialeti *Kurgan* Culture.
Trialeti Culture kurgans and burials are known from eastern and southern parts of Georgia, e.g., Sagarejo (Pitskhelauri 2004), Dmanisi (Kakhiani 2004), Marneuli (Japaridze 1969), Tetritskaro (Tushishvili 1972), Tsalka (Kuftin 1941), Borjomi (Gambashidze 2004) and Adigeni (Japaridze 1969) Districts.
Trialeti Culture elements have been noted in burials excavated in Armenia and Azerbaijan (Kushnariova 1994).

**Late Bronze Age / Early Iron Age**

The end of the Trialeti Culture in Georgia corresponds to the middle of the second millennium BC. The succeeding Late Bronze Age-Early Iron Age lasts until the middle of the first millennium BC. A large number of archaeological sites dated to this period have been discovered in eastern Georgia. Ceremonial buildings, the remains of metal and pottery workshops, and hoards, together with settlements and cemeteries have been excavated.
This was a period that saw great technological improvement, an example of which is the widespread use of the potter's wheel. Pots made on a potter's wheel are known from the beginning of the Middle Bronze Age and the custom continued in succeeding periods. Handmade pottery is known, but is exceptional. Dark pottery with a variety of geometric patterns and decorated with burnished, grooved or incised techniques are diagnostic of this period.
Industrial improvements are most evident in metalwork. The composition of bronze changed, with arsenic and antimony gradually being replaced by imported tin. Late Bronze Age metal wares were made of alloys with many constituents. Metalwork is represented by weapons such as axes, spears, daggers, or arrows; or by jewellery such as pins, beads, finger rings, bracelets, pendants, or badges.
There is evidence for these activities at a number of Late Bronze Age sites in Tsalka District. Late Bronze Age settlements were excavated at Bareti, Eli-Baba, Santa, Gumbati, and Avranlo villages, cyclopean fortifications at Nardevani and Ozni villages and cemeteries at Darakov, Beshtasheni and Saphar-Kharaba.
Later, bronze casting gave way to iron smelting, and iron objects appear from the 16th century BC. Bronze was rapidly replaced by a more common and more efficient material, namely iron, for making tools and weapons. It did, however, continue in use alongside iron for many decorative purposes right down to the Roman and Medieval periods. One indication of this are some $8^{th}$-$7^{th}$ century BC bronze belts decorated with a great variety of incised ornament, as well as bronze cast sculpture. The dissemination of ironworking can be dated to the 12th-11th centuries BC. Objects made from iron often resemble the earlier bronze, and for this reason they are thought to have been made locally.
The development of an iron industry encouraged progress in agriculture, and this was also influenced by irrigation. The discovery of a wide range of cultivated grape pips,

curved iron knives for pruning vines, as well as wine storage jars, provide evidence of the development of winemaking.
Horse breeding rapidly developed in the second half of the second millennium BC, attested to by finds of horse gear and statues of horses wearing harness.
The development of farming and livestock breeding encouraged an increase in population. This was the period when Georgian tribes and their political alliances are first mentioned in the ancient Near Eastern written sources.
From the beginning of sixth century BC eastern Georgia was less intensively occupied, and there is evidence of large-scale disturbance at settlements of this period. Western Georgian sites of the following period by contrast enjoyed the rather different Colchian Culture.

**Iron Age / Classical Period, Hellenistic**
Archaeological evidence from the late 6th-early 4th centuries BC illustrates the decline of eastern Georgian settlements. Later finds, from the 4th-3rd centuries BC, as well as Georgian written sources, indicate progressive change. The development of the economy and of trade supported the establishment of settlements that later became towns. Towns of the Hellenistic period consisted in the main of a citadel built on a hill (Samadlo, Nastakisi, Tsikia-Gora). Complete town plans have not yet come to light. The main criteria for the discussion of the way of life of this period are derived from the burials and grave goods that have been found throughout eastern Georgia. The artefacts recovered from citadels include a considerable number of imported wares, which suggests that trade possessed an international character.
Cist burials were the norm, although pit graves have also been found. Urn burial is diagnostic of this period, but was only practiced in Kvemo and Shida Kartli. The urns were mainly laid in the ground horizontally; only rarely were they placed in a vertical position. Urn burials were made using fine-ware pots of red or buff fabric, occasionally decorated with red paint or with incised or grooved bands around the neck. Most burials contained single crouch burials, but occasionally there might be a double burial.
The great variety of grave goods included both metalwork, and plain and decorated pottery. Different shapes of pottery, such as bowls, trefoil-lipped jugs, or jars were mostly decorated with red slip or paint, as well as with black painted bands and various geometrical ornaments. Rich burials in a number of places (e.g. Akhalgori, Algeti) included large amounts of gold and silver, suggesting that they were the interments of a privileged group. This in turn indicates the nature of the social structure at the time, headed presumably by the local aristocracy.
Classical period cemeteries have been excavated in Tsalka District at Santa, Beshtasheni, and Neron-Deresi villages.
The archaeological record of this period confirms the picture we derive from the 11th century Georgian chronicle *Kartlis Tskhovreba* ("The Life of Kartli"), where the 3rd century BC was characterized by the struggle of the local aristocracy to rule the various ethnic and political groupings of the eastern Georgian tribes. All of which came to an end in the eighties when Parnavaz was proclaimed the first ruler of the kingdom of Iberia (eastern Georgia).

Judging by the archaeological record and the written sources, the establishment of Iberia or kingdom of Kartli was probably the result of the political consolidation of Georgian tribes over a long period.

There were two states named Iberia in the classical world. One was in southwest Europe, on the Pyrenean peninsula, and the other in the Caucasus, in eastern Georgia. The term Iberia was used by Greeks, and later on Roman and Byzantine authors adopted it, while Georgians called it Kartli.

## Roman Period

The end of the 1st century BC marks the beginning of Georgia's relations with Rome. Pompey conquered Iberia by following the river Mtkvari upstream, but the Roman domination of Iberia did not last very long. There was a kind of a partnership between Rome and Iberia in the first and second centuries AD that in some way supported Iberia's foreign policy. This was the period when the kingdom of Iberia flourished. The archaeological record points to part of society, namely that which played a leading role in country life, having been rich and prosperous. Rich tombs found in Armaziskhevi contained a great variety of artefacts: gold brooches, daggers, belts, diadems, bracelets, necklaces, pendants, and inscribed finger rings; silver jars, plates, and bowls, amulets, iron weapons, glass vessels, and fine ware pottery. Gold vessels decorated with precious and semi-precious stones, silver bowls and glass vessels were of high artistic value. Rich burials also were discovered in other parts of eastern Georgia (at Bori, Zguderi, the Aragvi Gorge).

The Samtavro cemetery next to the northern part of the modern city of Mtskheta contained the burials of the middle and lower classes in Iberian society. The cemetery contained of burials of several different kinds: pit graves roofed with stone slabs, tiles or bricks, cists, tile graves, and graves of brick. In some cases brick graves were roofed with tiles or stone slabs. Tile and brick graves were spread for the most part long the banks of the Mtkvari. Such graves have not been found in Kvemo Kartli, where pit graves and cist burials are the norm.

Various types of jugs, jars and bowls can be recognized among the finds. Pithoi and large pots were common, and were used for storing wine and grain.

Pottery was mostly wheel made, and was either red or buff ware, or slipped red and burnished at the same time. It might be adorned with red painted bands or geometric ornament. Glassware, mostly imported from Syria, became widespread and was an essential component of burial assemblages.

From the first century AD such essential elements of Roman civilization as Roman baths, water pipes, and sewers were normal.

This archaeological information allows us to reconstruct a picture of life in Roman period Iberia.

## Medieval Period

The collapse of the Roman Empire in the west in the late fifth century AD is generally regarded as the end of the Classical period of the ancient world. The beginning of succeeding Medieval period coincides with increased Persian political influence and with the abolition of local royal rule in eastern Georgia.

Before the start of the Medieval period, however, the Georgian Christian tradition began around 330, when St. Nino of Cappadocia (Asia Minor) spread the Gospel in eastern Georgia, and the kingdom of Iberia was converted to Christianity. This event brought about a radical change in the mentality and self-identity of the people that was to be reflected in every social and economic sphere. These changes were demonstrated in the way the state developed, in international relations, and in popular culture.

The evidence of Medieval archaeology provides confirmation of the complicated picture of Medieval Georgian history that we receive in both Georgian and non-Georgian written sources. The instability of the Georgian state, shifting foreign influences and other social or economic changes are well reflected in the archaeological record.

Medieval archaeology in Georgia down to the 13th century is divided into the Early and High Medieval periods. A great variety of Medieval archaeological sites are known in Georgia. City-fortresses, baths, industrial workshops, and irrigation channels are recorded together with rural settlements and cemeteries. Grave goods are less numerous as a consequence of Christianity, but they are still present. Inscribed artefacts are more common among Medieval finds.

In the Medieval period the feudal landowning system was established. Arable farming, cattle husbandry, viticulture, and horticulture were still the main agricultural activities. An increasingly effective range of agricultural techniques and the development of irrigation systems stimulated the Medieval economy.

Agricultural activity became more important in particular during the Early Medieval period. The Persian invasions brought about a decline of city life. Trading and handicrafts also suffered as a result of the disturbances brought on by the collapse of the Roman Empire, and the abandonment of what is termed the Silk Road (a trade route from China and India to Rome, that ran through Central Asia and the Caucasus in the Classical period). The limited amount of imported goods and foreign coins of this period found in excavations bears witness to this.

The Medieval population lived in permanent settlements, some of which were situated close to fortified cities.

In the Early Middle Ages the territory of Tsalka was densely populated. The increase in building activity is apparent in the Tsalka region in the ninth century.

Excavations in a number of other Medieval cities mentioned in Georgian historical narrative sources, such as Mtskheta, Ujarma, Urbnisi, Rustavi, and Dmanisi have produced rectangular houses built of limestone and large pebbles, with flat plastered or tiled roofs. In some cases *spolia* from the preceding Roman period were employed.

Rural settlements of the $12^{th}$-$13^{th}$ centuries excavated in Chivchavi gorge, in Tetritskaro District, produced buildings, enclosures and roads built, fenced and paved with basalt. Although the buildings consisted of several rooms employed a new method of construction, they still displayed traditions carried over from the Early Bronze Age, such as the central column erected in the middle of the principal dwelling chamber close to the hearth. The hearth in Medieval habitations was lined with stones. Other rectangular rooms were used for storing wine and grain, and as cattle-sheds. Storage pits and wine storage jars embedded in the floors of the rooms, as well as numerous animal bones bear witness to this.

Artefacts from urban and rural settlements include tiles, clay water pipes, pottery and glass, weapons, jewellery, and coins.

Medieval pottery varied in shape, and includes wine storage jars, pots of different sizes, jugs, jars, stemmed bowls, cups, and saltcellars. A considerable number of wine storage jars and large pots illustrate the development of viticulture. The presence of glaze appears to be a diagnostic element for local Medieval pottery. Glazing techniques included the application of glaze to painted or slipped vessel surfaces. Beginning in the 6th century, glazed vessels decorated with various painted ornaments and floral and zoomorphic devices are to be found throughout the entire Medieval period. There are also red plain and slipwares with occasional grooved or incised ornaments. Stemmed glazed bowls were common in the pottery of the 9th to 13th centuries.

Early Medieval glassware included local, Byzantine, Syrian, and Iranian imported tablewares and perfume vessels (*unguentaria*). Locally made glassware was almost identical to Roman period vessels. From the 7th century the number of imported glass wares decreased and locally made goods became more plentiful.

Seals, gems, and amulets made of precious or semiprecious stones have mostly been found in Mtskheta and Urbnisi. Gems were imported from Sassanian Iran and also made locally; they include gems and finger rings inscribed probably with their owner's name. Precious metal, glass, jewellery, and perfume vessels were also found, some of high artistic quality and fine specimens of the Early Medieval jeweller's repertoire.

A great variety of foreign and local coins have provided evidence for both the internal and external economy of the country. In the Early Medieval period the main international currency used both in eastern and western Georgia seem to have been gold and silver Byzantine coins. From the sixth century Sassanian Iran drachms are found as well, but later they are replaced by Mongol coins of the 11th-13th centuries, which existed side-by-side with Georgian currency.

Further evidence for the high level of craftsmanship and of industrial progress in general in Medieval eastern Georgia is to be found among the large quantity of locally made objects (pottery, glass, gems), as well as the kilns and workshops found in Mtskheta. A tombstone of the 3rd or 4th century with a Greek inscription from Mtskheta, attests to the existence there of the post of head of architects and artists.

Medieval cemeteries have been found throughout eastern Georgia. Three types of burials are known in this period: cists, pit graves frequently roofed with stone slabs, and clay sarcophagi. Burials are often collective. Individuals were mostly laid extended on their backs, although in some cases they were deposited in a crouch position. Mostly personal objects were recovered from Medieval period burials, although metal weapons also occur.

The 12th and 13th centuries witnessed a flowering of Georgian culture in both town and country. The Nadarbazevi royal residence, and the churches at Phitareti, Gudarekhi and Manglisi were built then. Glazed vessels, gold and glass jewellery found in both urban and rural sites show that the country was developing equally well at both centre and periphery.

The Mongol invasions devastated Georgia from the second half of 13th century until the 15th century. In one area of Kvemo Kartli region alone, in the Chivchavi and Khrami Gorges (modern Tetritskaro District) more than 200 villages are known to have been practically wiped out by Mongol incursions, few of them to recover.

Between the 15th and 17th centuries Georgia was subject to invasion from both the Ottoman Empire and Iran, and fell under their strong political and cultural influence.

From the 13th century until the end of the Medieval period, Georgia experienced internal fragmentation and decline.

**Post Medieval**

Continual invasions by various enemies from the Late Middle Ages onwards led to Trialeti gradually becoming deserted, and by the beginning of the 19th century it seems to have been nearly completely abandoned.

In the 19th century Georgia was conquered by Russia. Local royal rule came to an end and Georgia became one of the provinces of Russia.

The unification of Georgia with Russia also brought about changes in Tsalka region, namely, after each war between Russia and Turkey from 1829 onwards, there was an active migration of Greeks and Armenians from Turkey to Tsalka.

**Modern Period**

In 1918 Georgia was established as an independent state, but only survived as such for a few years, before the Soviet occupation in the early 1920's. The Soviet Union developed an entirely new kind of economy that relied on the interdependence of Soviet states. The effects can still be seen in modern Georgia. A number of agricultural and industrial enterprises were developed in several districts of Kvemo Kartli.

There were population movements in the Tsalka region in the modern period. Since the 1990's, the Greek residents of Tsalka District are returning to their historical homeland, Greece, and people from the mountainous regions of Georgia, who had been displaced due to natural disasters, are settling this region.

Despite numerous incursions from abroad during and after the Middle Ages, Georgia has retained its identity as a Christian nation and created an indigenous art and architecture that is widely regarded as one of the main Georgian contributions to the world.

## 3.2 Summary of Previous Research

Archaeological investigations carried out in and around the Saphar-Kharaba cemetery have a long history. The sites identified and investigated within a one kilometre radius of Site IV-156 Saphar-Kharaba cemetery are presented below in Table 1.

**Table 1** Archaeological sites within 1 km of site IV-156

| Site ID | Site Type | Time Period | Date of Excavation | Associated Publication/Report |
|---|---|---|---|---|
| Beshtasheni | Settlement; cemetery | Hellenistic | 1990 | Archaeological Excavations Undertaken 1989-1992, 2004 |
| Beshtasheni | Cyclopean settlement; cemetery | Bronze Age | 1939; 1991-1993 | В.А. Куфтин, Археологические раскопки в Триалети, 1941; Archaeological Excavations Undertaken 1989-1992, 2004 |
| Saphar-Kharaba | Cemetery | Medieval | 1896 | Е.Такаишвили 1898 |
| Saphar-Kharaba | Cemetery | Bronze Age | 1993 | Narimanishvili. G., Report of Archaeological Investigations in 1993, 2004 |
| Beshtasheni | Kurgan | Bronze Age | 1938 | Д. Жоржикашвили, Э. Гогадзе, Памятники Триалети Эпохи ранней и средней бронзы, Тб. 1974 г |
| Eli-Baba | Stone Cross | Medieval | | Narimanishvili. G., Report of Archaeological Investigations in 1993, 2004 |
| Eli-Baba | Cemetery I | Bronze Age | | Narimanishvili. G., Report of the Investigations Conducted at Eli-Baba Cemetery in 2004 |
| Eli-Baba | Cemetery II | Bronze Age | | Narimanishvili. G., Report of the Investigations Conducted at Eli-Baba Cemetery in 2004 |
| Eli-Baba | Cyclopean settlement | Late Bronze Age | 1990-1998 | Archaeological Excavations Undertaken 1989-1992, 2004 |
| Knole | Cyclopean Fortification | Iron Age | 1990 | Archaeological Excavations Undertaken 1989-1992, 2004 |
| Knole | Kurgan | Early Bronze Age | 1940 | Д. Жоржикашвили, Э. Гогадзе, Памятники Триалети Эпохи ранней и средней бронзы, Тб. 1974 г |

## 4.0 Methodology

### 4.1 Field Methods

Initially, the dimensions of the investigated area were determined, and the piles of burial stone in the area were marked off with tape. A grid layout was generated and all the stone piles were recorded on it. Then a topographical map was created, and correlated with a grid made in 2003.

The investigated area was divided into more than 200 plots, each measuring 18 x 24 m. The parts with concentrations of burials were divided into smaller squares, measuring 6 x 6 m, 2 x 2 m or 1 x 1 m.

Forty-five trial trenches were dug, some of which were oriented E-W, while others were aligned N-S.

In order to reveal the piles of stone, a layer 0.20 m thick was removed. In the burial cavities layers 0.05-0.10 m thick layers were carefully removed by hand using knives. The bottoms of the burials and the skeletons were cleaned with knives, scalpels, and brushes. The layers were numbered from the top downwards.

Our architect made plans using a theodolite, recording the relief, the plot grid, and relating everything to a datum point outside the site. During the excavation, each plot had a substitute datum point in addition to the basic datum point. Since the area to be investigated was extensive, it was divided into three sections. Maps were made of each section.

Architectural drawings, plans and stratigraphical sections were made of each burial. Drawings on a scale of 1:20 were made before and after the tombs were opened, while drawings on a scale of 1:10 or 1:5 were made of the floors of the tomb chambers.

Artefacts were selected, numbered according to their place of discovery, labelled and wrapped.

Undiagnostic ceramic material was selected and buried in a specially dug pit beyond the borders of the pipeline corridor, and which was marked on the plan. A photographic and video record was made of the various stages of the excavation.

Samples for anthropological, palaeozoological and pollen analysis were collected from the cemetery.

### 4.2 Laboratory Methods

Artefacts were grouped by grave. Some of them were relabelled. Ceramic artefacts were cleaned with a brush and washed in diluted hydrochloric acid. The artefacts were prepared for restoration, but only a selection was actually restored.

Each artefact was recorded, described and catalogued, then labelled and placed in a plastic bag. Palaeoanthropological, palaeozoological, palaeobotanical studies, chemical and technological analyses of metal, as well as restoration and conservation of some of the metal and ceramic objects were carried out. Detailed descriptions of the methods employed are given in the attached interdisciplinary reports. Electronic and hard-copy versions of the documentation relating to field and laboratory studies are deposited with the Otar Lordkipanidze Centre for Archaeological Studies of the Georgian National Museum.

## 5.0 Results

### 5.1 Basic Data Summary

The Saphar-Kharaba cemetery was spread over an area that measured 900,000 (1500 x 500-600m) sq. m. (Pl. III). In 2003-2004, an area measuring 50,908 sq. m (1157 x 44 m) was excavated, and in 2005 an area of 23,140 sq. m (1157 x 20 m). In 2003, six trial trenches, measuring 450 m in total length and 2 m in width, were dug in the middle of KP 119+500 – 120+200.

In 2005, 38 trial trenches were dug at the same place for revision purposes. The total length of the trenches was 290 m, and their width 2 m. In 2005, at KP 120+200 three trial trenches were dug, 240 m long and 2 m wide.

Six trial trenches were dug in the middle of KP 120+200 – 120+500, 210 m long and 2 m in width.

In 2005, a total of 41 trial trenches were dug. Their combined length was 530 m, and their width was 2 m.

A total of 1190 m of trenches, all 2m wide, were dug at the cemetery in 2003-2005 when 122 burials were found. Of these 78 were excavated in 2005. On the route of the pipeline corridor, between the oil and gas pipelines, 16 additional burials were identified but they were left undisturbed because the expedition had no chance to investigate them. 1589 objects were found in the cemetery, of which 198 were clay vessels, 13 metal items, and 1295 personal ornaments.

For palynological studies 769 soil samples were collected, of which only 72 were processed.

The Saphar-Kharaba cemetery represents a one-level site. However, sherds of Mediaeval clay vessels were found both in heaps of earth in the vicinity and at the cemetery itself (Pl. IV, 1,2).

### 5.2 Features

In 2005 91 burials were identified at the Saphar-Kharaba necropolis (Nos. 32-122). Of these, 78 were excavated, while 13 (Nos. 46, 57, 58, 60, 65, 66, 70, 102, 111-115) were left unstudied, since they were located beyond the borders of the pipeline corridor. All the burials excavated at the Saphar-Kharaba cemetery were, with one exception, individual pit-graves.

The construction of the burials was typically as follows: a quadrangular burial chamber (2.0 x 1.2 m) cut into clay loam was covered with basalt slabs or wooden beams (Pl. VI, 1, 2; Pl. IX, 1, 2). Above the stone or wooden roofing, there were piles of large basalt rocks and cobblestones. These stone piles were round in shape. Their lower parts consisted of small cobblestones, while their upper parts were composed of large basalt rocks (Pl. V, 2). The diameters of the stone piles ranged between four and 18 m and were as a rule larger than the burial chambers (Pl. V, 1). Some burials were also excavated that just had piles of stone over the tomb chambers.

One burial was exceptional in having two chambers (Nos. 67, 68). These were covered with an ordinary pile of stones (Pl. VII, 1, 2). In burial No. 67 a young woman was buried, while four children of various ages were found in burial No. 68 (Pl. VIII, 1,2; XIV, 1).

Of 78 burials excavated at the cemetery only one, burial No. 90, was remarkable for its size and ceremonial aspect. It was 4.5 m long and the deceased lay on a rectangular wooden bier, with figured handles and lugs (Pl. X, 1, 2).

The burial chambers generally lay north to south, though there were a few minor departures from this rule. The deceased lay in a crouched position on their sides with their heads at the north end. (Pls. XI, 1; XII, 1, 2; XIII, 1, 2).

In most cases, the bones of the deceased were covered with a uniform black solid mass 0.2-0.4 m thick and containing many remains of wood. The same material lay beneath the skeleton as well. (Pl. XIV, 1, 2).

The disposition of the grave goods was typically as follows: each burial contained between one and eight clay vessels, mostly placed in the northern part of the burial, behind the head. Weapons were placed in front of the head. Bronze pins were located in the area of the neck, while beads and pendants were found in the chest area. Strings of cornelian beads occurred both at the wrists and feet.

The remains of bones of cattle and small livestock were discovered in all the burials (Pl. XVI-2), placed on the floor. In some burials (e.g. No. 90) the complete skeleton of a goat or a sheep might be found Pl. XVII-1) with unworked obsidian flakes placed in the area of its neck. Some cattle bone remains were found inside some vessels as well (Pl. XVII-2). A noteworthy feature was the presence of ritual pits near some of the burials. These were located north of the burials and were dug next to their stone piles. They ranged in size between 0.4 x 0.5 m and 0.6 x 0.8 m. Some of them were covered with stone slabs or piles of small stones. Perhaps three or even five clay vessels might be in the pits. Some contained the bones of cattle and were covered with stone lids (Pl. XVIII – 1, 2).

## 5.3 Artefacts

During the fieldwork conducted at Saphar-Kharaba cemetery in 2005, 688 artefacts were recovered. They are classified by material and function in Tables 2 and 3 below:

**Table 2 Artefacts classified by material**

| Artefact | Cemetery Context | Out of Context | Total |
|---|---|---|---|
| Pottery | | | **372** |
| Metal | | | |
| Bronze | | | 9 |
| Gold | | | 5 |
| Iron | | | 2 |
| Total | | | **16** |
| Lithics | | | |
| Obsidian | | | 218 |
| Andesite | | | 4 |
| Basalt | | | 2 |
| Flint | | | 14 |
| Sandstone | | | 1 |
| Undetermined Stone | | | 8 |
| Semiprecious Stone | | | 22 |
| **Total** | | | **269** |
| Glass | | | **11** |
| Paste | | | **20** |
| **Total** | | | **688** |

**Table 3 Artefacts classified by function**

| Artefacts | Cemetery Context | Out of Context | Total |
|---|---|---|---|
| Household Vessel | | | |
| Kitchenware | | | |
| Tableware | | | |
| Household Tool | | | |
| Armament | | | |
| Jewellery | | | |
| Insignia | | | |
| Undetermined | | | |
| **Total** | | | **688** |

The largest category among the grave goods were the numerous and varied ceramic vessels which, judging by their shapes and contents, had a domestic function. Many vessels contained cattle bones and other food remains. In addition, the vessels had traces of fire on their external surfaces.

All this helps to define their functions. Among domestic items tableware and kitchenware were identified.

According to manufacturing technique, the pottery could be divided into three groups:

- Fine ware, wheel made, fired black
- Coarse ware, wheel made, fabric fired black inside, brownish-grey on the surface
- Coarse ware, hand made, fired unevenly

Nine shapes of pottery could be distinguished at Saphar-Kharaba cemetery:

- Large pot (*dergi*) (Plate XXI-7, XXII-1, 2, 3, 4, 6, 7)
- Pot (*kotani*) (Plate XXI-5)
- Jar *(kila*) (Plate XXIV-1, 4, 7, 8; XXIII-1, 2, 3, 4, 5, 7)
- Small pot (*kochobi)* (Plate XXIV-2, 3, 5; XXIII-6, 8, 9, 10, 11, 12)
- Cup (*sasmisi) (*Plate XXIV-6, 10)
- Jug (*doki)* (Plate XXII-5; XXIV-9)
- Basin (*badia)* (Plate XXV-1,2,3,4,5,6,7,9,10,11,12,13,15)
- Strainer (Plate XXV-8)
- Pan (*kvabi*) (Plate XXV-14)

All vessels were handless and had flat bases. The exception was a stemmed incurved cup (Plate XXIV-10).

The following types were distinguished by shape:

- Out-turned, cylindrical (Plate XXIV-6)
- Tall-necked (Plate XXIII-1, 2, 3, 4, 5)
- Low-necked (Plate XXIII-7)
- With shoulders (Plates XIX, 2, 3, 6; XX, 3; XXI, 3, 4)
- With spherical belly (Plates XIX, 1, 5, 7; XX, 7; XXI, 1, 2, 6)
- With spherical body (Plate XX, 6)
- With biconical body (Plate XXIV-8)

Pottery was also classified by the proportion of one part to another, and the following types were distinguished:

- Equal height and body diameter (Plate XX, 4)
- Height less than body diameter (Plates XIX, 4,8; XX, 1,7)
- Height exceeding body diameter (Plate XXII, 2, 3)
- Equal neck and mouth diameter (Plate XXIII-5)
- Mouth diameter less than neck diameter (Plate XXIII-3, 4)
- Mouth diameter exceeding neck diameter (Plate XXIII-1, 2)

As for the surface treatment, the vessels had both plain and polished surfaces. Their decoration varied. The necks of some specimens were decorated with vertical polished lines and relief bands (Plate XXIV-1). The shoulders of some other specimens had a netlike pattern composed of polished lines, as well as broad, engraved bands on their bellies (Plate XXIV-4). Some vessels were decorated only with incised and relief bands. Similar incised ornament frequently occurred on the base as well (Plates XIX, 1, 5; XX, 2; XXI, 3, 4).

Tools, jewellery, and insignia were made of metal, stone, glass and paste.

Armaments consisted of a short bronze dagger and arrowheads of obsidian and flint found in burial 85 (Plates. XXVI, 5; XXVII, 1-30). The same burial yielded a bronze decorative element with remains of wood in the shaft (Plate XXVI, 6).

A great number of beads made of paste, sard, agate and glass were recovered from the burials. Some of them were also made of bronze and gold.

Four cylinder seals decorated with geometric devices were recovered from burials 38, 40, 56, 73 (Plate XXVIII, 4, 5, 6, 7).

## 6.0 Interpretation

We found an overall picture of homogeneity in design and construction, in localization and orientation, and in grave interiors and funeral rites at the Saphar-Kharaba necropolis.

There were only a few exceptions. For example, the size and burial style of burial No. 90 differed from the rest. The black solid mass containing remains of wood found in burial chambers Nos. 39 and 56 might indicate an atypical funerary practice, for example a wooden construction covered with leather inside the burial chamber, which in the course of time may have turned into such a mass after its roof collapsed onto it. A similar phenomenon was attested in Armenia, at the Late Bronze Age Artik necropolis, where a black accumulation containing the remains of wood and textile was found beneath the skeleton (Khachatrian, 1975, 1979). The bronze mace head discovered in burial No. 85 was another distinctive feature. These, however, were solitary cases, and are not sufficient to allow generalizations or conclusions to be drawn.

The burials were mostly located far from each other, with exception of some places where there were distinct concentrations. At this stage, given the lack of information, no conclusions could be drawn. In one section, however, where several smaller graves surrounded a burial of notable size and shape, we might speculate that the head and other members of a family were buried in a group of separate burials.

The artefacts excavated at the Saphar-Kharaba necropolis could be divided into local and imported products. Pottery was of local production, although the closest counterparts of one stemmed cup are to be found in northern Iran, southern Turkmenistan and northern Afghanistan (Stankevich 1978).

Imported products were Mitanian cylinder seals decorated with geometric ornaments, glass beads, and eye-beads. Biconical beads marvered with white or red paste were widespread in NE Iran (Tepe Hissar III), southern Turkmenistan (Murghabi basin) in the Namazga VI period and in Northern Afghanistan (Mundigak). The discovery in Trialeti of Near Eastern imports, materials and artefacts similar to those from southern regions of the Caspian Sea serves as a proof that cultural contacts existed between these regions.

With rare exceptions the Saphar-Kharaba ceramics were wheel made. Ornament of the kind characteristic of Middle Bronze Age pottery was not present; rather, Late Bronze Age decoration was featured. To the same period belong parallels for the footed cup.

It was possible on the basis of an analysis of the objects found at Saphar-Kharaba, to conclude that the necropolis was dated to between the 15$^{th}$ and mid-14$^{th}$ century BC, corresponding to the second phase of the Late Bronze Age.

