

**Archaeological Investigations at Site IV-260 Skhalta, KP 80
Tetristsqaro District, Kvemo Kartli Region**

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Abstract

The Otar Lordkipanidze Centre of Archaeology of the National Museum of Georgia undertook a series of evaluation and salvage excavations at Skhalta (IV-260, KP 80+600), Tetristsqaro District, in connection with the construction of the BTC and SCP Pipelines. This report presents the results of field and laboratory studies carried out in 2004-2007 at the site in question.

Excavations were carried out within the framework of a corridor designated for the pipeline route. Consequently, the archaeological site was not fully excavated and studied. A settlement and a cemetery dated to the 4th-3rd centuries BC were found. The settlement was composed of several Buildings and household or ritual pits, while the necropolis consisted of rectangular cists. Most of the finds were made at the necropolis.

Anthropological, palaeozoological and palynological material was collected at the site. Analysis provided important data for the reconstruction of the environment in the pre-Hellenistic and Hellenistic periods. Future construction at the site in question and in its environs is not recommended, since the site has only been partially excavated and its full extent is unknown. Presumably, considerable parts of the site extend both to the north and to the south and await excavation.

A settlement of the 4th-3rd centuries BC with a contemporary necropolis has never been found before in the region of Kvemo Kartli. Various scientific questions arose both during the excavation and after laboratory processing of the finds. They are of paramount importance for the investigation of the way of life in Kvemo Kartli in the period under discussion, namely

- Settlement types in the period when the kingdom of Iberia was founded
- Branches of the economy
- Architecture and domestic interiors
- The demographic situation
- Contacts with the outer world

It is clear that further archaeological research should be carried out on undisturbed parts of the site so as to obtain more thorough information regarding these topics.

1.0 Introduction

Purpose of the investigation

The objective of the excavations was to salvage the remains of a settlement and cemetery of the 4th-3rd centuries BC, discovered in connection with the construction of the **BTC** and **SCP** Pipelines. The excavations were carried out by the Tetrtsqaro Archaeological Expedition, under the supervision of Zebede Shatberashvili. In the course of the excavations a settlement with a contemporary cemetery was found at the Skhalta Site: 5 buildings, 17 pits and 51 burials in total. (Pl. I).

Project sponsor

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

Permits and contract number

Permit No. 9, form No. 1, issued by the Archaeological Commission of the Georgian Academy of Sciences, licensed Zebede Shatberashvili to conduct archaeological excavations in the Tetrtsqaro District, at KP 80+600.

Contract references related to the works at KP 80+600 area: HL-078, HL-122, HL-166, HL – 175, HL – 151, HL – 154, HL – 157, HL – 161, HL – 173 (field work); HL – 201, HL – 215, HL – 224 (laboratory studies).

Legal requirements

According to Georgian legislation, the Archaeological Commission of the Georgian Academy of Sciences authorized an applicant of the Otar Lordkipanidze Centre of Archaeology upon his request, to conduct archaeological excavations in the territory of Georgia in conformity with the specifications approved by the Archaeological Commission.

Dates of investigation

The investigation of the Skhalta site took place in October 2004 and between June and September 2005. Fieldwork was mainly carried out on the side of the **SCP** Pipeline, since the excavations on the side of the **BTC** Pipeline were limited. Consequently, the northern and southern portions of the site were left unexplored and, correspondingly, the borders of the settlement and the cemetery were not identified.

Final disposition and repository address

The finds and records from Skhalta Site **IV-260** have been deposited with the Otar Lordkipanidze Centre of Archaeology of the National Museum of Georgia, Room No. 5 (Address: 14, Uznadze Street, 0102, Tbilisi, Georgia, Tel.: 995 32 952920).

2.0 Environmental Background

The Skhalta site lies within Kvemo Kartli in south-eastern Georgia. The area is surrounded on three sides by the mountainous ridges of Kakheti, Trialeti and Javakheti and on the fourth, southern, side by the Azerbaijan plain, which together contribute to the environmental diversity of the region.

The landscape of Kvemo Kartli is characterized by a wide variety of plains, river valleys, plateaux, and canyons, but the area is mostly mountainous. Volcanic mountains are also to be seen in Kvemo Kartli. The central plain and southern parts of Kvemo Kartli rise gradually from *c.* 270 metres above sea level at Marneuli terrace to *c.* 1950 metres at Bedeni plateau. At around 1800 metres above sea level the area rises to a sub-alpine zone, which reaches a maximum altitude of 2400 metres. The alluvial plain of Kvemo Kartli is divided by the Mtkvari river into the Marneuli and Gardabani valleys.

The Kvemo Kartli area experiences a Continental climate, but specific subdivisions of other climatic zones occur, resulting from land formations and bodies of water. Arid, humid, and highland climates come together in the area.

The average annual temperature is 12⁰-13⁰ C, the coldest month being January when the average temperature is -3⁰-0⁰ C. The average annual precipitation is 350-500 mm. The mixture of different land formations, environmental conditions and climate zones creates a diverse floral and faunal community. The region possesses both mixed hardwood and savannah/grassland vegetation, including oak, fir, pine, poplar, willow, mulberry, sedge, and cereals. The wildlife includes a number of mammals such as bear, wolf, fox, wild boar, roe, field vole; birds such as eagle, hawk, jay, and reptiles such as snake, lizard, and turtle. Several rivers and streams flow through Kvemo Kartli, and aquatic life includes trout, carp, shemaya, etc. The Kvemo Kartli land formations appear to have been influenced by the Quaternary glacial period and also by erosive-denudative and accumulative processes in the past and present. The building of the earth is variable in different parts of the region. Highland deposits are mostly represented by Middle Cretaceous sediments consisting of arkosic sandstone, limestone and lithic tuff. Relatively young effusive rocks, dolerite lavas and volcanic glasses also occur in the region. Forest areas have brown soil, while meadows possess fertile top and sub soils. The soils of Kvemo Kartli soils are regarded as Transcaucasia dry steppe soils.

2.1 Site Location and Description

The Skhalta Site, IV-260, is located in Kvemo Kartli, Tetrtsqaro District, 3 kilometres south of the town of Tetrtsqaro. It is situated at 1100 m amsl in a slightly inclined position that measures 1000 sq. m. The Chivchvavi River flows 500 m to the south of the site. In the course of the investigations, variations in the soil types were noted in the stratigraphical section. Immediately overlying bed-rock at a depth of 2 m was a layer of black soil 30-40 cm thick and rich in humus. Then came a 50 cm thick layer of yellowish and clayey soil, and finally a similar yellowish clayey soil containing lime inclusions.

The whole of the site was covered with brush and grass, and light forest.

2.2 Past Environment

The Pliocene, Pleistocene, and Holocene epochs of the Tertiary and Quaternary periods coincided with the appearance of early hominids, their evolution and subsequent distribution. The Quaternary period is on this account also called the anthropogenic period. Lasting geological processes such as earth formation and numerous glacial and interglacial ages occurred within these geological periods; they affected the environment and subsequently the development of early hominids.

The Lower Palaeolithic coincided with the final stage of the Pliocene and the glacial and interglacial ages of the Pleistocene. Judging by palaeozoological, palaeological, and pollen analysis evidence from Dmanisi, the landscape of eastern Georgia during the Pliocene consisted of mountain ranges traversed by deep gorges and valleys. The climate was moderately dry and warm, there were a great number of rivers and lakes, and a rich fauna and floral cover supported early human distribution and establishment in Transcaucasia. In the Middle Pleistocene environmental conditions changed in both the Mediterranean and Transcaucasia as the result of a fall in temperature. Palaeozoological analysis from sites in Georgia and Azerbaijan suggest the existence of an ancestor of the horse (*Equus*), of the southern elephant, as well as of an archaic antelope and cow.

At the beginning of the Apsheon period, there were floral and faunal changes. Palynology suggests that herbaceous plants and crops were prevalent, and forests, savannas, and steppe landscapes were widespread. It is probable that the early hominid community lived mostly in warm climatic conditions, which will have promoted their development.

Only limited palaeoenvironmental research has been conducted with regard to the Middle and upper Palaeolithic periods in Georgia. The Middle Palaeolithic corresponds to four glaciations that occurred in the Pleistocene and it has been suggested that the climate, flora, and fauna of Georgia would have reflected the prevailing characteristic elements of the Ice Age.

The Upper Palaeolithic lasted from the second stage of the last ice age of Quaternary period and until the beginning of the Holocene. Climate fluctuation affected both flora and fauna, as is indicated by the variation of vertical zones within the landscape. Mixed broad-leaved forests, as well as ferns and thermophilic mammals and rodents were widespread. The climate at the end of the Pleistocene in Georgia is generally considered to have been humid and moderately warm.

The Mesolithic corresponded to the end of the Pleistocene and beginning of the Holocene. This period is associated with great environmental changes, such as global warming and glacial retreat, which resulted in the elimination of a number of animal species such as the mammoth and woolly rhinoceros (*Dicerorhinus sumatrensis*). Horse, bison, elk, European red deer (*Cervus elaphus*), wild boar, fox, and wolf were still present.

The climate was gradually getting more and more arid and warm, and between 12,000 and 9,000 years ago it reached its postglacial optimum, followed by the total elimination of floral and faunal elements typical of the Ice Age. In northern latitudes forest biotypes spread, in the south forests and steppes, and as a result these extended faunal communities and complete environmental modifications affected human activities.

The Holocene includes the period from the Neolithic to the present. The Neolithic corresponds to the middle of the Atlantic period Holocene, which experienced its warmest and driest stage in Eurasian continental regions after the Ice Age. The arid climate that formed during this period affected the environment, therefore decreasing the forest areas and prevalent thermophilic floral and faunal elements. Palaeobotanical, palaeozoological, and palaeopedological sample analysis of sites in eastern Georgia where early agriculture has been recognised has shown that really favourable environmental conditions were generated there for the expansion of thermophilic vegetation and of mammals.

The subsequent cultural periods were not marked by substantial ecological change, but palaeobotanical and pollen analysis of some Hellenistic sites has indicated flora that was different from that of the modern period. The chestnut was prevalent among lime, walnut, oak, maple, beech, and hornbeam (Kvavadze, Connor 2005). The climate was also warmer and humid, which supported the growth of nut trees, vines, and wheat. Field-crop cultivation seems to have been the main agricultural activity, and soft wheat, barley, and millet were most frequently grown (Rusishvili, Meladze 2005).

Considerable climate changes brought about a minor glaciation in the 18th century AD, when lower temperatures, increasing humidity, and a significant expansion of ice cover took place in the Greater Caucasus.

2.3 Land Use History

The site is located on an incline, and it was cleaned of vegetation before work began on pipeline construction. In the recent past the site in question was put to agricultural use. Today it serves as a pasture.

3.0 Cultural Background

3.1 Prehistoric and Historic Contexts

Palaeolithic

There are several areas in Georgia where Palaeolithic sites and artefacts have been discovered. A 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 2,000,000 years ago, appears to be Dmanisi. *Homo erectus* is generally considered to have lived in the Olduvan period, and the site of Dmanisi is recognized as earliest *Homo erectus* habitation in Europe.

Fossilized lower Palaeolithic faunal remains that are 1.5 million years old, of sabre-toothed tiger, southern elephant, and horse were discovered in the villages of Imera, Beshtasheni, and Darakov in Tsalka District. Finds were made at Imera and Darakov in connection with the BTC pipeline construction.

Lower Palaeolithic tools were made of stone materials such as andesite, basalt, flint, or obsidian. Hand axes, choppers, and scrapers made from thick flakes were diagnostic tools of 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 about several villages of Tsalka District. Some occurred 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 suggested 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 Pleistocene. Mesolithic stone industries are often distinguished by an abundance of flint and obsidian microliths; burins and fish hooks appear, but hunting and gathering are still the only life style.

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 works and burials. 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 Kiultepe 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 Cultures has been suggested. 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 ditches 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.

An Early Farming Culture settlement dated to the fifth-fourth millennium BC was excavated at KP 85.

Kura-Araxis Culture

The Early Bronze Age Kura-Araxis Culture existed in the fourth millennium BC, and succeeded 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 manufacturing.

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, burying practices, and artefact assemblages. Kura-Araxis diagnostic pottery and the horseshoe shape hearth also reached Syria and Palestine.

Naturally raised hills or places next to watercourses were usually chosen for habitation. 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 for safety reasons.

The style of house buildings is more complex. Buildings became rectangular in plan and wooden building materials were widely used. Walls and roofs were built from wooden materials. 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 perforation 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.

A number of Kura-Araxis culture sites have been recognized in the Kvemo Kartli Region. One, located at KP 85, is dateable to the second half of the fourth millennium BC, and was excavated as a result of BTC pipeline construction.

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.

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 in 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 be present. 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 wealthy 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 Kura-Araxis culture were still evidenced in pottery manufacturing techniques: features such as handmade black burnished vessels. However new decorative styles and shapes were 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 metal work.

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 be said, 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), Tetrtskaro (Tushishvili 1972), Tsalka (Kuftin 1941) 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 till 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 it 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. Bronze composition changed, with arsenic and antimony gradually being replaced with 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.

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 the 8th-7th 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 be made locally.

The development of an iron industry encouraged progress in agriculture, and this was also influenced by irrigation. The discovery of wide range of cultivated grape pips, bent iron knives for pruning vines, and 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.

Late Bronze-Early Iron Age sites are known in Kvemo Kartli in the Algeti gorge (Tushishvili 1972), in the “Cyclopean” fortifications at Chkhikvta village and on the northern slope of Bedeni mountain. Remains of an Early Iron Age settlement were found close to Tetrtskaro in the village of Varkhuno (Lomtadze 1989). Iron Age iron and copper smelting furnaces were discovered in the gorge of Bogvistskali, the tributary of the river Algeti (Gzelishvili 1964).

Iron Age / Classical Period, Hellenistic

Archaeological evidence of 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. Urn burials were mainly laid in the ground horizontally; only rarely were they placed in a vertical

position. Urn burials were made 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. Akhagori, 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 building at the time, headed presumably by the local aristocracy.

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).

It is noteworthy that Samshvilde is mentioned in these chronicles as an administrative unit of eastern Georgia in the 3rd century BC.

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.

A large number of Classical period cemeteries are known in Kvemo Kartli: at sites such as Tetrtskaro (Bokhochadze 1963), Asureti (Margishvili 1992), Abelia (Lomtadze 1980), or Etso (Shatberashvili 2005). Only one settlement, however, has been discovered so far. Artefacts recovered from cemeteries well demonstrate the political and social situation of Classical Kartli as well as its relationships with the Greek, Roman and eastern worlds.

Pollen analysis relating to this period suggests that cattle-grazing was the principal activity. Arable farming was now less important, although wheat was still grown, as were grapes and vegetables.

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 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, 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 badges, daggers, belts, diadems, bracelets, necklaces, pendants, and inscribed finger rings; silver jars, plates, and bowls, amulets, iron weapons, glass vessels, and fineware pottery. Gold vessels decorated in precious and semi precious stone, 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 burials illustrative 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.

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

Pottery was mostly made on the potter's wheel, 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 envisage the life that was lived in Roman period Iberia.

Medieval Period

The collapse of the Roman Empire in the west in the late 5th 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 the culture of the people.

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 is 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, 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, as is illustrated by the Early Christian cemetery excavated at KP 74 close to the village of Dageti.

Inscribed artefacts are more common among Medieval finds.

In the Medieval period the feudal landowning system was established. Grain 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.

Judging by the monuments and archaeological sites excavated in Kvemo Kartli, and by Georgian narrative sources, Samshvilde County was one of the most populated areas in Medieval times. Its centre appeared to be Samshvilde citadel, constructed on a naturally fortified hill overlooking the confluence of the Chivchavi and Khrami rivers. Investigations at Samshvilde fortress revealed elements of urban life within the citadel; such features as rectangular stone buildings, together with water reservoirs and drainage systems. Glazed pottery fragments were also recovered from the structural remains.

Georgian historiography suggests that Samshvilde had the status of a town in the Medieval period, which lasted until the 17th century, while later on it only functioned as a fortress.

Excavations in a number of other Medieval cities mentioned in Georgian historical narrative sources such as Mtskheta, Ujarma, Urnisi, Rustavi, or Dmanisi yielded rectangular dwellings built with limestone masonry and stones, with flat plastered or tiled roofs. In some cases *spolia* from the preceding Roman period were reused.

Rural settlements of the 12th-13th centuries excavated in Chivchavi gorge, in Tetrtskaro 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 faunal devices are to be found throughout the entire Medieval period. There are also red plain and slip wares 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 Urnisi. 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 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 burials frequently roofed with stone slabs, and clay sarcophagi. Burials are often collective. Individuals were mostly laid on their backs extended, 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 Tetrtskaro 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

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, a situation that lasted until the teens of the twentieth century. The Russians imposed a totally different lifestyle, and it was through Russia that European culture and a European life style penetrated Georgia.

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

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.

3.2 Summary of Previous Research

No other archaeological site was identified within one kilometer of Skhalta Site, IV-260.

4.0 Methodology

4.1 Field Methods

In the first place, our architect used a theodolite to create a plan, and a datum point was established within the area to be investigated. A grid was imposed over the site aligned north-south. Each square measured 6 x 6 m. Occasionally, and where necessary, some were divided even into smaller squares, measuring 2 x 2 m. The axes of the squares were numbered east-west and north-south.

In order to see how far the site extended, a total of six trial trenches were dug. Two measured 20 x 20 m, another two 30 x 2 m, and a further two 6 x 3 m. The topsoil was removed to reveal the upper parts of the burials and an occupation layer. The excavations were carried out manually for the most part, using spades, shovels, pickaxes, knives, scalpels and brushes. In the course of the pipeline construction, spoil was removed from the area under study by heavy vehicles. The finds were mostly obtained from occupation levels. A few chance finds are also reported.

Thanks to well-dated artefacts, a comparative chronology was worked out in advance.

Drawings were made and photos of all parts of the excavation were taken at various stages of the work. Anthropological, palaeozoological, palaeobotanical and palynological samples were collected at the site and given to relevant specialists for investigation. For further information regarding their research methods, see the attached interdisciplinary reports. Each find was taken from the field for further laboratory processing.

4.2 Laboratory Methods

The artefacts were categorized according to material. Ceramic artefacts were cleaned with a brush, washed in water diluted with hydrochloric acid, and then analyzed according to style and type. All artefacts were numbered, described and catalogued, then labelled and placed in plastic bags. Palaeoanthropological, palaeozoological, palaeobotanical analyses were carried out. Metal objects were investigated in chemical and technological laboratories. Some of the metal and ceramic objects underwent restoration and conservation. The methods of analysis are scrupulously described in attached interdisciplinary reports.

