კავკასიისა და ანატოლიის ადრელითონების ხანის არქეოლოგიის პრობლემები

PROBLEMS OF EARLY METAL AGE ARCHAEOLOGY OF CAUCASUS AND ANATOLIA

საერთაშორისო კონფერენციის მასალები
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სპილენძის დამუშავების კვალდაკვალ ადამიანმა ბრინჯაოს წარმოება დაიწყო, რაც ამ ეპოქის უდიდეს მიღწევად შეიძლება ჩაითვალოს. თავისი ტექნოლოგიური და მექანიკური თვისებებით ბრინჯაო ხარისხობრივად სჯობდა სპილენძს და მის დანერგვას ლითონწარმოებაში უდიდესი პროგრესული მნიშვნელობა ჰქონდა. მეურნეობაში და საერთოდ ყოფაში ლითონის იარაღის ფართოდ დანერგვამ აამაღლა შრომის ნაყოფიერება, ბრინჯაოს საბრძოლო იარაღმა კი საგრძნობლად გაზარდა მოსახლეობის საბრძოლო პოტენციალი. ბრინჯაოს მეტალურგიის და სამთო საქმის განვითარებამ ხელი შეუწყო ბრინჯაოს ხანის კულტურების ფართოდ განფენას ევრაზიის კონტინენტზე. ნიშანდობლივია, რომ ძველმა ბერძენმა პოეტმა ჰესიოდემ ბრინჯაოს ეპოქას - ‘‘გმირული ხანა‘‘ უწოდა.

ბრინჯაოს ეპოქა სამხრეთ კავკასიასა და ანატოლიაში ძვ.წ. IV ათასწლეულში იწყება და ჯ. მელაარტის აზრით, დაკავშირებულია ურუქის პერიოდის მესოპოტამიელი ვაჭრების გამოჩენით ანატოლიაში, რომელთაც სურდათ ნედლეულით მდიდარ აღმოსავლეთ ანატოლიაში შეესყიდათ ლითონი.

სამხრეთ კავკასიის ადრებრინჯაოს ხანის კულტურის ძეგლების კონცენტრაცია ლითონის საბადოებთან, მათი განლაგება სატრანზიტო გზებზე, სპილენძისა და ბრინჯაოს მეტალურგიის განვითარების მაღალი დონე მიუთითებს, რომ სამხრეთ კავკასიის ბრინჯაოს ხანის კულტურების ჩამოყალიბება და აყვავება ლითონის წარმოებასთან არის დაკავშირებული.

ადრებრინჯაოს ხანაში სამხრეთ კავკასიის ცენტრალურ ნაწილში ჩამოყალიბდა მტკვარ-არაქსის კულტურა, რომელიც კავკასიასა და ახლო აღმოსავლეთში დიდ ტერიტორიაზე გავრცელდა. ამ კულტურამ მნიშვნელოვანი როლი შეასრულა ჩრდილოეთ კავკასიის, ანატოლიის, ჩრდილო-აღმოსავლეთ ირანის და აღმოსავლეთ ხმელთაშუაზღვისპირეთის უძველეს ისტორიაში. არცერთი კავკასიური კულტურა არც მანამდე, არც შემდეგ ასე ფართოდ არ გავრცელებულა და არც ასეთი შესამჩნევი კვალი დაუტოვებია ახლო აღმოსავლეთის ისტორიაში.

მტკვარ-არაქსის კულტურის ერთ-ერთი ძირითადი მახასიათებელი მეტალურგიის დიდი აღმავლობაა. ამ დროს ჩნდება ლითონის ჩამოსხმის წესით დამზადებული სხვადასხვა დანიშნულების იარაღი. მრავალფეროვანი ხდება ლითონის სამკაული. სამხრეთ კავკასიაში მეტალურგიის სწრაფი და ინტენსიური განვითარება ახლო აღმოსავლეთის უძველეს ცივილიზაციებთან ურთიერთობით არის ახსნილი. არაერთხელ აღინიშნა, რომ წინააზიური წარმომავლობის ნივთები სამხრეთ კავკასიის გავლით მოხვდა ჩრდილოეთ კავკასიაში.