Archaeological studies carried out at the Saphar-Kharaba (Baiburti) necropolis belong within a long tradition. Many scholars have been concerned with the definition of the chronological framework within which the Saphar-Kharaba necropolis and contemporary monuments might fit (Kuftin 1949, Japaridze 1969, Gogadze 1972, Pitskhelauri 1973, 1979; Abramishvili 1978, Kavtaradze 1981, Sadradze 2002, Ramishvili 2004). Each was guided by specific arguments regarding the classification of the Bronze Age.

One idea that has been proposed is that from the 15$^{th}$ century BC a homogenous culture was established in southern Caucasia, occupying the area of the preceding Trialeti Culture (Pitskhelauri 1979).

In central southern Caucasia the earliest monument dateable to the second phase of the Late Bronze Age was excavated in Trialeti, at Baiburti situated in the centre of the Bareti basin. The homogenous culture just mentioned, dated to 1500-1350 BC and occupying

the area of the Trialeti Culture, could therefore be conventionally named the Bareti Culture.

The Saphar-Kharaba necropolis might be included within this homogenous culture as well. Artefacts characteristic of the immediately following central Transcaucasian Culture began to appear precisely from this period.

Palaeozoological and palynological studies of the burial material have refined our knowledge of various aspects of the Saphar-Kharaba people. In some cases these studies confirmed information already known from the archaeological record, while in other cases completely new data were collected. For example, the abundance of palaeozoological and palynological materials threw much fresh light on fundamental aspects of the economy of the period in question, in particular cattle-breeding, arable farming, horticulture and viticulture. Besides, our knowledge has been enriched by numerous details concerning funeral rites; for instance, analyses showed that various kinds of funerary food were preserved in vessels of different shapes and sizes. Large pots covered with stone lids contained boiled beef, while smaller ones contained edible greens and porridge, while bowls contained honey, hazel and walnuts.

Palynological analyses produced information about human diet and dress in the period in question.

The diet of the population of Saphar-Kharaba appeared to have been quite varied. The contents of clay vessels placed in burials included various animal (cow, sheep, lamb, goat, piglet) and plant (wheat, rye, nettle, goosefoot, juniper, walnut, hazel nut and honey) food products. For cooking, animal fat was used, while umbellifers were used for seasoning.

Garments were mainly of linen and woollen cloth. Cotton was rarely used. Textiles of linen, wool and cotton varied in their weave and colour. Some linen samples had been comparatively roughly made. Turquoise, brown, grey, blue and purple-red textile fibres were identified.

The production and distribution of purple and blue textiles in the mid-second millennium BC were connected with east Mediterranean cities, since the red dye was extracted from a species of mollusc inhabiting only the Mediterranean coast. The dye could not endure long-term preservation. For this reason, the dye itself was worthless as an export commodity. The textiles, however, dyed purple-red and indigo-blue belonged to the category of expensive imports. The undyed wool that was exported throughout Asia Minor was in its way no less important, for all that it was a relatively cheap product (*The History of the Ancient East*, 1988; Bernkhardt 1982).

The textiles discovered at the Saphar-Kharaba necropolis presumably came from Asia Minor or the Near East.

It was possible to obtain this information thanks to palynological analyses carried out simultaneously on samples collected from burial chambers, ritual pits, inside clay vessels and from various areas of the deceased's skeleton, as well of other organic samples. This is the first time in the history of Georgian archaeology that this has been done. Non-palynological research was also conducted for the first time as well. As a result, both the potential of the Saphar-Kharaba necropolis and the efficiency of such a versatile approach were demonstrated.

The data obtained thanks to archaeological, anthropological, palaeozoological and palynological studies provide grounds for placing the Saphar-Kharaba necropolis in the

company of distinguished sites of the 15th-14th centuries BC, not only those of Georgia alone, but among those of the whole of the southern Caucasus.

## 7.0 Conclusions and Recommendations

The excavations of Saphar-Kharaba cemetery located at KP 120 were only partially completed. Of 122 burials identified during fieldwork in 2003-2005, the Tsalka-Trialeti expedition managed to excavate 91 burials, 78 of which were excavated in 2005.

A cluster of burials partially located within the project ROW, and adjacent to the northern border remain unexcavated. Another group of burials was located beneath the track that runs between the BTC and SCP pipelines. As a protection measure the stone piles over the burials were covered with geotextile and gravel. In the summer of 2006, after the track was no longer operative, the artificial cover was removed, revealing partially damaged stone piles.

For the long term protection of intact and partially damaged burials, therefore, it is recommended that no building activity should take place in or around the area of archaeological interest.

A contemporary settlement 400-500 metres south of Saphar-Kharaba cemetery was identified by the Tsalka-Trialeti Archaeological Expedition in 1991-1992. The serious political and economic conditions that prevailed in Georgia at that time were unfavourable for large scale investigations. As a result, only a small part of the settlement was studied, and the finds were insufficient for site interpretation.

At present, the renewal of excavations of the settlement contemporary with the Saphar-Kharaba cemetery is of paramount importance, for it will facilitate the conceptualization of both cemetery and settlement and their interpretation in a common context. Joint research at two sites of different character but dated to the same period, will make it easier to create a picture of the way of life in the Late Bronze Age and also facilitate the identification of various important aspects such as the salient characteristics and structure of agriculture and the economy. In turn, this will enable us to reconstruct the general cultural and economic process and to investigate it thoroughly.

It should be also mentioned that owing to the short time it was possible to allot to laboratory study, only a part of the pottery restoration was accomplished; it was thus not possible to make a complete typological and stylistic analysis.

The results of the palynological studies were also incomplete. It was only possible to process 72 of the soil samples intended for palynological research, resulting in but partial answers to our questions.

A complete interpretation of the Saphar-Kharaba cemetery could be provided by a combined study of the material obtained in 2003, 2004 and 2005. In view, therefore, of these remarks, additional laboratory studies ought to be carried out.

## References Cited

Abramishvili, R. et al. 1978. *Trelis samarovnis dzv.ts.ag. XIII-XII saukuneebis samarkhebi* (Burials Dated to 13th - 12th Centuries BC from Treli Cemetery) Tbilisi I, Tbilisi, 48-85

Bernkhardt, K. 1982. *Drevnii Livan* (Ancient Lebanon). Moscow

Gabunia, M. 1981. *Trialetskaja arkheologicheskaja ekspedicja* (Trialeti archaeological expedition), Polevye arkheologicheskie issledovanija v 1978 godu. Tbilisi.

Ghambashidze, O. et al. 2004. *Meskhet-Javakhetis arkeologiuri ekspeditsia 1989-1991 tslebshi* (Archaeological expedition of Meskhet-Javakheti in 1989-1991). *Savele-arkeologiuri kvleva-dzieba 1989-1992 tslebshi (mokle angarishebi)* (Field archaeological research in 1989-1992 (Brief reports). Tbilisi

Gogadze, E. 1972. *Trialetis qorghanuli kulturis periodizatsia da genezisi* (Periodization and Genesis of the Trialeti Kurgan Culture). Tbilisi

Japaridze, O. 1969. *Arkeologiuri gatkhrebi trialetshi* (Archaeological Excavations in Trialeti). Tbilisi

Kakhiani, K. et al. 2004. *Arkeologiuri gatkhrebi dmanisis raionshi 1989-1990 tslebshi* (Archaeological excavations in Dmanisi District in 1989-1990). *Savele-arkeologiuri kvleva-dzieba 1989-1992 tslebshi (mokle angarishebi)* (Field archaeological research in 1989-1992 (Brief reports). Tbilisi

Kavtaradze, G. 1981. *Sakartvelos eneolit-brinjaos khanis arkeologiuri kulturebis kronologia akhali monatsmebis shukze* (Chronology of Eneolithic-Bronze Age Cultures Based on New Data). Tbilisi

Khachatrian, T. 1975. *Drevnyaya kultura Shiraka* (Ancient Culture of Shirak). Yerevan

Khachtryan, T. 1979. *Artikskii mogilnik* ( Artyk Necropolis). Yerevan

Kuftin, B. 1949. *Kartuli kulturis udzvelesi kera trialetshi (*Earliest Centre of Georgian Culture in Trialeti). Tbilisi

Kushnareva, K. 1964. *Pamyatniki Trialetskoiy kulturi na territorii yuzhnogo Kavkaza* (Sites of the Trialeti culture on the territory of Southern Caucasus). *Epokha bronzi Kavkaza i Sredney Azii, rannyaya i srednyaya bronza Kavkaza.* Moscow

Pitskhelauri, K. 1973. *Aghmosavlet sakartvelos tomta istoriis dziritadi problemebi dzv.ts. XV-XII ss* (Main Issues of the History of Eastern Georgian Tribes in $15^{th}$-$12^{th}$ centuries BC). Tbilisi

Pitskhelauri, K. 1979. *Konets Bronzovogo veka na Kavkaze* (The End of the Bronze Age in the Caucasus). Tbilisi

Pitskhelauri, K. et al. 2004. *Kakhetis arkeologiuri ekspeditsia* (Kakheti Archaeological expedition). *Savele-arkeologiuri kvleva-dzieba 1989-1992 tslebshi (mokle angarishebi)* (Field archaeological research in 1989-1992 (Brief reports). Tbilisi

Ramishvili, R. et al. 2004. *Brinjaos khanis arkeologiru dzeglebi tsaghvlshi* (Bronze Age Archaeological Sites at Tsaghvli) Dziebani VII. Tbilisi

Sadradze, V. 2002. *Mtskhetisa da misi shemogarenis dzv.ts. II da I atastsleulis pirveli nakhevris arkeologiuri dzeglebi* (Mtskheta and Its Neighborhood Archaeological Sites Dated Second and First half of First Millennium BC). Tbilisi

Stankevich, I. 1978. *Keramika Yujhnoi Turkmenii v Bronzovom veke* (Pottery of Southern Turkmenistan in the Bronze Age) Drevnost i srednevekovye Srednei Azii (Antiquity and Middle Ages of Central Asia). Moscow. Pages 17-31

*The History of the Ancient East*, 1988. vol 2. Moscow

Tushishvili, N. 1972. *Madnischalis samarovani* (Necropolis of Madnischala). Tbilisi

## *Appendix*

### *Metal Artefact Analysis Report*

The results of the restoration and technological studies of the metal finds from Site IV – 156, KP 120 by the Trialeti Archaeological Expedition are as follows:
Six bronze items were restored:

1. Bronze pin No. 1: 351
2. Bronze bracelet No. 2: 352
3. Bronze pin No. 3: 388
4. Bronze mace head No. 4: 435
5. Bronze dagger with bone handle No. 5: 436
6. Bronze bracelet No. 6: 564

Chemical composition of four artifacts was identified by spectral analysis (Fig. 1), (Photo 1).

1. Dagger with shaft No. 5: 436, alloy of copper and tin (Cu: 82.0; Sn: 16.3). Characterized by high mechanical qualities.
2. Bracelet No. 6: 564, grave No. 119, copper, with admixtures (Cu: 98.0; Sn: 0.75; Pb: 0.002; Ag: 0.023). Material is highly plastic.
3. Bracelet No. 2: 352 (incomplete), grave No. 56, alloy of copper and tin (Cu: 89.5; Sn: 9.25; Pb: 0.35). Characterized by optimal mechanical values.
4. Mace head No. 4: 435, grave No.85, made of tin and bronze alloy (Cu: 93.5; Sn: 6.0). Characterized by mechanical values.

Spectral analysis revealed that the metalworking centre at Trialeti tended to use an alloy of copper and tin. The alloy employed was chosen according to the function of an object, typical for bronze products of the early period of the Late Bronze Age.
The scheme of restoration for the bronze material was as follows:
Before restoration each object was studied both macrostructurally and morphologically and photographs were taken (Photo 2).
Bronze artefacts were processed mechanically by means of a scalpel and other sharp tools. Mechanical cleaning was conducted beneath a microscope under conditions of intense light. Cleaned objects were processed with acetone, then, for their conservation, the surface was covered with Paraloid B 72, polymer of thermoplastic acryl, Paraloid B 72 + acetone (40 g + 1.5 l)], (Photo 3).

**Table 1 Spectral Analysis Results**

| Lab Cipher | Artefact Form/Number | Feature | Cu | Sn | Pb | Zn | Bi | Ag | Sb | As | Fe | Ni | Co | Au |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| U-699 | Bronze dagger | Burial | 82.0 | 16.3 | 0.06 | | | 0.08 | | 0.0 | 0.035 | | | |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 436 | 85 | | | | | | | | 19 | | | | |
| U-700 | Bronze Bracelet 564 | Burial 119 | 98.0 | 0.75 | 0.02 | | | 0.023 | | | 0.009 | | | |
| U-701 | Bronze Bracelet 352 | Burial 56 | 89.0 | 9.25 | 0.35 | | 0.003 | 0.08 | | 0.06 | 0.06 | | | |
| U-713 | Bronze Insignia 435 | Burial 85 | 93.5 | 6.0 | | | | | | | 0.03 | 0.009 | | |

## Appendix

### Anthropological Analysis Report

**By Liana Bitadze**

The Saphar-Kharaba necropolis is dated to the first stage of the Late Bronze Age. The anthropological material of this period hitherto known from Georgia consisted of the crania of 53 males and 34 females. No crania have been found before in the Tsalka District. Consequently, the Saphar-Kharaba finds are in themselves of great significance.

Osteological remains were discovered in only 31 of the burials that were excavated within the frame of the pipeline corridor. Their identification according to age and sex, as well as a thorough description of the finds is presented in the appendix.

Modern palaeodemographic researches are based on mortality tables that allow the definition of the morbidity level corresponding to various age groups, their vitality and probability of morbidity, and their life expectancy (Acsadi, Nemeskeri 1970, 151). It was impossible to carry out a comprehensive palaeodemographic investigation with our material because it would require the complete excavation of the necropolis to obtain all the osteological remains, and to establish their exact identification by age and sex.

The distribution of the deceased according to sex (Table No. 1, Fig. 1) gave the following percentage division: male 28.2%, female 41.0% and children 25.6%. The age structure of morbidity reflects processes that occurred within the population. In the ancient world the death rate was high in younger age groups. Drawing conclusions regarding the overall population of Saphar-Kharaba on the basis of the data obtained from the necropolis may be open to question, but it is in any case noteworthy that the average life expectancy of males (30.7) exceeded that of females (25.0) by 5.7 years, and the average life expectancy, taking into account child morbidity, was 23.7. Relying on the latter, it might be supposed that the reproduction rate of the population was very high. The average age of the population often equals the longevity of the generation actually coincident with it. The average life expectancy defined in such case should be regarded as a low index, while the reproduction rate as an accelerated one.

The average life expectancy of the population of the territory of Georgia in the first stage of the Late Bronze Age, without taking child morbidity into consideration, corresponds to 39.7. In males it was 41.6, in females 37.8 (Bitadze 2005, 20). The characteristic feature for the deceased found in the Atskuri hill-burial dated to the Late Bronze Age, was a very great difference in average life expectancy between the sexes (Bitadze et al. 2002, 81). Males lived 10 years longer than women, though the males of Atskuri (40.9) lived 10 years longer, and females (30.9) 5.9 years longer when compared with Saphar-Kharaba population. The age structure of morbidity was also different. At Atskuri 55% of deceased women belonged to the age groups 25-29 and 30-34, while half (50%) of the

women belonged to the age group 20-25 at the moment of their death. In total, 87.5% of deceased women and 81.8 % of deceased men were at a reproductive age. This index also indicates a fast rate of reproduction.

Table 1

Distribution of the Saphar-Kharaba population by age and sex

| Age | M (♂) | | F (♀) | | Ch | | Sum | |
|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % |
| 0-4 | | | | | 1 | 2.6 | 1 | 2.6 |
| 5-9 | | | | | 4 | 10.3 | 4 | 10. 3 |
| 10-14 | | | 1 | 2.6 | 5 | 12.8 | 6 | 15.4 |
| 15-19 | 2 | 5.1 | 3 | 7.7 | | | 6* | 15.4 |
| 20-24 | 2 | 5.1 | 8 | 20.5 | | | 11* | 28.2 |
| 25-29 | 1 | 5.1 | 2 | 5.1 | | | 3 | 7.7 |
| 30-34 | 3 | 7.7 | 1 | 2.6 | | | 4 | 10.2 |
| 35-39 | 2 | 5.1 | | | | | 2 | 5.1 |
| 40-44 | | | | | | | | |
| 45-49 | | | | | | | | |
| 50-54 | 1 | 2.6 | 1 | 2.6 | | | 2 | 5.1 |
| 55-> | | | | | | | | |
| Sum | 11 | 28.2 | 16 | 41.0 | 10 | 25.6 | 39 | 99.9 |
| Medium age | 30.7 | | 25.0 | | 9.4 | | 23.7 | |

***Individuals that died at this age, but sex not identified.**

Reconstruction of the complete craniological characterization of the Saphar-Kharaba population on the basis of available data is impossible. None of the skulls was restored to such a condition (Fig. 1-4) that would enable the determination of the following features: width and height of the face, the narrowest width of the forehead, the space between cheekbones, etc. Generally, at this period the crania of the population of Georgia were characterized by greater length and smaller width measurements, mostly with a cranium of average height, a base of considerable length, the considerable height of the whole face, a wide forehead, the restrained width of the middle part of the face, the small distance between cheekbones, and the face exaggeratedly profiled in the horizontal and vertical planes.

The only cranium that allowed some assumptions was that of a male discovered in burial No. 85. It is characterized by a small linear diameter (177 mm), an inclined forehead, a high back to the head, and a small mastoidal process. The shape of the cranium from above (*norma verticalis*) is ovoid (*ovoides*). Notwithstanding the fact that it was impossible to measure the skull's transverse diameter, the shape of the cranium from above and the general view in profile (Fig. No. 1) provides us with an opportunity for

identification of the craniotype as a mesocranial one. The height of the body is one of the most significant morphological features, determining other sizes of the body. It reveals high individual variability as well as age, sex and territorial divergences. On the basis of the tubular bones of nine men and five women, we established body height. In men body height varied within 154.5 and 175.0 cm. On average it was 165.2 cm, implying this was the median height of the male body. The women's height varied within 151.3 and 165.3 cm, with an average height of 155.5 cm. On the basis of the average data, the females of the Saphar-Kharaba necropolis, like males, were of median height. The relatively small quantity of the remains investigated and the accidental character of the samples should be emphasized.

Body proportions (dolicho-, meso- and brachymorphic types) were estimated in conformity with the height of the body. All types of body proportion (dolicho-, meso- and brachymorphic) were revealed in men, while in women only meso- and brachymorphic types were identified.

Body weight was calculated by an equation of regression that in men corresponded to 55.7-70.0 kg (average weight 63.1 kg), and in women 52.7-65.5 kg (average weight 59.6 kg). These data are preliminary since statistical reliability requires more material before reliable results are forthcoming.

## Appendix

### Paleozoological Analysis Report

**By Oleg Bendukidze**

The results of research on material from Saphar-Kharaba revealed the existence of typologically rather homogeneous material. In the majority of burials the remains of complete skeletons of young sheep were revealed (in three cases a shearling, and in one a lamb). The bones of grown animals were discovered in only one case. In addition to sheep bones cow remains were found in some burials, consisting mainly of bones of extremities and vertebrae.

As for the breed of cattle discovered at Saphar-Kharaba, it had a small body and was presumably a close relative of Khevsurian cattle. Remains of cattle of this breed have been found in great quantities on most archaeological sites throughout eastern Georgia, apart from those of the Trialeti Culture, where two species were observed: small aboriginal Khevsurian cattle (*Bos taurus brachyceros*) and large cattle (*Bos taurus primigenius*). A shoulder blade and hock (Inv. No. 705) presumably belonged to a representative of *Bos primigenius*. B. Kuftin discovered remains of this breed in the shape of a rather large bovine in a barrow of the Trialeti Culture. According to the well-known paleozoologist N. Burchak-Abramovich, the morphology of the skull and other bones cannot be defined in terms of similar Ukrainian and Hungarian grey breeds, and so the breed of the cow in question ought once again to be *Bos taurus primigenius*.

As for the breed of the large cattle at Trialeti, we do not exclude a possibility that the tribes, the creators of the Trialeti Culture in the 2nd millennium B.C. used cattle of this especially large breed in their rites. It is noteworthy that in the earlier period (the Early

Bronze Age) remains of large cattle were not identified. Only the remains of small breeds, resembling Khevsuretian cattle (*Bos taurus brachyceros*) have been found at sites of this period.

Besides the bones of these two animals, remains of a piglet were found at Saphar-Kharaba, near the wall (burial No. 110).

Apart from the above-mentioned remains of domestic animals, the shoulder-blade of a wild sheep (*Ovis orientalis*) was found in burial No. 50 at the Saphar-Kharaba necropolis. This find is of special interest since at present the wild sheep or mouflon only survives in the Caucasus in Armenia.

## Appendix

### Pollen Analysis Report

***By Eliso Kvavadze***

Material for palynological analysis was collected from burials, and ritual pits at the Saphar-Kharaba necropolis as well as from uncultivated soil and from surrounding areas currently under wheat. A total of 72 samples were studied. Of these nine were collected from burials, six from ritual pits, and three from uncultivated soil.

The collection of samples was conducted at various levels and in different parts of the burials. For instance, they were collected from inside vessels and from various parts of the skeletons. Dark coloured spots of organic remains that were preserved in the burials were analysed as well. This novel approach proved to be reasonable since heterogeneous palynological spectra were characteristic of various parts of burials and skeletons (Kvavadze, Narimanishvili 2006).

The palynological material was worked on at the Palynological Laboratory of the Institute of Paleobiology using modern methods. There were three stages:

**Stage 1:** the samples underwent laboratory processing. 100-150 g of soil or rock were placed in a 1 litre ceramic vessel, covered with 10% solution of KOH (or NaOH), and boiled for 3-5 minutes while being stirred with a glass stick. The resulting material was cooled, then diluted and poured through a sieve with 0.1 mm perforations. The boiled and sieved sample was poured into a large recipient and suspended for 24 hours.

**Stage 2:** the sediment was separated from the sample by means of centrifugation. The sample was washed with distilled water until the water became transparent. Liquid cadmium was added to the sample and centrifuged for 20 minutes. As a result of this process, a separation of soil and pollen grains took place. The whole pollen mass began to float on the surface. It was poured into a small vessel, diluted with distilled water and suspended for 24 hours. The cadmium solution was prepared in the following way: 1 kg Cadmium iodide (CdI2) and 800 g. potassium iodide (KI) were diluted in 900 g of hot distilled water and then filtered. A solution was prepared with an ideal weight of 2.2.

**Stage 3:** the resulting solution was centrifuged in small test-tubes, and the cadmium was washed away. Then acetolysis was carried out, as a result of which the pollen grains became dark. This facilitated their identification. Acetolysis was done in the following way: a solution was prepared, consisting of nine parts of acetic anhydride and one part of hydrochloric acid. Material was dried with acetic acid and centrifugation. The sample

was placed into the acetolysis solution and put into a bath (the test-tube was placed into hot water for 2 minutes with the water temperature no less than 80 degrees). Then the test-tube was centrifuged and dried by means of acetic acid. Finally, the sample was washed with distilled water. The collected pollen spores were dried and placed in glycerine. One drop of material was taken for investigation and then analysis was begun. The identification and counting of the pollen material was performed by means of a microscope. No fewer than 200-300 pollen grains could be counted in one sample.

Then the percentage of pollen grains was calculated according to the ecological groups of the plants, and these data were marked on graphs.

The description and analysis of the palynogram allow the reconstruction of vegetation, which in turn provides a foundation for a reconstruction of the palaeoclimate.

The palynological material was studied from the following burials:

Ten samples were studied from the burial of a young woman **No. 67** (Fig. 1, table I); 44 plant species and numerous nonpalynological microremains were defined. The richest spectrum was revealed in the sample that was collected from beneath the cranium. This sample contained 171 pollen grains. Among them were grains of pine (*Pinus*), oak (*Quercus*), and cultivated vine (*Vitis vinifera*), as well as pollen of cultivated cereals together that of accompanying weeds, such as knot-grass (*Polygonum*), common knot-grass (*Polygonum aviculare*), and thistle (*Carduus*). Among ruderals characteristic of places of human habitation, there were pollen grains of great plantain and clover. It is remarkable that clusters of pollen grains of bird's-foot trefoil (*Lotus corniculatus*) were in abundance in the samples collected beneath the cranium. Such clusters are characteristic of the stamens of flowers. Consequently, it could be assumed that a bunch of these flowers was placed near the head of the deceased. An analogous case was attested in the Paravani burial ground dated to the Early Bronze Age (Kvavadze, Kakhiani 2007). The bird's-foot trefoil belongs to the family of pulses and has a pleasant scent. It is a honey-producing flower and the plant is edible.

Among the non-palynological remains, parenchymal cells of pine timber were discovered, implying the existence of a construction made of pine in the grave.

Forty-eight fibres of cotton and linen textile were identified, including the remains of light blue and yellow threads.

Analysis of organic remains preserved between the teeth of the deceased revealed pollen grains both of cultivated and wild plants. Of the cultivated plants, there were pollen grains of grapes, walnut and hazel nut. Among them well preserved pollen grains of grapes predominated (Pl. I). Pollen grains are preserved perfectly in wine, and it is possible that the deceased was served with wine before her death.

Of the wild plants, pollen grains of oak (*Quercus*) and reedmace (*Typha*) predominated. Both plants possess medical qualities, and the deceased was presumably treated with an infusion or decoction of these plants. Oak bark is used for the treatment of diseases down to the present. It is remarkable that in the sample in question both pollen grains of oak and parenchymal cells of oak timber were found.

In the sample collected near the knees of the deceased there were perfect specimens of pollen grains of both of arboreals and herbs. These included oak, hornbeam, fir, spruce and pine. Among the herbals were numerous ruderals that occur near places of human habitation. There were pollen grains of wheat and accompanying weeds. It was obvious,

however, that plants that grew in places of human habitation and by roadsides predominated.

In the group of nonpalynological remains, there were many cotton textile fibres. There were remains of dyed (green and light blue) threads. There were spores of dung fungus, parenchymal cells of timber, sheep wool and the remains of waterplants (*Dinoflagellata***).**

Four samples were collected from the area of the thighs and lower parts of the legs (Fig. I). Of cultivated plants, pollen grains of vine and wheat were found. There were also weeds characteristic of areas under crops and places of human habitation. There specific weeds such as swede (*Brassicaceae*) that could have grown only in vineyards.

Among the nonpalynological remains there were cotton and linen fibres, parenchymal cells of timber and spores of coprophages. In a sample collected from the area near the heel the egg of a parasitic worm (*Paragonimus ringeri*) was identified.

In the samples collected from areas near the upper parts of the skeleton (shoulder-blade, ribs, phalanges) pollen grains of oak, pine, spruce, fir and cultivated vine were found. Among herbaceous plants, wheat and field and yard weeds were found. There was a great amount of bird's-foot trefoil's pollen, especially near hands of the deceased, who had been buried in a crouched position, with the hands near the face.

Among the nonpalynological remains, fibres of linen and cotton textile were found in abundance, especially beneath the ribs. It is possible that the sample contained remains of the deceased's garment. Remains of Coryneum canker, spores of dung fungus, waterplants and parenchymal cells of timber might also have been introduced here via the garment.

From Burial No. **56** of a woman**,** 13 samples were studied. Palynological material from this burial was richer than that from Burial No. 67. The average amount of pollen grains was 150-300, while the quantity of identified plants was nearly the same as in the previous burial. The sample collected from the area beneath the cranium proved to be the richest, and 310 pollen grains were counted there (Fig. 2). Pollen grains of bird's-foot trefoil (*Lotus corniculatus*) predominated in this sample. The identification of its pollen clusters implied that bird's-foot trefoil flowers were placed in the grave. There were abundant specimens of pollen of wheat and other cultivated cereals, and weeds that accompany areas under crops were well represented as well. These included bindweed, goosefoot, knotgrass, etc. There were no pollen grains of grapes or weeds characteristic of vineyards. Of arboreals, there were pollen grains of hazel nut, spruce and pine. Many nonpalynological remains were identified, including 56 cotton and linen textile fibres. No coloured fibres were found. There were cells of pine timber and spores of fungus. It is remarkable that evidence for tick setae (bristles) was found in the grave, presumably carried there on flowers.

The palynological spectrum of the sample collected near the head of the deceased was nearly the same as the previous one. It contained pollen grains of bird's-foot trefoil in abundance, as well as weeds typical land under cereal crops. But in a complex of ruderals characteristic of human habitation, pollen grains of stinging nettles were found. Of the arboreals, there were pollen grains of hornbeam, joint pine, sour plum as well as conifers. As for remains of a non-palynological type, there were numerous cells of pine and oak, ascospores and several cotton textile fibres.

The taxonomic list of pollen grains in the sample collected from the area between the teeth is quite long (Fig. II). Their state of preservation is perfect (Fig. II). From among

cultivated plants, there were found pollen grains of walnut (*Juglans*) and wheat (*Triticum*), but pollen grains of thistle (*Carduus*) predominated. There were also pollen grains of stinging nettle, sorrel and goosefoot.

Three samples were collected from areas near the knees and shins. Their palynological spectra also proved to be rich. Weeds typical of land under wheat predominated, but ruderals characteristic of places of human habitation were also remarkable for their diversity and abundance. Of arboreals, there were oak (*Quercus*), lime (*Tilia*), joint pine (*Ephedra*)**,** walnut (*Juglans*)**,** hazel nut (*Corylus*)**,** guelder-rose (*Viburnum*) and conifers. It is noteworthy that the pollen of the fir prevailed over that of spruce, since fir is a more thermophilic and moist-loving tree.

In the sample collected near the knees spores of forest elements were identified, such as ferns, adders tongue fern and adder's fern. There were many cotton and linen fibres. In addition, there were pine timber cells, tick setae, ascospores and the remains of waterplants.

Significant data were yielded from the sample collected from a bronze bracelet discovered on the hand of the deceased. Bronze corrosion products had perfectly preserved both pollen grains and textile fibres. Besides cotton and linen, there were fibres of woollen textile, a rare find in a burial, since woollen fibre only occurs under special conditions.

The pollen of wheat and its typical weed companions predominated in the palynological spectrum. There were also ruderals characteristic of places of human habitation.

A similar palynological spectrum was attested in the sample collected near the bronze pin. Both plant pollen and other kinds of organic material were perfectly preserved (Pl. III). A small but perfectly preserved fragment of textile was found near the bronze pin (Pl. III), and when investigated microscopically, it proved to be made of cotton (Pl. II, Fig. 2,3). The textile was presumably the remains of a garment worn by the deceased since it contained many plant pollen grains. Walnut pollen grains were found as well, and wheat pollen grains were present in abundance. Just as in the other instances, there were many weeds characteristic of places of human habitation, but pollen grains of cereals predominated here too (Table II). There was wheat inside the first vessel, where 55 wheat pollen grains were counted. The conclusions to be drawn from the presence of so much wheat in the grave in question under discussion are problematic, but it could be that the scattering of wheatears or grains was part of the funeral ritual. Similar data occurred in Burial No. 90 as well (Table III).