Electronic and hard-copy versions of the documentation relating to field and laboratory studies are deposited with the Otar Lordkipanidze Centre of Archaeology of the National Museum of Georgia.

5.0 Results

5.1 Basic Data Summary

The excavation carried out at the Skhalta settlement and the cemetery took place over an area of 1000 sq. m. Six trial trenches of various size were dug; two measured 20 x 20 m, another two 30 x 2 m, and a further two 6 x 3 m, revealing remains of buildings (Pls. III 1,2; IV 1,2; V 1,2; VI, VII), 17 household pits (Pl. VIII), and 60 burials (Pls. II; X; XI 1,2; XII 1,2,3), of which ten lacked grave goods. Only five buildings were excavated, since the sixth extended beyond the limited frame of the pipeline corridor. Only a corner was recorded.

Monuments were mainly concentrated in an area measuring 500 sq. m. In total, 413 artifacts were found, including 236 ceramic, 134 metal, 18 stone, 18 glass, 3 bone, and one wooden. In addition, there were two textile remains and one fragment of plaster.

Of the artefacts, 273 were household objects, eight weapons, two ritual objects, 120 jewelry and 5 objects related to cosmetics.

The Skhalta settlement and the cemetery represent a single-level monument, cut into clayey soil to a depth of one metre. The settlement and the cemetery functioned more or less simultaneously in the 4th and 3rd centuries BC.

5.2 Features

The settlement was located to one side of the cemetery on a sloping area, measuring 350 sq. m. (Pls. III 1,2; IV 1,2; V 1,2; VI; VII).

Rectangular buildings, built of stone and plastered with clay, had their backs cut into the rocky ground, resembling semi-dugouts. Their entrances faced south or south-east. It is likely that the buildings in question had flat roofs. Building No. 3 was best preserved, and will have been a two-roomed house with a total area of 60 sq. m. Its walls were one metre thick and happened to be preserved to a height of one metre. Two bread ovens built of stone and clay were found inside. Their surfaces were covered with fragments of large vessels. The surviving dimensions of the ovens were 1.20 x 0.8 x 0.4 m. In the building was a pantry 1.60 x 1.20 m for keeping food.

Building No. 5 consisted of a single room and measured 7.5 x 5.5 m. Remains of charred logs were found inside, and it is likely that it originally resembled Building No. 3 (Pl. VII). In the area of the settlement, but mainly near Building No. 3, household and ritual pits were discovered filled with fragments of ceramic vessels, animal bones, and other organic remains. Their mouths were round or oval and they had broader bottoms than tops.

The diameters of the mouths varied between 1.20 m and 1.60 m, and they were between 0.80 and 1.0 m deep (Pl. VIII).

A cemetery measuring 150 sq. m was found extending in a northerly direction towards the unexcavated area (Pls. X, XI 1,2). The burials were 0.50-1.50 m apart, but in some cases they overlapped (Nos. 24/37; 52/53).

The burials were laid out neatly in rows, and we identified three or four such rows. There were two types of burials: cists and pit-graves. The cists were rectangular made of five or six rough-hewn basalt slabs that varied in size, between 1.0 and 1.4m in length and 0.6 and 0.9m in width (Pl. XII 1,2,3).

The pit graves were oval and covered with stone slabs.

The burials were individual, with the deceased lying on their left or right sides and their heads oriented to the NE. In one case the deceased had an eastward orientation. The remains of sacrificed cattle were identified nearly in or near all the burials.

5.3 Artefacts

Artefacts recovered from Skhalta Site IV-260 are presented here in Tables 1 and 2 classified by function and material.

Table 1 Artefacts classified by material

	Settlement	Cemetery	Out of Context	Total
Pottery	128	72	36	236
Metal				
Bronze		38		38
Iron	5	68	5	78
Silver		11		11
Mixed		7		7
Sub Total				134
Stone				
Obsidian	6		1	7
Flint	2		2	4
Basalt	1			1
Sard		1	1	2
Undetermined	2	1		3
Sub Total				17
Glass		19		19
Bone		3		3
Wood		1		1
Textile		2		2
Plaster	1			1
Total	145	223	45	413

Table 2 Artefacts classified by function

	Settlement	Cemetery	Out of Context	Total
Tableware	30	47	7	84
Kitchenware	22	24	4	50
Household Vessel	76		25	101
Household Object	1	2		3
Weapon	1	6	1	8
Household Tool	12	16	7	35
Constructional	1			1
Ceremonial		2		2
Jewellery		119	1	120
Cosmetic		5		5
Garment		2		2
Undetermined		2		2
Total	143	225	45	413

Among the artefacts ceramic vessels were by far the most numerous, and they also display a wide variety of shape. Most of the ceramic vessels came from Buildings No.3 and No. 5, in the ovens, and in pit No. 4. Iron objects included a knife, an axe, and a dart. The iron knife belongs to the domestic group of artefacts, while the axe and the dart represent weapons. Domestic tools made of obsidian and flint falls into the stone category. Between one and three vessels might be found in a burial, and these included jars, jugs, pots, chalices and bowls (Pls. XIII – XV).

A typology of ceramic vessels was worked out. Two groups of jars and jugs were identified, one consisting of pieces with a pear-like body and trefoil mouth, while the other had pieces with a pear-like body and round mouth. Jars and jugs fired buff or red with a pear-like body and round mouth were painted red (Pl. XIV 17, 18, 54).

Similarly, two groups were distinguished among the plain and painted jars and jugs: examples with biconical and trefoil lips (Pl. XV 93), and those with spherical bodies and trefoil lips (Pl. XXII 136). Chalices and bowls (Pl. XV 94, XXIII 137, 138) had both incurved and out-turned lips; most were painted red.

Pots were plain and spherical, but cylindrical and biconical variants were identified among smaller pots.

One handleless jar was exceptional and did not fit into any group. Its body and base had decorated bands composed of indentations and vertical grooves (Pl. XV 4). Another specimen, a kettle-like jug with a tube (Pl. XV 104), was also distinguished as a separate type. Metal implements (of iron, bronze, or silver) were found in nearly every burial. Weapons were made of iron, and included spearheads with long and narrow blades (Pl. XVII 150) and examples with diamond-shaped blades (Pl. XX 34).

Iron battleaxes had oval holes for handles, hammer-like elements, and oval cutting edges (Pl. XX 59).

Household tools included iron knives and an adze. The knives were of three types: straight (Pl. XVI 143), bent (Pls. XVII 45, 151, XX 60), and sickle-shaped (Pl. XX 59).

A wide variety of jewellery was found in the cemetery, including bronze and silver rings, an iron torque, bracelets of silver, bronze and iron; silver and iron temple-rings, a silver earring, and beads of various materials and shapes.

The highlights among the jewellery were the bracelets and rings. The bracelets were made of bronze, silver and iron. The silver and bronze bracelets were either round or oval in shape (Pl. XVI 145). Iron bracelets were divided into plain and knobbed according to their degree of decoration.

The iron, silver and bronze rings that were discovered at Skhalta cemetery are of various shapes. Some are very simple made from narrow wire, while others had bezels. These were of two types: oval bezels and bezels made of wire. The rings with oval bezels bore intaglios of various kinds.

The finds also included several objects for personal hygiene and daily activity, such as a comb, an ear-pick, and a spindle-whorl.

Of the pottery, bowls, chalices, pots and jars were found at both the settlement and the cemetery (Pl. IX), while wine storage jars, small jars and basins were found only at the settlement.

In general, ceramic vessels formed the greatest number of finds both at the settlement and the cemetery. Metal objects with domestic and defensive functions were fewer, although they were found both at the settlement and the cemetery. The artefacts made of glass, bone, wood and textile were found only at the cemetery.

6.0 Interpretation

The houses and cemetery at Skhalta constitute a multi-functional site. There is no other contemporary site in Kvemo Kartli that is as well preserved. The Shavsagdara settlement, excavated in the Tetrtsqaro District, was badly damaged by later (Roman) construction and its investigation presented certain problems. The Skhalta site produced many new features, hitherto unknown and unresearched.

The masonry of the Skhalta houses resembled that known in the ethnographic record of eastern Georgian construction traditions. For example, flat-roofed buildings occur in eastern Georgia contexts of the 14th-16th centuries BC. Their interiors had such regular features as double ovens for baking bread. This implies a link between monuments of the Bronze, Iron and Classical Ages and throws a strong light on the timeless character of Georgian building traditions, and as a consequence for the study of the genesis of the Georgian people (Shatberashvili 2005).

The ceramic vessels have parallels on sites dated to the Classical period.

As for the stone material recovered from the settlement, the obsidian and flint artefacts were identified as Palaeolithic domestic tools, but it is quite possible that they were re-used in the Classical period as well.

The burial types in the Skhalta cemetery were characteristic of Kvemo Kartli in the Classical period, as well as for other regions of Georgia. Both individual and collective burials are known at contemporary cemeteries in Kartli, while at Skhalta only individual burials were found.

It is noteworthy that of 60 burials only five contained iron weapons, spearheads and axes. According to the results of the anthropological study, more than 45% of the deceased appeared to be male. Every fifth man was buried with a weapon, which shows up a discrepancy with statistical data obtained from cemeteries dated to the 4th-3rd centuries BC, where every third or fourth man was buried with a weapon. In the part of the Skhalta cemetery we studied, it was clear that the deceased belonged to the middle level of society. There was not a single rich or in any way distinguished burial among the 60 burials we excavated. This could have been the result of a distorted sample, but even so, it is noteworthy that middle-rank cemeteries in Kvemo Kartli and beyond, display the rudiments of property differentiation among the local population (Shatberashvili 2005).

On the basis of finds of ceramic vessels, it was possible to divide the burials into two chronological groups. The earlier one consisted of burials containing trefoil-mouthed jars and jugs with pear-like bodies dated to the 4th century BC, and the second had burials containing round-mouthed jars and jugs with pear-like bodies that date between the mid-4th and the beginning of the 3rd centuries BC. (Shatberashvili 2005).

Trefoil- or round-mouthed jars and jugs with pear-like bodies have been frequently discovered at many cemeteries in both eastern and western Georgia, and were especially prevalent in the 4th century BC and at the beginning of the 3rd century BC (Narimanishvili 1991).

Jars and jugs with trefoil mouth and biconical or spherical bodies also have many parallels in Georgian cemeteries dated to the 4th-3rd centuries BC

Generally, chalices and bowls with incurved or out-turned lips are characteristic of the 4th-3rd centuries BC (Shatberashvili 2005).

Among the objects recovered from the Skhalta cemetery, a kettle-like jug with a tube is of special interest. It is type widespread in Georgia in the 5th-4th centuries BC and it generally thought that the model had come from the Iranian world. No parallels are known for the jug indentations (Burial No. 51, artefact No. 199), but given the context in which it was found, it was also dated to the 4th-3rd centuries BC

One part of the ceramic vessels had features characteristic of 5th century vessels, while another, namely the pear-shaped jars and jugs, had features diagnostic of the 4th-3rd centuries BC

Some of the pottery from the cemetery repeats shapes of vessels found at the settlement, thus conforming their contemporary status.

Among the metal implements, the iron spearheads are noteworthy in that they do not differ from earlier weapons. In line with the other grave goods, they were dated to the 4th-3rd centuries BC

Iron axes from Skhalta are similar to those from elsewhere in Georgia, and which are dated to the 6th-3rd centuries (Kvizhinadze 1975; Gagoshidze 1982; Shatberashvili 2005). The Skhalta axes were dated by analogy with the others.

Among the domestic tools, the bent and sickle-like knives are noteworthy, and in all probability they were used for pruning vines. An iron adze used for working wood is a rare specimen. Until now, the shape was unknown among contemporary finds in Kvemo Kartli, but it stands close to other objects with the same function that are dated to the pre-Classical period. The lack of novelty among the iron weapons or the household tools is noteworthy, and they closely resemble material of the preceding period.

From among the various personal ornaments found in the cemetery, the most important for dating purposes are bracelets made from rods that are oval or round in section, as well as knobbed bracelets dating to the first half of the 4th century BC. Bracelets with straight and concave backs of the second half of the 4th century BC were apparently produced until the 3rd century BC (Gogiberidze 2003).

Thus, knobbed iron bracelets, together with pear-shaped jugs thought to be important for dating complexes of the 4th into the 3rd century BC

Similarly, the Skhalta rings have parallels in burial contexts dated to the 4th-3rd centuries BC (Abramishvili 1980; Margishvili 1992; Ramishvili, Shatberashvili 1997; Shatberashvili 2005).

The bone cosmetic items seem to be unique, having no parallels in Georgia. On the basis of their contexts, they can be dated to the 4th-3rd centuries BC

The cemetery was dated to the 4th-3rd centuries BC on the basis of a typological analysis of the burial material and by means of dated parallels elsewhere.

Palynological analysis enabled us to determine the principal activities in the 4th-3rd centuries of the people who lived in and around Skhalta. Cattle-breeding was much more common than arable farming, although horticulture and viticulture were practised as well.

Remains of linen and cotton textile, identified on metal objects and human bones, indicate that linen and cotton were grown in the 4th-3rd centuries BC, and also give us some idea of the clothing worn by people at that time.

Palaeozoological analysis confirmed the findings of the palynological analysis. Remains of a funerary feast were found, consisting of the bones of sacrificed domestic animals, namely pigs and cows. These finds attest to the existence of developed cattle-breeding. Scientific research on Skhalta settlement and its cemetery has simultaneously highlighted new information and new topics of scientific interest, and has contributed to an awareness of the great significance of the site. Without at doubt, Skhalta settlement and cemetery represent one of the primary sources for the study of the history of Georgia in the 4th -3rd centuries BC.

7.0 Conclusions and Recommendations

The archaeological study of the Skhalta Site cannot be thought of as complete, since the areas to north and south remain unidentified and unexcavated. This creates an obstacle to further understanding of the site. It is recommended that geophysical investigation be carried out in the future outside the pipeline corridor in order to determine how far the site originally extended. The resulting data would provide the basis for archaeological studies beyond the borders of the pipeline corridor on the undisturbed portions of this site. This would provide an opportunity for solving scientific issues that have arisen in the course of fieldwork and laboratory study. With a more detailed knowledge of the buildings, the type of settlement that once stood at Skhalta (village, sanctuary, town) could be identified. A full study of the cemetery should be enhanced by analysis of the demographic state and social stratification of the period in question. When processing the additional anthropological material, attention should be paid to such aspects as: the sex of the population, their age, diet, health, traumas, reasons for death, etc.

Faunal and floral data obtained from further excavations, will, in their turn, provide new material for palaeoenvironmental research.

An important area for further research would be to undertake radiocarbon analyses of organic materials found both at the cemetery and settlement. This would define more accurately the chronology of the site (4th-3rd centuries BC), thus far worked out principally on the basis of dated pottery finds.

In general, research on Skhalta promises to define in a more detailed fashion the way of life in Kvemo Kartli in pre-Hellenistic and Hellenistic times.

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Appendix

Ceramic Analysis and Conservation Report

By Merab Dzneldze

Most of the artefacts at the Skhalta site consisted of pottery, from among which 63 vessels were selected for restoration, and in the end 19 were actually restored.

The following method was employed for the restoration of the vessels: conjoining fragments were identified and glued. Missing pieces searched for again or were filled with plaster. Glue resin CO-M300 was used for gluing clay vessels.

During the five days set aside for the restoration and conservation of the pottery, the following clay vessels were completely or partially restored: Nos. 45, 61, 70, 76, 80, 88, 99, 112, 122, 123, 137, 164, 182, 202, 203, 300, 301, 304, 390.

Restoration of the clay vessels made it possible to analyse them according to form and type, and assisted in finding parallels, something that is paramount importance in classifying the artefacts and in general for creating a comparative chronology.

Appendix

Metal Artefacts Analysis Report

From among the metal finds excavated at the Skhalta settlement and cemetery, 110 artefacts were restored. The chemical composition of six artefacts was established by means of spectral analysis (Table 1).

1. Bracelet, grave No. 23, No.20-101: an alloy of copper and tin (Cu-90.0; Sn-8.25; Pb-0.55), characterized by high mechanical features.
2. Pin, grave No. 19, No.12-65: copper with admixtures (Cu-98.0; Sn-1.25; Ag-0.023), the material is highly plastic (Copper with tin).
3. Pin, grave No.4, No.15-83: an alloy of copper and tin (Cu-88.8; Sn11.0; Fe-0.02), characterized by optimal mechanical indices.
4. Bracelet, grave No.25, No.21-106: an alloy of copper and tin (Cu-85.0; Sn-14.0), characterized by optimal mechanical indices.
5. Chain, grave No.42, No.36-168: an alloy of copper and tin (Cu-89.0; Sn-8.5; Pb-2.3), characterized by optimal mechanical indices.
6. Pin, grave No.48, Nos. 42-188: an alloy of copper and tin (Cu-83.5; Sn-11.5; Pb-3.25), characterized by optimal mechanical indices.

Spectral analysis revealed a tendency for the use of copper and tin alloys at the Tetrtskaro District metal-working centre. The material of the alloy was chosen in accordance with the function of the object.

Five iron items were studied metallographically:

1. Spearhead No.6-34, steel of medium hardness
2. Knife No.6-39, steel of low hardness
3. Knife No.10-57, steel of low hardness
4. Axe No.10-59, steel of medium hardness
5. Spearhead No.13-72, cemented steel

The restoration scheme for the bronze material was as follows:

Macro-structural and morphological investigation and photography of each item was conducted prior to restoration.

Bronze artefacts were worked on mechanically by means of a scalpel or other sharp tools. The work was done under a microscope in conditions of very bright light. The bronze ring No.108 revealed an organic inclusion, possibly a fragment of human skin (Pl. XXVI, Fig.

2; Pl. XXVII, Fig. 1, 2). Cleaned items were processed with acetone, dry items were covered with a thermoplastic acrylic polymer, Paraloid B 72 (Paraloid B 72 + acetone [40 g + 1.5 l]).

The scheme for the restoration of iron material was as follows:

Iron implements were processed mechanically, by means of a mechanical drill, using diamond and steel brushes.

Remains of textile and other organic inclusions were retained on some of the objects (Pl. XXVII, Fig. 1-14).