In the male Burial No. **90,** 11 samples were studied (Table III). There were pollen grains of various arboreals, such as oak (*Quercus*), hornbeam (*Carpinus*)**,** lime (*Tilia*)**,** walnut (*Juglans regia*)**,** elm (*Ulmus*)**,** and alder (*Alnus*). An especially large number of forest elements were detected in the sample collected from beneath the cranium. These indicators were four to five times higher than relevant indicators from burials Nos. 67 and 56, where women were buried. Pollen of arboreals and an abundant amount of forest fern spores were identified in the sample collected from the area near the legs.

A large number of pollen grains of wheat and its weed companions were found in samples collected from around the abdomen, thighs and hands as well as in the sample collected from a clay vessel. Pollen grains of Italian millet and barley were identified in the second vessel.

There were parenchymal cells of oak timber.

Nearly all samples contained fibres of linen and cotton textile. Some of them even contained woollen fibres.

There were plenty of spores of various fungi, including those of the dung fungus (*Sordaria, Neurospora, Sporormiella*). There were also setae of ticks and of carpet-beetle larvae.

It is remarkable that in the samples collected from areas beneath the knees and feet there was abundant evidence of parasites in the shape of the eggs of the pig tapeworm (*Taenia solium*) (see Figure).

Burial **No. 89** contained the remains of a five or six-year-old child, and eight samples were collected. An abundant variety of weeds characteristic of gardens, vineyards and places of human habitation were found (Table IV).

In samples collected from areas near the abdomen and legs, eggs of the pig tapeworm were identified in great quantity (Pl. 7,8); it is quite possible that this very helminth brought about the death of the child.

Burial **No. 85** contained the remains of a man, and 11 samples were studied (Table V). Pollen grains of bird's-foot trefoil were identified in samples collected from around the cranium and teeth. Weeds associated with cereals were present in abundance as well as pollen grains of oak, hornbeam, alder, joint pine, juniper, hazel nut and forest elements. Non-palynological remains were also present in great quantities, such as linen and cotton textile fibres, cells of pine and oak timber and ascospores.

From Burial No. **78**, that of a man, ten samples were studied (Table VI). There was rich and well-preserved material. In the sample collected from the area beneath the cranium, pollen of 14 arboreals and 24 herbaceous plants were found. Besides, there were great quantities of timber cells of pine and other trees, fungal spores, and textile fibres, some of which were coloured.

Of the group of arboreals, pollen grains of pine, spruce, fir, juniper, hornbeam, oak, lime, joint pine, dog-rose, hazel nut, alder, walnut and zelkova were represented in the palynospectrum, with oak predominating. There were also pollen grains of the cultivated vine. Among herbaceous plants, cereal weeds predominated, but pollen grains of wheat were also present. Pollen of weeds characteristic of pastures were identified as well. Ruderals typical of places of human habitation were well represented, and spores of forest ferns were also found.

In the samples collected from the teeth, there was much pollen of lime, great plantain and thistle. A similar picture was derived from the sample collected from the abdominal area. There were cells of oak bark and parenchymal cells of oak timber as well.

Linen, cotton and wool textile fibres and the eggs of parasitic worms were identified.

**Ritual pit 54:** Pollen grains of wheat and weeds typical of areas under wheat, such as bindweed, knotgrass, and common knotgrass, were found in abundance in the sample collected from the first vessel. It is obvious that it contained wheat, or food made from wheat. The spectrum of the sample collected beneath the vessel revealed 51 pollen grains of cultivated vine. It could well be that the pot was placed on a pile of vine leaves. Vineyard weeds were well represented. Pollen grains of joint pine were identified beneath the second vessel (Table VII).

**Ritual pit 79:** Sheep hairs were discovered in the first vessel. Presumably, either mutton or food prepared with sheep fat had been placed in the vessel in question. Pollen grains of

cereals were found in the second vessel, while the third one contained remains of waterplants (Table VII).

Thus, the results of our palynological studies showed that the characteristic landscape of the environs of Saphar-Kharaba environs was rather different in the Late Bronze Age, and that the climate was much warmer. The warm climate facilitated the existence of deciduous forest, in which oak, lime, and hornbeam predominated. Zelkova trees grew as well. Thanks to such favourable climatic conditions, the principal human activity was arable farming. Wheat, barley and other cereals were grown. Horticulture and viticulture were also developed. Cattle-breeding was another branch of the rural economy.

In the Late Bronze Age people's garments were made of linen, cotton and wool. The appearance of cotton in this period was a novelty not only for the Caucasian region, but for the Near East as well. The earliest remains of cotton textile until now were found in Turkey in a context of the first millennium BC (Zohary, Hohf 1993).

**References:**


1. Skliarovski L.I. 1975, *Tselebnie svoistva pishchevikh rastenii* (Medicinal properties of edible plants). Rosselkhozizdat (Publishing House of Russian Agriculture), Moscow.
2. Kvavadze E., Kakhiani K. 2007, *Extrafossils in the pollen spectra of the samples of organic formation from the Paravani Kurgan* (the Early Bronze Age, Georgia). Vegetation History and Archaeobotany (in press).
3. Kvavadze E., Narimanishvili G. 2006, 'An experimental approach to the palynology of remains from Middle Bronze Age Burials in Saphar-Kharaba, southern Georgia).' *Abstracts of the 7th European Palaeobotany-Palynology Conference*, Prague, 77-78.
4. Kvavadze E., Narimanishvili G. 2006, 'The remains of Gossipium, Linum and sheep hairs as textile fibres of cotton, flax and wool in palynological material from Bronze Age burials.' *Palyno-Bulletin*, vol. 2, No. 1-4, Innsbruck, 34-37.
5. Zohary D., Hopf M. 1993, *Domestication of plants in the Old World*. Oxford: Clarendon Press.


Description of Plates

Plate XXXIV

Burial 67, Pollen grains of cultivated vine discovered between teeth ( x600).

Burial 56, Organic remains and pollen grains of plants found on the floor of the burial (magnification 300); 1- spirogira (*Spirogira*); 2: pine (*Pinus*); 3 hazel nut (*Corylus*); 4,5: black spleenwort (*Dryopteris*); 6,7: joint pine (*Ephedra*); 8: Pteridophyta (*Polypodiaceae*); 13,14: thistle (*Carduus*); 15: cichorium (*Cichorioidae*); 16: undif. NAP; 17: barley (*Hordeum*); 18: bird's-foot trefoil (*Lotus*); 19-21: wheat (*Triticum*); 22,23: fragrant wormwood (*Artemisia*).

Plate XXXV

Burial 56, remains of cotton textile (1) and its fibre (2,4).

Plate XXXVI

Burial 90, 1,2: barley (*Hordeum*); 3: thistle (*Carduus*); 4: Serratula; 5: cichorium (*Cichorioidae*); 6: Noogoora burr (*Xanthium*); 7: goosefoot (*Chenipodium album*);

8,9,12: Caryophyllaceae; 10: knot-grass (*Polygonum*); 11: buttercup (*Ranunculus*); 13: vine (*Vitis vinifera*); 14,15: Chenopodiaceae.

Plate XXXVII

Burial 90, sample 17a, 1,2: fir (*Abies*); 3-5 hazel nut (*Corylus*); 7: lime (*Tilia*); 8: hornbeam (*Carpinus caucasica*); 9: walnut (*Juglans regia*); 10: Polypodiaceae; 11: pine (*Pinus*); 12: alder (*Alnus*), magnification: x300.

Plate XXXVIII

Burial 90, sample 30a, fibre of wool thread, (*Abies*); 4: cryptograma (*Cryptograma crispa*); 5: adder's tongue fern (*Ophioglossum vulgatum*); 5,6: fungal spore; 7: polypodiaceae; 8 wheat (*Triticum*); 9,10: Sordaria; 11,12,20,21: cichorium (*Cichorioidae*); 14: alder (*Alnus*); 15,28: Aster; 16: elm (*Ulmus*); 17: violet (*Viola*); 19: hornbeam (*Carpinus orientalis*); 22,25: Caryophyllaceae; 23: oak (*Quercus*); 26,29: Chenopodiaceae; 27: alder (*Alnus*); 30: Zygnema; 31: fungal detail; 32,33: parenchymal cells of pine timber.

Plate XL

Burial 89, sample collected from abdominal area, 1-13: eggs of the parasitic pig tapeworm; 14-17: dung fungus sordaria (Sordaria type); 18-20: maiden's hair fern (*Adiantum*).

# Quantity of plant pollens and spores in the organic residues

Table No. 1.

| Burial No. 67 | Near skull | Betw. teeth | Near knees | Near thigh | Under foot | Near shank | Near heel | Near arms | Near scapula | Near ribs |
|---|---|---|---|---|---|---|---|---|---|---|
| **Sample No.** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **Wood plants:** | | | | | | | | | | |
| Abies nordmanniana | 0 | 2 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 2 |
| Picea orientalis | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Pinus | 6 | 7 | 7 | 5 | 0 | 6 | 2 | 5 | 2 | 5 |
| Juglans regia | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Carpinus caucasica | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Carpinus orientalis | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Alnus | 0 | 4 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Quercus | 1 | 24 | 2 | 0 | 1 | 2 | 0 | 0 | 0 | 1 |
| Corylus | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vitis vinifera | 1 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| ***Sum*** | ***8*** | ***43*** | ***12*** | ***6*** | ***2*** | ***9*** | ***3*** | ***5*** | ***4*** | ***8*** |
| **Herbs:** | | | | | | | | | | |
| Poaceae | 3 | 7 | 5 | 6 | 4 | 2 | 4 | 4 | 0 | 3 |
| Triticum | 0 | 0 | 2 | 3 | 0 | 4 | 0 | 4 | 0 | 3 |
| Cerealia | 4 | 0 | 4 | 7 | 2 | 0 | 0 | 0 | 1 | 6 |
| Chenopodiaceae | 0 | 3 | 0 | 0 | 2 | 3 | 2 | 2 | 0 | 2 |
| Artemisia | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 1 |
| Aster type | 2 | 2 | 3 | 0 | 0 | 3 | 3 | 3 | 5 | 3 |
| Achillea | 0 | 0 | 0 | 0 | 6 | 0 | 2 | 0 | 0 | 3 |
| Cichorioidae | 5 | 6 | 8 | 5 | 21 | 5 | 10 | 11 | 4 | 13 |
| Carduus | 3 | 4 | 2 | 2 | 1 | 3 | 0 | 1 | 3 | 2 |
| Fagopyrum | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| Polygonum type | 4 | 2 | 2 | 6 | 2 | 6 | 0 | 5 | 3 | 0 |
| Polygonum bistorta | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Polygonum persicaria | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Alisma | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Convonvulus | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ranunculus | 0 | 0 | 2 | 3 | 1 | 0 | 1 | 0 | 1 | 1 |
| Knautia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Apiaceae | 0 | 3 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 |
| Caryophyllaceae | 0 | 0 | 2 | 0 | 5 | 0 | 0 | 2 | 0 | 2 |
| Saxifragaceae | 0 | 0 | 0 | 3 | 2 | 0 | 2 | 1 | 0 | 1 |
| Boraginaceae | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| Plantago m/m | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Plantago lanceolata | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Typha | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lotus type | 135 | 0 | 4 | 6 | 0 | 12 | 2 | 35 | 0 | 13 |
| Trifolium | 2 | 0 | 1 | 3 | 1 | 0 | 0 | 2 | 0 | 0 |
| Brassicaceae | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Sphagnum | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Bothrychium lunaria | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 2 | 0 | 0 |
| Polypodiaceae | 3 | 2 | 2 | 2 | 9 | 4 | 3 | 5 | 2 | 2 |
| Polypodium vulgare | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Asplenium | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Undeterminate NAP | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| ***Sum*** | ***163*** | ***46*** | ***45*** | ***49*** | ***62*** | ***45*** | ***31*** | ***82*** | ***19*** | ***63*** |
| **Sum of palynomorphs** | **171** | **89** | **57** | **55** | **64** | **54** | **34** | **87** | **23** | **71** |

Table No. 2

| **Burial No. 56** | **Near skull** | **Near face** | **Betw. teeth** | **Near knees** | **Near shank** | **Under foot** | **Near arms** | **Abdo-minal** | **Fabric** | **Pin** | **Vessel 1** | **Vessel 2** | **Vessel 3** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample No.** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** |
| **Wood plants:** | | | | | | | | | | | | | |
| Abies | | 6 | 3 | 8 | 5 | 5 | 10 | 3 | 6 | | 3 | 4 | 2 |
| Picea orientalis | 1 | 1 | 3 | | 1 | 1 | 4 | | | | 1 | 3 | |
| Pinus | 15 | 22 | 18 | 33 | 40 | 11 | 60 | 21 | 12 | 4 | 19 | 17 | |
| Juglans regia | | | 2 | 1 | | | | | 1 | | | | |
| Carpinus caucasica | | 2 | 1 | | | | 2 | | | 1 | | | |
| Carpinus orientalis | | | | | | | | | 1 | | | | |
| Alnus | | | 1 | | | | | | | | | | |
| Quercus | | | 1 | 1 | | | | | | 1 | | | |
| Tilia | | | | 1 | | | | | | | | | |
| Corylus | 2 | | | 3 | | | 3 | | | | | | 2 |
| Ephedra | | 1 | 1 | 1 | | | | 3 | | | 1 | | |
| Evonymus | | | 1 | | | | | | | | | | |
| Prunus | | 1 | | | | | | | | | | | |
| Rosaceae | | | | | | | | 1 | | | | | |
| Viburnum | | | | | 1 | | | | | | | | |
| ***Sum*** | ***18*** | ***33*** | ***31*** | ***48*** | ***47*** | ***17*** | ***79*** | ***28*** | ***20*** | ***6*** | ***24*** | ***24*** | ***4*** |
| **Herbs:** | | | | | | | | | | | | | |
| Poaceae | 9 | | 1 | | | | 4 | 5 | 6 | 6 | 2 | 1 | 2 |
| Triticum | 17 | 1 | 5 | 4 | 4 | | 29 | 3 | 39 | 49 | 55 | 3 | |
| Cerealia | 19 | 2 | 4 | | 1 | 1 | 14 | 4 | 13 | 32 | 12 | 2 | |
| Chenopodiaceae | 4 | 2 | 2 | 2 | 2 | 3 | 3 | | 1 | 1 | | | |
| Chanopodium album | 1 | | | | | | | 1 | | | | | |
| Artemisia | 3 | | | | 1 | 2 | 2 | | 1 | | 3 | | |
| Artemisia annua | | 4 | 4 | | | | | | | | | | |
| Aster type | 5 | 2 | 6 | 15 | | 6 | 4 | 3 | | | 8 | 6 | 3 |
| Achillea | | | 1 | 7 | | 4 | | | 1 | 1 | | | |
| Cichorioidae | 16 | 23 | 15 | 88 | 62 | 19 | 16 | 16 | 2 | 3 | 18 | 32 | 5 |
| Carduus | 3 | 26 | 38 | 13 | 12 | 12 | 3 | 10 | 1 | 2 | 12 | 1 | 2 |
| Cirsium | | | 2 | 3 | | | | | | | | | |
| Fagopyrum | 1 | | 2 | 2 | 3 | | | 5 | | 2 | 5 | | |
| Serratula | 2 | | | 2 | | | 1 | | 2 | 2 | 1 | | |
| Polygonum type | 7 | 12 | 8 | 5 | 10 | 18 | 5 | 11 | 4 | 1 | 14 | 3 | |
| Polygonum aviculare | | | | | | | | | | | 3 | | |
| Polygonum bistorta | | | | | | | | 1 | 3 | | | | |
| Convonvulus | 1 | | | | 1 | | 1 | | | 1 | | | |
| Ranunculus | 3 | | 2 | 2 | 4 | 7 | 4 | | | 3 | | 1 | |
| Knautia | | | | | 1 | | | | 1 | | | | |
| Xsanthium | | | 1 | | | | | | 1 | | | | |
| Rumex | | | 1 | | | | | | | | | | |
| Apiaceae | | | 4 | 5 | | 3 | | 2 | | | | | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Caryophyllaceae | 2 | 5 | 9 | 4 | 5 | 1 | 4 | 3 | 2 | | 2 | 2 | 2 |
| Cerastium | | | | | 2 | 4 | | | | 1 | | | |
| Saxifragaceae | | | | | | 6 | | | | | | | |
| Boraginaceae | | | | 3 | 5 | 6 | | | | | | | |
| Plantago m/m | | | | | 2 | 3 | | 1 | | 2 | | | |
| Plantago lanceolata | | | | | | | 1 | | | | | | |
| Fragaria type | | | 2 | | | | | | | | | | |
| Urtica | | 1 | 2 | | | | | | 1 | | | | |
| Lotus type | 180 | 88 | 6 | | 8 | 20 | 30 | 2 | 6 | 30 | | | |
| Brassica | | | | | | | | | 2 | | | | |
| Sphagnum | | | | | | | | | 1 | | | | |
| Bothrychium lunaria | 5 | 1 | 2 | 1 | 1 | 2 | 4 | 2 | | | 4 | | |
| Ophioglossum | | | 1 | 1 | | | | | | 1 | | | |
| Polypodiaceae | 3 | 10 | 10 | 5 | 2 | 8 | 10 | 21 | 3 | 2 | 5 | 2 | 1 |
| Polypodium vulgare | | | | 1 | 1 | | | | | | | | |
| Polypodium serratum | | | | | | | 1 | | | | | | |
| Asplenium | | | 1 | | | | | | | | | | |
| Cryptogramma crispa | | | | 1 | 1 | | | | | | | | |
| Undeterminate NAP | 9 | 11 | 5 | 5 | | 5 | 8 | 6 | 4 | 3 | | | |
| ***Sum*** | ***290*** | ***188*** | ***134*** | ***169*** | ***128*** | ***130*** | ***144*** | ***96*** | ***94*** | ***142*** | ***144*** | ***53*** | ***15*** |
| **Sum of palynomorphs** | **308** | **221** | **165** | **217** | **175** | **147** | **223** | **124** | **114** | **148** | **168** | **77** | **19** |

Table No. 3

| **Burial No. 90** | **Near skull** | **Near knees** | **Near thigh** | **Left shank** | **Right shank** | **Near heel** | **Near arms** | **Abdo-minal** | **Vessel 1** | **Sacral vessel 1** | **Sacral vessel 2** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample No.** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
| **Wood plants:** | | | | | | | | | | | |
| Abies nordmanniana | 7 | 17 | 12 | 4 | 5 | 6 | 3 | 13 | | 2 | 6 |
| Picea orientalis | 2 | 5 | 1 | | 1 | 16 | 3 | 3 | | | 2 |
| Cedrus libani | | | | 1 | | | | | | | |
| Pinus | 32 | 37 | 42 | | 8 | | 23 | 25 | 9 | 4 | 54 |
| Juniperus | | | | | | | 1 | | | | |
| Betula | | | | | | | | | 1 | | |
| Juglans | 1 | | | | | | | | | | |
| Fagus orientalis | | | | | | | | | | | |
| Carpinus caucasica | 1 | | | | | | 1 | 1 | | | 1 |
| Carpinus orientalis | | 2 | | | | | | | 1 | | |
| Alnus | 27 | 9 | 4 | | 1 | | 2 | 1 | 3 | | |
| Ulmus | 1 | | | | | | | | | | |
| Quercus | | 1 | | | | | | | 2 | | |
| Tilia | | 1 | | | | | | | | | |
| Corylus | 4 | 2 | | | 1 | | 1 | 2 | 1 | 2 | 1 |
| Rosaceae | | | | | | | | | 2 | | |
| Vitis vinifera | | | | | | | | | | | |
| Ephedra | | | | | 1 | | | 2 | | | |
| ***Sum*** | ***75*** | ***74*** | ***59*** | ***5*** | ***17*** | ***22*** | ***34*** | ***47*** | ***19*** | ***8*** | ***64*** |
| **Herbs:** | | | | | | | | | | | |
| Poaceae | 6 | 3 | 8 | 5 | 2 | | 8 | 12 | 4 | 26 | |
| Triticum | 14 | 8 | 28 | 1 | 1 | | 160 | 26 | 204 | | |
| Cerealia | 13 | 3 | 8 | 1 | | | 58 | 20 | 16 | | |
| Panicum type | | | | | | | | | | 33 | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chenopodiaceae | 2 | 4 | 4 | 3 | | 1 | 4 | 6 | 3 | 4 | 4 |
| Chanopodium album | | | 1 | | 2 | | 2 | | | | |
| Artemisia | 3 | 2 | | 1 | | | 3 | 5 | 5 | | |
| Aster type | 17 | 18 | 18 | 3 | 4 | 4 | 9 | 4 | 10 | 1 | 7 |
| Achillea | 5 | 3 | 5 | 1 | 2 | | 21 | 2 | 6 | | 4 |
| Xanthium | | | | 1 | | | | | 1 | 1 | |
| Cichorioidae | 69 | 96 | 96 | 20 | 21 | 5 | 21 | 20 | 19 | 4 | 74 |
| Carduus | 10 | 5 | 8 | 4 | 5 | 4 | 5 | 12 | 10 | 3 | 6 |
| Cirsium | 4 | 1 | 1 | | | | | | | | |
| Centaurea | 1 | 2 | 1 | | | | 1 | | | | 1 |
| Centaurea cyanus | | | | | | | | 1 | | | |
| Serratula | 1 | 1 | 2 | | | | 4 | 4 | 8 | | 2 |
| Fagopyrum | 3 | | 1 | | | | 2 | 2 | 8 | | 1 |
| Rumex | 1 | 1 | | | | | | | | | |
| Polygonum type | 4 | 8 | 16 | 3 | 5 | 2 | 52 | 26 | 10 | | 14 |
| Polygonum aviculare | | | | | | | | | 1 | 3 | |
| Polygonum bistorta | | 1 | | | | | | | | | |
| Convonlvulus | | | | | | | | | 1 | | |
| Ranunculus | 4 | 2 | 9 | 4 | 2 | 1 | 11 | 6 | 15 | | 7 |
| Papaver | | | | | | | | | | | |
| Malva | | | | | | | 2 | | | | |
| Geranium | | | | | | | | | | | |
| Viola | | | | | | | | | | | |
| Cyclamen | | | | | | | 2 | | | | |
| Symphitum | | | | | | | 1 | | | | |
| Valeriana | 1 | | | | | | 2 | | | | |
| Dipsacus | | | 1 | | | | 1 | | | | |
| Veronica | 1 | | | | | | | | | | |
| Lamiaceae | | | | | | | | | 3 | 2 | |
| Apiaceae | 6 | | | 1 | | | 3 | | | | |
| Heracleum | | | | | | | | | | 1 | |
| Fabaceae | | | | | | | | | 3 | | |
| Caryophyllaceae | 7 | 24 | 15 | 6 | 2 | 10 | 4 | 8 | 5 | 4 | 8 |
| Saxifragaceae | | | | | | | 1 | | | | |
| Boraginaceae | | | 5 | 3 | 4 | | 2 | | | | 3 |
| Plantago m/m | | 2 | 1 | 1 | | | 1 | | | | |
| Plantago lanceolata | | 1 | | | | | | | 1 | 1 | |
| Lotus | 3 | | | | | | 4 | 3 | 6 | | 3 |
| Liliaceae | | | | | | | | | | | 1 |
| Colchicum | | | | | | | 2 | | | | |
| Trifolium | | | | | | | 1 | | | | |
| Brassicaceae | | | 1 | | | | | | | | |
| Typha | | | | 1 | | | | | | | |
| Phragmites | | | | 3 | | | | | | | |
| Sphagnum | | | 1 | | | | | | | | 1 |
| Lycopodium | | | | | | | | | | | |
| Lycopodium selago | | | | | | | | | | | |
| Bothrychium lunaria | 2 | 2 | 1 | 3 | | 1 | | 3 | | 1 | 2 |
| Ophioglossum | | | | | | | | | | | 1 |
| Polypodiaceae | 33 | 15 | 10 | 14 | 1 | 6 | 6 | 21 | 4 | 1 | 20 |
| Polypodium serratum | | | | | | | | | | | 4 |
| Polypodium vulgare | 2 | | 2 | | | | | | | | |
| Asplenium | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Asplenium ruta-muraria | | | | | | | | | | | |
| Dryopteris | | | | | | | | | | | |
| Cryptogramma crispa | | | | | | | | | | | |
| Pteris cretica | | | | | | | | | | | |
| Undeterminate NAP | 5 | 8 | | | 4 | | | 7 | 18 | | 2 |
| ***Sum*** | ***217*** | ***210*** | ***243*** | ***79*** | ***55*** | ***34*** | ***393*** | ***188*** | ***361*** | ***85*** | ***165*** |
| **Sum of palynomorphs** | **292** | **284** | **302** | **84** | **72** | **56** | **427** | **235** | **380** | **93** | **229** |

Table No. 4

| **Burial No. 89** | **Near skull** | **Near face** | **Near legs** | **Near arms** | **Abdo-minal** | **Vessel 1** | **Vessel 2** | **Betw. vessels** |
|---|---|---|---|---|---|---|---|---|
| **Sample No.** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| **Wood plants:** | | | | | | | | |
| Abies nordmanniana | 11 | 4 | 2 | 4 | 10 | | 1 | 2 |
| Picea orientalis | 2 | 1 | 2 | 1 | 2 | | 2 | 1 |
| Pinus | 65 | 11 | 22 | 27 | 19 | 2 | 22 | 28 |
| Juniperus | | | 2 | 2 | | | | |
| Betula | | | | | | | | 1 |
| Carpinus caucasica | | | | 1 | | | | |
| Carpinus orientalis | | | | | 1 | | | |
| Alnus | 1 | 4 | | | 6 | | | 1 |
| Ulmus | | 2 | 1 | | 3 | | | |
| Quercus | | 5 | 2 | 1 | 2 | | | 1 |
| Tilia | | | 1 | | 1 | | | 1 |
| Acer | | | | | 1 | | | |
| Corylus | 3 | 2 | | | 7 | | | 1 |
| Rosaceae | | | | | 1 | | | |
| Rhamnus | | | | | 1 | | | |
| Vitis vinifera | | | | 2 | | | | |
| Ephedra | | 1 | | | | | | |
| ***Sum*** | ***82*** | ***30*** | ***32*** | ***38*** | ***54*** | ***2*** | ***25*** | ***36*** |
| **Herbs:** | | | | | | | | |
| Poaceae | 4 | 8 | 5 | 16 | 7 | | 3 | 3 |
| Triticum | | 6 | 3 | 5 | 12 | | | |
| Cerealia | 3 | 10 | 11 | 2 | 7 | | 1 | |
| Chenopodiaceae | 2 | 3 | 3 | 2 | 5 | 1 | | 2 |
| Chanopodium album | | 1 | | 2 | 1 | | | |
| Artemisia | | | | | 1 | | | |
| Aster type | 13 | 14 | 4 | 18 | | 1 | 1 | 12 |
| Achillea | 6 | 15 | 2 | 7 | 20 | 2 | | |
| Cichorioidae | 112 | 108 | 16 | 83 | 114 | 3 | 18 | 50 |
| Carduus | 12 | 21 | 5 | 4 | 19 | 1 | 2 | 3 |
| Cirsium | 1 | | | | 1 | | | |
| Centaurea | | 5 | | | 4 | | | |
| Serratula | 4 | 1 | | 1 | 4 | | | 3 |
| Fagopyrum | 3 | 4 | | 2 | 10 | | | 3 |
| Polygonum type | 4 | 7 | | 7 | 14 | | 2 | 4 |
| Polygonum persicaria | | | | | 1 | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Convonlvulus | | 1 | | | 2 | | | |
| Ranunculus | 5 | 4 | | 6 | 19 | | 3 | 1 |
| Valeriana | | | | | 1 | | | |
| Urtica | | 2 | 1 | | 1 | | | |
| Lamiaceae | | | | | 8 | | | |
| Apiaceae | | 1 | | | 7 | | | |
| Caryophyllaceae | 3 | 6 | 1 | 6 | 4 | | 3 | 16 |
| Stellaria media type | 27 | 24 | | 27 | 15 | | | |
| Saxifragaceae | 1 | 1 | | | | | | |
| Plantago m/m | | 12 | | 3 | 4 | | | |
| Plantago lanceolata | | 10 | | 1 | | | | |
| Lotus | | 2 | | 4 | 2 | | | 5 |
| Sparganium | | 1 | | | | | | |
| Bothrychium lunaria | 1 | 2 | | 1 | 7 | | | 2 |
| Ophioglossum | | | | | | | | |
| Polypodiaceae | 13 | 14 | 3 | 10 | 7 | | | 5 |
| Polypodium vulgare | | | | | | | | 1 |
| Asplenium | | | 1 | | | | | |
| Cryptogramma crispa | | | | | 1 | | | |
| Adiantum | | 2 | | | | | | |
| Undeterminate NAP | | 12 | | 9 | 16 | | 4 | 10 |
| ***Sum*** | ***214*** | ***297*** | ***55*** | ***216*** | ***314*** | ***8*** | ***37*** | ***120*** |
| **Sum of palynomorphs** | **214** | **327** | **87** | **254** | **368** | **10** | **62** | **156** |

Table No. 5

| **Burial No. 85** | **Near skull** | **Betw. teeth** | **Near knees** | **Near thigh** | **Near foot** | **Near arms** | **Vessel 1** | **Vessel 2** | **Vessel 3** | **Vessel 4** | **Vessel 5** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample No.** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
| **Wood plants:** | | | | | | | | | | | |
| Abies nordmanniana | 4 | 1 | 6 | 3 | | 3 | 1 | | 1 | 2 | 1 |
| Picea orientalis | | | 1 | | | | | | | | |
| Pinus | 27 | 8 | 23 | 17 | 13 | 15 | 2 | 11 | 2 | 3 | |
| Carpinus caucasica | 2 | | | | 1 | | | | | | |
| Carpinus orientalis | | | 1 | | | | | | | | |
| Alnus | 1 | | | | 1 | 2 | | | | | |
| Quercus | | | | | 1 | 1 | | 1 | | | 1 |
| Corylus | 1 | | | | 1 | | | | | | 4 |
| Ephedra | 1 | | | | | | | 1 | | | |
| ***Sum*** | ***36*** | ***9*** | ***31*** | ***20*** | ***17*** | ***21*** | ***3*** | ***13*** | ***3*** | ***5*** | ***6*** |
| **Herbs:** | | | | | | | | | | | |
| Poaceae | 2 | 12 | 5 | 1 | 2 | 21 | | 1 | | | |
| Triticum | | | | | | 1 | | 1 | | | |
| Cerealia | 4 | | 3 | 2 | 1 | | | | | | |
| Panicum type | | | | | | | | | | | |
| Chenopodiaceae | 1 | | 2 | | 1 | 2 | | | | | |
| Chanopodium album | 1 | | | | | | | | | | |
| Artemisia | | | 1 | | | | | | | | |
| Aster type | 6 | 3 | 12 | 1 | 11 | 7 | 1 | | | 2 | |
| Achillea | 2 | | | | | 2 | | | | | 1 |
| Cichorioidae | 35 | 8 | 53 | 11 | 36 | 63 | 17 | | 9 | 3 | 1 |
| Carduus | 6 | | 13 | 3 | 4 | 4 | 1 | | 1 | 2 | 1 |
| Cirsium | | 2 | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Serratula | 3 | | 1 | | 1 | 1 | | | | | |
| Fagopyrum | | | | | 1 | | 1 | | | | |
| Polygonum type | 22 | 2 | 5 | | 3 | 1 | | | 1 | | |
| Polygonum aviculare | | | | | | 1 | | | | | |
| Polygonum bistorta | | | | | | | | 2 | | | |
| Convonlvulus | | 1 | | | | | | | | | |
| Ranunculus | 4 | | | 1 | | 1 | | | 1 | | |
| Apiaceae | 2 | | | | | | | | | | |
| Astrantia | 1 | | | | | | | | | | |
| Caryophyllaceae | 6 | | 2 | | 4 | | | | | 2 | |
| Cerastium | 2 | | | | | | | | | | |
| Saxifragaceae | 3 | | 1 | | | | | | | | |
| Boraginaceae | | | | | | | | | 2 | 6 | |
| Lotus | 146 | 51 | 14 | | 9 | 9 | | | | | |
| Rosaceae | | 3 | | | | | | | | | |
| Trifolium | | 1 | | | | | | 1 | | | |
| Alisma | 1 | | | | | | | | | | |
| Sparganium | | | | | | | | 2 | | | |
| Bothrychium lunaria | 2 | 1 | 2 | | 1 | 4 | | | 1 | | |
| Ophioglossum | | | | | | | | | | | |
| Polypodiaceae | 16 | 4 | 9 | 1 | 10 | 4 | | | | 9 | 3 |
| Polypodium serratum | | | | | 5 | | | | | | |
| Polypodium vulgare | | | | | 10 | | | | | | |
| Undeterminate NAP | 5 | | 4 | | 5 | | | 3 | | | |
| ***Sum*** | ***270*** | ***88*** | ***127*** | ***20*** | ***104*** | ***121*** | ***20*** | ***10*** | ***15*** | ***24*** | ***6*** |
| **Sum of palynomorphs** | **306** | **97** | **158** | **40** | **121** | **142** | **23** | **23** | **18** | **29** | **12** |

Table No. 6

| **Burial No. 78** | **Near skull** | **Betw. teeth** | **Near thigh** | **Abdo-minal** | **Vessel 1** | **Under vessel 1** | **Vessel 2** | **Under vessel 2** | **Vessel 3** | **Under vessel 3** |
|---|---|---|---|---|---|---|---|---|---|---|
| **Sample No.** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| **Wood plants:** | | | | | | | | | | |
| Abies nordmanniana | 6 | 1 | 2 | 3 | | 2 | 1 | | 2 | 3 |
| Picea orientalis | 2 | 3 | | 1 | 2 | | | | | |
| Cedrus libani | | | | | | | 1 | 1 | | |
| Pinus | 12 | 4 | 7 | 4 | 29 | 8 | 9 | 3 | 5 | 3 |
| Juniperus | 1 | | | | | | | | | 1 |
| Juglans | 1 | | 1 | | | | | | | |
| Fagus orientalis | | | | | 1 | | | | | |
| Carpinus caucasica | 1 | | 1 | | 1 | | 1 | | | |
| Carpinus orientalis | | | | | | | | | | |
| Alnus | 4 | | | | 1 | 1 | | | | |
| Ulmus | | | | | | 1 | | | | |
| Zelkova | 2 | | | | | | | | | |
| Quercus | 7 | | 1 | | 1 | | | | 1 | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Tilia | 1 | 3 | | | | | | | | |
| Corylus | 4 | | | 1 | 1 | | 1 | 1 | | |
| Rosaceae | 4 | | | | | | | | | |
| Rhamnus | | | 3 | | | | | | | |
| Vitis vinifera | 2 | | | | | | | | | |
| Ephedra | 1 | | 1 | | | | | | | |
| ***Sum*** | ***48*** | ***11*** | ***16*** | ***9*** | ***36*** | ***12*** | ***13*** | ***5*** | ***8*** | ***7*** |
| **Herbs:** | | | | | | | | | | |
| Poaceae | 7 | 1 | 4 | 2 | 1 | 1 | | | | 2 |
| Triticum | 4 | 5 | 2 | | | 1 | | | | |
| Cerealia | 3 | | 1 | | | | | | | |
| Chenopodiaceae | 3 | 1 | 1 | 4 | 1 | 1 | | | 1 | |
| Chanopodium album | 1 | | | 1 | | 1 | | | | |
| Artemisia | 8 | 3 | 2 | | | 3 | 2 | 1 | | |
| Aster type | 8 | 1 | 3 | 4 | 14 | 2 | 3 | | 2 | 1 |
| Achillea | 3 | | | 3 | 3 | 1 | | | | |
| Xanthium | 1 | | | | | | 1 | | | |
| Cichorioidae | 41 | 5 | 6 | 29 | 64 | 13 | 11 | 4 | 19 | 9 |
| Carduus | | 5 | 1 | 2 | 5 | 5 | 2 | 3 | 1 | 2 |
| Cirsium | | | | | 2 | | | | | |
| Serratula | 1 | | | | 4 | | | | 2 | |
| Fagopyrum | 2 | 1 | | 2 | 2 | 1 | 2 | 1 | | |
| Polygonum type | 3 | 3 | 4 | 2 | 18 | 8 | 2 | 2 | 3 | 2 |
| Polygonum bistorta | 1 | | | 2 | | | | | | |
| Convonlvulus | 2 | 1 | | | | | | | | |
| Ranunculus | 2 | | 7 | | 6 | 2 | 3 | | | 1 |
| Primula | 2 | | | | | | | | | |
| Potentilla | | | | | 3 | | | | | |
| Rosaceae | 1 | | | | | | | | | |
| Fragaria | 2 | | | | | | | | | |
| Valeriana | | | | 1 | | | | | | |
| Lamiaceae | | | 2 | | | | | | | |
| Apiaceae | | | | | 1 | | | | | |
| Fabaceae | | | | | 3 | | | | | |
| Caryophyllaceae | 2 | | | 3 | 3 | 4 | 1 | | | 2 |
| Saxifragaceae | | | 1 | | | | | | | |
| Boraginaceae | 5 | | | 3 | 4 | | 3 | | 2 | |
| Plantago m/m | | 2 | 2 | | | | 4 | | | |
| Plantago lanceolata | | | 2 | | | | 1 | 2 | | |
| Lotus | | | 5 | | | | | | | |
| Brassicaceae | 2 | 4 | | | 3 | 1 | | | | |
| Bothrychium lunaria | | 1 | | | | | 1 | | 1 | |
| Polypodiaceae | 10 | | 3 | | 10 | 6 | 4 | 3 | 3 | 3 |
| Polypodium vulgare | | | | | | | | 1 | | |
| Undeterminate NAP | 16 | 2 | | 3 | 4 | 2 | | | | |
| ***Sum*** | ***130*** | ***35*** | ***46*** | ***61*** | ***151*** | ***52*** | ***40*** | ***17*** | ***34*** | ***22*** |
| **Sum of palynomorphs** | **178** | **46** | **62** | **70** | **187** | **64** | **53** | **22** | **42** | **29** |

Table No. 7

| **Ritual pits Nos. 54, 72, 79** | **No. 54** | | | | **No. 79** | | | **No. 72** | |
|---|---|---|---|---|---|---|---|---|---|
| | **Vessel 1** | **Under vessel 1** | **Vessel 2** | **Under vessel 2** | **Vessel 2** | **Under vessel 2** | **Vessel 3** | **Vessel 2** | **Vessel 3** |
| **Sample No.** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** |
| **Wood plants:** | | | | | | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Abies nordmanniana | 1 | 1 | 3 | | | | 5 | 11 | 1 |
| Picea orientalis | | | 2 | 3 | 1 | | | 2 | 1 |
| Cedrus libani | | | | | | | | | |
| Pinus | 5 | 5 | 11 | 10 | 3 | 2 | 30 | 34 | 8 |
| Juniperus | | | | | | | | 1 | 2 |
| Betula | | | | | | | | | |
| Juglans | | | | | | | | | |
| Fagus orientalis | | | | 1 | | | | | |
| Carpinus caucasica | | | | 1 | | | | | |
| Carpinus orientalis | | | | 1 | | | | | |
| Alnus | | | | | | | | | |
| Ulmus | | | | | | | | | |
| Quercus | | 3 | | 10 | | | 2 | | 1 |
| Tilia | | | | | | | | | |
| Acer | | | | | | | | | |
| Corylus | | | | | | | 1 | 1 | |
| Rosaceae | | | | 1 | | | | | |
| Rhamnus | | | | | | | | | |
| Vitis vinifera | | 51 | | 3 | | | | | |
| Ephedra | | 1 | | 28 | | | | | |
| ***Sum*** | ***6*** | ***61*** | ***16*** | ***58*** | ***4*** | ***2*** | ***38*** | ***49*** | ***13*** |
| **Herbs:** | | | | | | | | | |
| Poaceae | 5 | 3 | 8 | 6 | 2 | | 2 | | 2 |
| Triticum | 21 | 4 | | | | | | | |
| Hordeum | | | | | | | 3 | | 1 |
| Cerealia | 9 | 5 | | | | | | | |
| Panicum type | | | | | | | | | |
| Chenopodiaceae | | 5 | | 2 | | | 1 | | |
| Chanopodium album | | 1 | | | | | | | |
| Artemisia | | 1 | | 1 | | | | 1 | |
| Aster type | | 1 | | | 3 | 3 | 3 | 3 | 3 |
| Achillea | | | | | | | | 2 | |
| Xanthium | | | | | | | | | 1 |
| Cichorioidae | | 15 | 10 | 12 | 20 | 5 | 35 | 49 | 31 |
| Carduus | 2 | 1 | 7 | 4 | 2 | 4 | 8 | 4 | 3 |
| Cirsium | | | | | | | | | |
| Centaurea | | | | | | | | 1 | 1 |
| Centaurea cyanus | | | | | | | | | |
| Serratula | | | | | | | | 2 | 2 |
| Fagopyrum | | | | | | | | | |
| Rumex | | | | | | | | | |
| Polygonum type | 3 | 6 | 2 | 3 | 2 | 3 | 9 | 5 | 5 |
| Polygonum aviculare | | | | | | | | | |
| Polygonum bistorta | 3 | | | | | | | | 1 |
| Polygonum persicaria | | 1 | | | | | | | |
| Convonlvulus | 18 | 7 | | | | | | | |
| Ranunculus | 3 | | 1 | | | | 1 | 3 | 1 |
| Papaver | | | | | | | | | |
| Malva | | | | | | | | | |
| Geranium | | | | | | | | | |
| Viola | | | | | | | | | |
| Cyclamen | | | | | | | | | |
| Symphitum | | | | | | | | | |
| Valeriana | | | | | | | | | |
| Dipsacus | | | | | | | | | |
| Urtica | | | | | | | | | |
| Veronica | | | | | | | | | |
| Lamiaceae | | | | | | | | | |
| Apiaceae | | 2 | | 1 | | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Heracleum | | | | | | | | | |
| Fabaceae | | | | | | | | | |
| Caryophyllaceae | 1 | 3 | 1 | 1 | | 2 | | 5 | 1 |
| Stellaria media type | | | | | | | | | |
| Saxifragaceae | | | | | | | | | |
| Boraginaceae | | | | | | | | | |
| Plantago m/m | | 1 | | | | | | | |
| Plantago lanceolata | 1 | | | 2 | | | | | 1 |
| Lotus | | | | | 1 | | | | |
| Liliaceae | | | | | | | | | |
| Colchicum | | | | | | | | | |
| Trifolium | | 1 | | 1 | | | | | |
| Brassicaceae | 1 | | | | | | | | |
| Typha | | 1 | | 2 | | | | | |
| Alisma | | | | | | | | | |
| Sparganium | | | | | | | | | |
| Phragmites | | | | | | | | | |
| Sphagnum | | | | | | | | | |
| Lycopodium | | | | | | | | | |
| Lycopodium selago | | | | | | | | | |
| Bothrychium lunaria | 3 | 1 | | | 1 | | 1 | | |
| Ophioglossum | | | | | | | | | |
| Polypodiaceae | 3 | 3 | 4 | 4 | 3 | | 19 | 4 | 3 |
| Polypodium serratum | | | | | | | | 1 | |
| Polypodium vulgare | | | | | | | | | |
| Asplenium | | | | | | | | | |
| Asplenium ruta-muraria | | | | | | | | | |
| Dryopteris | | | | | | | | | |
| Cryptogramma crispa | | | | | | | | | |
| Pteris cretica | | | | | | | | | |
| Adiantum | | | | | | | | | |
| Undeterminate NAP | | | | 2 | | | 2 | | 2 |
| ***Sum*** | ***73*** | ***62*** | ***33*** | ***41*** | ***34*** | ***17*** | ***84*** | ***80*** | ***58*** |
| **Sum of palynomorphs** | **79** | **123** | **49** | **99** | **38** | **19** | **122** | **129** | **71** |

## Appendix

### Lithics Analysis Report

**By Ketevan Esakia**

The stone material from the Saphar-Kharaba necropolis was studied using the traceological method (Semenov 1957, 1968). The laboratory investigation consists of typological and functional studies. The typological analysis gives a technological and morphological definition of the stone material, while the functional analysis defines the actual use to which a tool was put. Together, they provide information about the technique of tool preparation as well the order in which tools were used. Conclusions concerning chronological and economic peculiarities were made on this basis. The study took a multilateral approach: macroanalysis, or the visual investigation of a tool (Korobkova, Skakun, Sharovskaya 1983) plus microanalysis: linear traces, burnishing, damage (magnification x100). Such an approach helps to specify the function and size of a tool, the duration of use and the kind of material being worked.

The Saphar-Kharaba stone inventory consisted of 27 surface finds and 44 burial finds. Among the surface finds, five tools were identified: an arrowhead (1), a grindstone (1), an axe (1), a mortar (1) and a hand-axe (1). The same number (5) of tools was found at the necropolis: burin-like tools (4) and an arrowhead (1). In practical terms,

no other kinds of tools were visually identified among the material we were given, though the quantity was rather large.
Of the 71 objects studied, only 14% represented typologically identified tools. According to our classification (Esakia, Margvelashvili 2004), they represent a second grade group, which does not provide us with enough information for the reconstruction of a tool production process.

## The Saphar-Kharaba Necropolis

Seventeen artefacts of the 44 stone objects from the Saphar-Kharaba necropolis were studied traceologically. Among them were identified 2 broken pieces, 23 flakes, 2 lamellae and the remains of a nucleus.
The microanalysis showed that of 44 objects from the necropolis, 26 were tools, while 15 artefacts were flakes without any traces of secondary working or use. Generally, knives for cutting meat predominated in the stone inventory of the necropolis (Burials Nos. 32, 39, 78, 90, 94), amounting to a total of 7 pieces.
Next come 6 scrapers (Burials Nos. 32, 39, 78, 90, 91), 6 expanders (Burials Nos. 56, 63, 90, 91), 4 perforators (Burials Nos. 39, 63, 75), 4 files (Burials Nos. 38, 85, 110), 2 side-scrapers (Burials Nos. 63, 94), a retouch (Burial No. 78), a cutter (Burial No. 90), a burin (Burial No. 90) and an arrowhead (Burial No. 78).
Taking into account the fact that the cutting edges of some tools were used for a range of purposes (combined tools), the number of functional tools increased to 31 items.
In what follows, the functional data of stone materials from both the necropolis and surface finds are treated together for statistical purposes.
Burial No. 32/No. 281-3, at a depth 0.5 m (in the southern part of the grave):

1. A chip, small, without retouch or trace of use. Obsidian. – 1.

Burial No. 32/ No. 279-1, at a depth of 0.5 m (in the southern part of the grave):

2. A scraper, single-edged, made from a large flake, the cutting edge slightly grooved and strongly obtuse (nearly polished). A linear trace, in the shape of short perpendicular lines, is visible along the selvage on a very small section. Without any retouch. For working bone and horn. Obsidian. – 1.

Burial No. 32/ No. 280 –2, at a depth of 0.6 m:

3. Single-edged knife, made from a large flake. The blade is slightly concave and slightly abraded on the back and body, polished, linear trace scarcely visible. The other edge blunted by a large blunting retouch. Obsidian. – 1.

Burial No. 38/ No. 250-302 (in the northern part of the burial):

4. Single-edged file, made from a small rough lamella. The cutting edge is partially broken. A small preserved fragment is abraded and densely cogged. The linear trace of long, parallel hatchings is visible along the edge. There is a chip on its cutting edge. The file was used for processing wood. Obsidian without retouch. – 1.

Burial No. 40/No.251-305 (near the deceased's thighbone):

5. A perforator with an asymmetrically broken ending, made from a medium-sized flake. Sides on the back are slightly abraded. The utilization retouch runs chainlike along its cutting edge. No linear trace. Feeble burnish. Obsidian without retouch. – 1.

Burial No. 39/No. 204-315 (south of the skull, at a distance of 20 cm):

6. A single-edged scraper, made from a single-edged knife, a large flake with an engraved cutting edge, with thin chips on its back and belly. A linear trace on the knife is preserved on its selvage in the shape of a short scrape, running

parallel to the tool, while on the scraper it is deeper, running perpendicular to the cutting edge. Flint without retouch. – 1.

Burial No. 51/ No. 332-252, at a depth of 0.6 m (in the central part):

7. A flake, large, without retouch or any trace of use. Obsidian. – 1.

Burial No. 56/ No. 356-253, at a depth of 0.6 m (near W part of the grave):

8. A flake, large, without retouch or any trace of use. Obsidian – 1.

Burial No. 56/No. 254 (the southern part of the burial).

9. An expander, on a small chip, with a massive cutting edge (near a bulb of percussion) that is flaky in its back and belly. An implement for working wood. Without retouch. Obsidian. – 1.

Burial No. 56/No. 356-355 (the southern part of the burial):

10. An expander, on a small chip, with a massive cutting edge, flaky on both sides. A wood processor. Without retouch. Flint. – 1.

Burial No. 62/No. 366-256, at a depth of 0.8-1 m.

11. A chip, medium-sized, without retouch or any trace of use. Obsidian. – 1.

Burial No. 62/No.366-256, at a depth of 0.8-1 m:

12. A side-scraper, on a small flake, with a very worn out (blunted) cutting edge and slightly rounded selvage (with a transversal linear trace and burnish). For working leather. Without retouch. Obsidian. – 1.

Burial No. 62/No. 366-256, at a depth of 0.8-1 m:

13. A chip, small, without retouch or any trace of use. Obsidian. – 1.

Burial No. 63/ No. 367-257 (2), (in the pit of the grave, at a depth of 0.25 m, near the eastern wall):

14. A flake, large, without retouch or any trace of use. Obsidian. – 1.

Burial No.63 / No. 367-257 (4), (at a depth of 0.25 m, near the eastern wall):

15. A perforator, on a triangular, small flake, with a symmetrical cutting edge. One edge has microscopic chips. With sharp angles and a broken point. Without retouch. Obsidian. – 1.

Burial No. 63 / No. 367-257 (1), (at a depth of 0.25 m, near the southern margin):

16. An expander, on a small flake, with a broken cutting edge, abraded on both sides. For working wood. Without retouch. Obsidian. – 1.

Burial No. 63/ No. 367-257 (3), (at a depth of 0.25 m, near the eastern wall):

17. An expander, with a broken cutting edge on the tip of the nucleus, abraded on both sides, the preserved cutting edge polished. For working wood. Without retouch. Obsidian. – 1.

Burial No. 75/ No. 401-259 (at a depth of 0.45 m, near the southern edge):

18. Perforators, on small chips, with broken cutting edges, utilization retouch on one side, polished on the preserved cutting edges. They were only in use for a very short time. Without retouch. Obsidian – 2.

Burial No. 85 / No. 466a-264 (in the lamb's cranium (V), near its cervical vertebrae):

19. A single-edged file with a very blunt cutting edge, on a medium-sized chip. With a fine sharpening retouch on its back, linear traces in the shape of oblong hatchings. For working wood. Obsidian. – 1.

Burial No. 78 / No. 408-262 (2) (in the central part of the grave, under the shoulder of a lamb, in the central part of the grave):

20. A knife, single-edged, on a large flake, with a grooved edge. A small segment used for cutting has obvious linear traces and dullness. Without retouch. – 1.

Burial No. 78 / No. 409-219 (in the western part of the pile of stones):

21. An arrowhead-scraper, on a medium-sized and triangular flake with retouch worked on both sides. The edge of the scraper is located in the angle of the arrowhead. Blunted owing to use. The arrowhead has no tang. Obsidian. – 1.

Burial No. 78 / No. 480-273 (7) (approximately in 40 cm from the northern wall of the grave, at a depth of 1.10 m):

22. A single-edged knife, broken, on a massive flake, with the preserved skin of the core on its striking platform. One edge is slightly grooved by the utilization retouch. Abraded on back and belly, slightly burnished. Light linear traces, running diagonally and across each another. Without retouch. Obsidian. – 1.

The Saphar-Kharaba necropolis, Burial No. 78 / No. 410-260 (from the surface layer of the burial):

23. A single-edged scraper: retouch, on a large rectangle flake, with grooved cutting edge. Both surfaces used. The implement is completely smooth. For working wood. Without retouch. Obsidian. – 1.

Burial No. 90 / No. 483 – 267 (1); (northern part of the chamber, on the top of the chamber):

24. A single-edged scraper, on a large chip, with a slightly grooved cutting edge. Thin lines, running perpendicular to the cutting edge, visible on a segment of the cutting edge. Without retouch. Obsidian. –1.

Burial No. 90 / No. 476-274 (at a depth of 1.20 m):

25. A semi-finished arrowhead, in the shape of a small triangle, without any traces of use. Obsidian. – 1.

Burial No. 90 / No. 477 – 276 (1) (from the surface between vessels No.1 and No. 2, at a depth of 1.25 m):

26. A large flake, triangular, with traces of use. The back is covered with the skin of the core. Without retouch. Obsidian – 1.

Burial No. 90 / No. 478 – 271 (5) (southern part of the grave):

27. A cutter, on a medium-sized chip with a broken cutter fragment, with a beaklike cutting edge, polished, for working wood. With retouch. Obsidian. – 1.

Burial No. 90 – No. 479 – 271 (9) (near upper part, at a depth of 1.20 m below the modern surface):

28. A single-edged knife, on a medium-sized flake, with thin chips on its back and belly. A preserved segment is polished. A slight linear trace. Without retouch. Obsidian. – 1.

Burial No. 90 / No. 481 – 270 (10) (at a depth of 0.75 m):

29. A chip, medium-sized, without retouch or any trace of use. Obsidian. – 1.

Burial No. 90 / No. 48279-271 (3) (at 0.75 m from the corner of the grave, in the centre):

30. A knife with a broken cutting edge on a large chip. One straight cutting edge processed with flat sharpening retouch, the other one broken, traces barely visible. Obsidian. – 1.

The Saphar-Kharaba burial, Burial No. 90 / No. 485-272 (6) (in the northern part of the grave, at a depth of 1,0 m):

31. A flake, medium-sized. Without any traces of use. Without retouch. Andesite. – 1.

Burial No. 90 / No. 484-268 (2) (in the central part of the grave, at a depth of 1.0 m):

32. A burin-expander, on a triangular flake, engraved on two sides, the implement completely smooth. For working wood. Without retouch. Flint. – 1.

Burial No. 91 / No. 490-277 (1), (T. Ch. No. 3):

33. A one edged scraper, on a rectangular flake, with two grooved surfaces, traces of use visible on the back: scale-like chips, uneven and flat. Burnishing and linear trace only preserved on stable areas of the cutting edge: slightly visible on both planes. Without retouch. Obsidian. -1.

Burial No. 91 / No. 491-279 (2):

34. An expander, with a solid cutting edge, on a medium-sized chip, one side chopped by a cutter (ant traces of use are not visible owing to an inscription), the other one is completely smooth. Without retouch. Obsidian. – 1.

Burial No. 91 / No. 491-279 (3,4):

35. A small chip. Without any traces of use. Without retouch. Obsidian. – 2.

Burial No. 92 / No. 495 – 280 (between vessels No. 1 and No. 2):

36. A small chip. Without any traces of use. Without retouch. Obsidian. – 1.

Burial No. 94 / No. 501 – 281 (west of a clay vessel, near the western wall):

37. A single-edged side-scraper, made on a single-edged knife, on a triangular flake, with a straight cutting edge, with thick facets on the belly side. Slight burnish preserved on the stable areas of the implement. Without any retouch. Obsidian. –1. Burial No. 107 / No. 539 – 288:

38. A medium-sized chip. Without any traces of use. Without retouch. Obsidian – 1.

Burial No. 110 / No. 550 – 284 (2) (in the pit, at a depth of 30 cm):

39. A single-edged file, on a small lamella with a broken tip and base, with one grooved edge and the other with a straight edge, blunted. With finely abraded cutting edge and parallel linear traces on both sides. For working bone. Without retouch. Obsidian. – 1.

Burial No. 110 / No. 549 – 283 (1) (south-eastern corner of the grave):

40. A massive rectangle-shaped flake. Without any traces of use, and without retouch. Obsidian. – 1.

Burial No. 122 / No. 580 – 283 (1) (found in large pot No. 1):

41. A medium-sized flake. Without any traces of use. Without retouch. Obsidian. – 1.

Burial No. 122 / No. 580 – 283 (1) (found in big pot No. 1):

42. A knife, on a medium-sized chip, with a broken cutting edge, thin and frequent scratches visible on a tiny area. Without retouch. Obsidian. – 1.

In total 44 artefacts were studied.

Accidental flakes were used as implements in the graves for specific functions. According to functional statistics, the implements in question were used for working wood and bone, namely:

1.The files found in Burials Nos. 38 and 85 were used for working wood, while the file from Burial No. 110 was for working bone. This fact attests to the existence (use) of wood and bone in the grave.

2. The knives found in Burials Nos. 32, 39, 78, 90, 94 and 122 were used to cut meat.

3. The implements found in Burials Nos. 56, 63 and 91 were used to widen a hole in a tree.

4. The arrowhead found in Burial No. 78 was used as a side-scraper.

5. Traces of woodworking are marked on the scrapers (only two specimens).

Surface finds

Obsidian (21), flint (5), basalt (1) and a pebble (1) were used as raw materials of the surface finds. Medium-sized lamellae with broken tips and bases were characteristic of the surface material industry (22).

An arrowhead, a perforator, a pestle, four flakes and remains of a nucleus are morphologically distinct implements.

Of 28 items, 26 implements were identified. Their number increases to 33, if we take into consideration combined cutting edges as well. Each implement is characterized separately.

KP – 120 / 720, at a depth of 0.40-0.45 m.

1. A single-edged file, on a single-edged knife on a medium-sized lamella with broken tips and base. The cutting edge of the knife was cogged in use. Large facets and deep, parallel lines specific for files are on its back, while those on its body are comparatively smaller. The cutting edge of the knife is smooth from use. The implement was used for working wood. Obsidian without any retouch. – 1.

KP – 120 / 798. 05. At a depth of 0.40-0.45 m.

2. A retouch, large, on a solid lamella. Both edges concave and blunt. Work was performed from the side of the body. Without retouch. Obsidian. – 1.

KP – 120 / 741, at a depth of 0.40-0.45 m.

3. A single-edged file, on a straight, medium-sized lamella with broken tip and base and with one straight cutting edge and a linear trace characteristic of a file. The other one is smooth by blunting retouch and slightly grooved. For working raw material. Obsidian – 1.

KP – 120 / 773, at a depth of 40 – 45 m.

4. A single-edged file, on a straight, medium-sized lamella with broken tip and base. One cutting edge slightly cogged and the other one blunt with straight cutting edge. With perfectly preserved traces of use. An implement for working fresh wood. Obsidian – 1.

KP – 120 / 595, at a depth of 0.40-0,45 m.

5. A side-scraper, on a medium-sized lamella with broken tips and base and obtuse retouch, with one edge straight and the other grooved. The cutting edge located in a small basal area. For leather processing. Obsidian. – 1.

KP – 120 / 770, at a depth of 40 – 45 m.

6. A two-edged knife, on a lamella with broken tip and base and one straight cutting edge. With small facets running from the back. The other one is broken. Without retouch. Obsidian. – 1.

KP – 120 / 782, at a depth of 40-45 m.

7. A single-edged knife, on a small lamella with broken tip and base, having fine chips. The cutting edge is blunt. A linear trace preserved on a tiny fragment. Without retouch. Obsidian. – 1.

KP – 120 / 855, at a depth of 40 –45 m.

8. A side-scraper-file on a medium-sized lamella with broken tip and base. The side-scraper has fine facets, running from the back due to use, while the belly side of the edge is smooth. The file edge is slightly cogged and sharpened. A deep linear trace is visible. The implement is abraded on both sides. Without retouch. Obsidian. – 1.

KP – 120 / 781, at a depth of 40-45 m.

9. A two-edged knife, on a medium-sized lamella with broken tip and base. Linear trace preserved on both surfaces. The implement is smooth owing to long use. Without retouch. Obsidian. – 1.

KP – 120 / 899, at a depth of 40-50 m.

10. A single-edged knife, on a medium-sized lamella with a broken tip and base. The cutting edge is blunt. Without retouch. Obsidian – 1.

KP – 120 / 769, at a depth 40 – 45 m.

11. A side-scraper with a loose end, on a single-edged file, on a medium-sized lamella. The cutting edge of the side-scraper is rounded. One edge of the file is formed by a thick blunting retouch, and the other by a thin sharpening retouch. Obsidian. – 1.

KP – 120 / 770, at a depth of 40 – 45 m.

12. A scraper, on a large uneven lamella, the cutting edge grooved, strongly abraded. A linear trace nearly erased, thick facets on one edge from the back of the implement, on the other edge a thick blunting retouch. Obsidian. – 1.

KP – 120 / 858, at a depth of 40 – 45 m.

13. A single-edged knife, on a small lamella with a broken tip and base, the cutting edge sharpened, finely cogged, facets very thin, shallow, slightly burnished. The linear trace is deep on preserved fragments. The other, non-working edge of the implement is partially made blunt by a thin section. Without retouch. Obsidian. – 1.

KP – 120 / 832, at a depth of 40 – 45 m.

14. A single-edged knife, on a medium-sized lamella with a broken tip, slightly concave in profile, the edge grooved, without retouch. Obsidian. – 1.

KP – 120 / 684, at a depth 40 – 45 m, surface finds:

15. A single-edged knife, on a large lamella with a broken tip, one edge grooved, with uneven facets on its back. Without retouch. Obsidian. – 1.