Textile fragments were discovered on the following steel artefacts: No. 97 (Pl. XXVII, Fig. 3); No. 190 (Pl. XXVII, Fig. 4); No. 118 (Pl. XXVII, Fig. 5); No. 195 (Pl. XXVII, Fig. 6-7); No. 192 (Pl. XXVII, Fig. 8); No. 100 (Pl. XXVII, Fig. 9-10); No. 66 (Pl. XXVII, Fig. 11); No. 81 (Pl. XXVII, Fig. 12-13); No. 206 (Pl. XXVII, Fig. 14).

Micro-photography of the organic inclusions was carried out (magnification x8).

Textile fragments were covered with oxides and other corrosion products. The above-mentioned items were worked on with a solution of Titriplex (1l distillate + 40 g Titriplex). This cleaning method facilitated differentiation of the weaving.

Mechanically cleaned items were worked on with a solution of tannin + orthophosphoric acid, then with a solution of tannin with alcohol alone (this process was repeated several times). In order to conserve an object, it might be covered with a polymer of thermoplastic acryl, Paraloid B 72 (Paraloid B 72 + acetone [40 g + 1.5 l]).

Some of the iron artefacts underwent reconstruction. In the course of reconstruction we used Araldite 2020A + stabilizing Araldite 2020B + talc + brown pigment.

The scheme for the restoration of the silver material was as follows:

Chemical and mechanical methods were used for the restoration of the silver material. Some of the silver items were cleaned with a solution of Titriplex (500 ml distillate + 18.5 g Titriplex). The restored items were processed with acetone and dry items were covered with a thermoplastic acrylic polymer, Paraloid B 72 (Paraloid B 72 + acetone (40 g + 1,5 l).

Photofixation of the items was conducted both before and after restoration (Pl. XXVI, Fig. 1,2,4), (Pl. XVI, Fig.1; Pl. XVIII, Pl. XX; Pl. XXVI, Fig. 3).

Table 1 Spectral Analysis Results

Lab Ciphe r	Artefact Form/Number	Feature	Cu	Sn	Pb	Zn	Bi	Ag	Sb	As	Fe	Ni	Co	Au
U-693	Bracelet 20/101	Burial 23	90.0	8.25	0.55		0.008	0.008			0.007	0.012		
U-694	Pin? Chain 12/65	Burial 19	98.0	1.25	0.002			0.023						
U-695	Pin 15/83	Burial 4	88.0	11.0			0.003	0.015			0.02	0.012		
U-696	Bracelet 21/106	Burial 25	85.0	14.0			0.003	0.55			0.06	0.009		
U-697	Chain 36/168	Burial 42	89.0	8.5	2.3		0.04	0.3	0.8		0.03	0.1	0.001	
U-698	Pin 42/188	Burial 48	83.5	11.5	3.25		0.005				0.007	0.06		

Table 2 Spectral Analysis Results

Artefact Form/Number	Feature	C	Mn	Si	Ni	Comment
Spear-head 6/34	Burial 13	0.4	0.002	0.004	0.001	
Knife 6/39		0.25	0.05	0.21	0.02	
Knife 10/57		0.2	0.07	0.25	0.01	
Axe 11/59		0.5	0.11	0.07	0.11	
Sear-head 13/72	Burial 20	0.6	0.005	0.35	0.01	

Appendix D

Anthropological Analysis Report

By Nana Kiladze

The bone material of 28 individuals found at the Skhalta cemetery was entrusted to the Anthropological Department of the Institute of History and Ethnology. The other osteological remains were poorly preserved and unfit for investigation. They were accordingly reburied at the cemetery in one of the cists, their sex and age having been preliminarily defined during fieldwork.

The anthropological material was worked on as follows: the bones were cleaned, washed, glued with special adhesive (a mixture of candlewax and rosin) by means of heating in the flame of a bunsen burner. Later on, anthropological features were studied.

The deceased were mainly lying on their right sides, buried in the typical crouch burial position with bent hands and feet. Exceptions were cists Nos. 25, 51, 55, 57 and pit-grave No. 14, where the deceased were lying on their left sides.

Since the bones were poorly preserved, in several cases the preliminary conclusions arrived at during fieldwork were altered after laboratory studies. For example, the age of the male deceased (♂) found in the pit-grave and defined as being 60-70 years of age, was considerably reduced to 45-50 on the basis of the ossification of seams on the skull and of tooth wear (M3 molar) (Table I, 1).

The 12-16 year-old youth (Inf.) found in the pit-grave No. 50 on the basis of premolars and molars and tooth roots was defined as a 16-20 year-old woman (♀) (Table I. 2).

The age of a male (♂) found in cist No. 29 was reduced from 50-55 down to 30-35 on the basis of grown molars and the ossification of the seam on the skull.

The deceased found in cist No. 42 was preliminarily defined as a woman of 30-35 (♀), but later, features such as the slope of the forehead, the arch over the eyebrow, the back of the head, and the mastoid process, led to a redefinition as a 25-30-year-old male (♂).

The age and sex of the deceased found in cist No. 28 was defined as a 35-40 year-old woman (♀) on the basis of teeth and the 90 degree angle of the pelvic girdle, which is characteristic for women (Table II. 1).

The deceased found in cist No.17 was preliminarily defined as a male (♂) of 60-65. After investigation of the gracile bone, the coccyx, and the nameless bone and the slope of the top of the thigh of the deceased, the age and the sex were changed to a female (♀) of 16-20.

The osteological material obtained at the burial was gracile, its relief was plain and smooth, skulls were mesocranial.

Calculation of height according to Martin (Martin, 1957) became possible by measuring longitudinal bones of 15 males and 4 women. Among men the body height varied between 1.533 m and 1.613 m. The average male height was 1.672 m, and of females 1.579 m. According to Martin, the body height of the Skhalta population was in the above median category (Roginsky, Levin 1978).

The craniological material obtained at the Skhalta burial was divided according to sex and age group. The data presented here do not objectively show the real morbidity structure since the available data was restricted to material from the graves dug only within the framework of the pipeline corridor, and therefore the morbidity level of the totality of the occupants of the cemetery remains obscure. Nevertheless, the material we do have is very interesting from several points of view. The analysis of the age structure of morbidity from the aspect of sex showed that 57% of women died at the reproductive age (15-45 years). If we widen the frames of the reproductive age up to 50 years, in such a case the number of women who died at a reproductive age increases up to 64.3%. If the reproductive age is limited within the frame of 18-55, then the number of deceased of this group reaches 77.3%. It is noteworthy that in total the morbidity is higher in men than in women. It is high in nearly all age groups, except when the morbidity is marked on one and the same level (Fig. 1, Table 1). Generally, relying on available data, it appeared that the deceased were divided into three groups: men 46.7%, women 29.8%, and children 23.4%.

The number of children in the population was much higher, and their morbidity should be much higher. Skeletons of children, especially of infants, were mostly found in the earth mainly in a damaged condition, and so their quantity was reduced. If we take child morbidity into consideration, average life duration will reduce to 34.4 years.

In our palaeomaterials the number of males always outnumbers that of females, which to some extent reflects existing sex correlation.

According to the data from the Skhalta cemetery, the average life expectancy of the Skhalta population (Fig. 1, Plate 1) actually corresponds to the average life expectancy of the population of Georgia in Hellenistic times (Bitadze 2005).

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Table I
Distribution of skeletal materials by Age and Sex

Age	♂		♀		ch		E	
	n	%	n	%	n	%	n	%
0-4	-	-	-	-	5	10,6	5	10,6
5-9	-	-	-	-	2	4,3	2	4,3
10-14	-	-	-	-	1	2,1	1	2,1
15-19	1	2,1	1	2,1	3	6,4	5	10,6
20-24	-	-	1	2,1	-	-	1	2,1
25-29	3	6,4	2	4,3	-	-	5	10,6
30-34	3	6,4	3	6,4	-	-	6	12,8
35-39	1	2,1	1	2,1	-	-	2	4,3
40-44	-	-	-	-	-	-	-	-
45-49	5	10,6	1	2,1	-	-	6	12,8
50-54	4	8,5	3	6,4	-	-	7	14,9
55-59	1	2,1	-	-	-	-	1	2,1
60→	4	8,5	2	4,3	-	-	6	12,8
Sum	22	46,7	14	29,8	11	23,4	47	99,9
Medium Age	44,4		39,7				34,4	

Appendix
Paleozoological Analysis Report
By Oleg Bendukidze

From among the paleozoological samples obtained at the Skhalta settlement and cemetery, 30 were chosen for analysis. Each sample was cleaned, glued, identified and prepared for photography. It was eventually concluded that the bones discovered in the graves represented the remains of a funerary feast, i.e. sacrificed animals, which were principally represented by the remains of bones of the hind leg of a gilt (an immature female pig) (Pl. XXIX, Fig. 1).

In addition, the remains of bullocks and cows were found in several graves (Pl. XXIX, Fig. 2). The assemblage of bones mainly consisted of skulls and the extremities of cattle. Presumably, this points to the deposition of skulls and extremities in graves as an ancient ritual that existed in eastern Georgia from the Early Bronze Age.

It is noteworthy that the bones of cattle discovered at the Skhalta cemetery bore no traces of cooking. Evidently, raw meat or whole animal body parts were placed in graves, rather different from the funeral rites encountered graves found on the Tsalka and Bedeni mountain plateaux, dated to a much earlier period namely the Bronze Age. In these graves cattle bones were mostly found in pottery vessels. Palynological analysis of the Saphar-Kharaba cemetery proved that the contents of the vessels in question apart from the cattle bones included a garnish. Clearly, cooked food was placed in graves.

The cow excavated at Skhalta is of small size and, presumably its breed will have been close to that of Khevsureti cattle. Cattle of similar breeds were widespread in Georgia since the Late Bronze Age. However, cows of two species, large and small, are known from sites of the Trialeti culture dated to the Middle Bronze Age. The breed of the Skhalta pig was not defined since there were no bones of an adult animal. It is a general rule that the bones of young animals are not informative for paleozoological studies. As a result, it could only be suggested that judging by its size, the pig excavated at the Skhalta site resembled the black Kakhetian breed widespread today.

Appendix

Pollen Analysis Report

By Eliso Kvavadze

Nine soil samples were collected at the Skhalta settlement and the cemetery. Two were from Buildings No. 3 and No. 5, three from Pits Nos. 5, 10 and 16, and four from Burials Nos. 4, 23, 28 and 48 (Table No. 1).

The samples were processed in accordance with standard laboratory methods used in palynology. At the first stage the material was boiled in alkali of potassium, at the next stage the sample was centrifugated with heavy liquid, and at the third stage its acetolysis, i.e. dyeing, was carried out. Thanks to acetolysis a sufficient quantity of pollen grains were defined.

Pollen grains were found in abundance in organic remains attached to bracelets recovered from the graves and represent textile remains. Microscopic analysis of the textile showed that it was made of linen. Evidently, it was a fragment of the deceased's garment (Pl. XXX, Fig. 1, 2). In addition, fibres of cotton textile were revealed (Pl. XXX, XXXI). Apart from the bracelets, both linen and cotton fibres were encountered in the pits and layers of the dwellings (Pls. XXXII, XXXIII).

The results of palynological research suggest that the basic type of economy in the Skhalta area in the 4th-3rd centuries BC was cattle-husbandry. The index of the quantity of herbaceous plants growing on pastures of the area in question, was high, while the index of elements of agricultural plants was much lower, indicating a low development of agriculture (Pl. XXXIV). In the area under discussion, people were mainly sowing wheat. Horticulture and viticulture were developed. Pollen grains of cultivated vine, walnut and hazel nut were identified.

As regards the natural vegetation of the period, there were forests in the environs of Skhalta. This is shown by the abundance of extracted pollen that belonged to arboreals and to the spores of forest ferns.

The plains, which were not put to arable use, and were not used for horticulture, seem to have been covered with hornbeam. On adjacent ridges, besides coniferous trees, beech, milk mushroom, azalea, and oak of higher mountains were widespread, while alder and elm were growing in damp gorges.

Thus, judging by the complexes of wild and cultivated vegetation, it could be concluded that climatic conditions in the Hellenistic period, compared to those in the Late Bronze

Age, were much more cooler. Palynological complexes lacked such thermophilic plants as chestnut, zelkova, lime, and wingnut. A cool and damp climate was favourable for growing linen. Our data also showed that textiles made of linen were widespread among dwellers of the settlement in question.

Table 1 Quantity of plants pollens and spores recovered from Skhalta Site

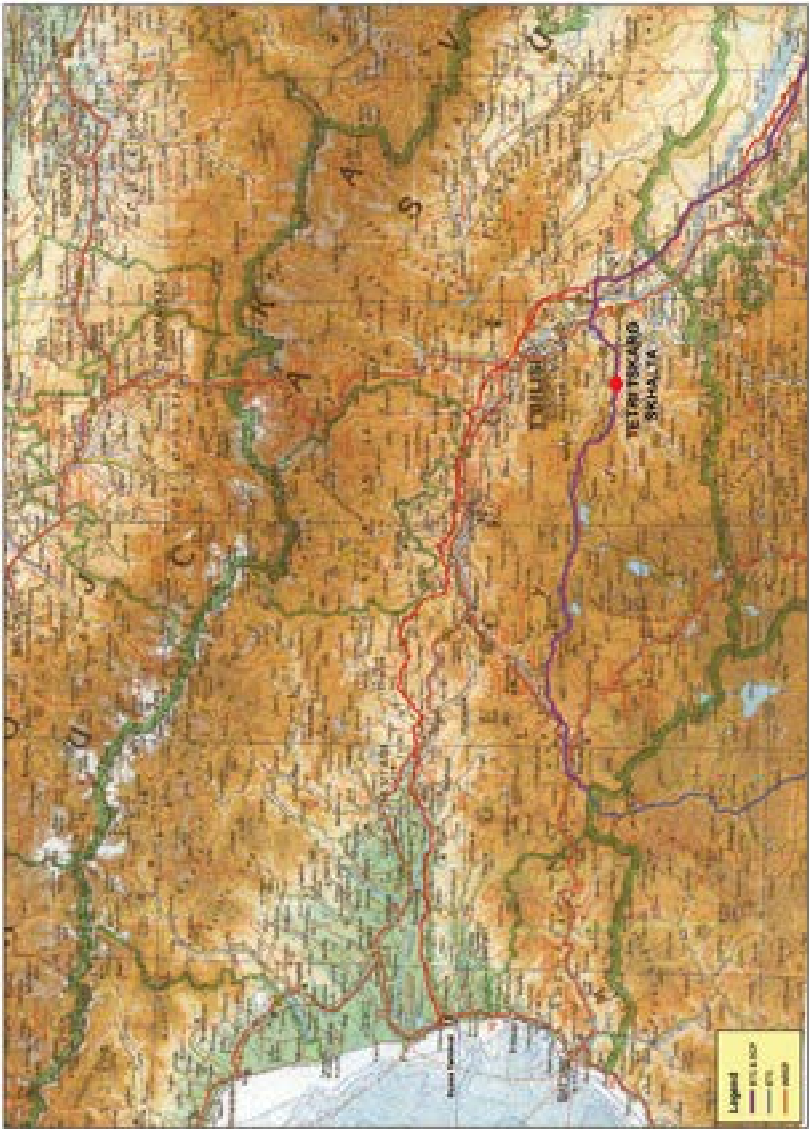
Skhalta Site	Burial 4	Burial 23	Burial 28	Burial 48	Pit 10	Pit 16	Pit 5	Building 3	Building 5
Soil Sample Number	1	2	3	4	5	6	7	8	9
<i>Tree plant Group</i>									
<i>Picea orientalis</i>	3	1	4	30	0	0	0	0	0
<i>Pinus</i>	15	8	12	60	2	1	12	2	4
<i>Cedrus</i>	1	0	0	0	0	0	0	0	0
<i>Fagus orientalis</i>	3	1	0	2	0	0	0	0	0
<i>Betula</i>	1	0	0	3	0	0	1	0	0
<i>Juniperus</i>	0	0	0	1	0	0	0	0	0
<i>Juglans regia</i>	0	2	0	2	0	0	0	0	0
<i>Carpinus caucasica</i>	2	1	0	11	0	0	2	1	2
<i>Carpinus orientalis</i>	1	0	0	2	0	0	0	0	0
<i>Alnus</i>	1	0	0	1	1	0	1	0	2
<i>Quercus</i>	3	1	0	4	0	0	0	0	0
<i>Ulmus</i>	0	1	1	0	0	0	0	0	0
<i>Corylus</i>	4	1	0	1	0	0	0	1	1
<i>Vaccinium</i>	0	0	0	2	0	0	0	0	0
<i>Rhododendron</i>	2	0	1	2	0	0	0	0	0
<i>Vitis vinifera</i>	0	3	0	0	0	0	0	0	0
<i>Tree plant Group Sum</i>	36	19	18	121	3	1	16	4	9
<i>Herbal Group</i>									
<i>Poaceae</i>	15	6	10	11	3	0	3	4	3
<i>Triticum</i>	2	2	0	4	0	2	2	2	1
<i>Cerealia</i>	4	3	2	4	0	3	6	2	2
<i>Chenopodiaceae</i>	21	11	0	21	0	0	0	2	0
<i>Chenopodium album</i>	1	1	0	0	0	0	0	0	0
<i>Artemisia</i>	3	1	0	4	0	0	0	0	0
<i>Aster type</i>	2	0	2	2	1	0	0	4	2
<i>Achillea</i>	1	0	0	1	0	0	0	0	0
<i>Cichorioidae</i>	4	7	0	2	0	0	20	15	0
<i>Carduus</i>	1	0	0	0	0	1	0	4	1
<i>Centaurea</i>	2	0	0	0	0	0	0	0	0

Cirsium	1	0	0	0	0	0	0	0	0
Serratula	0	0	0	0	0	0	0	2	0
Xanthium	0	0	0	1	0	0	0	0	0
Fagopyrum	0	0	0	2	0	1	0	0	0
Polygonum type	2	0	0	1	1	1	2	5	0
Polygonum aviculare	1	0	0	1	0	0	0	0	0
Polygonum bistorta	1	0	0	0	0	0	0	0	0
Convolvulus	1	0	0	0	0	0	0	0	0
Urtica	1	2	0	2	0	0	0	0	0
Ranunculus	2	0	0	1	0	0	0	1	0
Apiaceae	6	0	0	2	0	0	4	2	0
Heracleum type	4	0	0	1	0	0	0	0	0
Caryophyllaceae	2	1	0	3	0	0	3	0	0
Saxifragaceae	2	0	1	0	0	0	0	0	0
Boraginaceae	0	0	0	3	0	0	2	3	0
Onagraceae	0	0	0	2	0	0	0	0	0
Plantago m/m	0	0	1	1	0	0	0	0	0
Plantago lanceolata	0	0	0	0	0	0	0	1	0
Ophioglossum	0	0	0	0	0	0	0	2	0
Sphagnum	1	0	0	1	0	0	0	0	0
Bothrychium lunaria	9	2	1	20	0	0	0	0	0
Polypodiaceae	87	39	190	85	1	0	1	2	0
Undeterminate NAP	4	4	3	4	0	0	6	3	4
Herbal Group Sum	180	79	210	179	6	8	49	54	13
Palinomorphs Total Sum	216	98	228	300	9	9	65	58	22