KP – 120 / 767, at a depth of 40 – 45 m:

16. A file: a single-edged knife, massive, on the edge of a lamella with a broken tip and base. With a cogged cutting edge. Small facets on both surfaces. A linear trace preserved on both implements on a small area. Without retouch. Obsidian. – 1.

KP – 120 / 766, at a depth of 40 – 45 m.

17. A scraper: a side-scraper with a loose end, on a large, straight profiled lamella with remains of the core on its back. The working edge of the side-scraper blunted by a sloping retouch. The scraper is slightly grooved, blunt, with a deep linear trace. For working bone and horn. Obsidian. – 1.

KP – 120 / 597, at a depth of 40 – 45 m, surface finds:

18. A side-scraper: a single-edged knife, on a large foliaceous flake, with a rounded working edge and sloping retouch. A trace of the core is preserved on the back. The edge of the knife is straight. Microscopic chips on both sides. Obsidian. – 1.

KP – 120 / 773, at a depth 0.40 – 0.45 m.

19. A single-edged scraper, on a single-edged file, on a medium-sized lamella with a broken tip. The file edge is slightly cogged; a thin blunting retouch runs from its back, while microscopic chips are on its belly. Used for working wood. Obsidian. – 1.

KP – 120 / 768, at a depth of 0.40-0.45 m:

20. A single-edged file, made from a single-edged knife, on a large lamella with a broken tip and base. The tip is cut obliquely. One edge is grooved by a blunting retouch from the back of the artefact. The working edge of the file is cogged. Used for working wood. Obsidian. – 1.

KP – 120 / 688, at a depth of 0.40 – 0.45 m.

21. An arrowhead, without a tang, made from a small triangular flake by means of the bilateral working techniques. Obsidian. –1.

KP – 120 / 823, at a depth of 0.40-0.45 m.

22. A lamella, uneven-shaped, without any retouch or trace of use. Flint. –1.

KP – 120/ 747, at a depth of 0.40-0.45 m:

23. Remains of a nucleus with a cutting fragment, small, without any traces of retouch or use. Flint. –1.

KP – 120 / 748, at a depth of 0.40-0.45 m.

24. A single-edged scraper, made on a medium-sized flake, with a grooved edge, without any traces of retouch or use. Flint. –1.

KP – 120 / 709, at a depth of 0.40-0.45 m.

25. A perforator with an asymmetrical cutting edge, on a medium-sized flake, with distinguishable working edge; one side is blunt, the other one has a cutting chip. Flint. – 1.

KP – 120 / 686, at a depth of 0.40-0.45 m:

26. A scraper, with two marginal edges: a side-scraper, on a small straight-profiled lamella. A high, thick blunting retouch. Flint. - 1.

KP –120 / 901, at a depth of 0.40-0.45 m.

27. A single-edged knife, on a large triangular lamella, with one grooved edge, located on a fragment of the tip of the knife and its side. Without retouch. Basalt. – 1.

KP – 120 / 697, at a depth of 40-45 m.

28. A mortar for crushing dye, a medium-sized pebble, with a trace of dye on its extremity. Small, deep chips visible to the naked eye. – 1.

Thus, the surface material is mainly represented by lamellae. Primary investigation revealed the traces of slight use on some artefacts, while some preserved traces of retouch.

Four additional functional groups were distinguished, namely: knives for cutting meat (13), files and side-scrapers (7-7), and scrapers (5).

A general characterization of the Saphar-Kharaba stone material could be made on the basis of the data presented in the histogram.

The main group of the histogram data (knives) constituted its standard. According to our functional classification (Esakia 2003, 136-146), the implements found both at the necropolis and among the surface finds belong to a group reflecting the domestic economy, implying that at the site there were not found tools of a kind that would have enabled an assessment of its basic economic direction or the level of its development.

The following information was also extracted:

1. The functional groups (knives for cutting meat, files, scrapers, perforators, retouches) were used for specific funerary purposes.
2. The implements, with the exception of one or two items, were not specially made.
3. The fact that it was flakes for the most part, serving as tools, that were found in graves indicates that they were used fortuitously. When the positions in which they were found are taken into account, there are no grounds for speculating as to whether specific implements were deliberately placed in graves. Flakes were used for certain kinds of work and then abandoned afterwards. The functional statistics proves that wood and bone had been worked by implements present in the graves, namely:
    a) Trace of woodworking is evident on the files found in Burials Nos. 38 and 85, while the one found in Burial No. 110 reveals trace of bone processing. This attests to the existence (use) of wood in the grave;

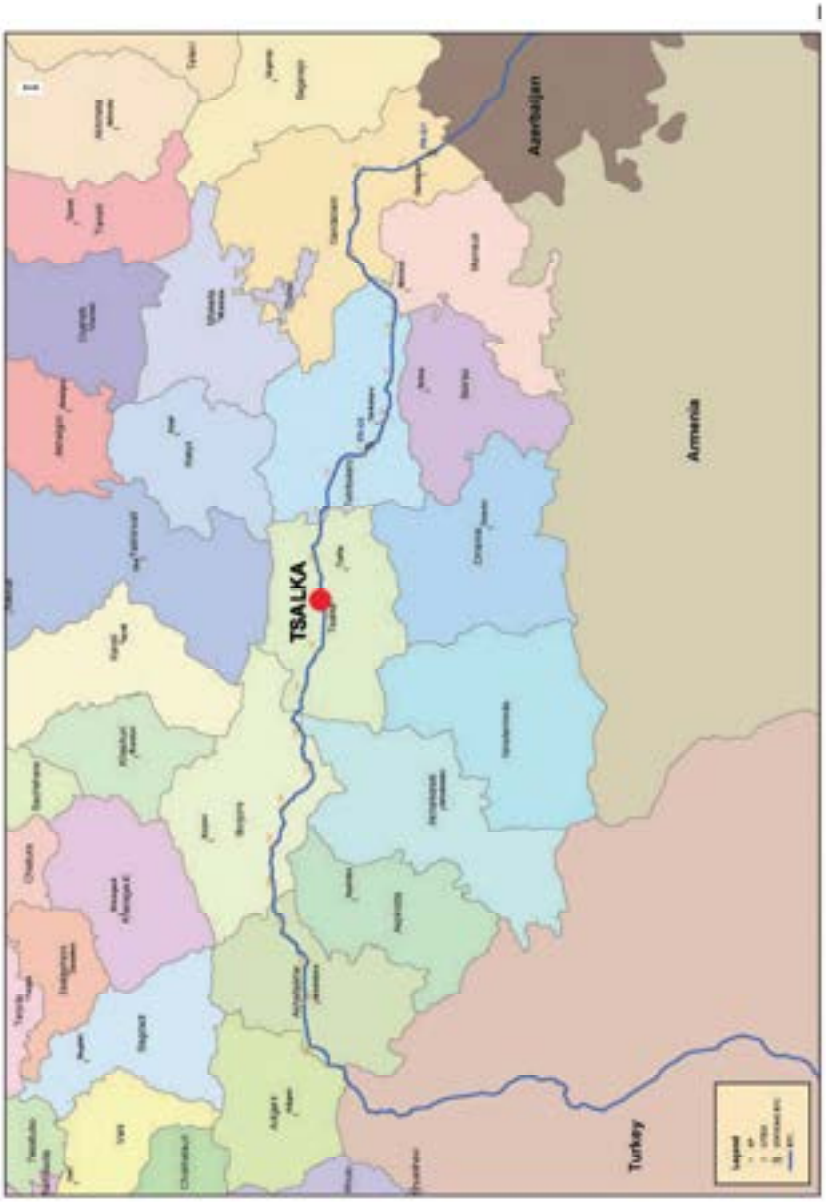
b) The knives found in Burials Nos. 32, 39, 78, 90 and 122 had been used for cutting meat. Taking into consideration the abundance of knives in the graves, we might well assume that meat was cut there. In favour of such an assumption is the fact that animal skeletons were found in several graves.

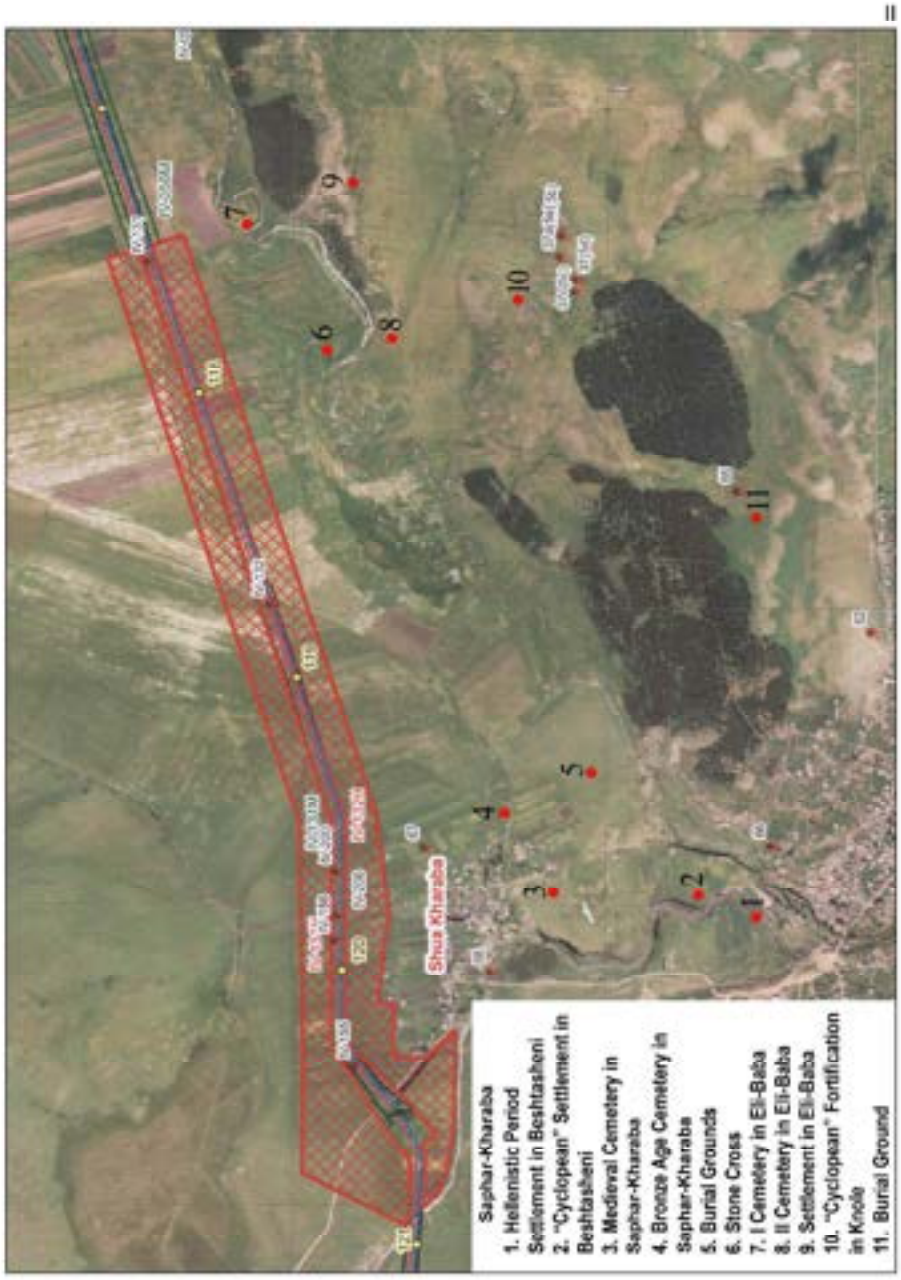
4. If our investigations could be conducted within a scheme of planigraphic analysis, the archaeological artefacts might become the basis for more focused conclusions.

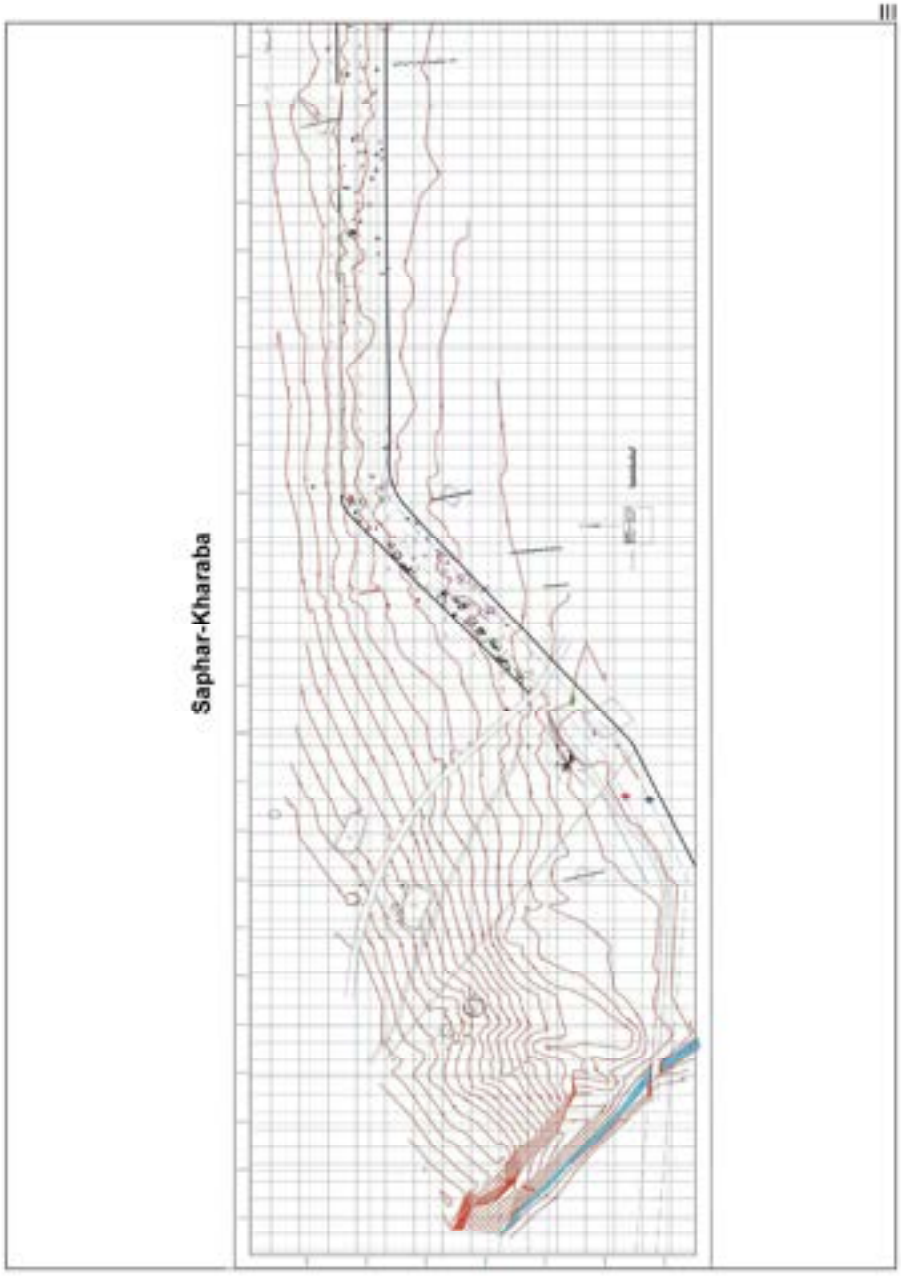
## References

1. Semenov, S.A. The Primary Technique. Materialy i issledovaniya po arkheologii SSSR, No. 54, 1957, Moscow-Leningrad
2. Semenov, S.A. Development of Technique in the Stone Age, 1968, Leningrad
3. Korobkova, G.F., Skakun, N.N., Sharovskaia, T.A. Functional Identification of Stone Implements on the Basis of Macro-signs // Summaries of the Papers Presented at the International Conference of INQVA, 1983, vol. 3
4. Esakia, K.M. Experimental and Traceological Technique and Economic Efficiency in Early Agricultural Households. Institute of the History of Material Culture of the Russian Academy of Sciences, St.-Petersburg, 2003, pp. 136-146

PLATES




Saphar-Kharaba
1. Hellenistic Period Settlement in Beshtasheni
2. "Cyclopean" Settlement in Beshtasheni
3. Medieval Cemetery in Saphar-Kharaba
4. Bronze Age Cemetery in Saphar-Kharaba
5. Burial Grounds
6. Stone Cross
7. I Cemetery in Eli-Baba
8. II Cemetery in Eli-Baba
9. Settlement in Eli-Baba
10. "Cyclopean" Fortification in Knole
11. Burial Ground
Shua Kharaba