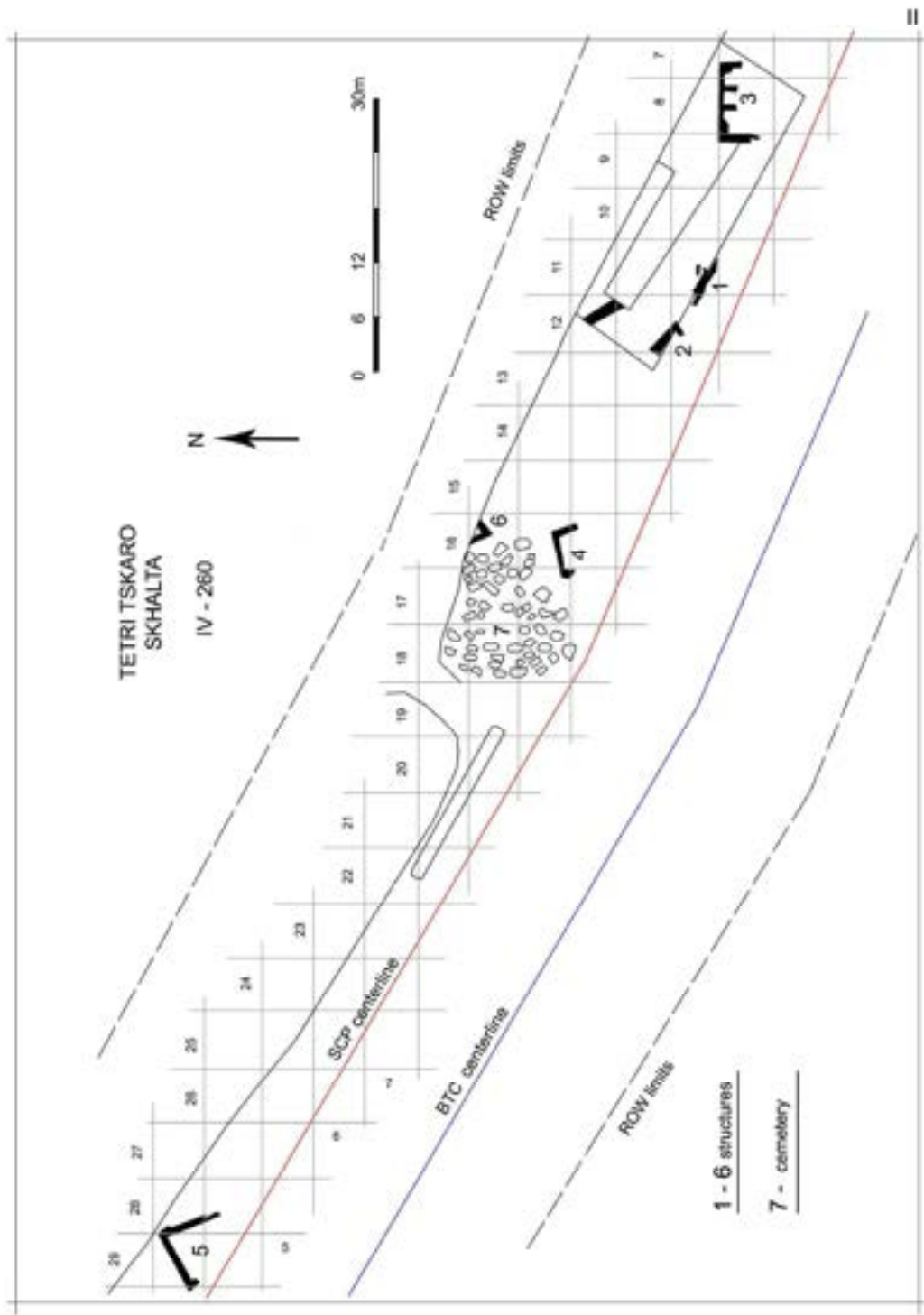
Paleoethnobotanical Analysis Report

By Nana Rusishvili
N. Meladze

With a view to finding fossilized botanical material, we worked on soil samples from various pits and storerooms of the Skhalta settlement. We studied a total of four samples. They were first studied under a microscope, and then subjected to flotation (i.e. the soil samples were washed with water and CCL4). Later the resulting material was divided into fractions by means of sieves with perforations of various diameters, dried, consolidated and prepared for identification. It must be reported however that neither soil inspection, nor the flotation method revealed the existence of any fossilized botanical remains.



PLATES

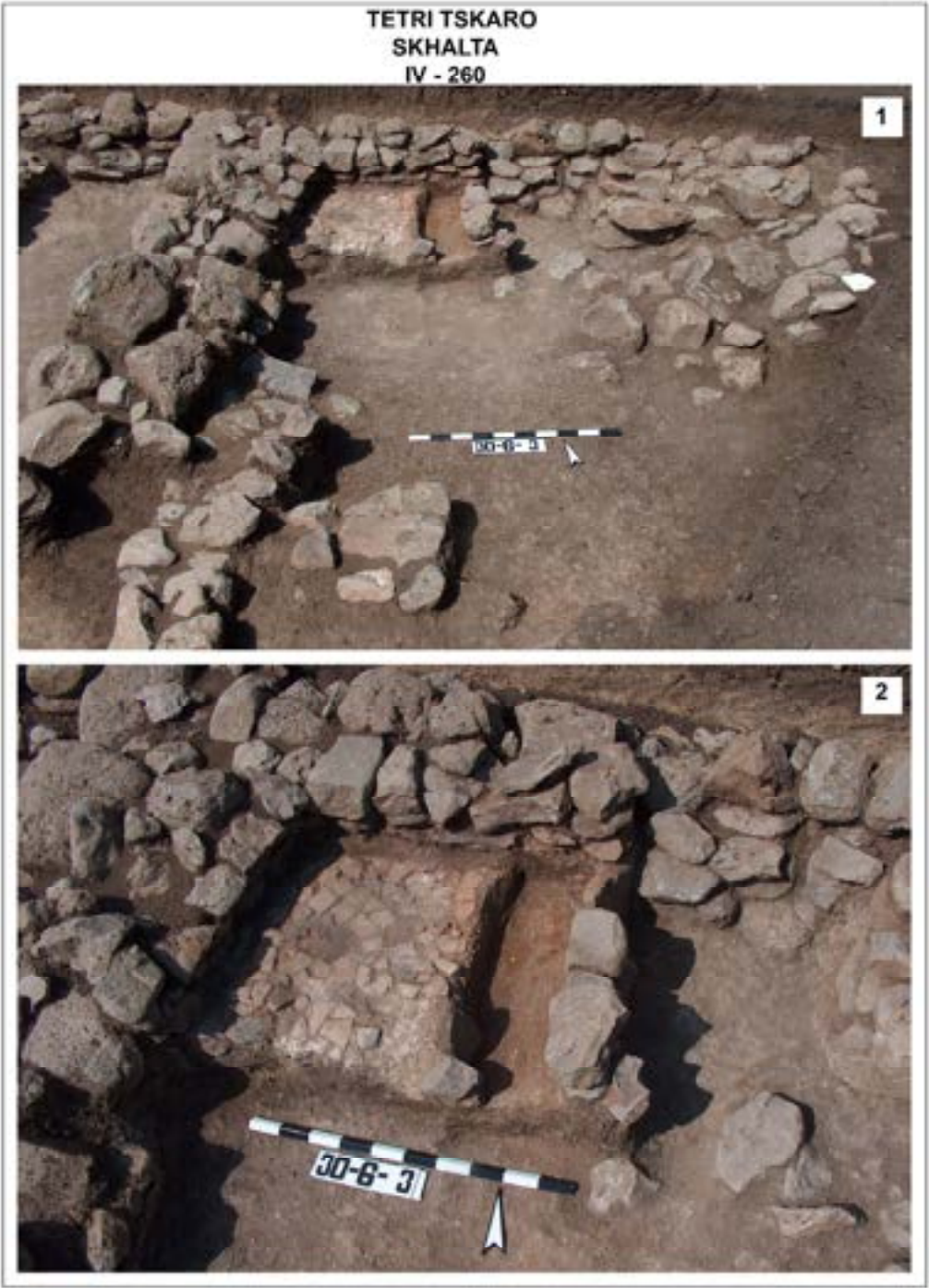


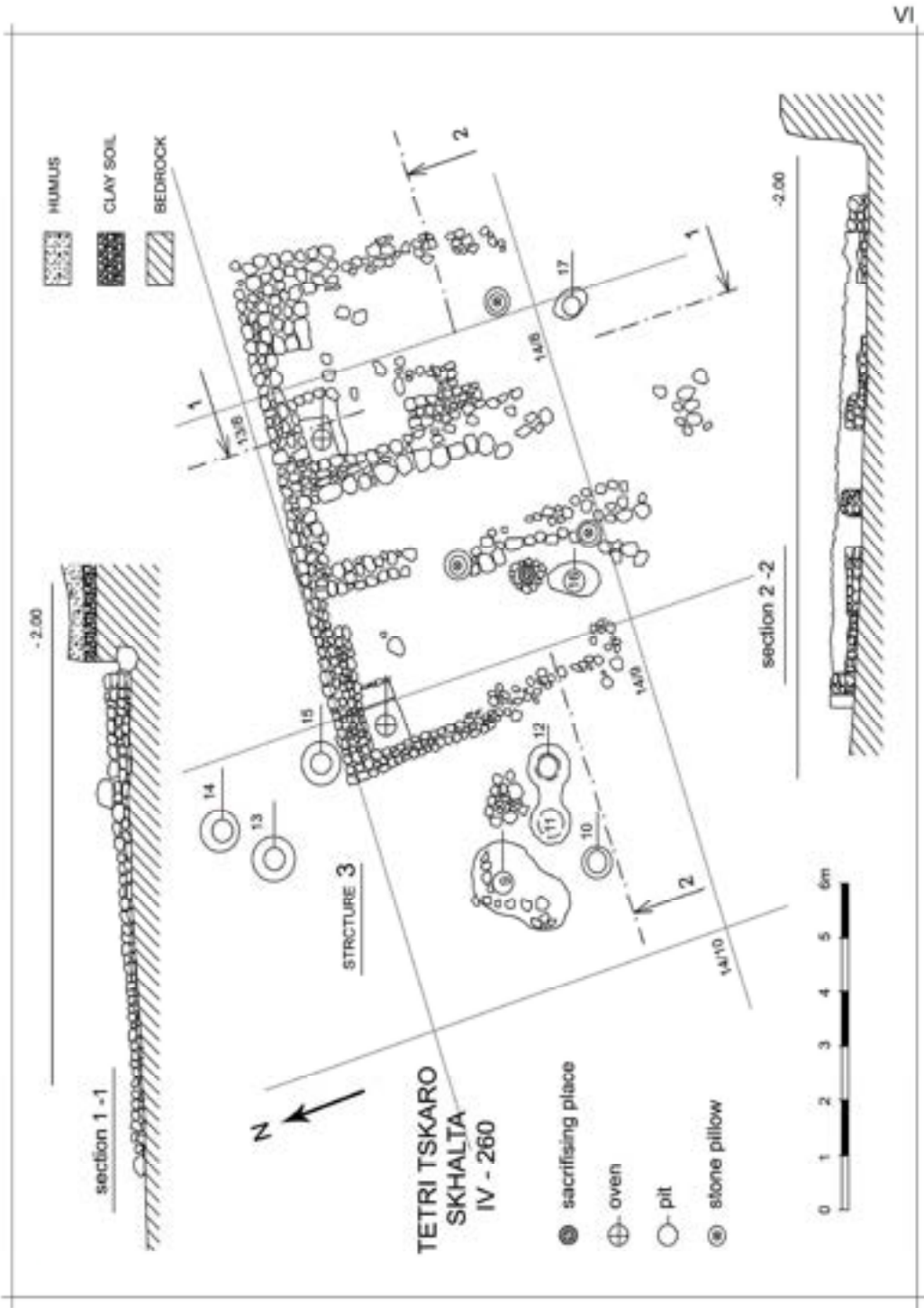


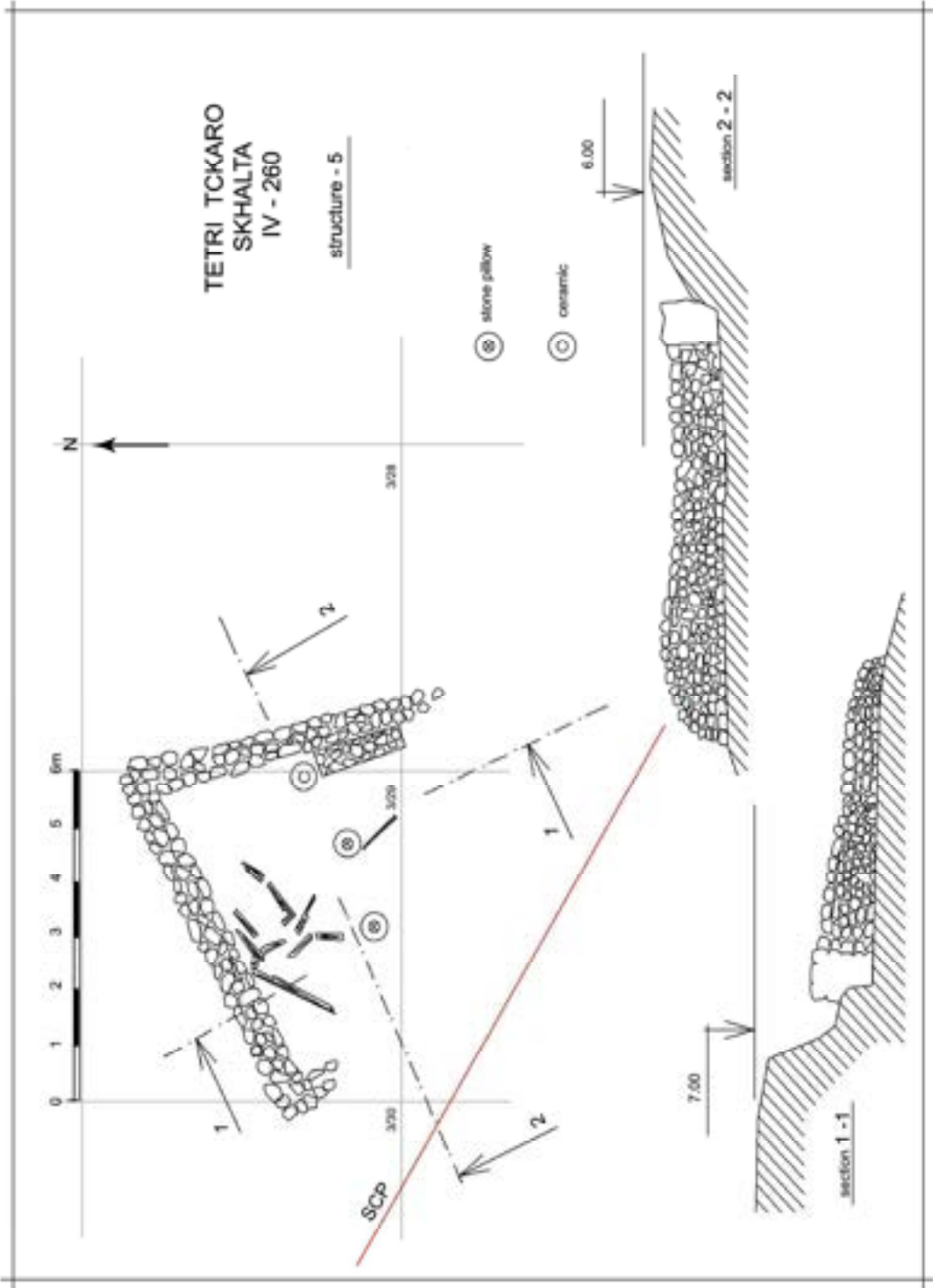
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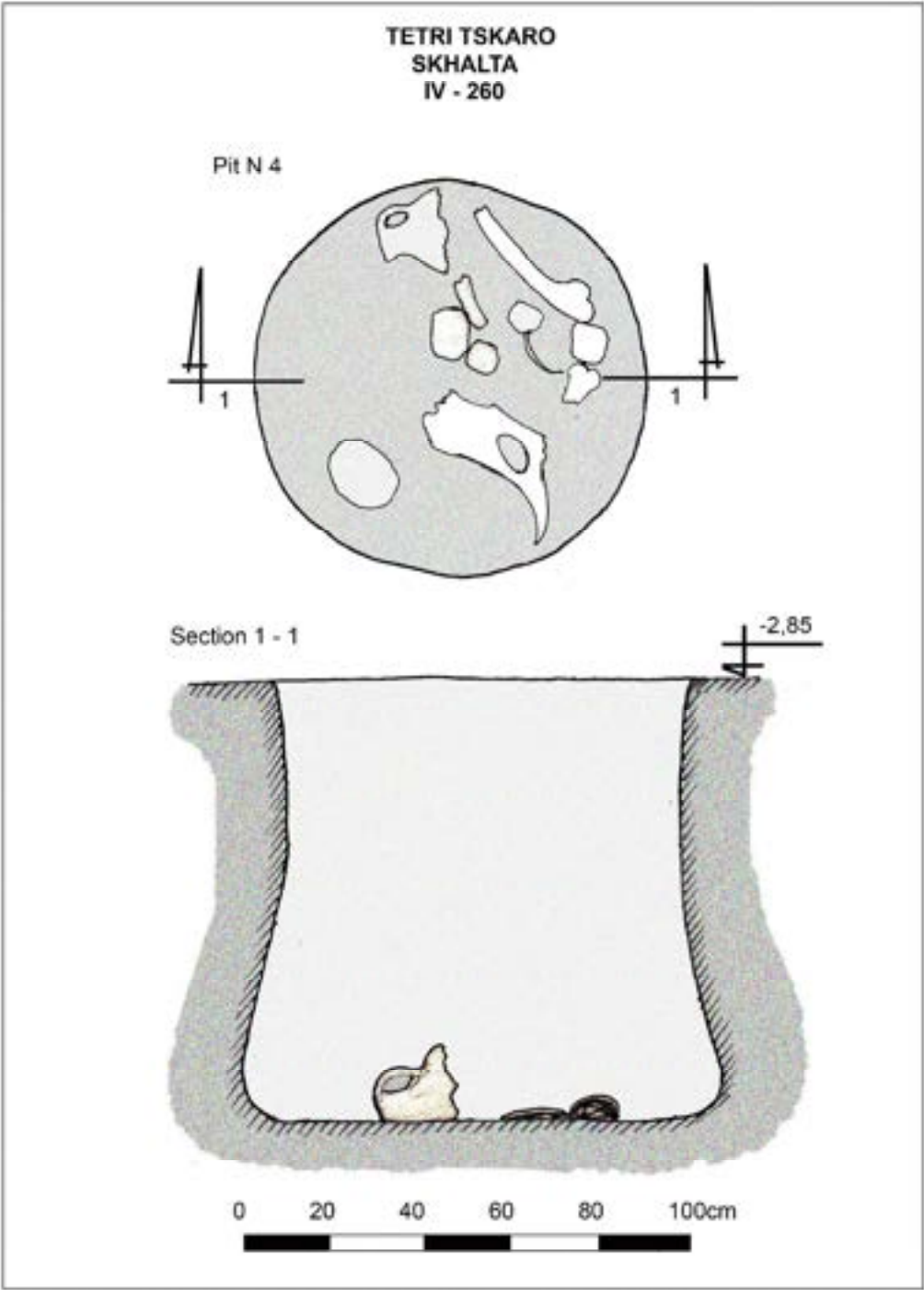


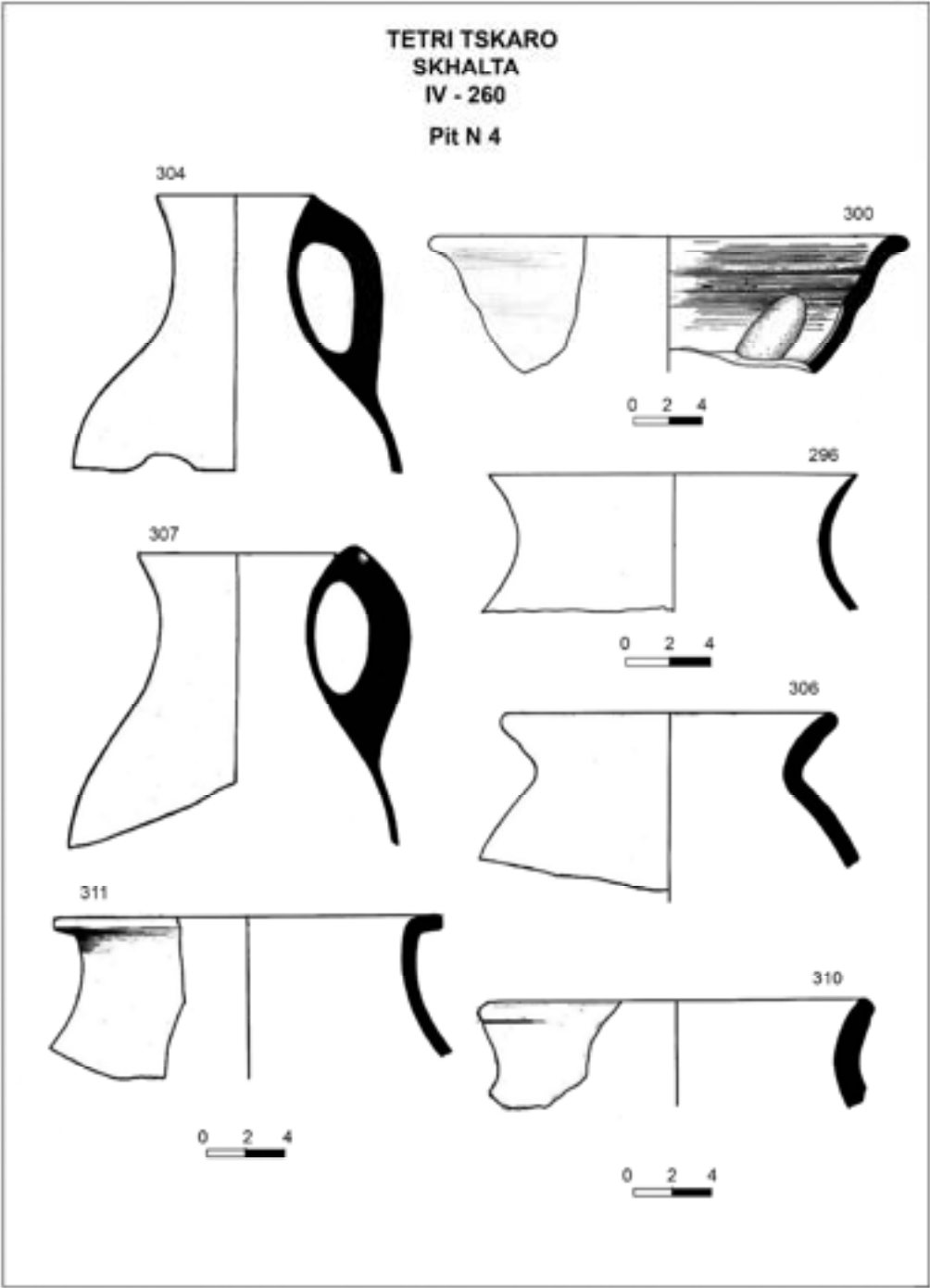
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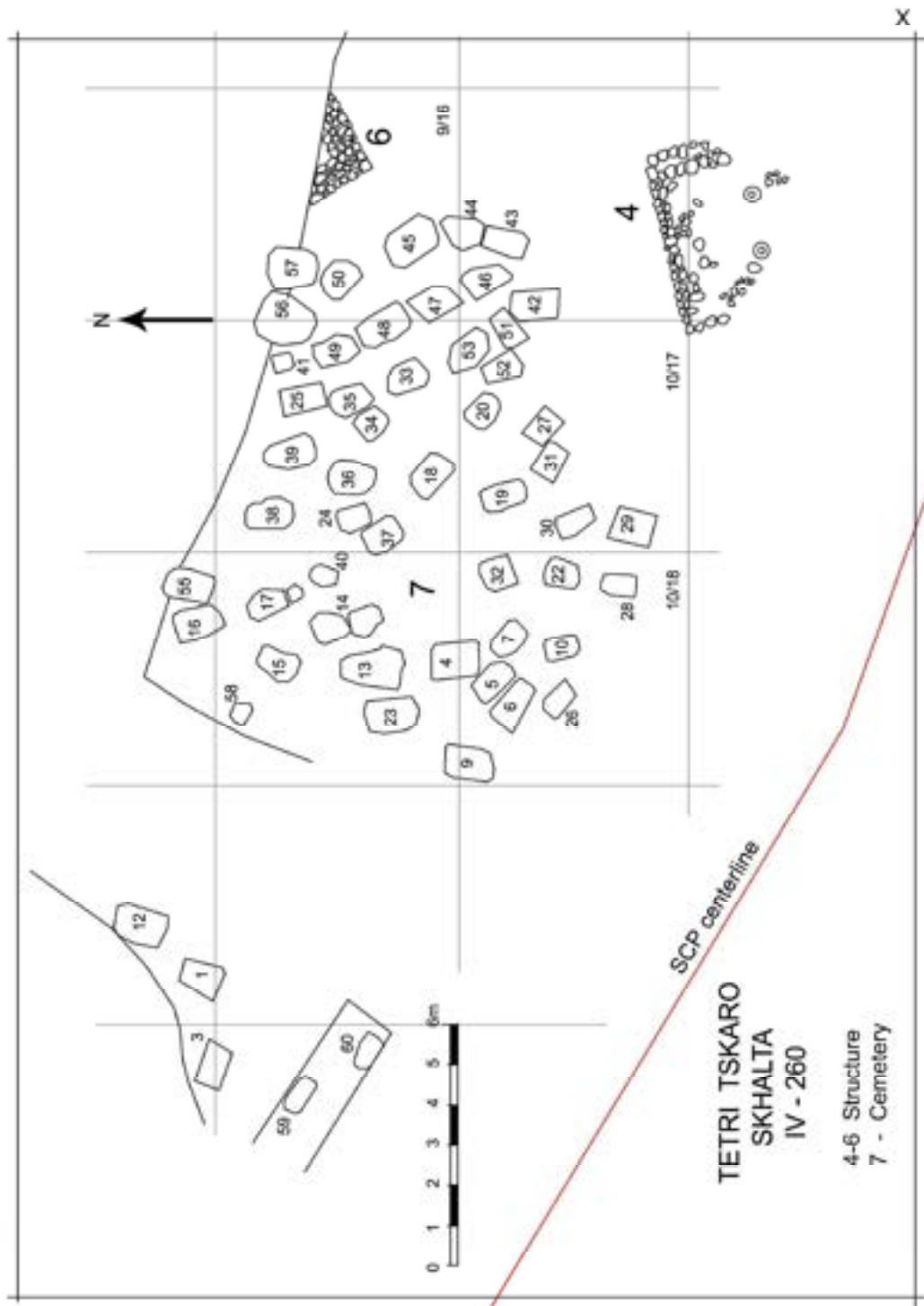