Saphar-Kharaba

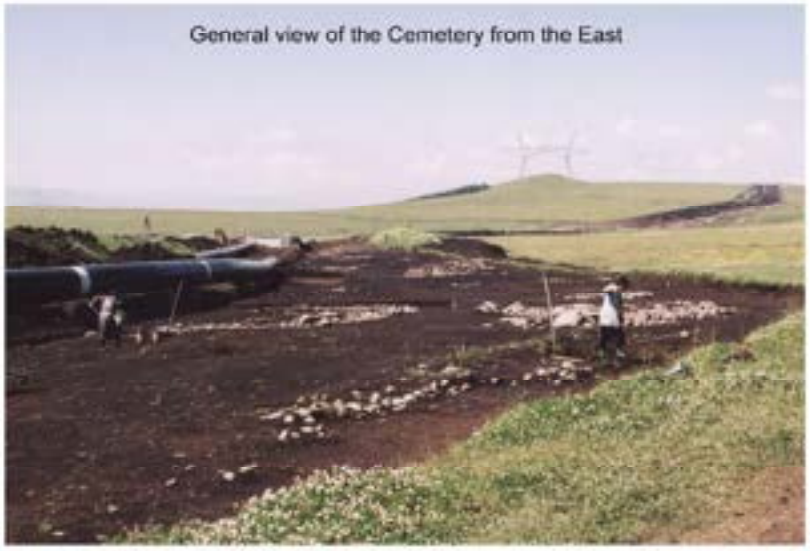
IV

**Saphar-Kharaba**
**IV-156**

General view of the Cemetery from the West

1

General view of the Cemetery from the East



2

V

**Saphar-Kharaba**
**IV-156**


1

Burial N 62


2

Burials N 49 и N 51

VI

**Saphar-Kharaba**
**IV-156**


1

Burials N 56+N98


2

Burial N 68

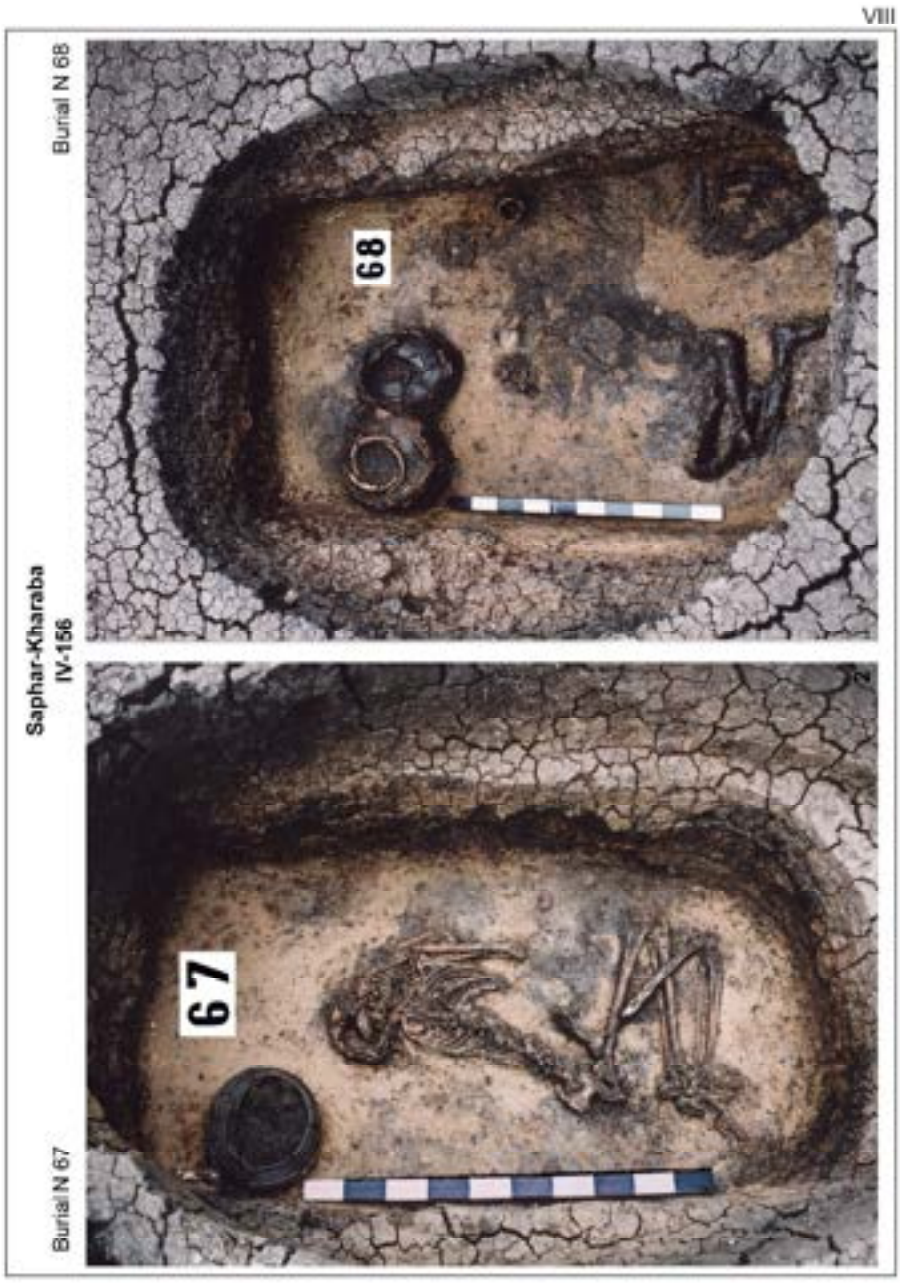
VII

**Saphar-Kharaba**
**IV-156**

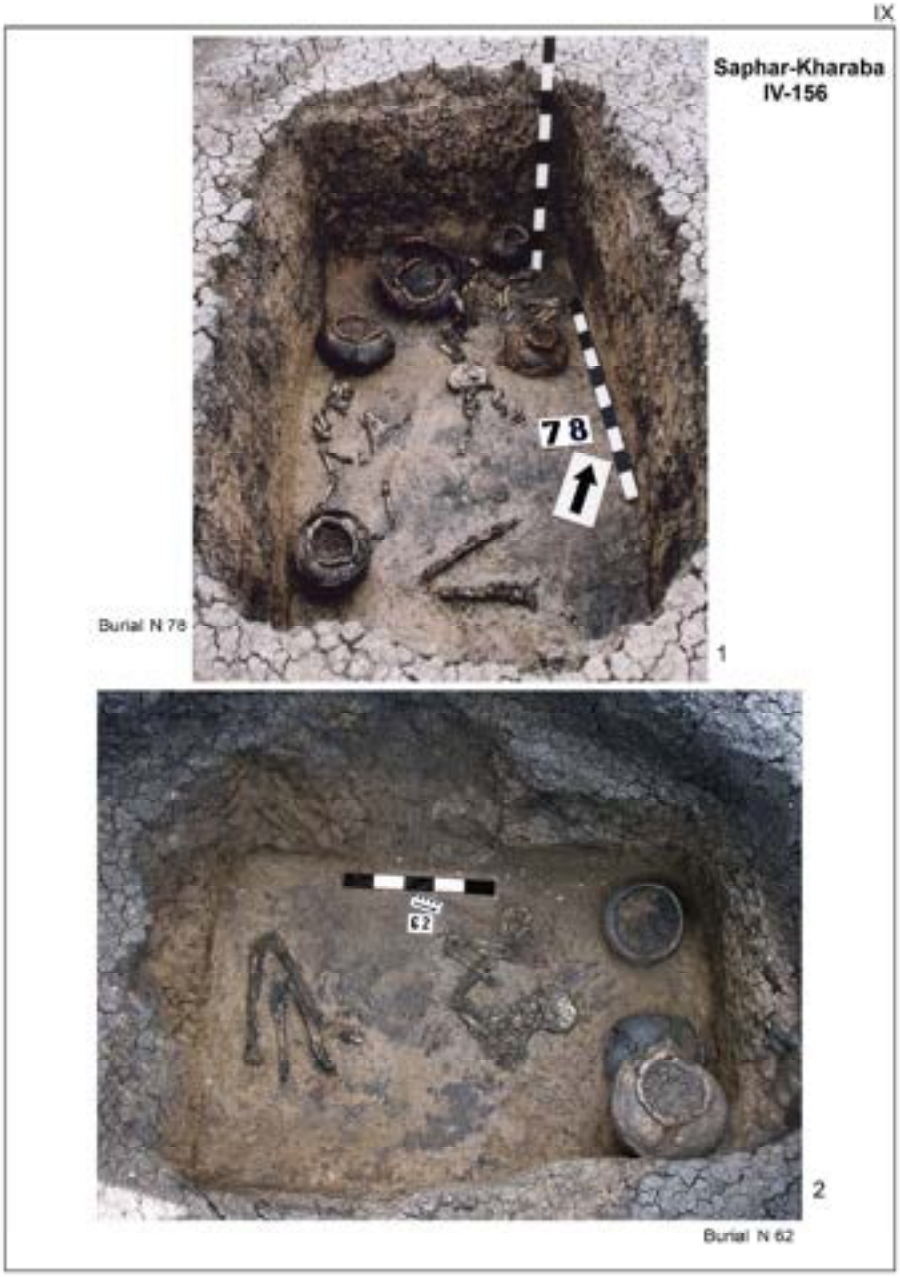
Burials N 67 & N 68


1

2

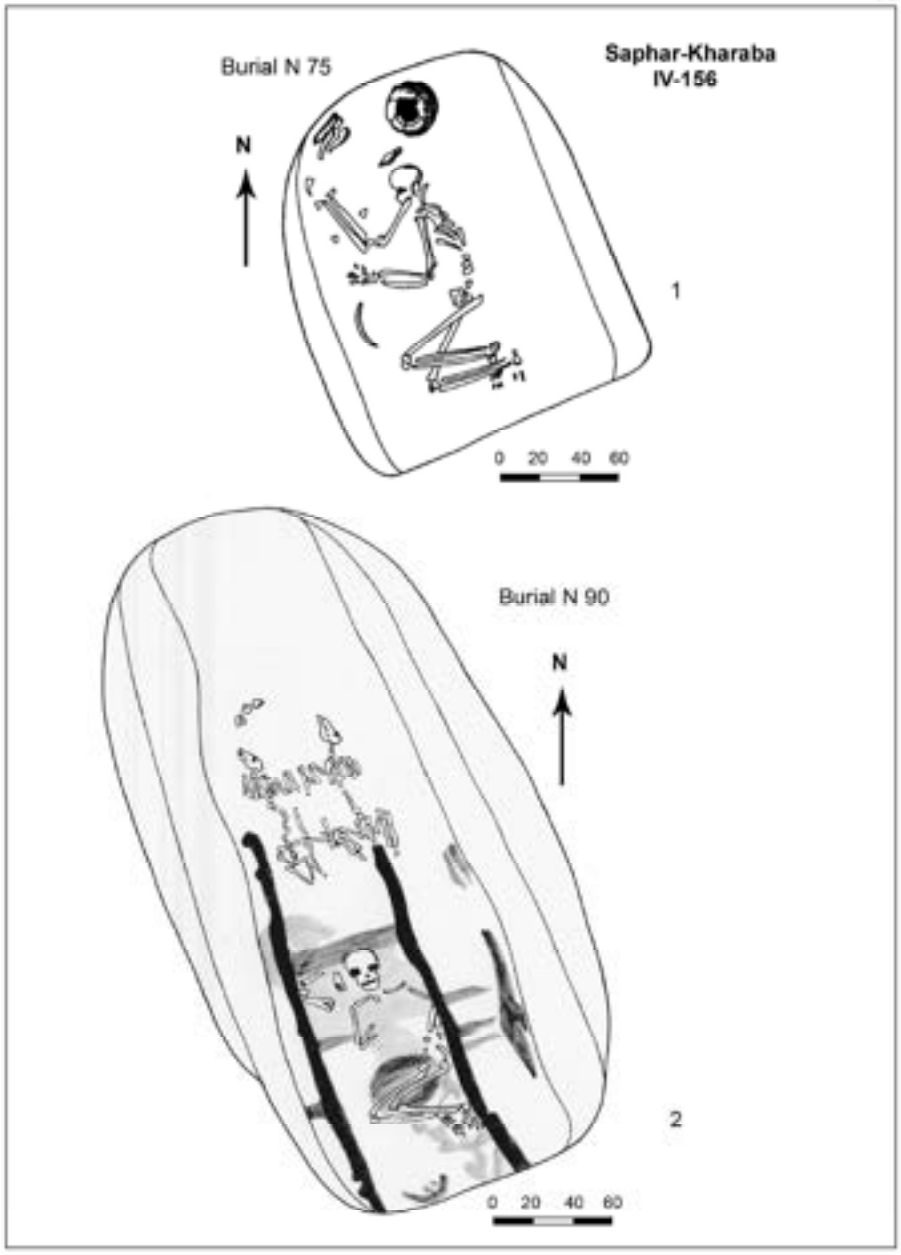

VIII
Burial N 68
68
Saphar-Kharaba
IV-156
Burial N 67
67

IX

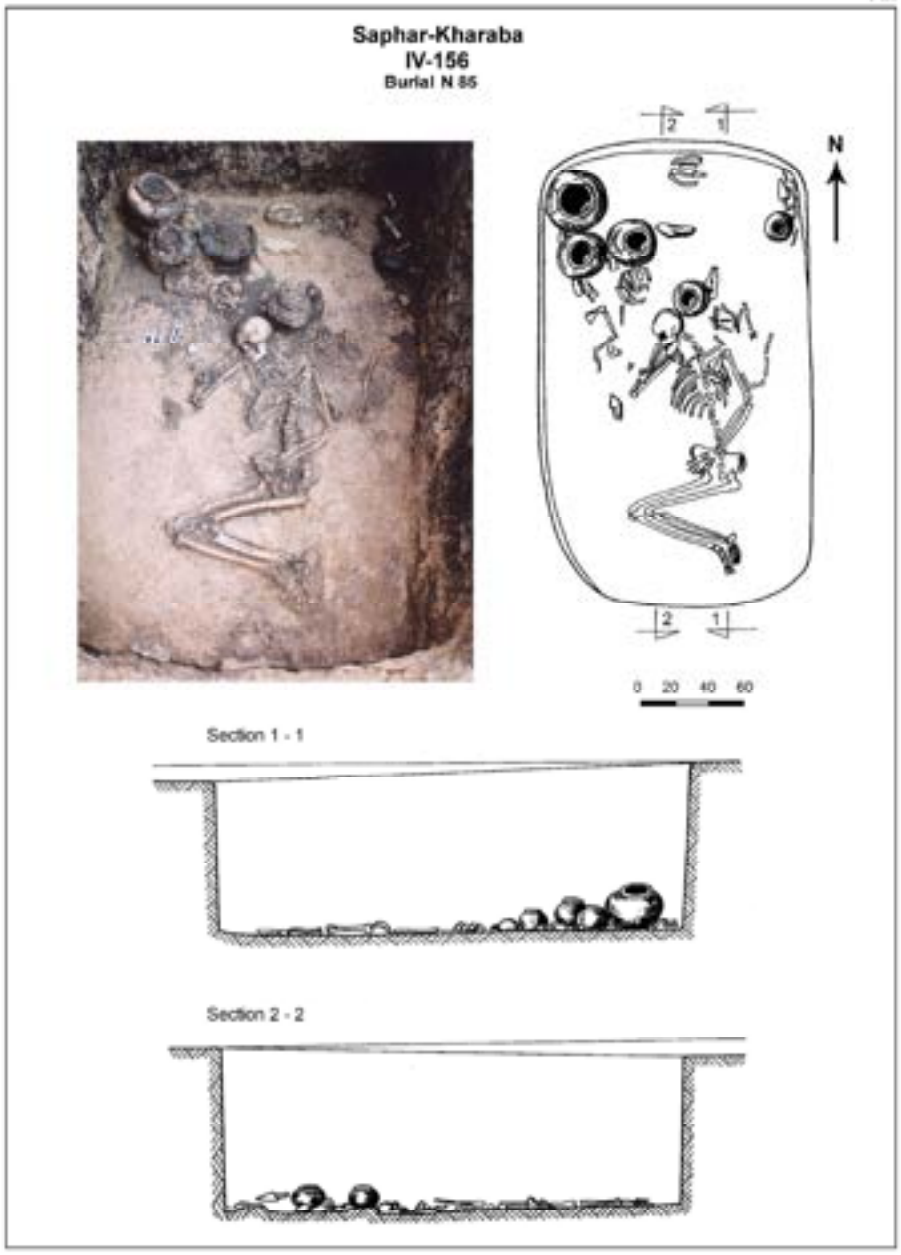



X
Saphar-Kharaba
IV-156
1
Burial N 90
f
90
2

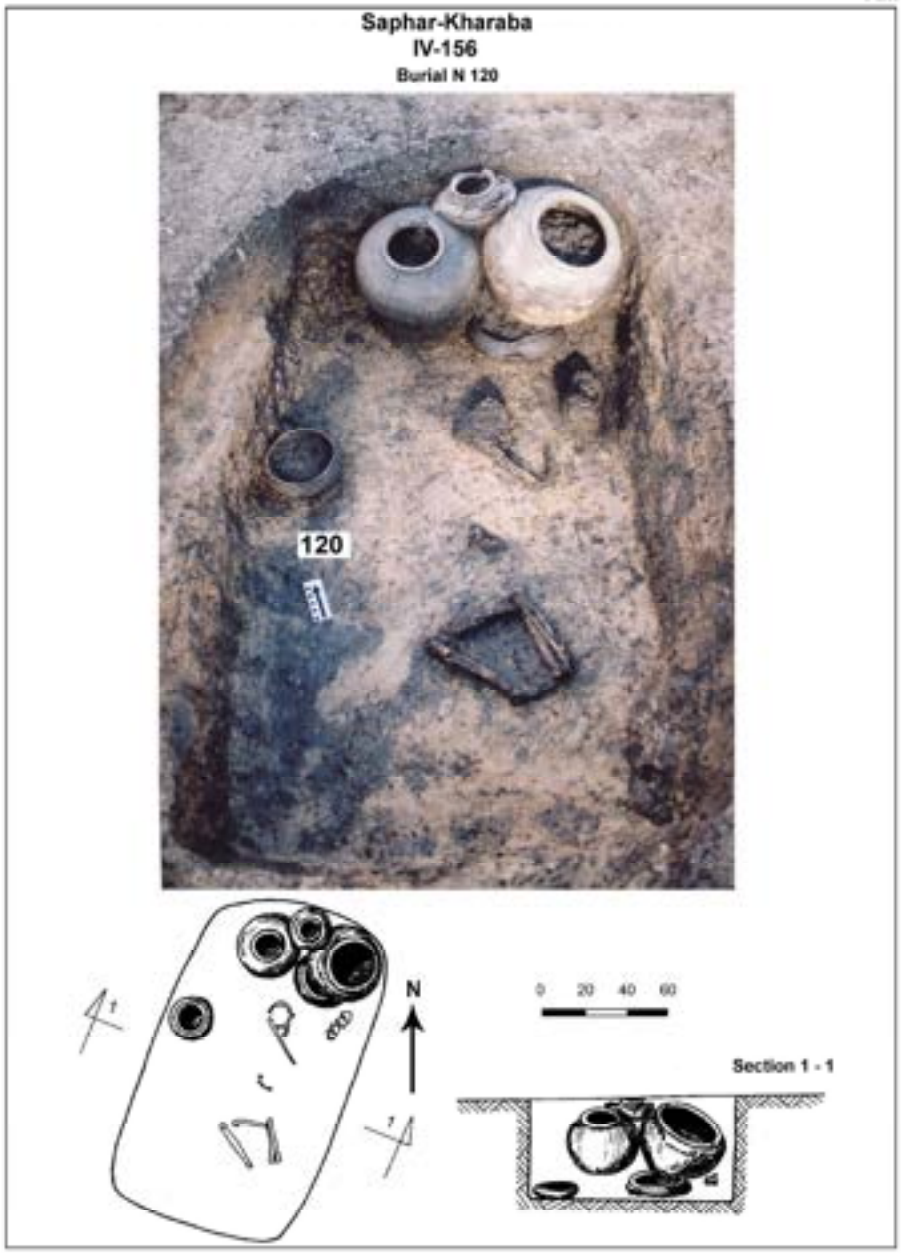
XI

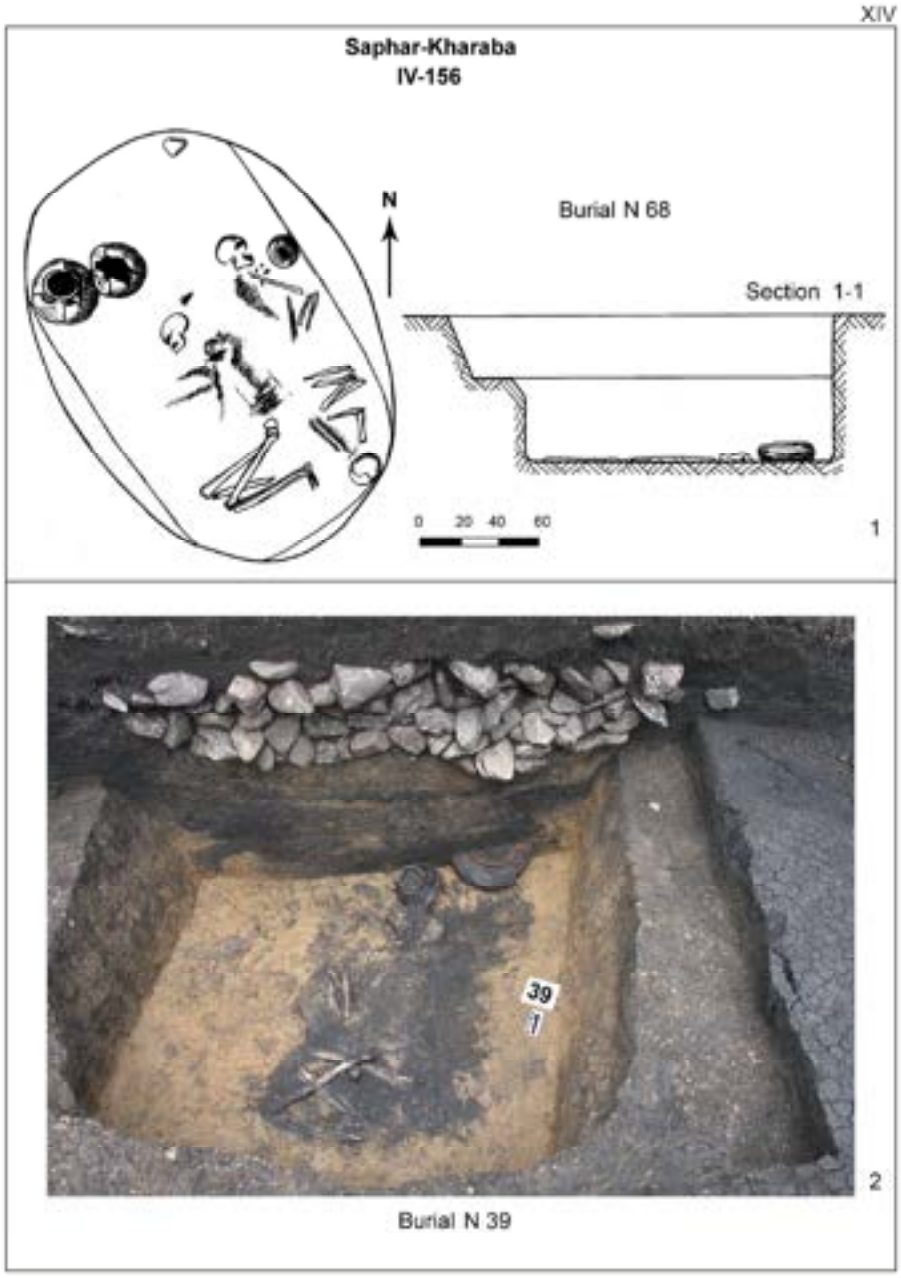

Saphar-Kharaba
IV-156
Burial N 75
N
1
0 20 40 60
Burial N 90
N
2
0 20 40 60

XII

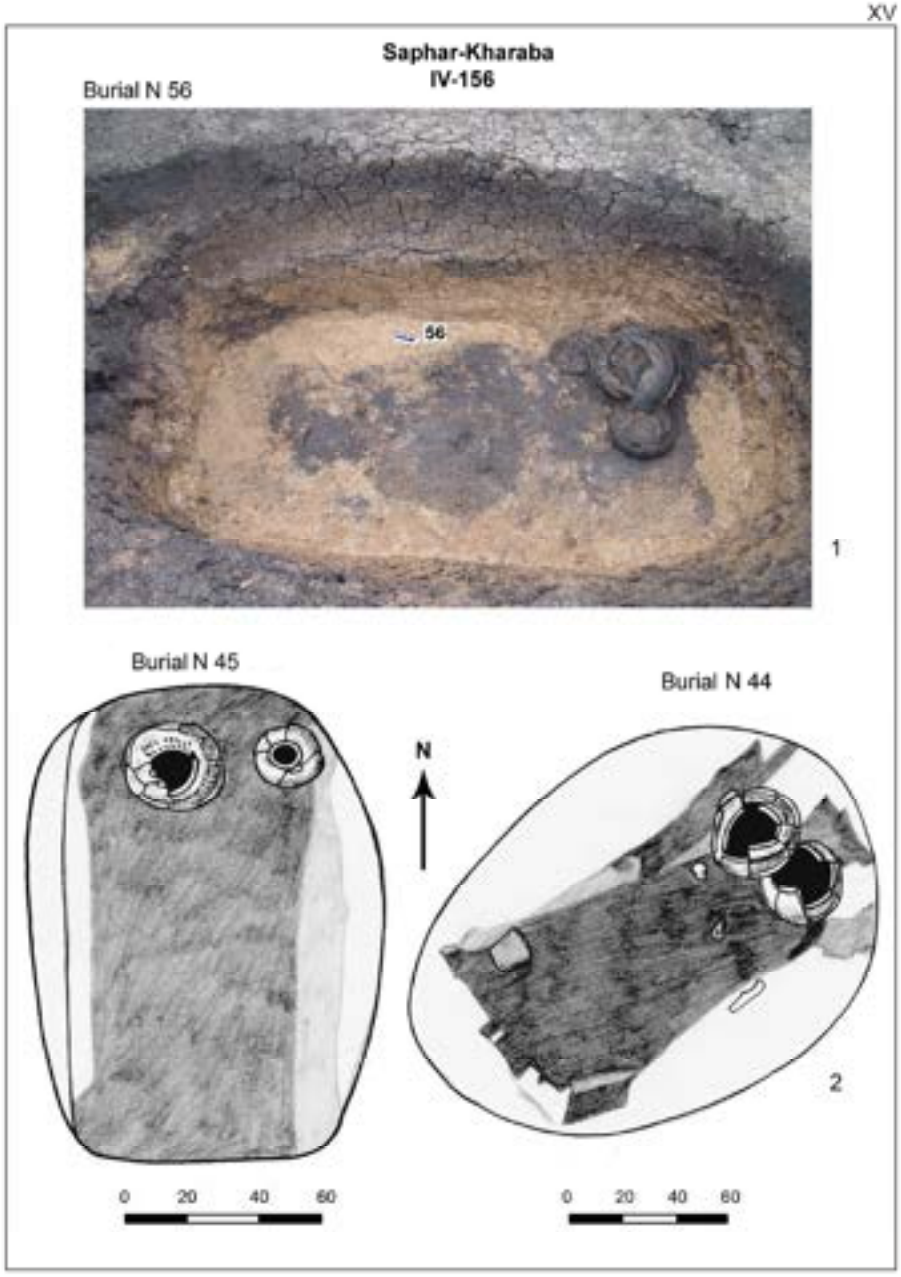

Saphar-Kharaba
IV-156
Burial N 85
2
1
N
2
1
0 20 40 60
Section 1 - 1
Section 2 - 2

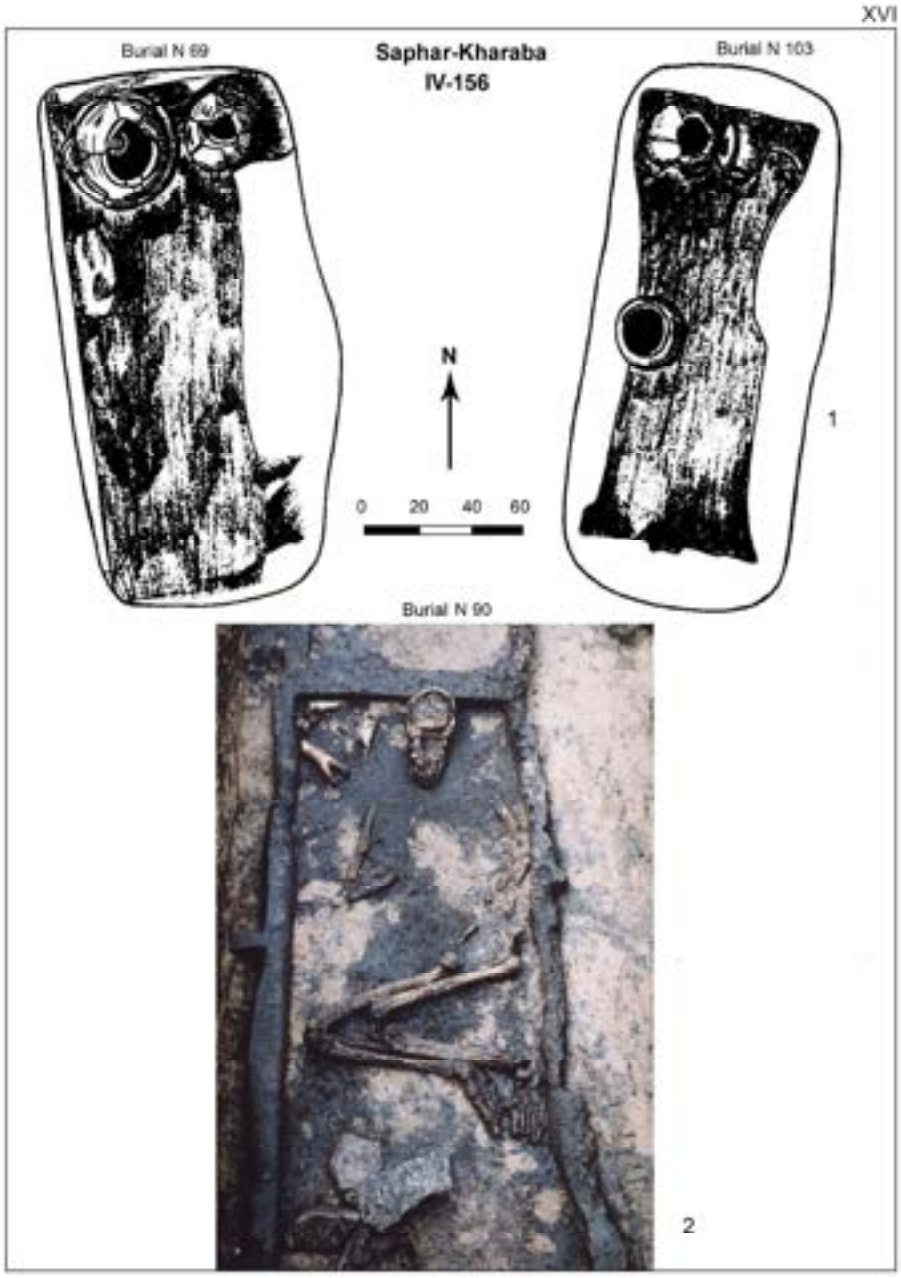
XIII




XIV
Saphar-Kharaba
IV-156
N
Burial N 68
Section 1-1
0 20 40 60
1
39
1
2
Burial N 39

XV


Saphar-Kharaba
IV-156
Burial N 56
56
1
Burial N 45
Burial N 44
N
2
0 20 40 60
0 20 40 60


XVI
Burial N 69
Saphar-Kharaba
IV-156
Burial N 103
N
0 20 40 60
1
Burial N 90
2

XVII

Saphar-Kharaba
IV-156

1

Burial N 90


2

Burial N 85

XVIII

**Saphar-Kharaba**
**IV-156**

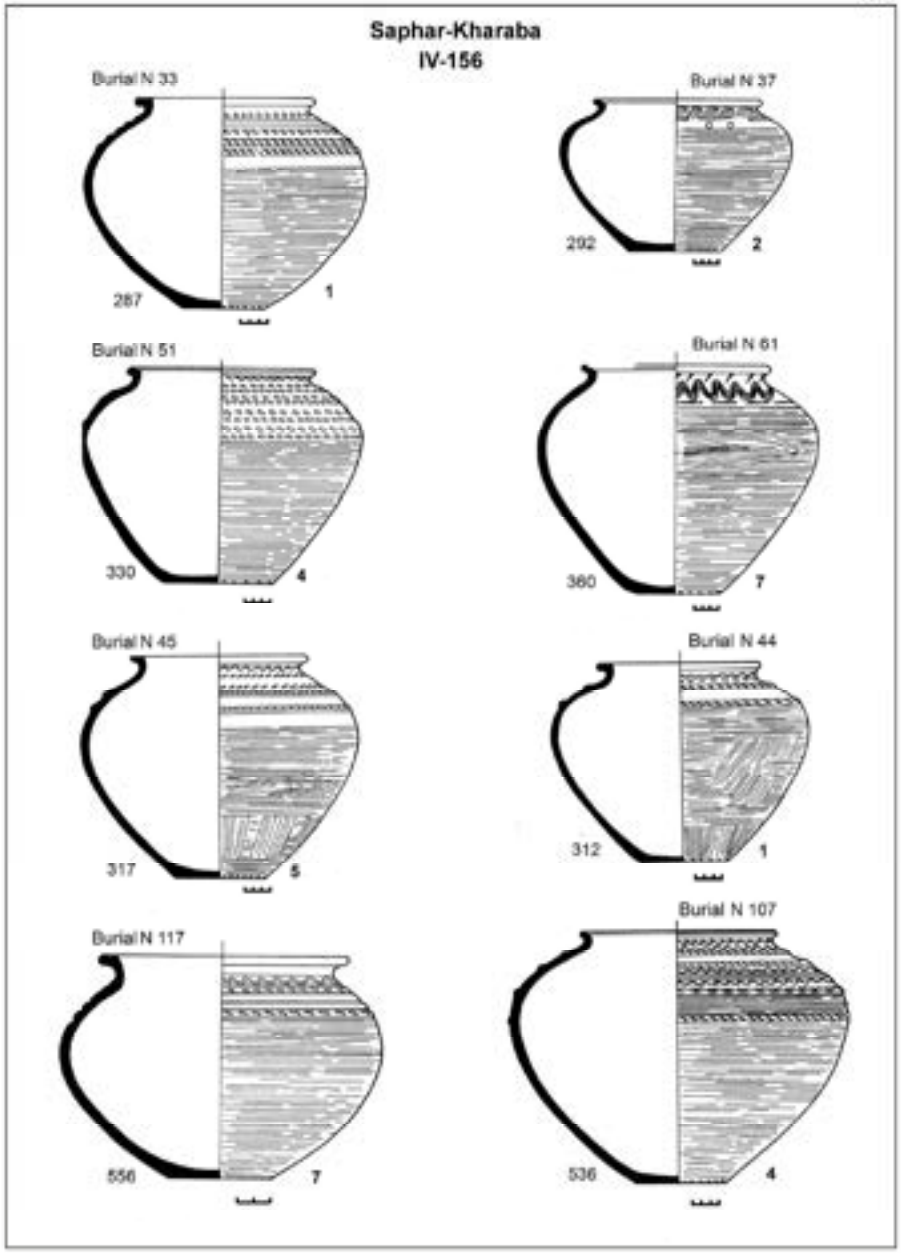

1

Burial N 49

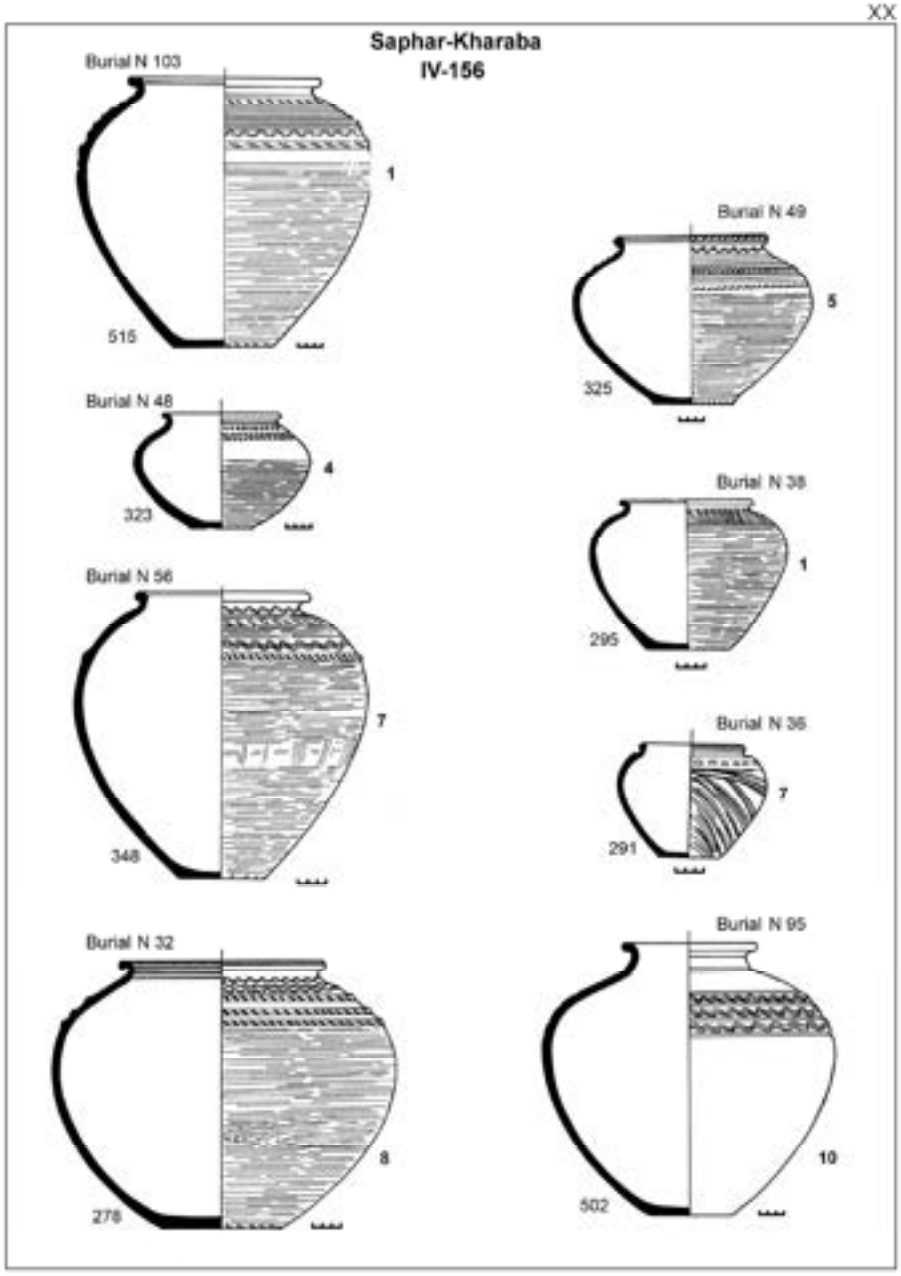

2

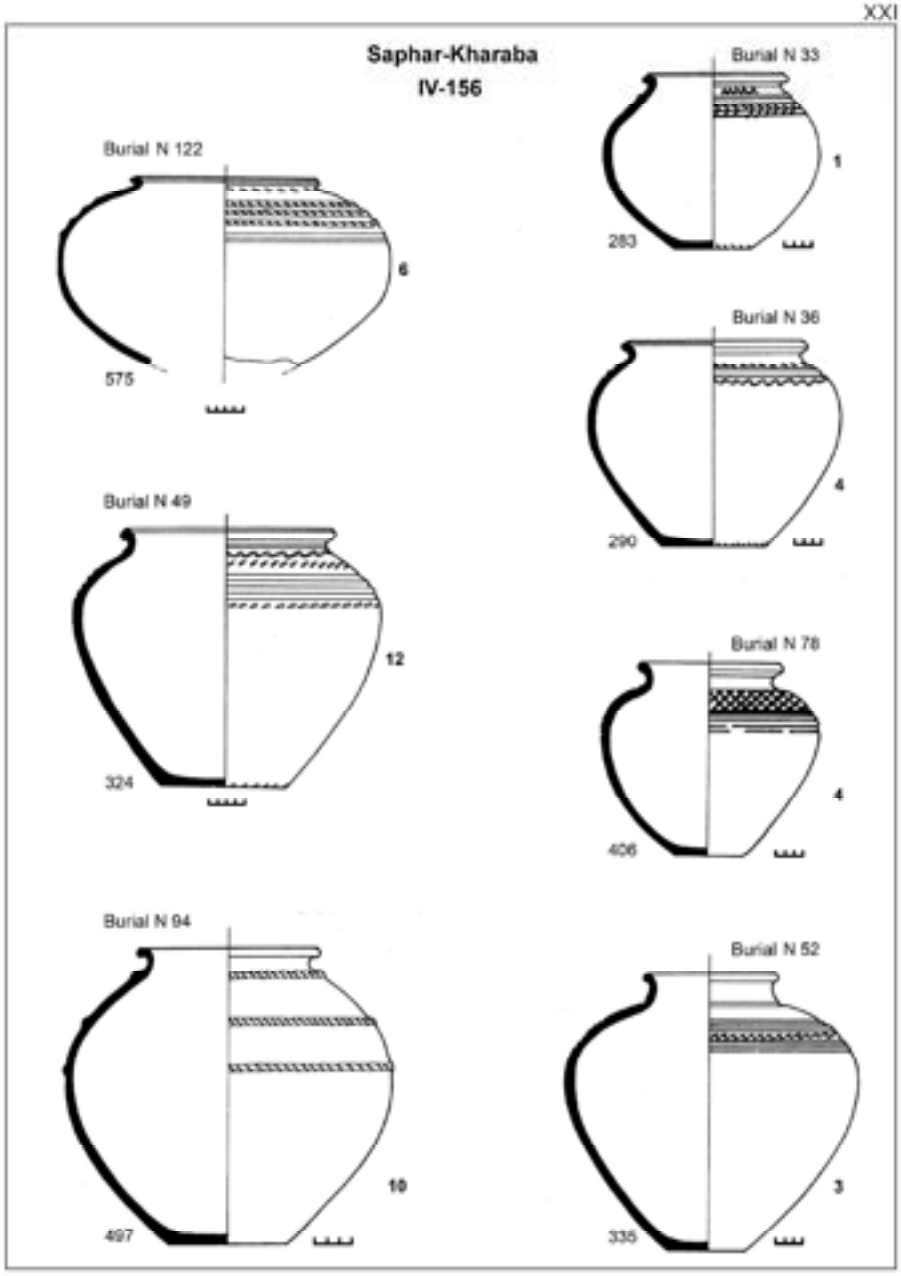
Burial N 122

XIX

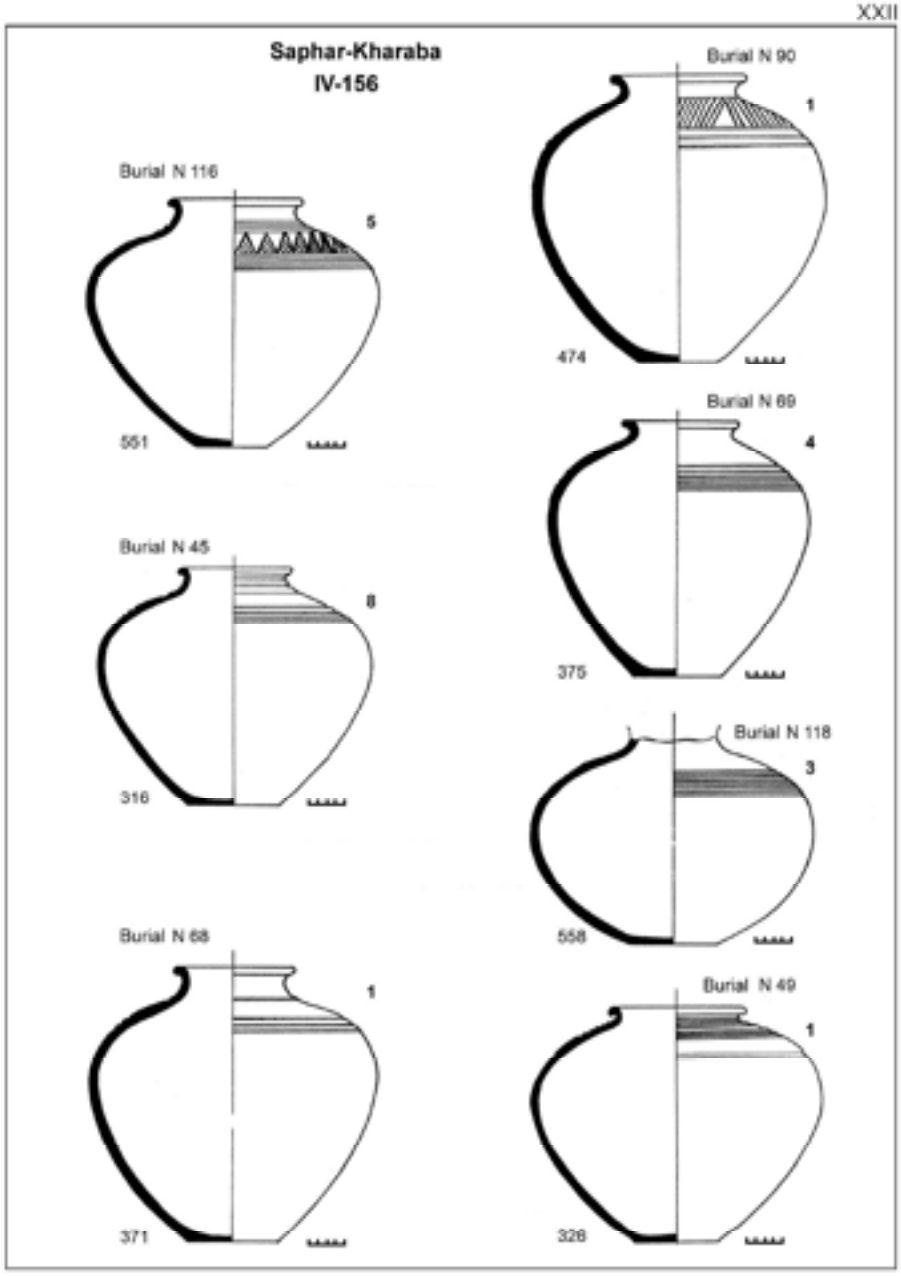

Saphar-Kharaba
IV-156
Burial N 33
287
1
Burial N 37
202
2
Burial N 51
330
4
Burial N 61
360
7
Burial N 45
317
5
Burial N 44
312
1
Burial N 117
556
7
Burial N 107
536
4