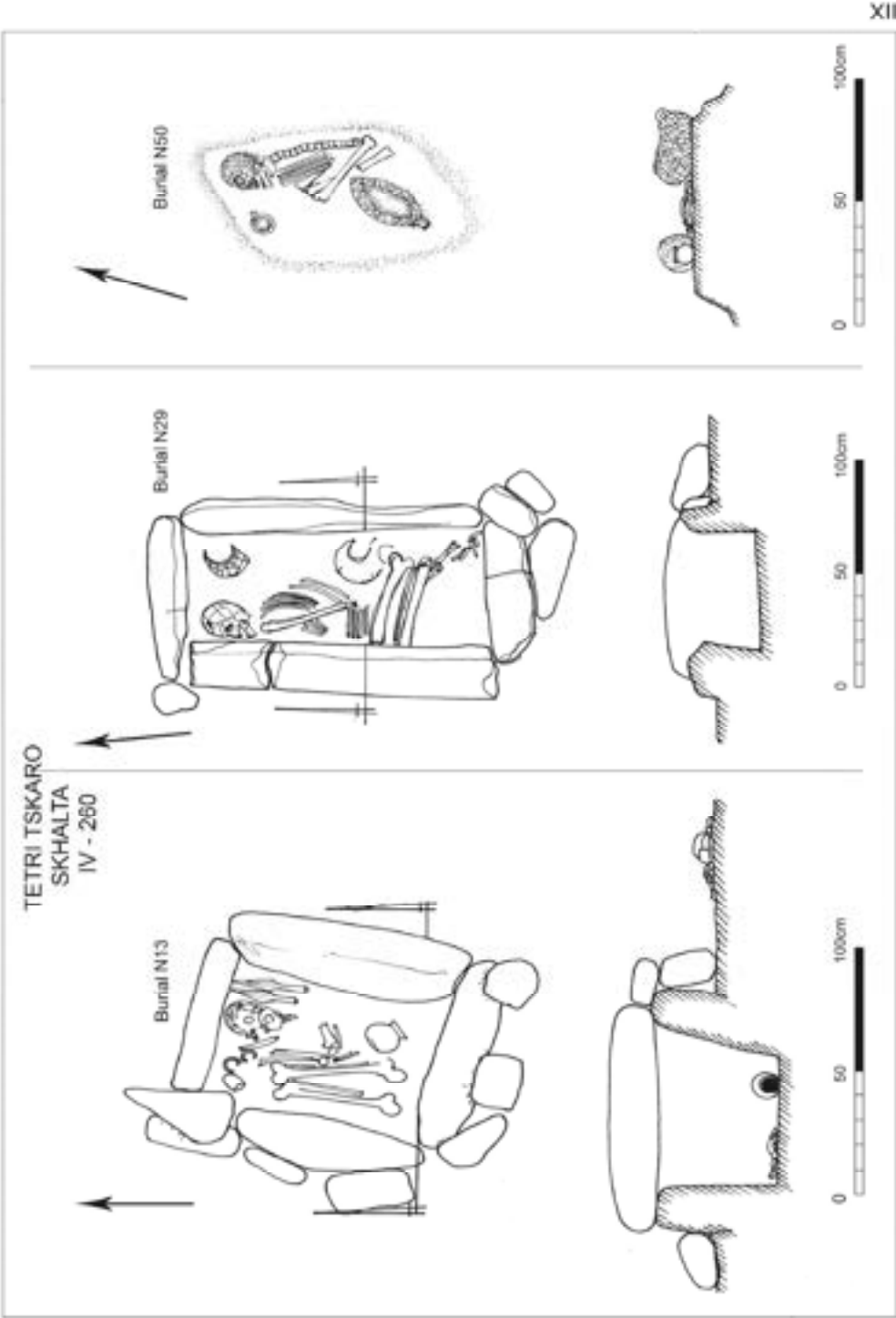


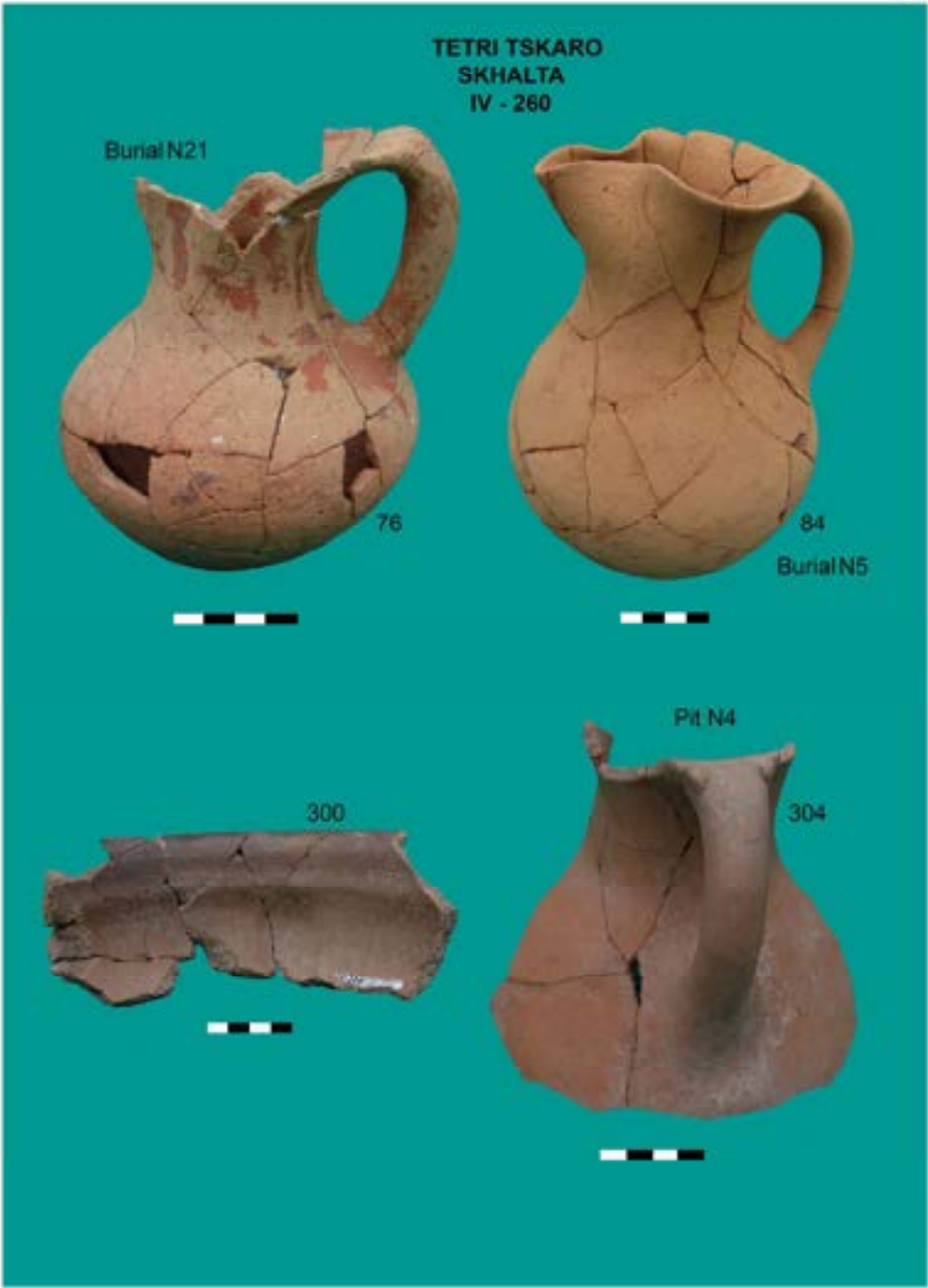




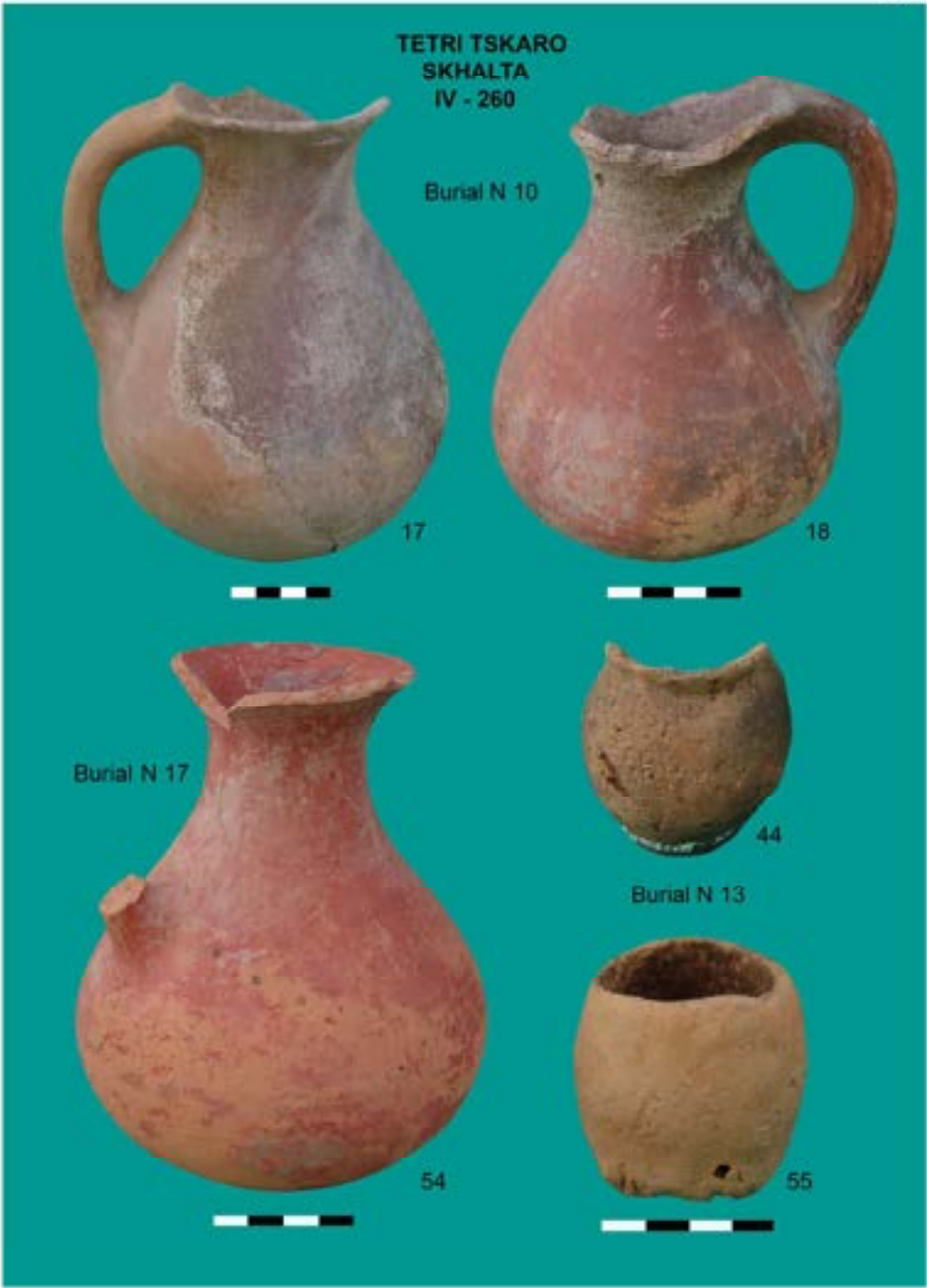




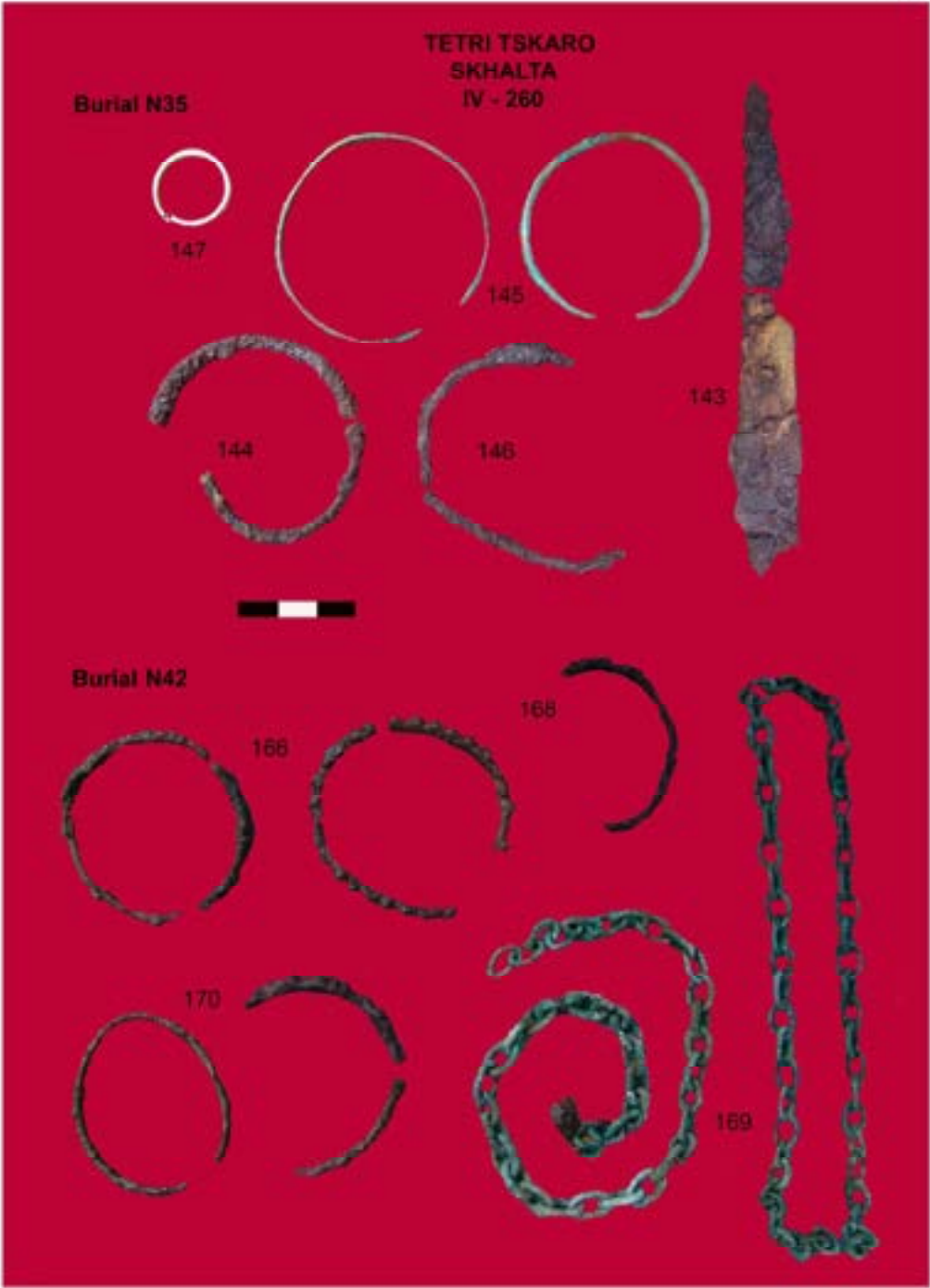


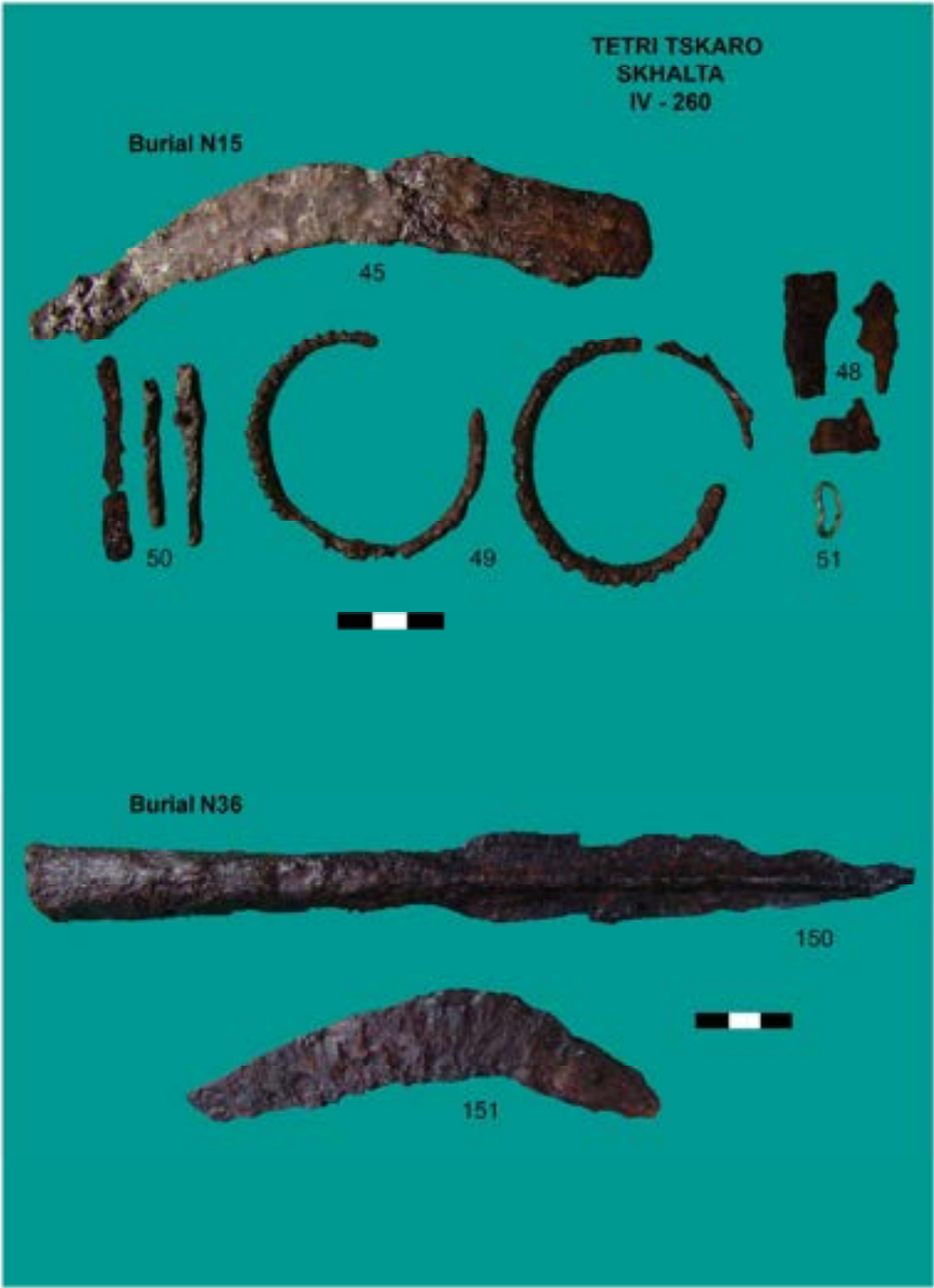


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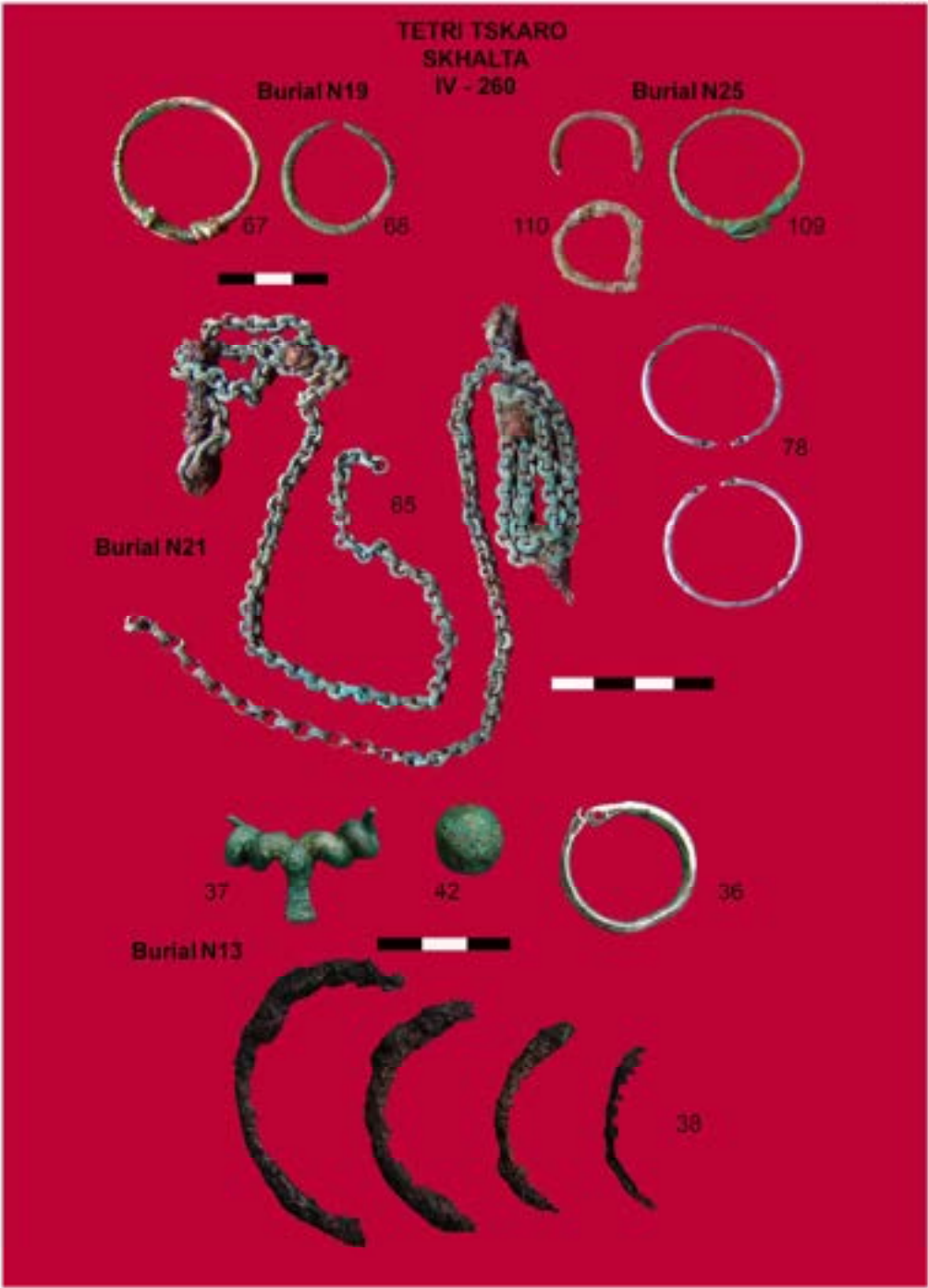