XX

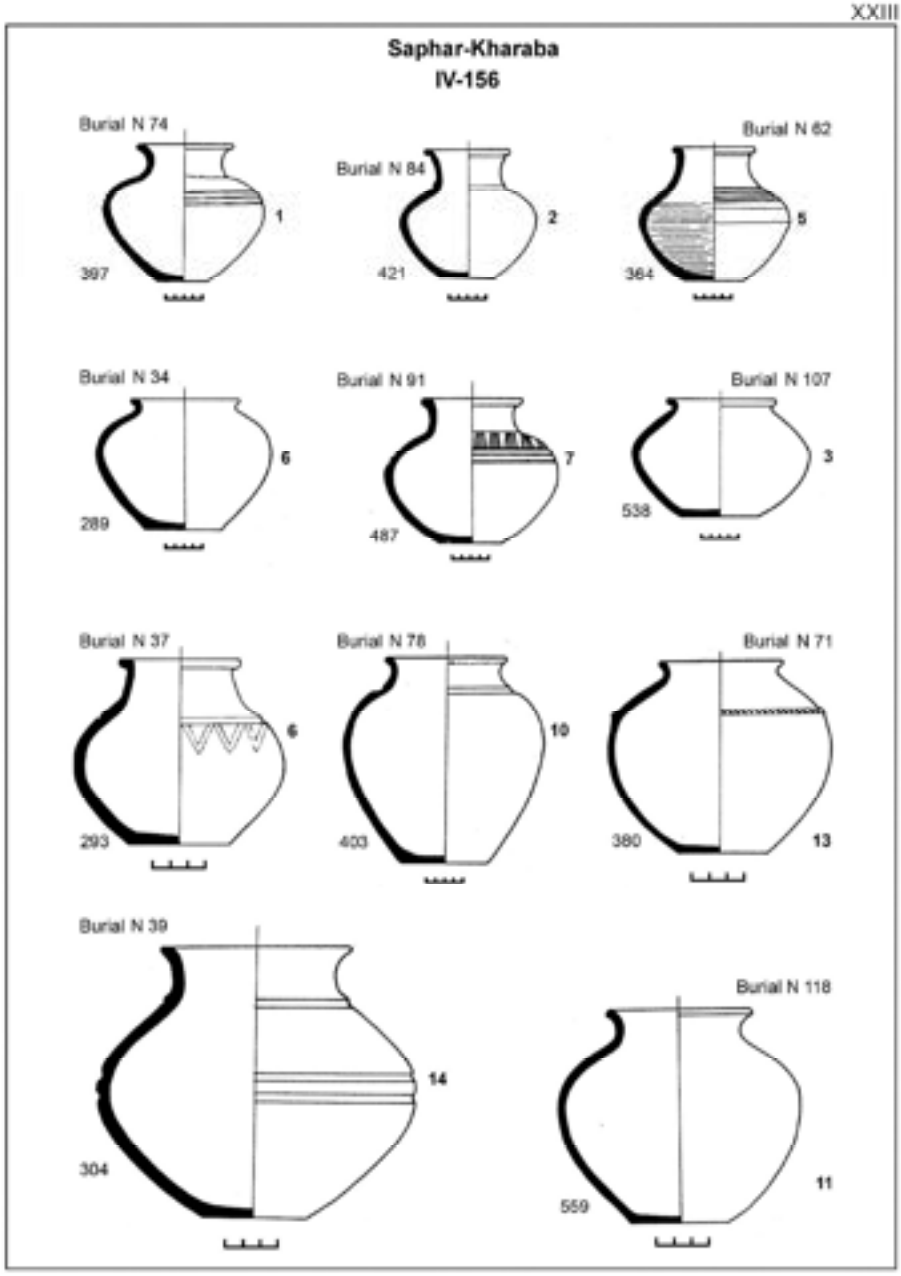

Saphar-Kharaba
IV-156
Burial N 103
1
515
Burial N 49
5
325
Burial N 48
4
323
Burial N 38
1
295
Burial N 56
7
348
Burial N 36
7
291
Burial N 32
8
278
Burial N 95
10
502


XXI
Saphar-Kharaba
IV-156
Burial N 122
6
575
Burial N 33
1
283
Burial N 36
4
290
Burial N 49
12
324
Burial N 78
4
406
Burial N 94
10
497
Burial N 52
3
335

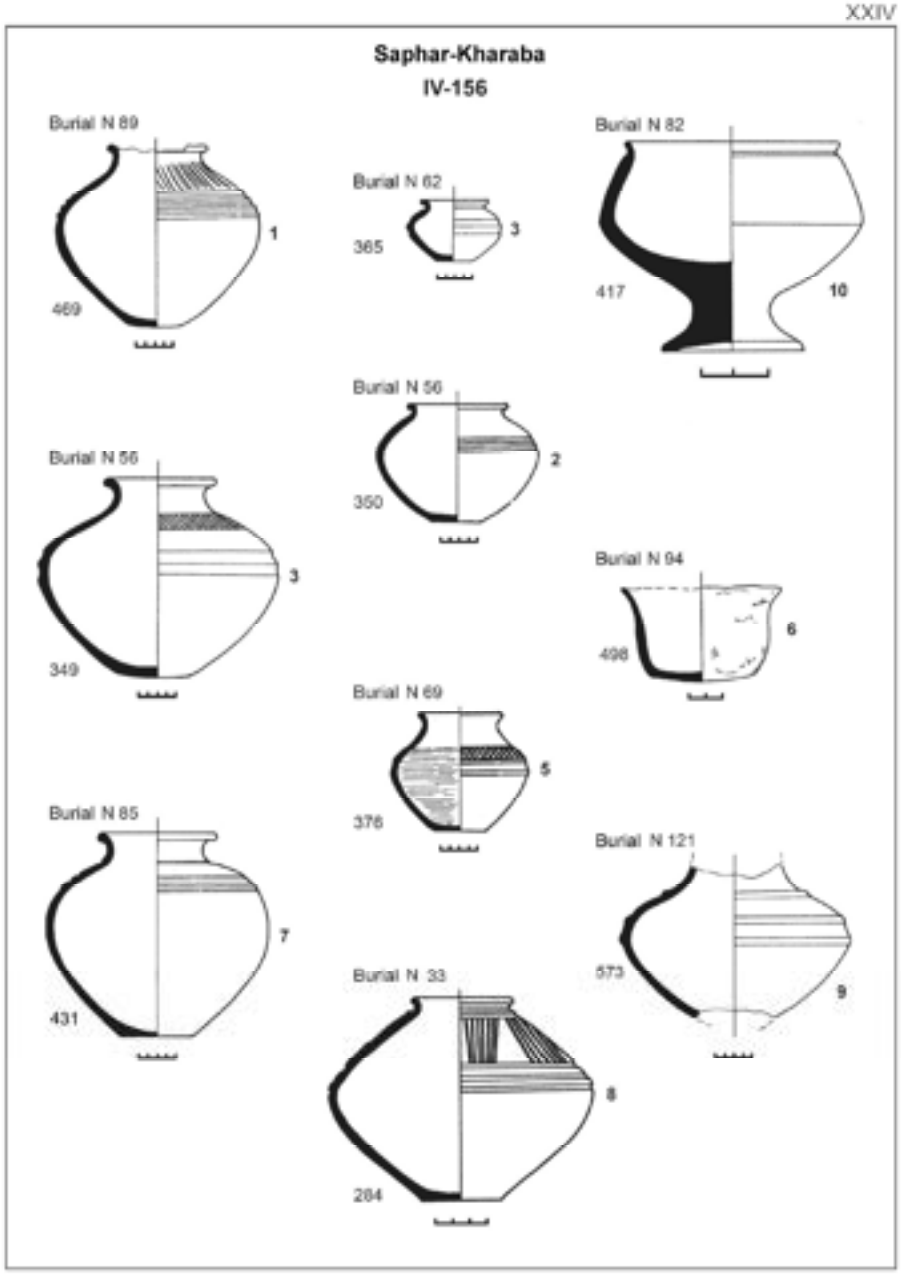
XXII


Saphar-Kharaba
IV-156
Burial N 116
5
551
Burial N 45
8
316
Burial N 68
1
371
Burial N 90
1
474
Burial N 69
4
375
Burial N 118
3
558
Burial N 49
1
328

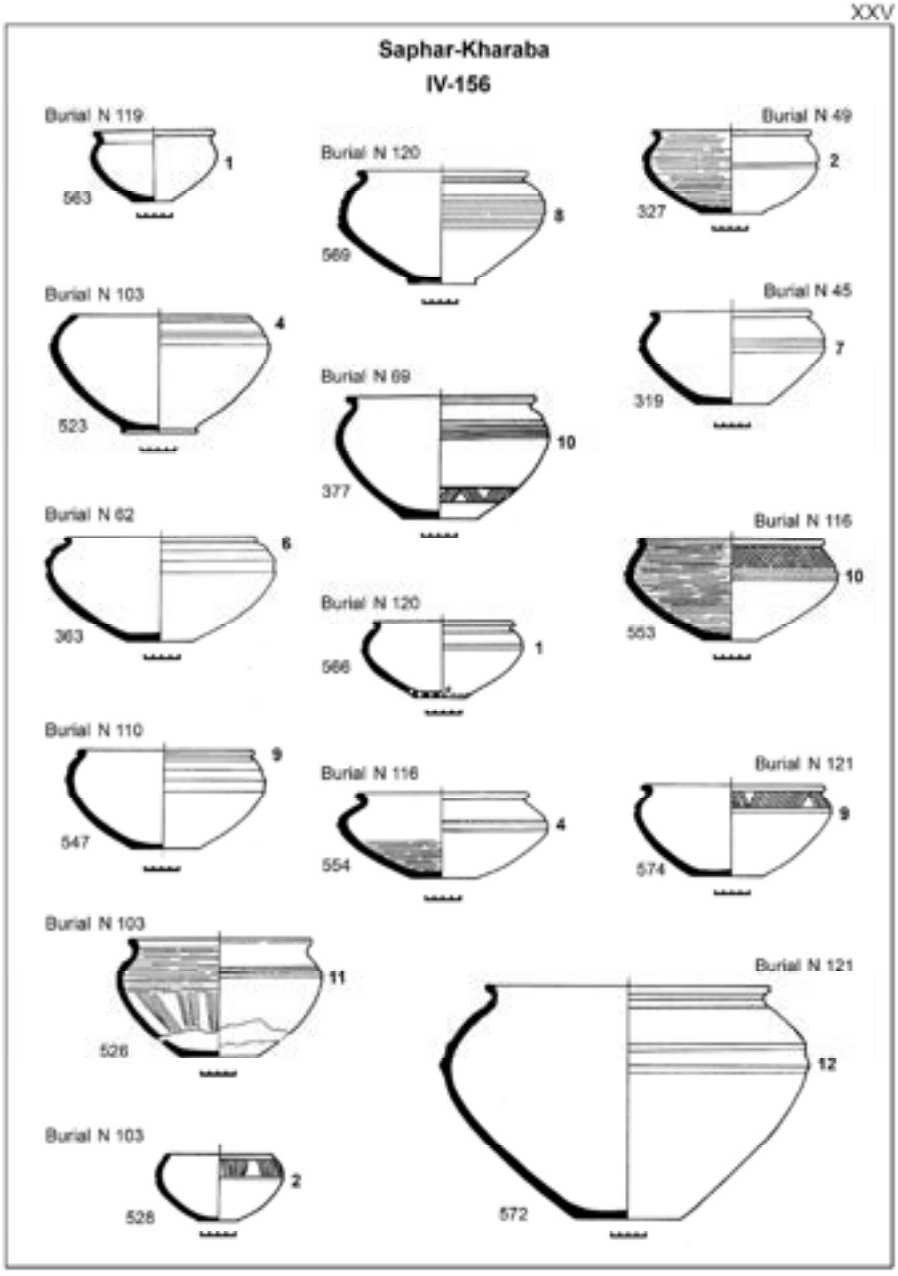
XXIII


Saphar-Kharaba
IV-156
Burial N 74
1
397
Burial N 84
2
421
Burial N 62
5
364
Burial N 34
6
289
Burial N 91
7
487
Burial N 107
3
538
Burial N 37
6
293
Burial N 78
10
403
Burial N 71
13
380
Burial N 39
14
304
Burial N 118
11
559

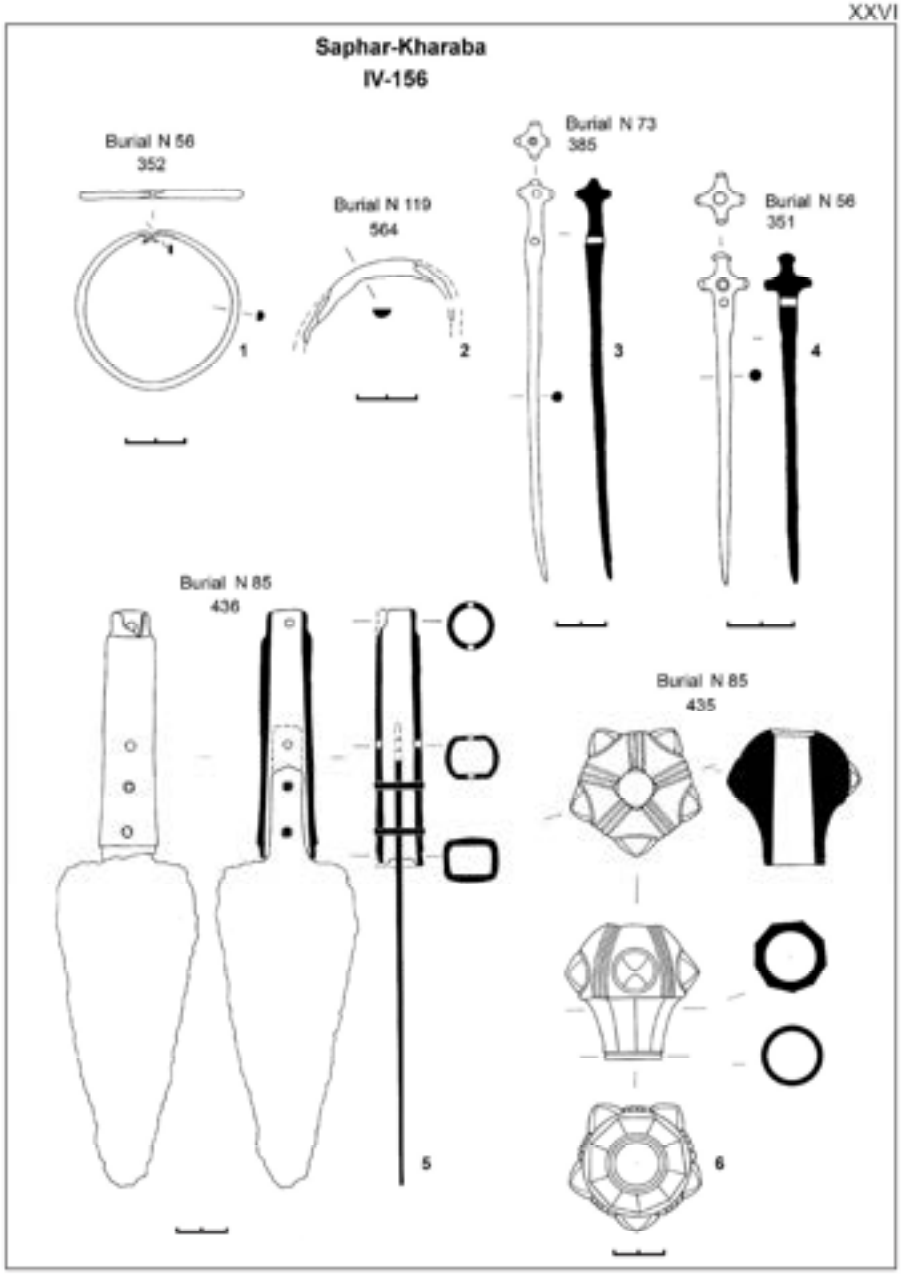
XXIV


Saphar-Kharaba
IV-156
Burial N 89
1
469
Burial N 62
3
365
Burial N 82
417
10
Burial N 56
2
350
Burial N 56
3
349
Burial N 94
6
498
Burial N 69
5
376
Burial N 85
7
431
Burial N 121
573
9
Burial N 33
8
284

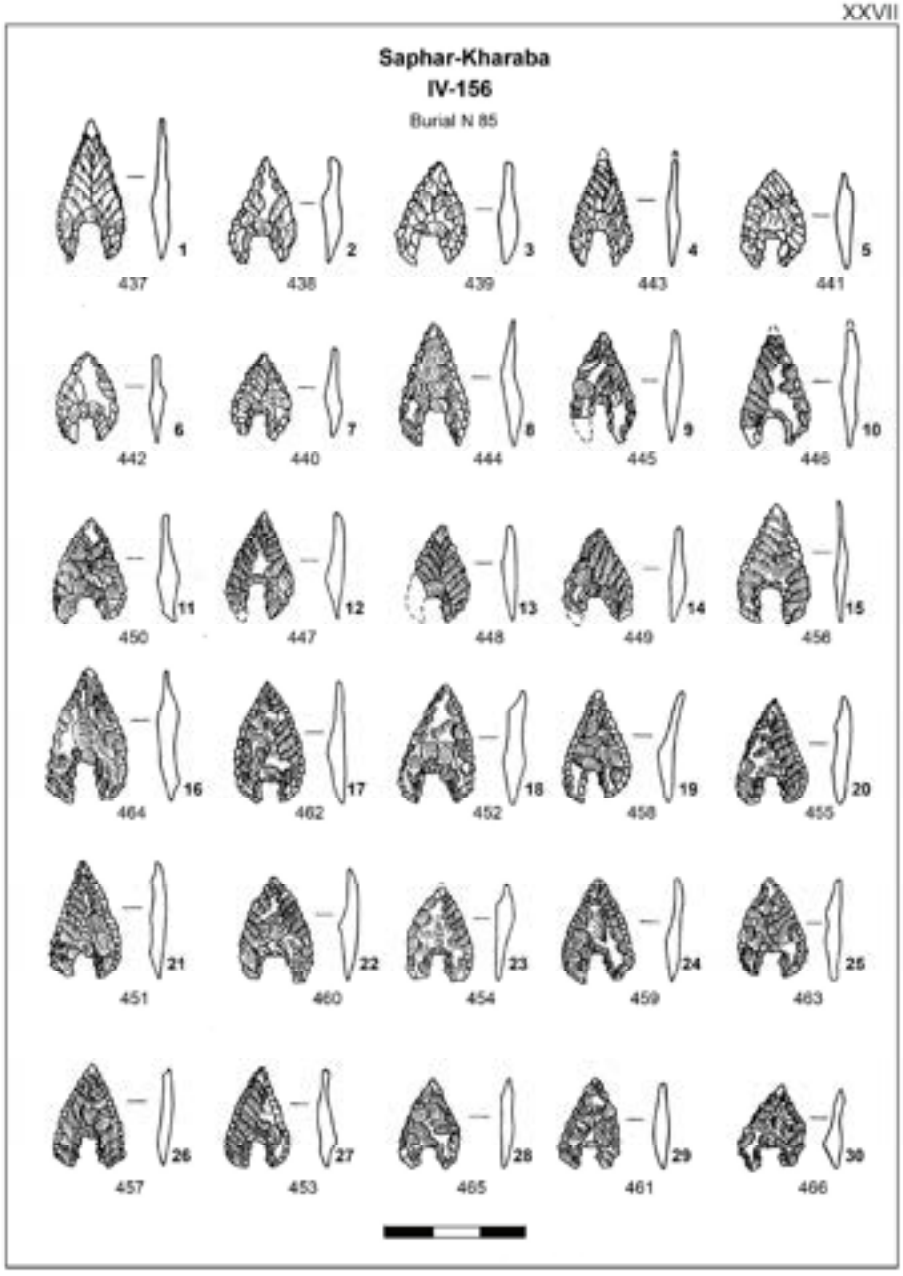
XXV


Saphar-Kharaba
IV-156
Burial N 119
1
563
Burial N 120
8
569
Burial N 49
2
327
Burial N 103
4
523
Burial N 69
10
377
Burial N 45
7
319
Burial N 62
6
363
Burial N 120
1
566
Burial N 116
10
553
Burial N 110
9
547
Burial N 116
4
554
Burial N 121
9
574
Burial N 103
11
526
Burial N 121
12
572
Burial N 103
2
528

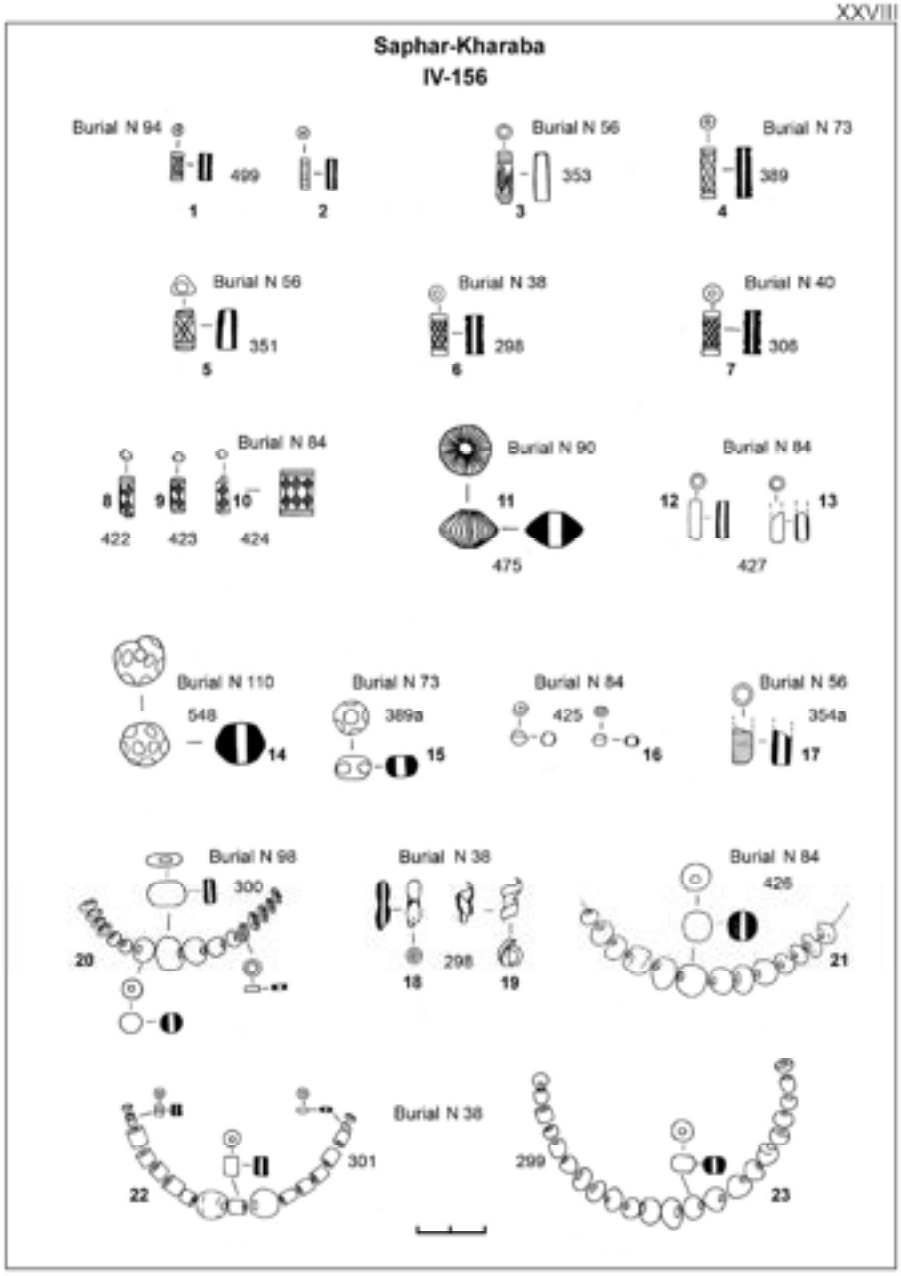
XXVI


Saphar-Kharaba
IV-156
Burial N 56
352
Burial N 119
564
Burial N 73
385
Burial N 56
351
Burial N 85
436
Burial N 85
435
1
2
3
4
5
6

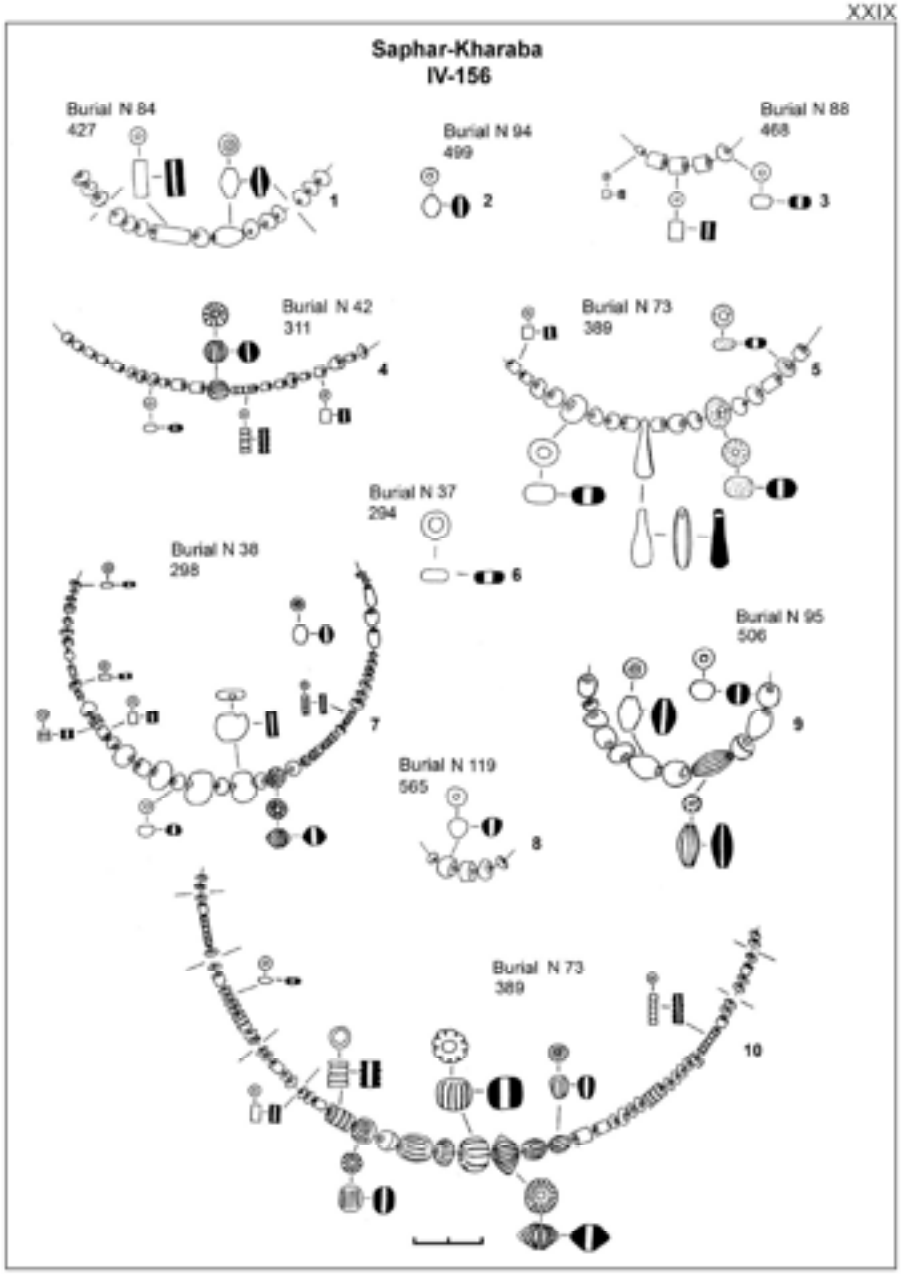
XXVII


Saphar-Kharaba
IV-156
Burial N 85
1
437
2
438
3
439
4
443
5
441
6
442
7
440
8
444
9
445
10
446
11
450
12
447
13
448
14
449
15
456
16
464
17
462
18
452
19
458
20
455
21
451
22
460
23
454
24
459
25
463
26
457
27
453
28
465
29
461
30
466