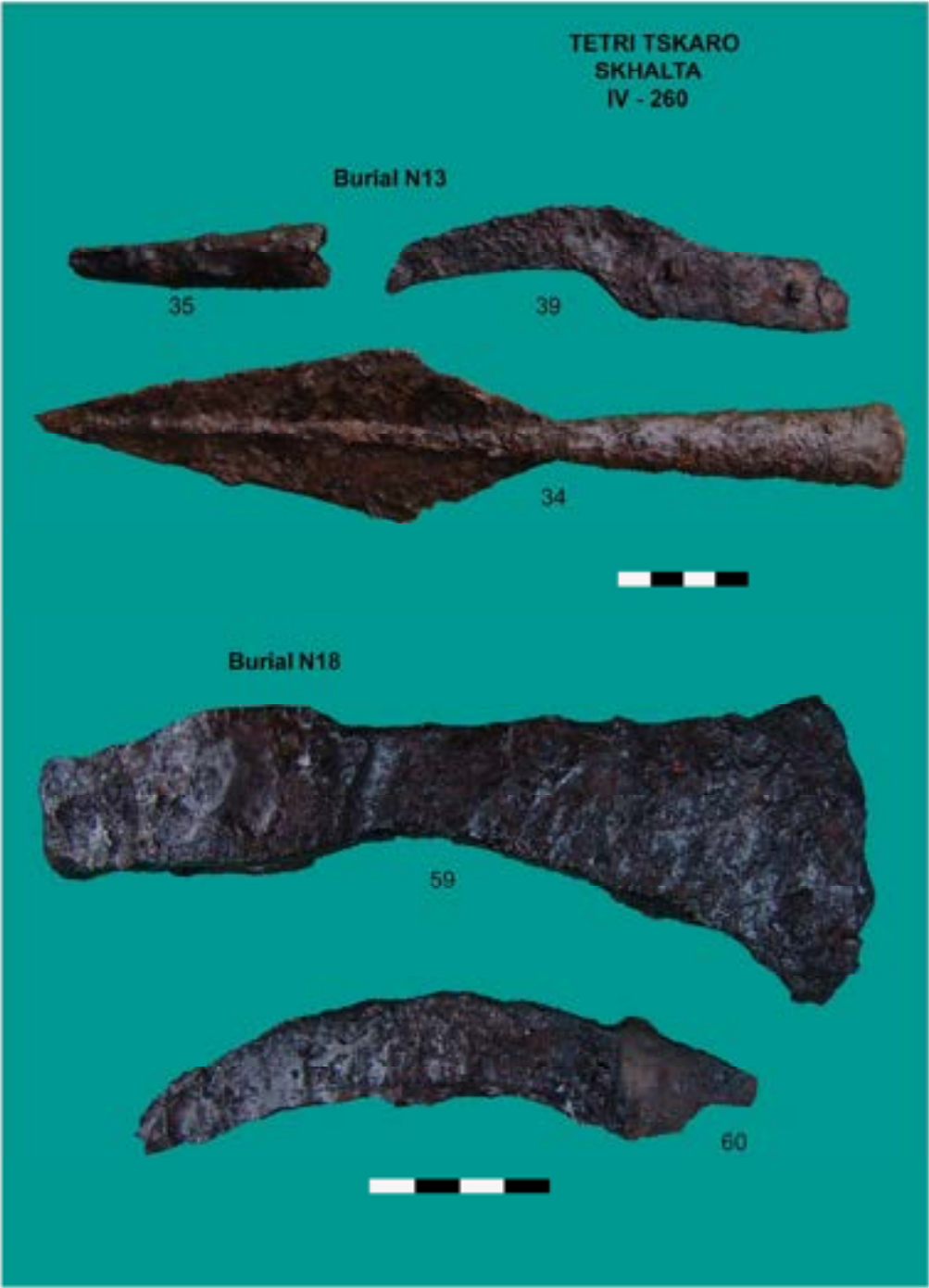


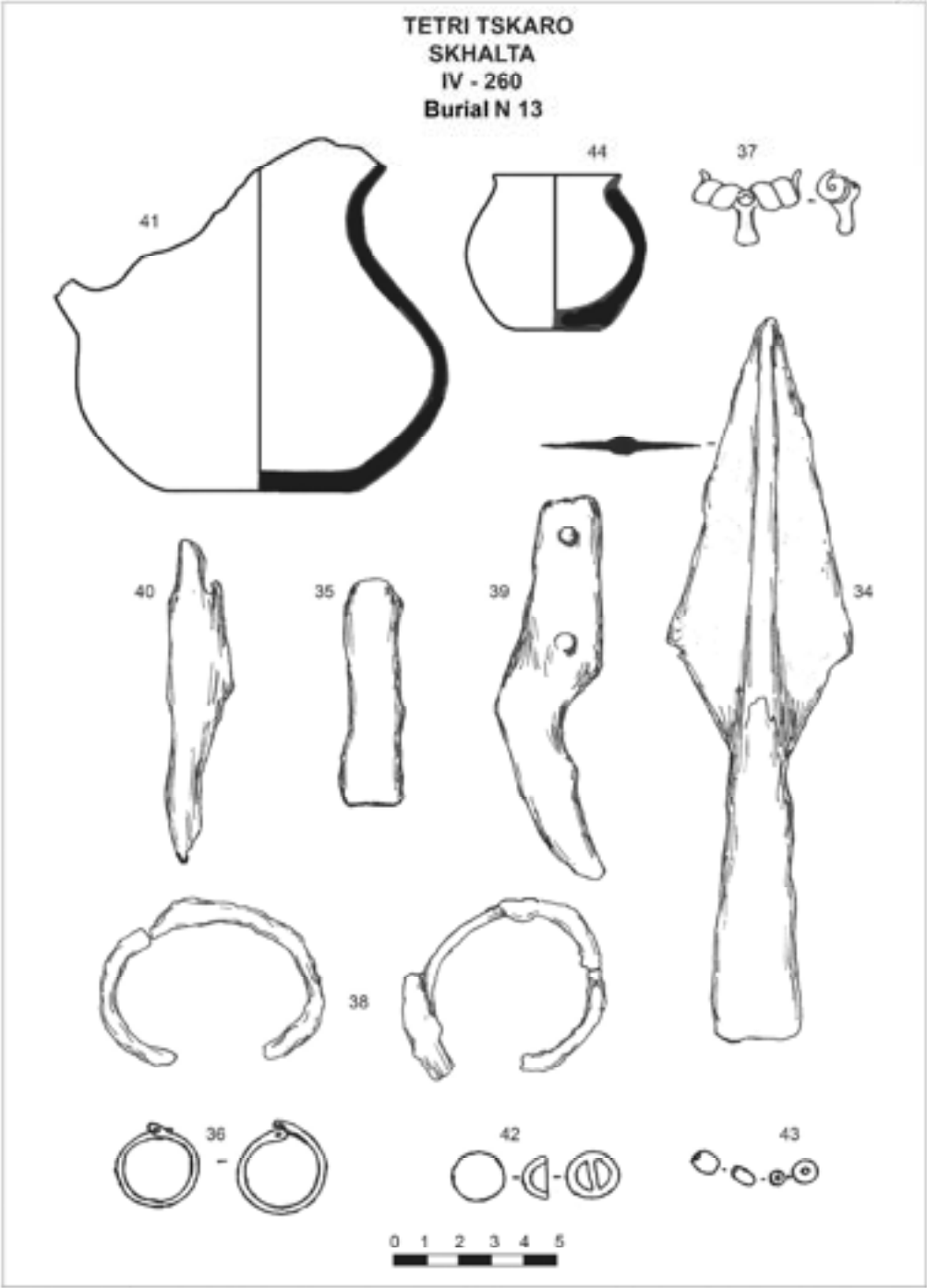


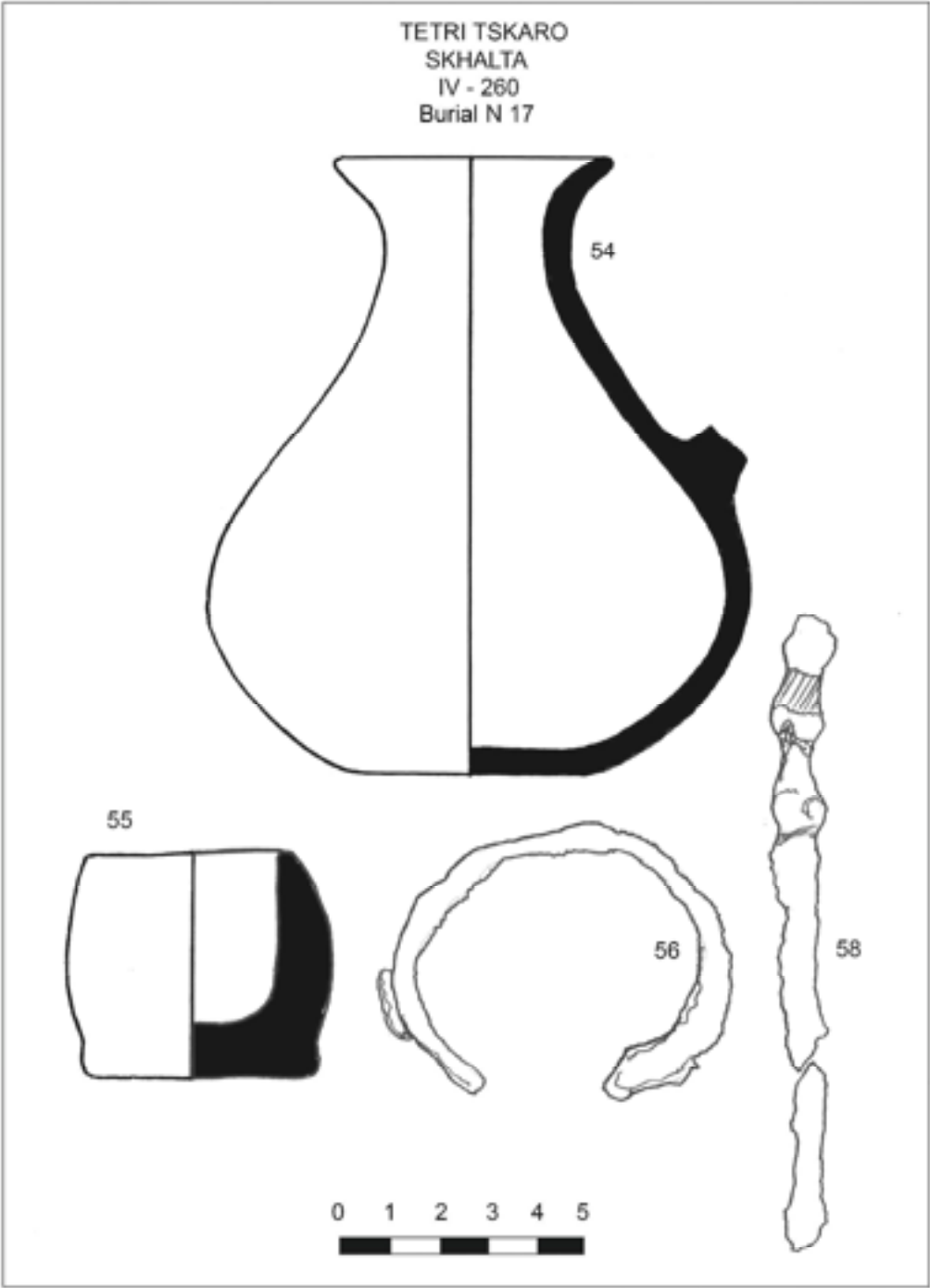


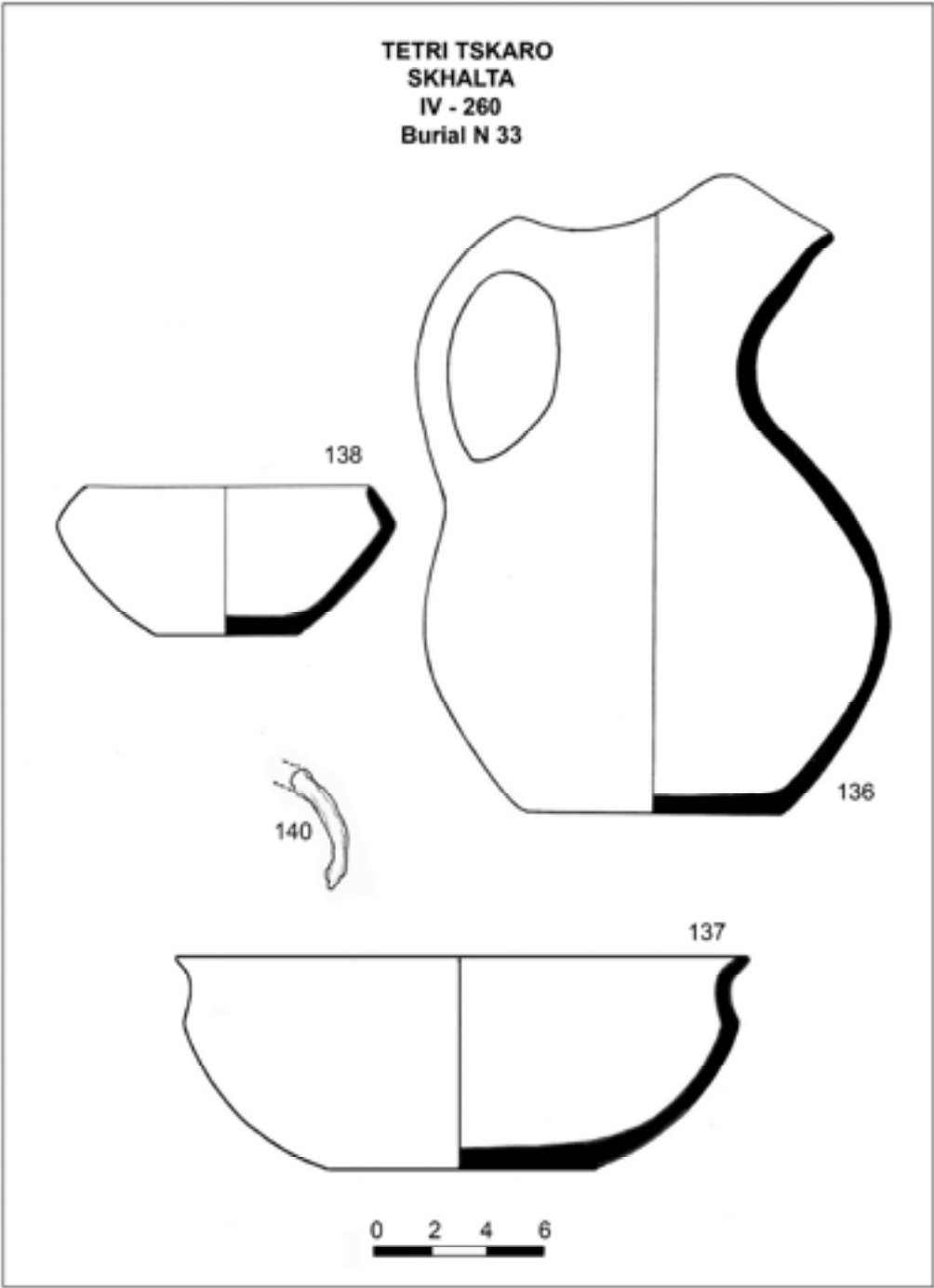


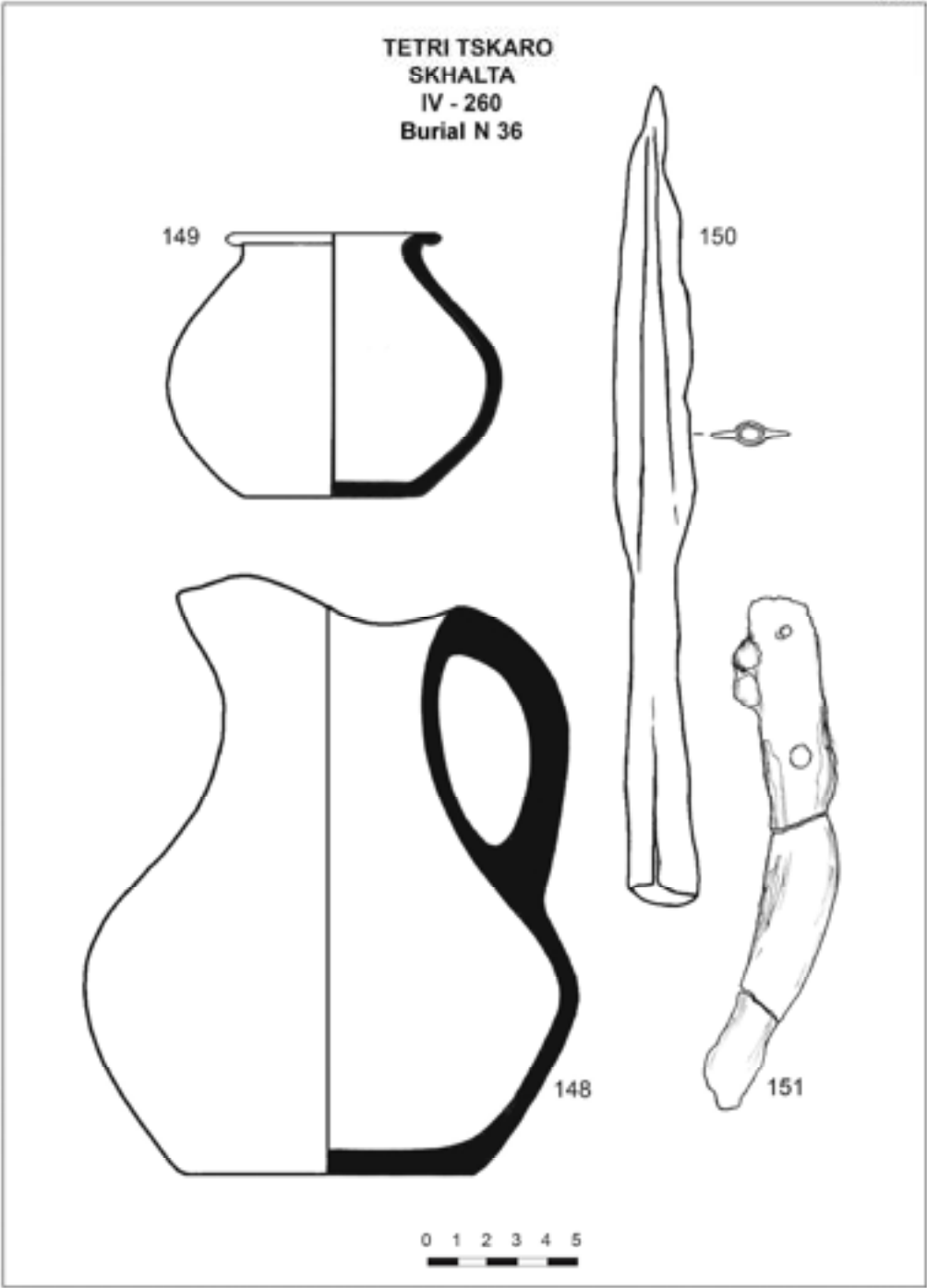


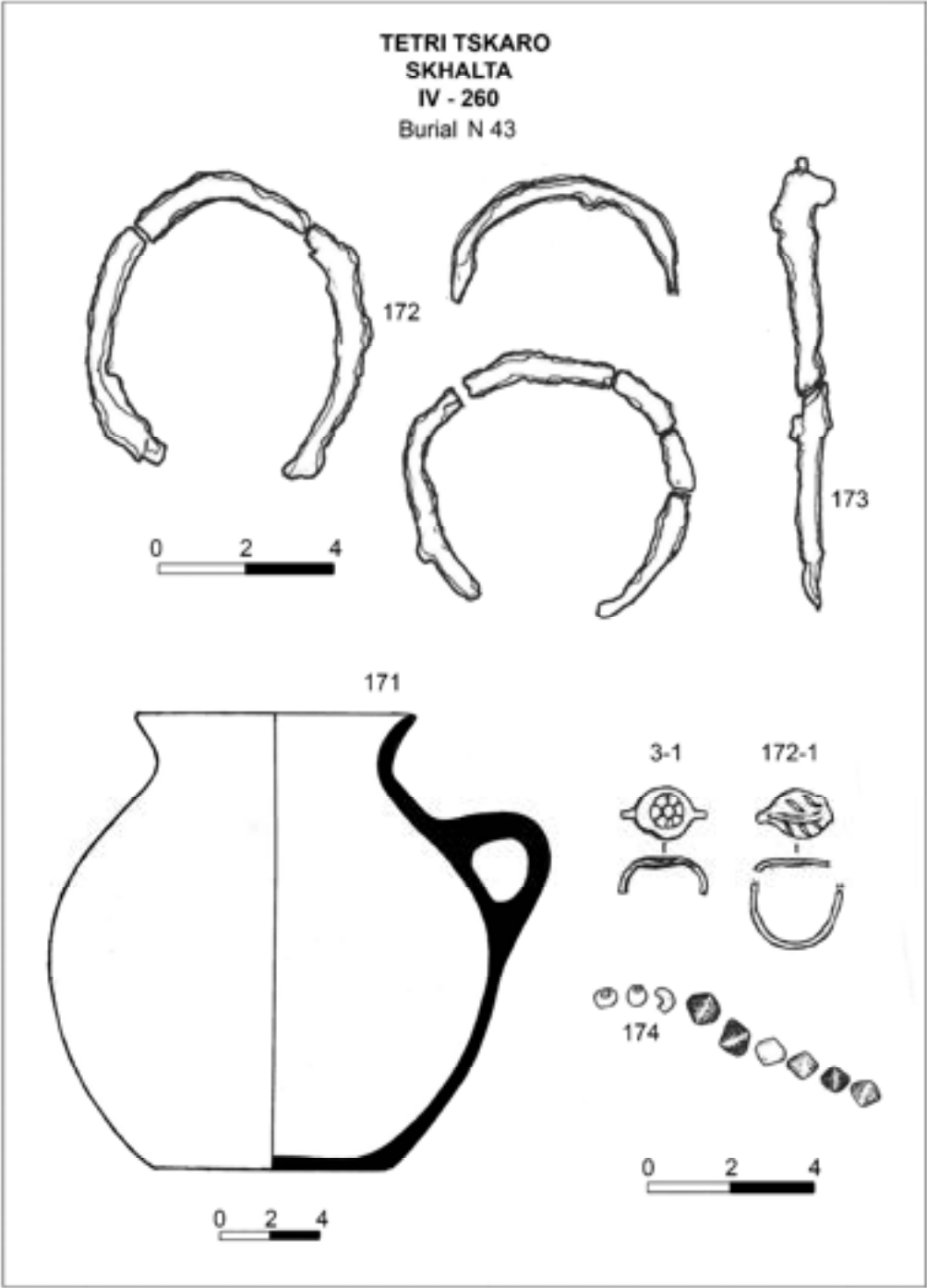


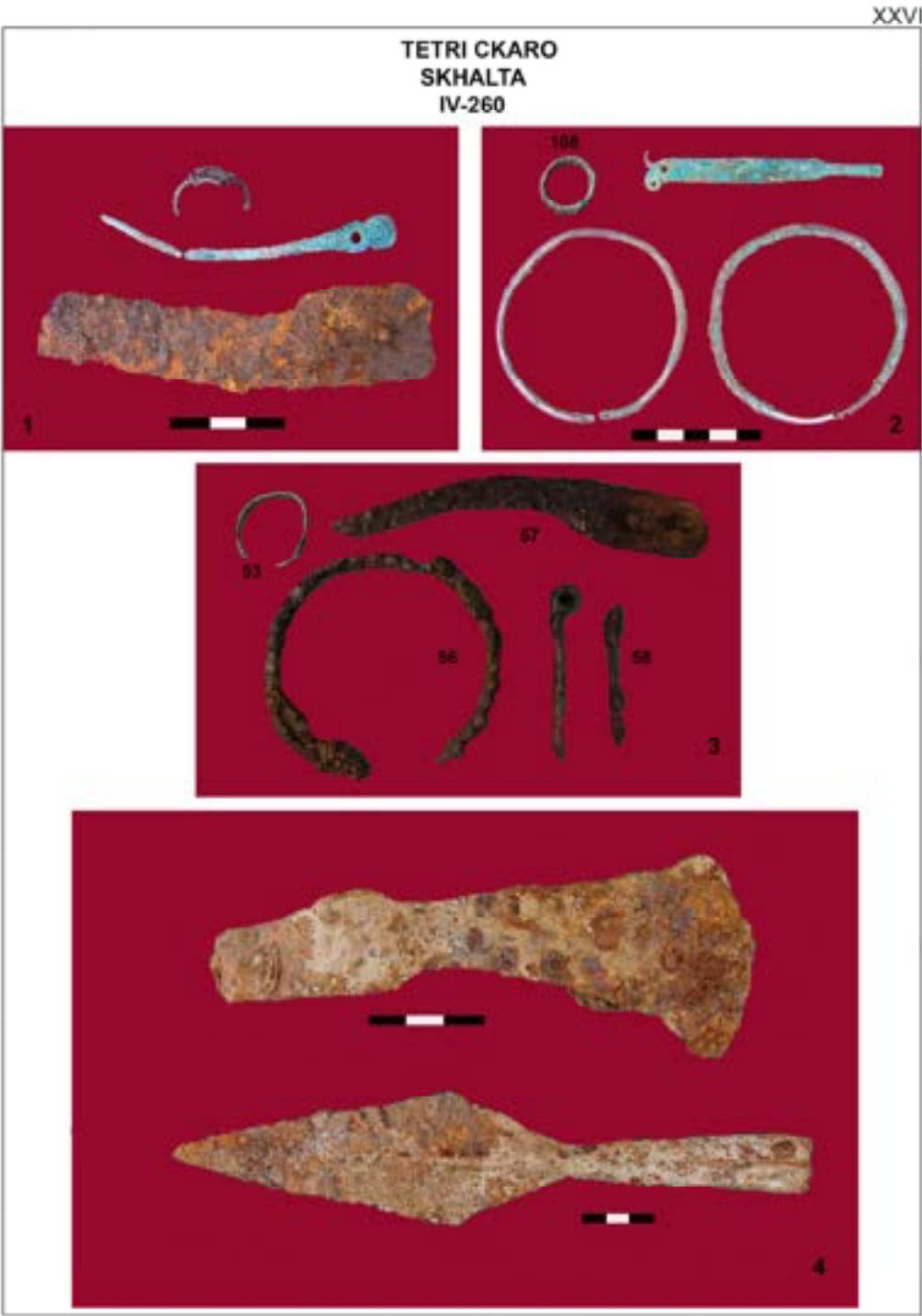


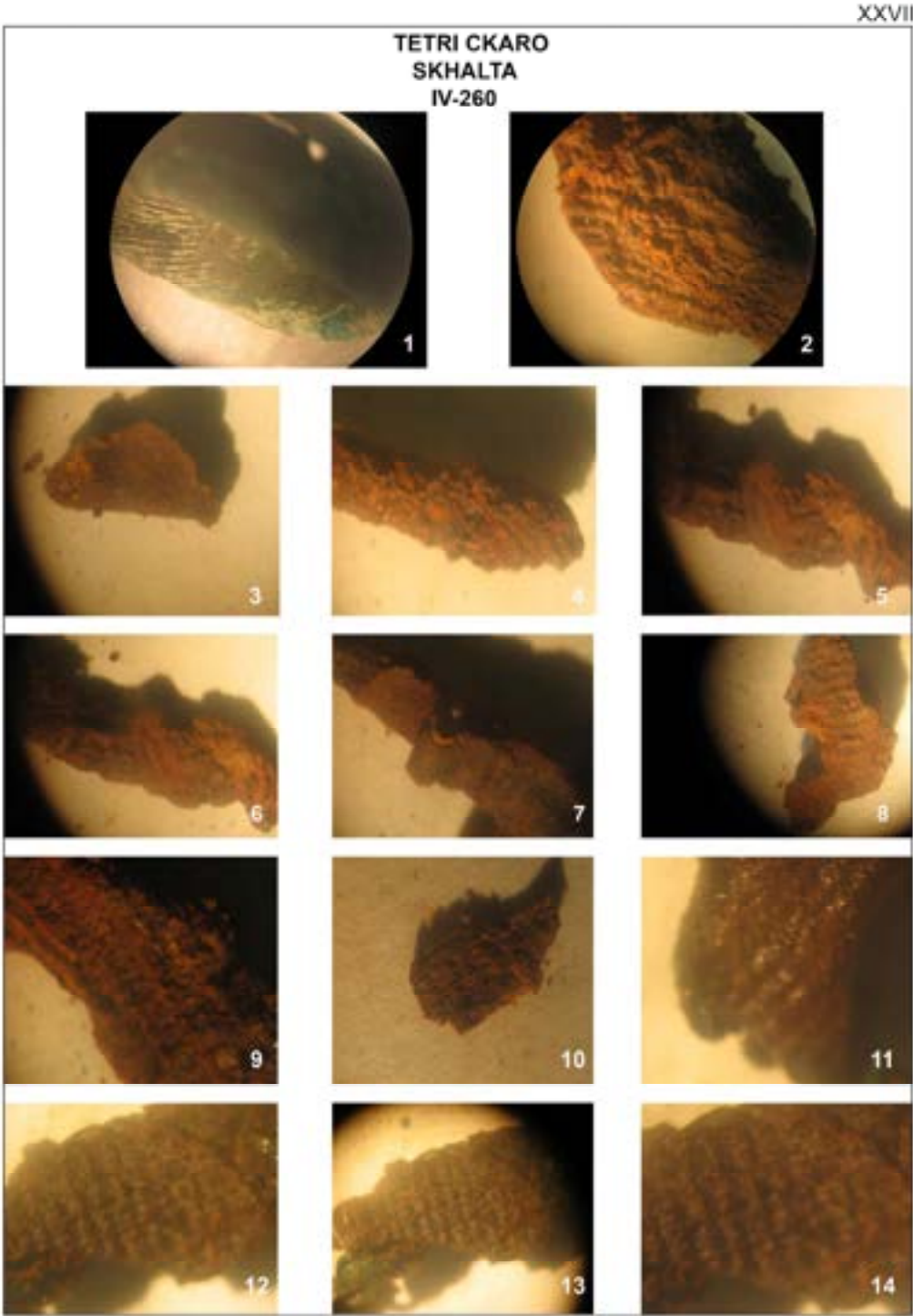


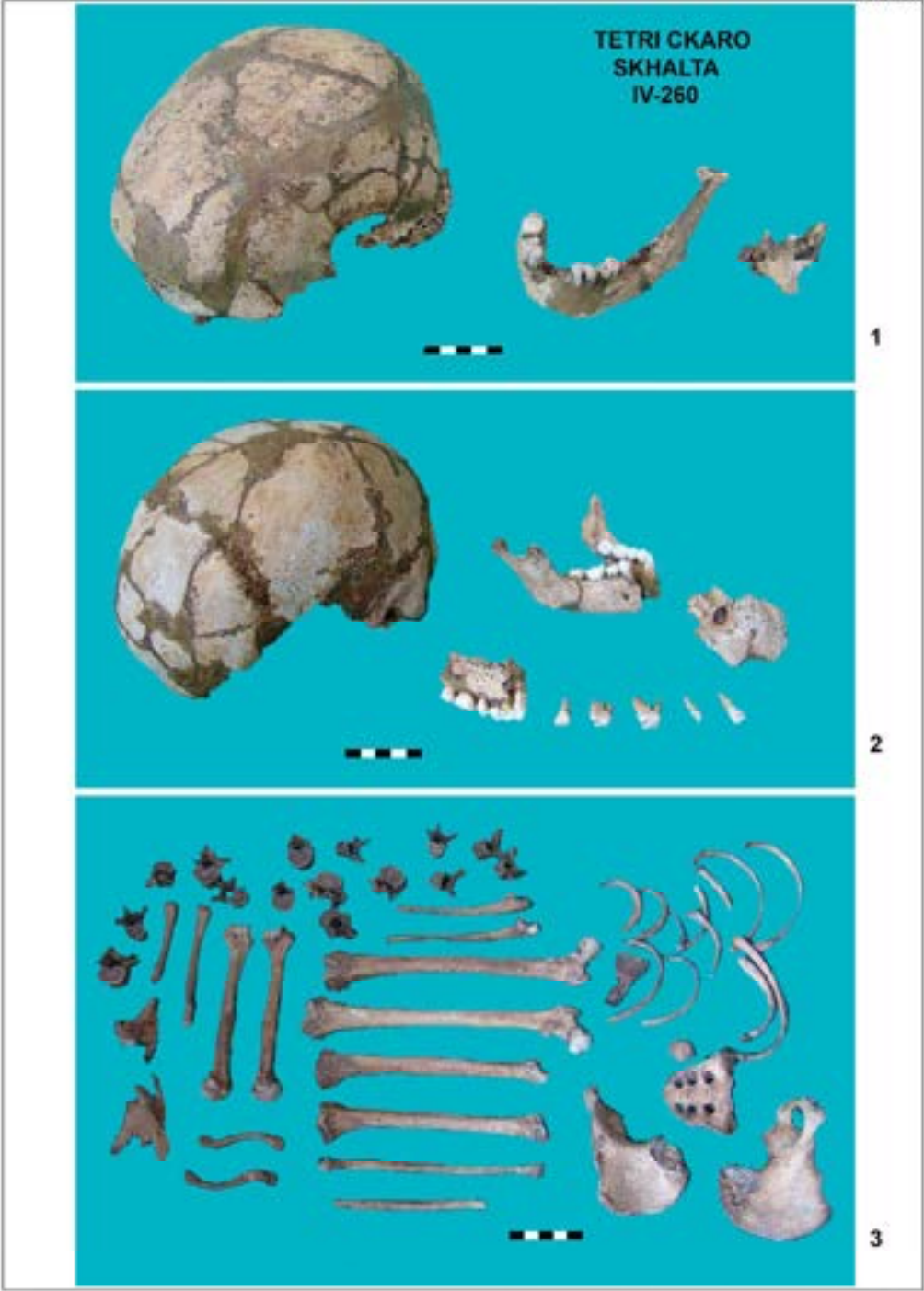




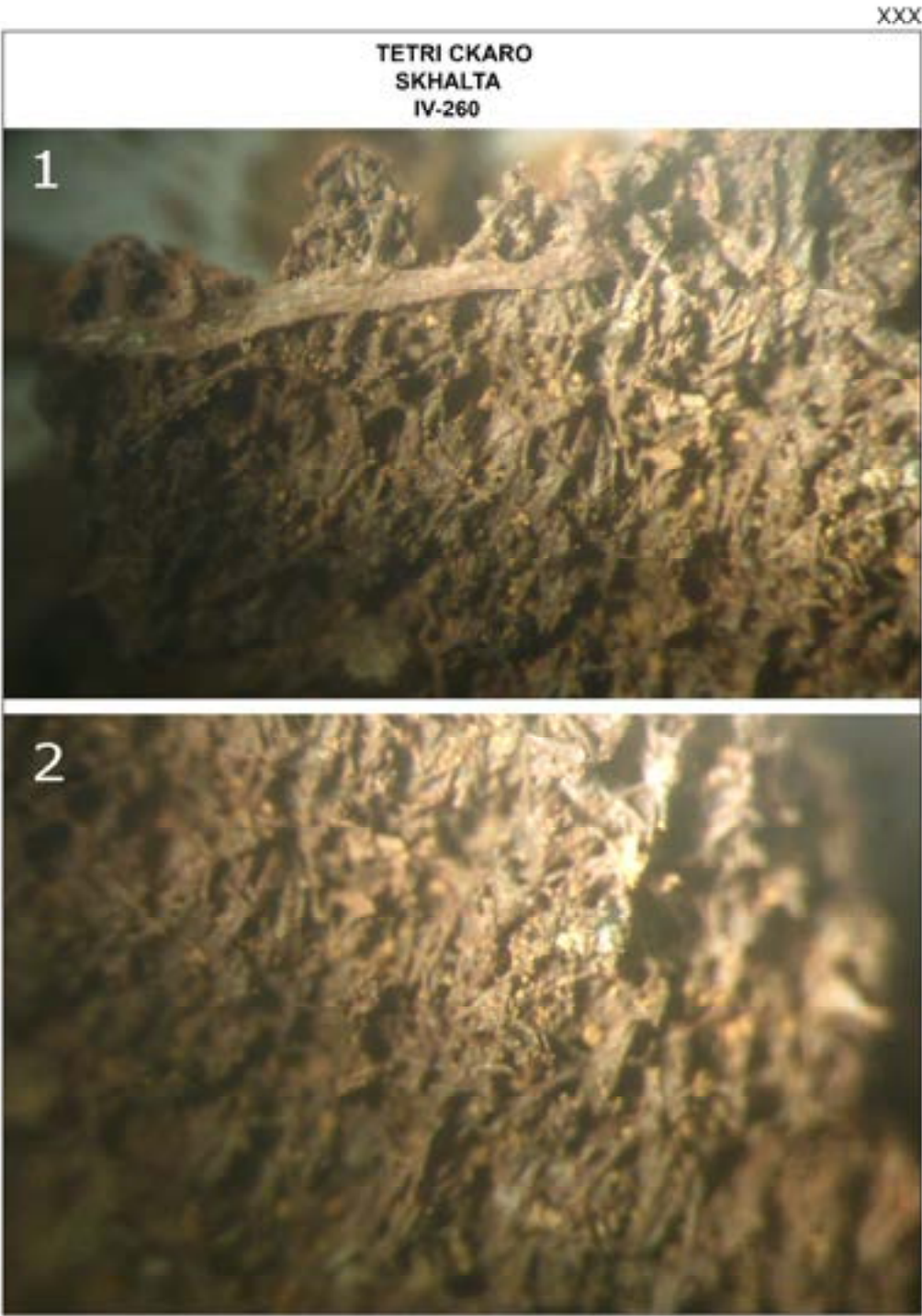




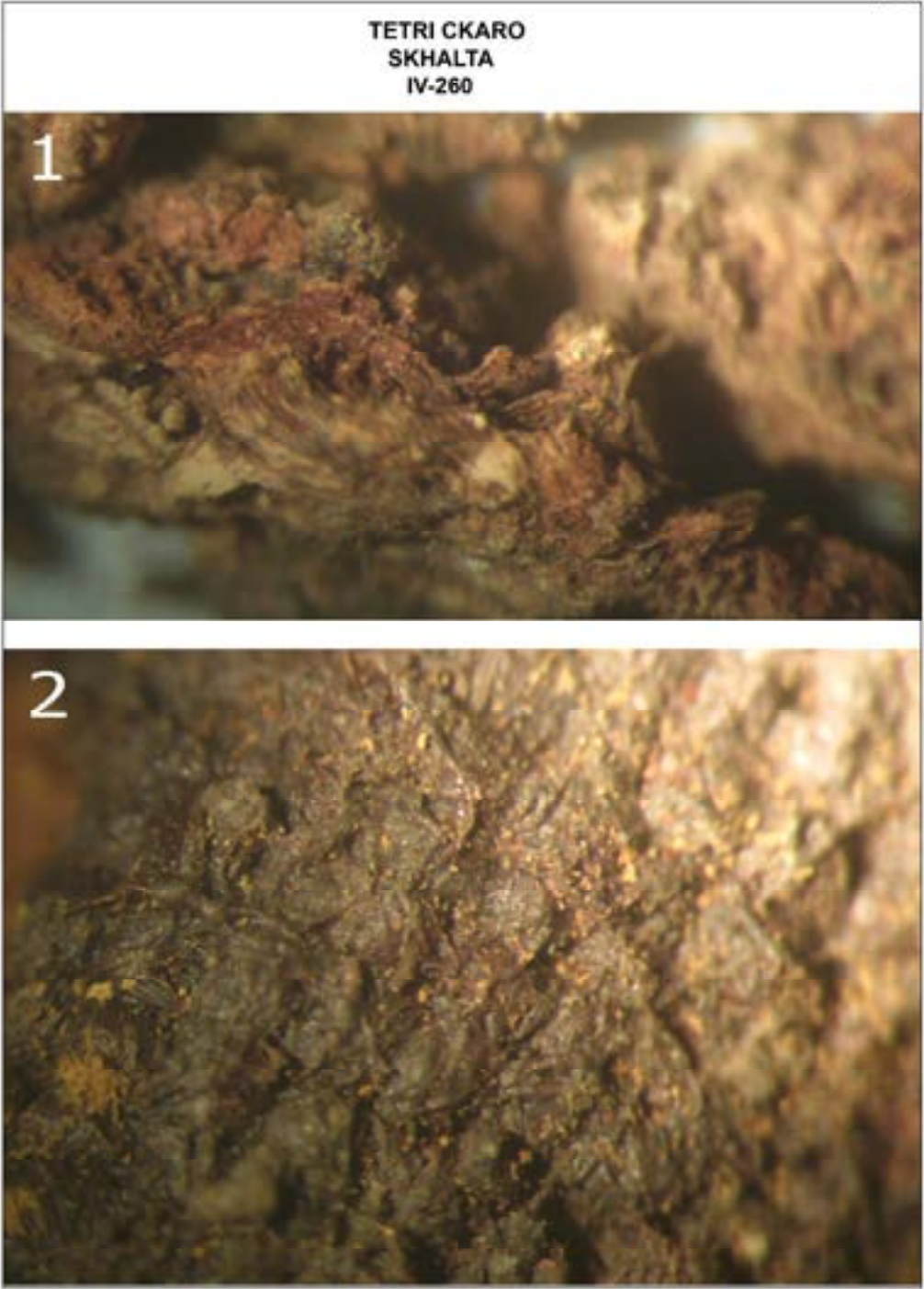








XXXI







XXXIV