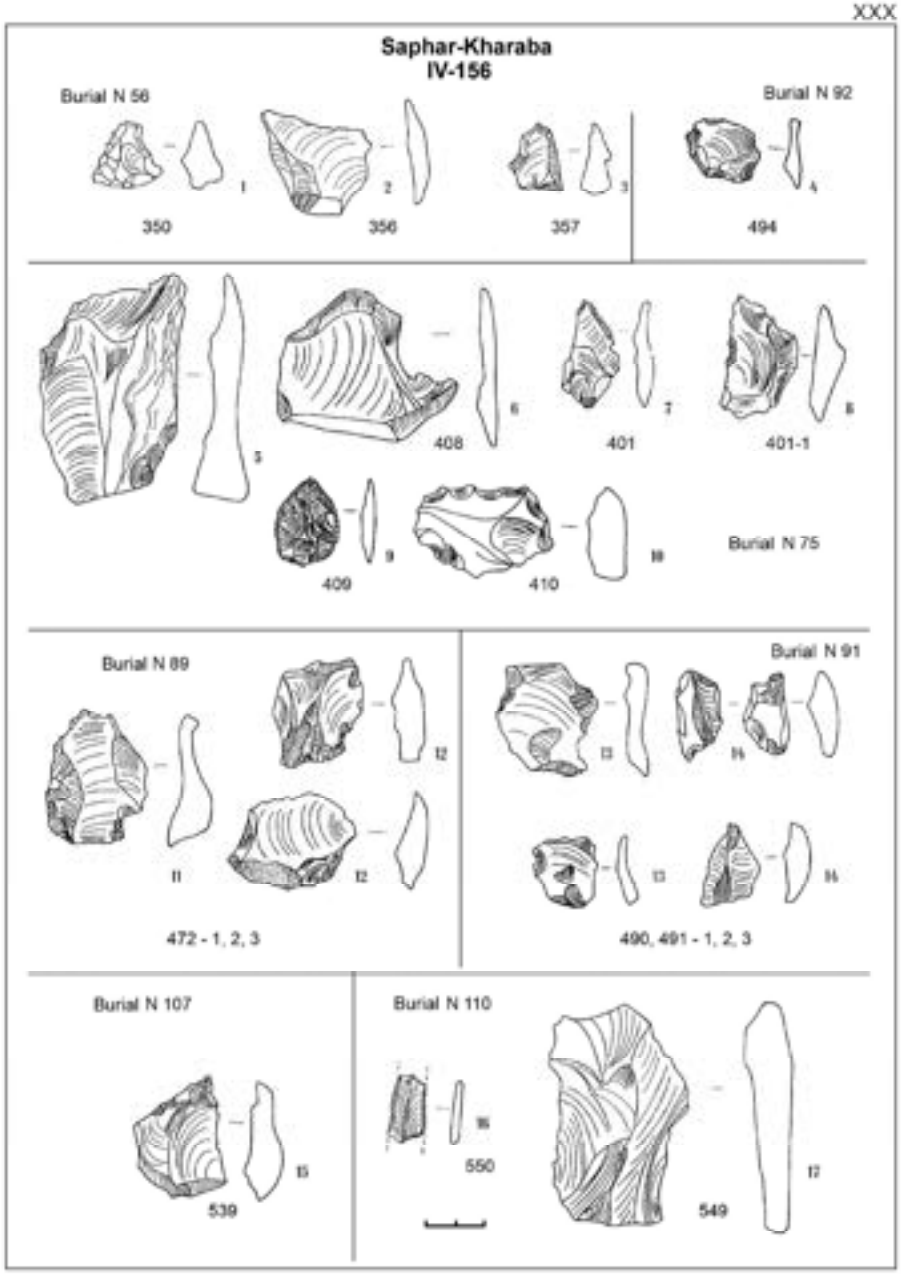
XXVIII


Saphar-Kharaba
IV-156
Burial N 94
499
1
2
Burial N 56
353
3
Burial N 73
389
4
Burial N 56
351
5
Burial N 38
298
6
Burial N 40
306
7
Burial N 84
8
9
10
422
423
424
Burial N 90
11
475
Burial N 84
12
13
427
Burial N 110
548
14
Burial N 73
389a
15
Burial N 84
425
16
Burial N 56
354a
17
Burial N 98
300
20
Burial N 38
298
18
19
Burial N 84
426
21
Burial N 38
301
22
299
23

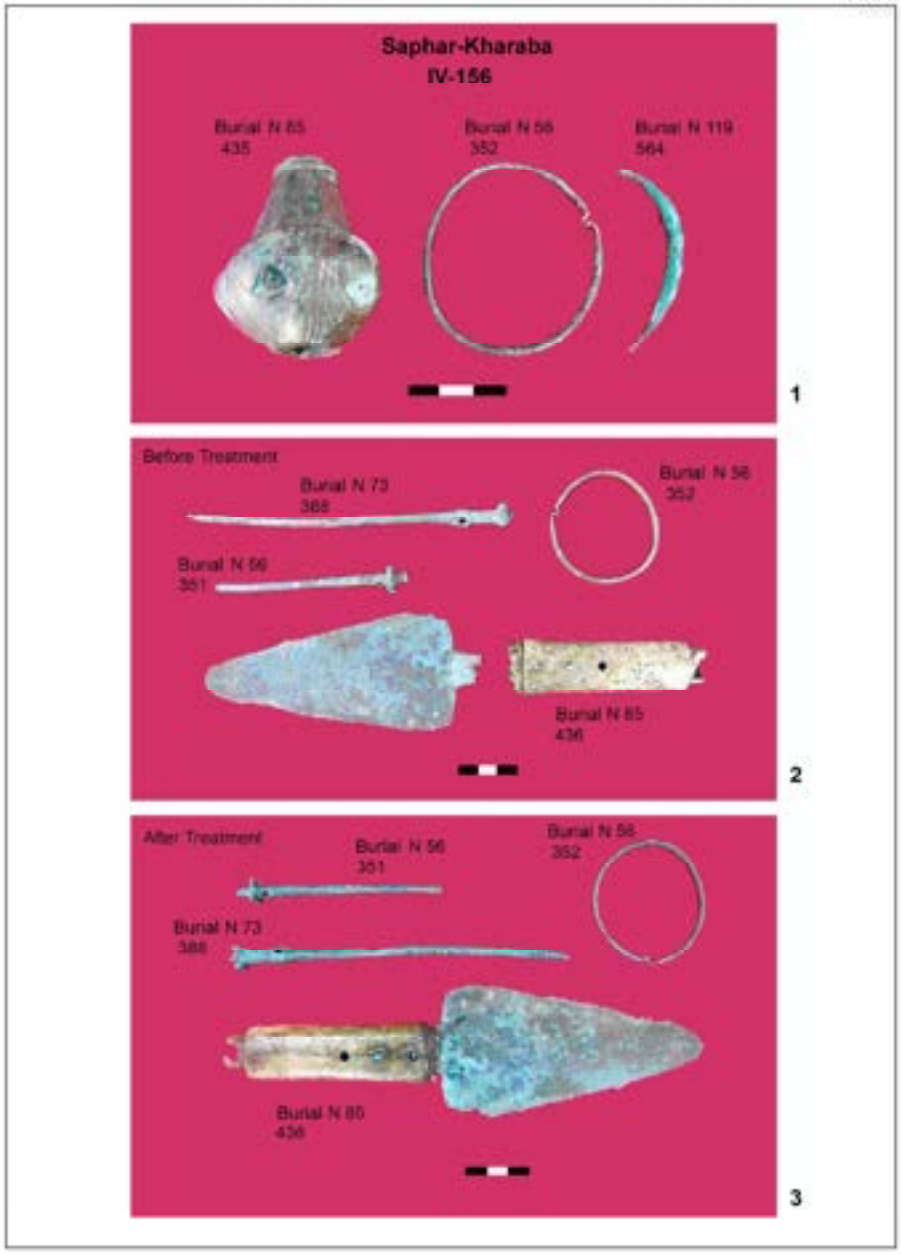
XXIX


Saphar-Kharaba
IV-156
Burial N 84
427
1
Burial N 94
499
2
Burial N 88
468
3
Burial N 42
311
4
Burial N 73
389
5
Burial N 37
294
6
Burial N 38
298
7
Burial N 95
506
9
Burial N 119
565
8
Burial N 73
389
10

XXX


Saphar-Kharaba
IV-156
Burial N 56
350
356
357
Burial N 92
494
408
401
401-1
409
410
Burial N 75
Burial N 89
472 - 1, 2, 3
Burial N 91
490, 491 - 1, 2, 3
Burial N 107
539
Burial N 110
550
549

XXXI

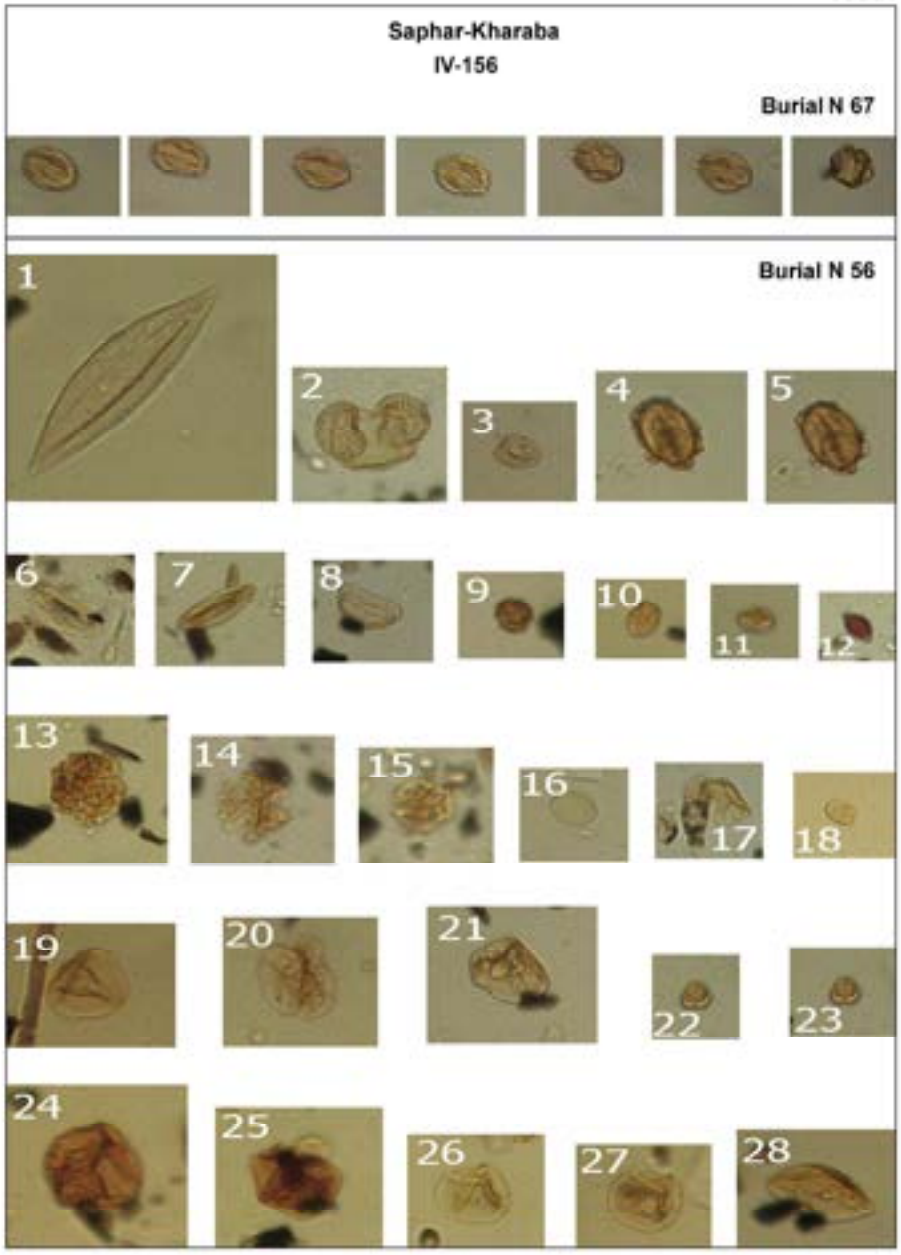

Saphar-Kharaba
IV-156
Burial N 85
435
Burial N 56
352
Burial N 119
564
1
Before Treatment
Burial N 73
388
Burial N 56
352
Burial N 56
351
Burial N 85
436
2
After Treatment
Burial N 56
351
Burial N 56
352
Burial N 73
388
Burial N 85
436
3

XXXII

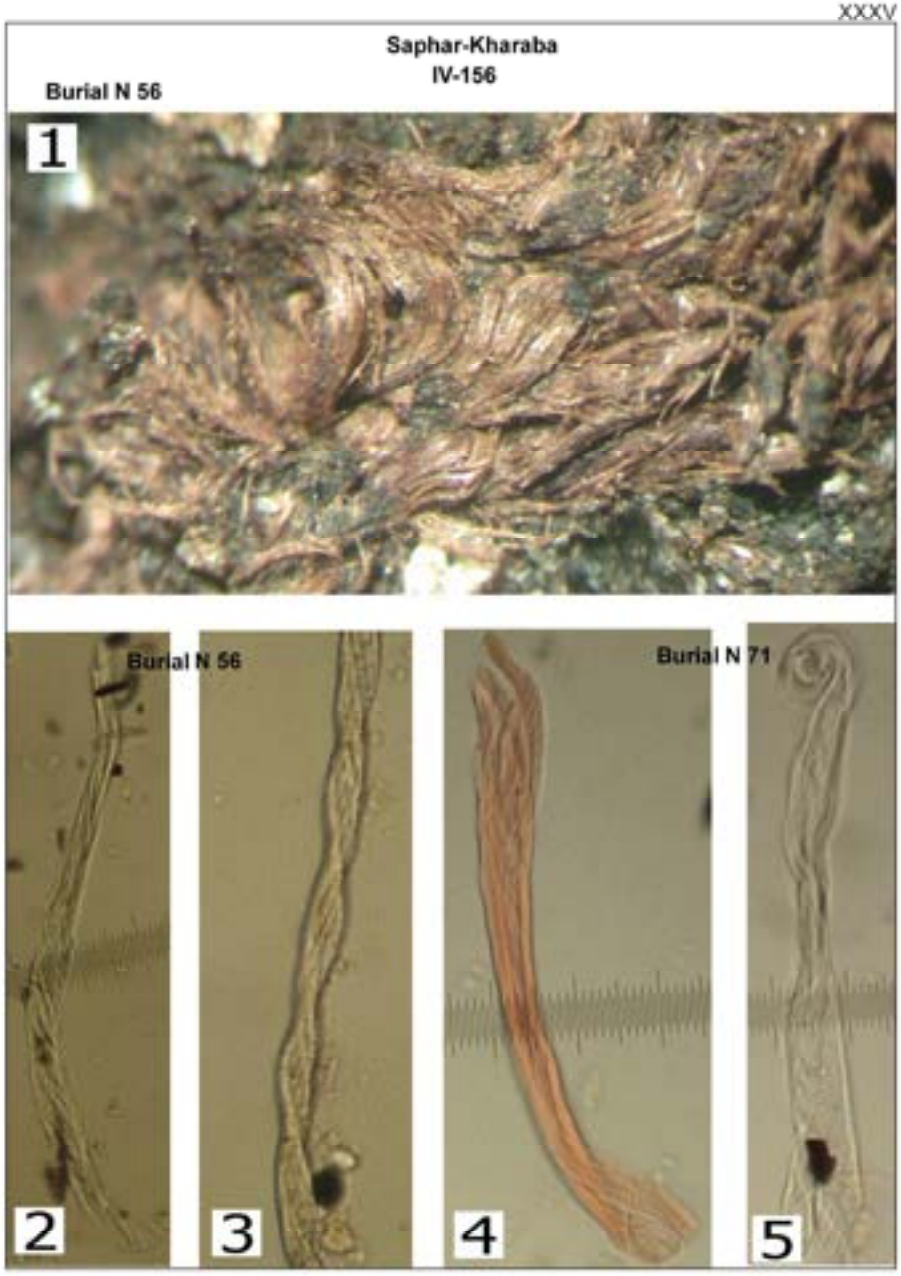
XXXIII


Saphar-Kharaba
IV-156
Burial N 91
Burial N 50
Burial N 38
Burial N 90

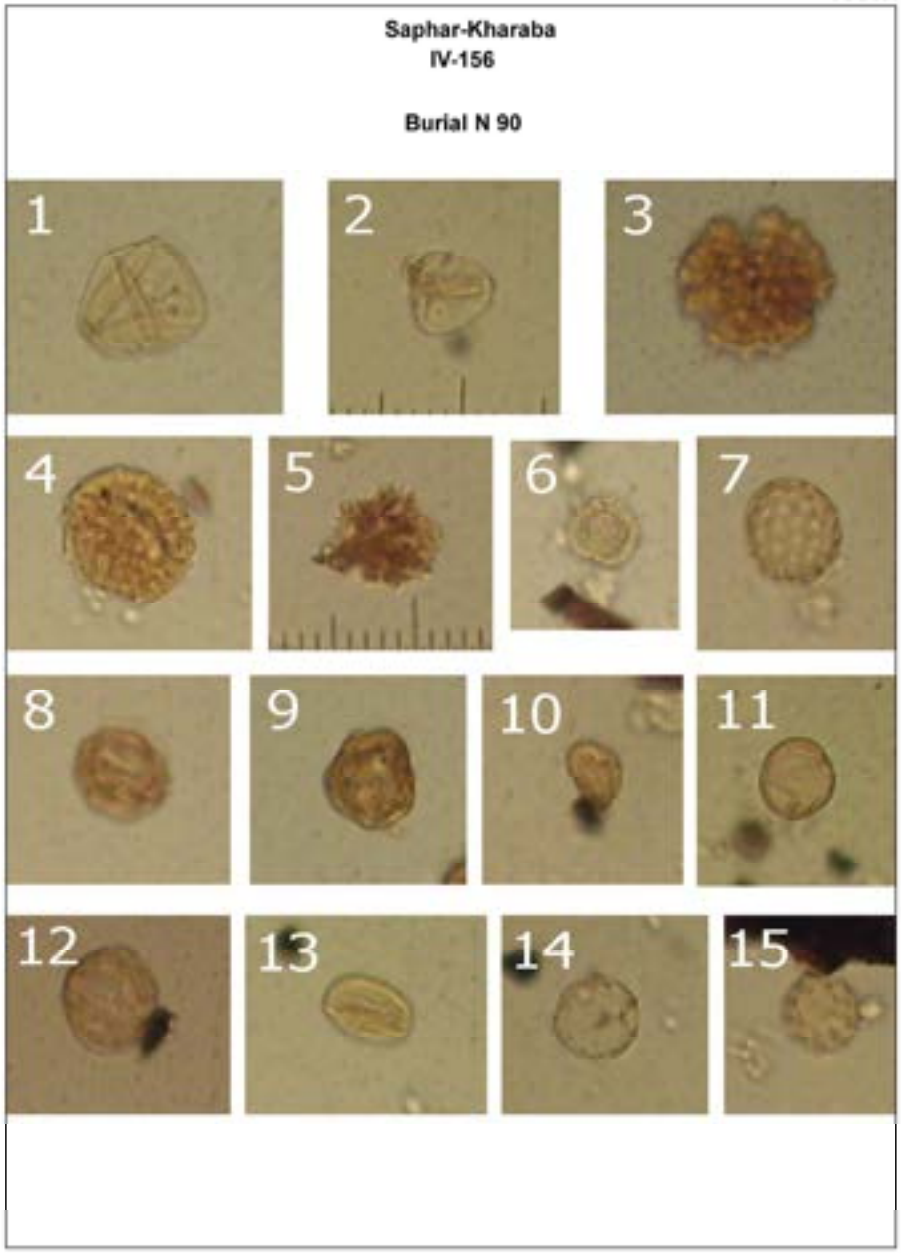
XXXIV


Saphar-Kharaba
IV-156
Burial N 67
Burial N 56
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

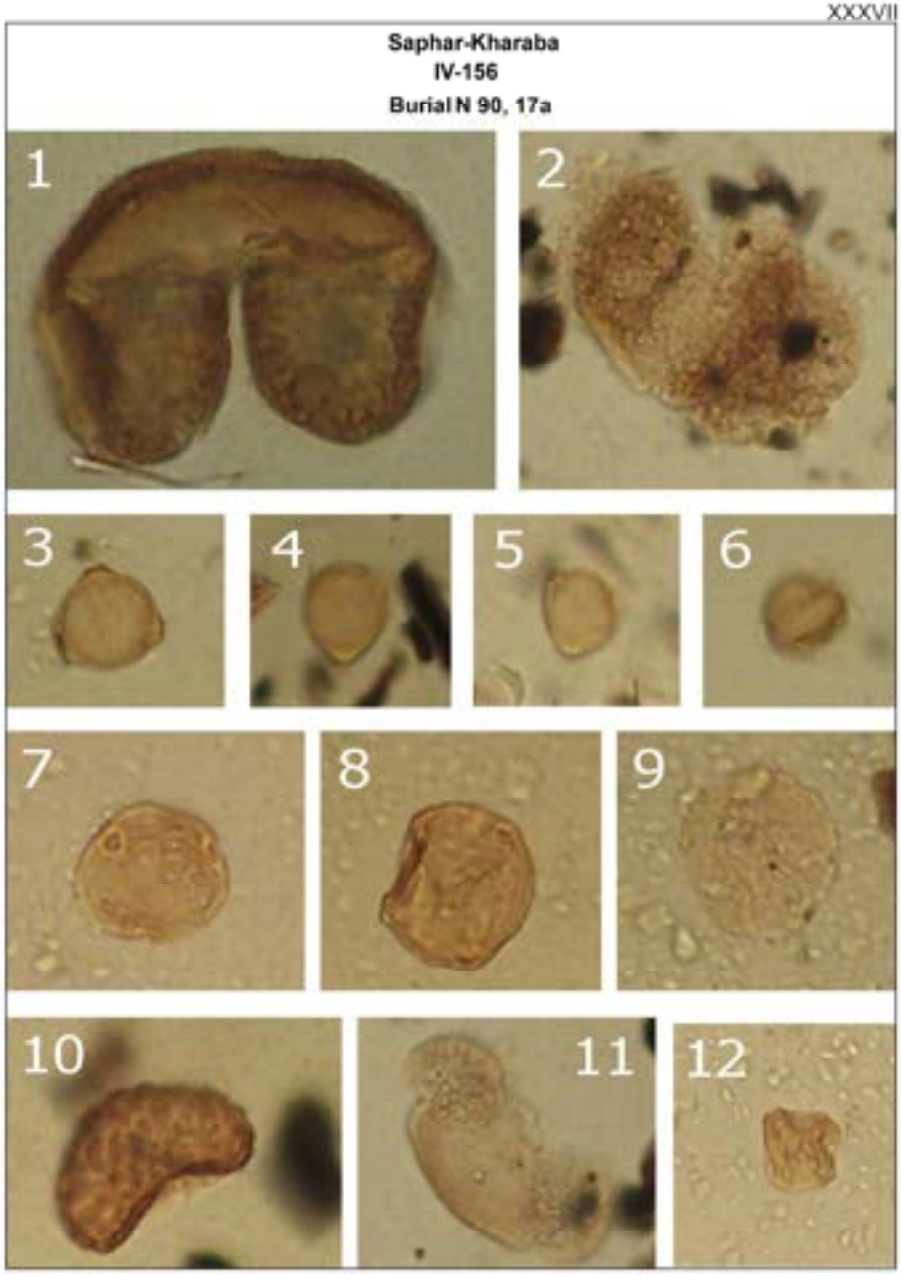
XXXV


Saphar-Kharaba
IV-156
Burial N 56
1
Burial N 56
Burial N 71
2
3
4
5

XXXVI



XXXVII

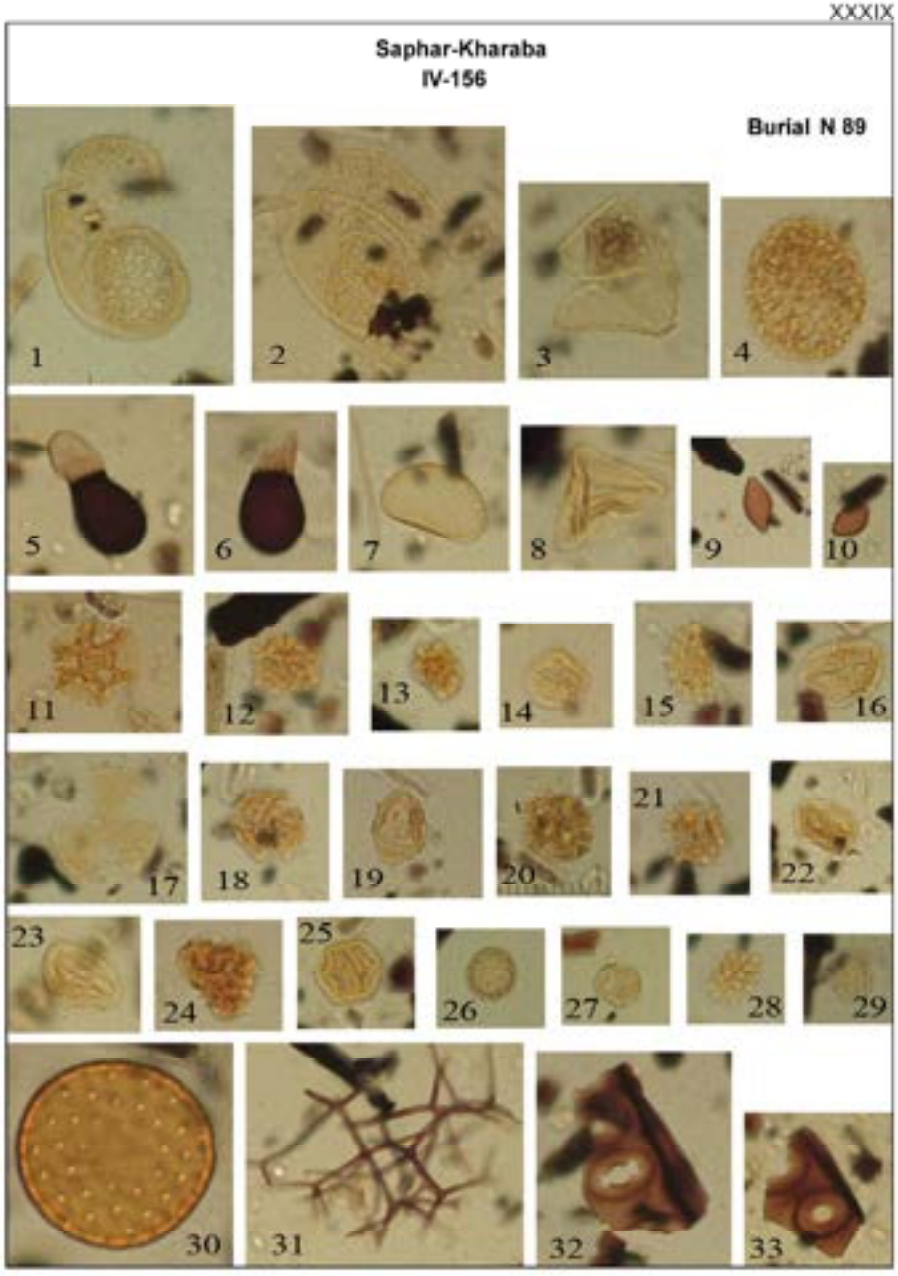


XXXVIII

Saphar-Kharaba
IV-156

Burial N 90, 30a

XXXIX


Saphar-Kharaba
IV-156
Burial N 89
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
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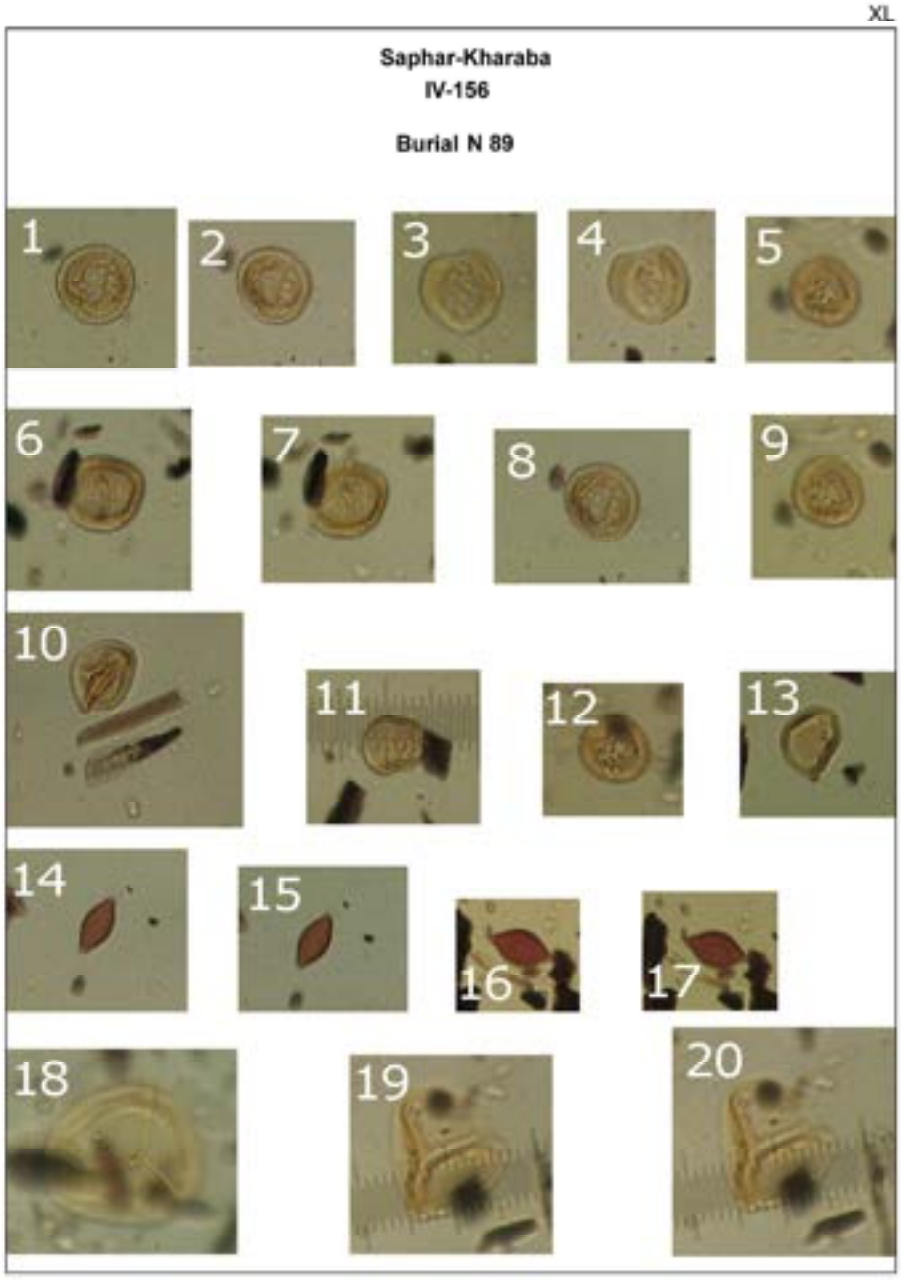
25
26
27
28
29
30
31
32
33


XL
Saphar-Kharaba
IV-156
Burial N 89
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20