ადრე და შუა ბრინჯაოს ხანის სამხრეთკავკასიური კულტურების აყვავების ეკონომიკურ საფუძველს, როგორც ჩანს, კავკასიის სპილენძის, სურმის და დარიშხანის საბადოების ინტენსიური ექსპლოატაცია წარმოადგენდა. სწორედ მეტალურგიამ გაიყვანა კავკასია საერთაშორისო არენაზე.

ძვ.წ. III ათასწლეულის მიწურული და II ათასწლეულის დასაწყისი ინტენსიური

საერთაშორისო ინტერაქტივობით ხასიათდება ანატოლიას, სამხრეთ კავკასიას, აღმოსავლეთ ხმელთაშუაზღვიპირეთსა და ახლო აღმოსავლეთის შიდა რეგიონებს შორის. ეს ინტერაქტივობა სხვადასხვა ფორმით (ვაჭრობა, სამეფო ქორწინება, დიპლომატია, სამხედრო კონფლიქტები) გამოიხატა.

ადრელითონების ხანის სამხრეთ კავკასიასა და ანატოლიაში მიმდინარე კულტურულ-ისტორიული პროცესი რეგიონებს შორის მჭიდრო სავაჭრო-ეკონომიკური და კულტურული ურთიერთობების ფონზე ვითარდებოდა, რაზეც ცალსახად მიუთითებს არქეოლოგიური მონაცემები.

ადრელითონების ხანაში გავრცელებული არქეოლოგიური კულტურების კვლევა სამხრეთ კავკასიასა და ანატოლიაში უკანასკნელ ხანებში ინტენსიურად მიმდინარეობს. გაითხარა ბევრი ახალი ძეგლი და გამოითქვა სხვადასხვა შეხედულება. დიდი ყურადღება ექცევა საზოგადოების განვითარების ისეთი მნიშვნელოვანი სფეროების კვლევას, როგორებიცაა მეტალურგიის და მიწათმოქმედების ჩასახვა-განვითარება, პრეისტორიული რელიგია და კულტი, საცხოვრებელი და სამარხი ნაგებობების არქიტექტურული ტიპები და გენეზისი, პრეისტორიული ვაჭრობა და გაცვლის ფორმები. კვლევის საგანს ასევე წარმოადგენს ადრელითონების ეპოქის არქეოლოგიურ ძეგლთა ტოპოგრაფიის, ქრონოლოგიისა და პერიოდიზაციის საკითხები.

შოთა რუსთაველის სამეცნიერო ფონდის დაფინანსებით ჩატარებული საერთაშორისო კონფერენციის - ,,კავკასიისა და ანატოლიის ადრელითონების ხანის არქეოლოგიის პრობლემები“ - ძირითად მიზანს სამხრეთ კავკასიისა და ანატოლიის არქეოლოგიურ კულტურათა ურთიერთობების და ლითონის წარმოების ადრეული საფეხურის (ძვ.წ. IV-II ათასწლეულებში) პრობლემების განხილვა, უახლესი საველე არქეოლოგიური კვლევა-ძიების მონაცემების გაცნობა და სამეცნიერო შეხედულებათა გაზიარება წარმოადგენს.

ადრელითონების ეპოქის არქეოლოგიური კულტურები საქართველოში, აზერბაიჯანში, სომხეთსა და თურქეთში გათხილ არაერთ ძეგლზე დასტურდება და ამ პერიოდის ისტორიისა და არქეოლოგიის პრობლემების შესწავლას დიდი ტრადიციები აქვს. მიუხედავად ამისა, საერთო პოზიცია კონკრეტული საკითხების ირგვლივ ჯერ კიდევ არ არსებობს და კონფერენციის აქტუალობის ერთ-ერთი მაჩვენებელი სწორედ ამ რეალობიდან გამომდინარეობს.

გოდერძი ნარიმანიშვილი,
თბილისი, ნოემბერი 2014 წელი

PREFACE

With appearance of the metalwork and mining, begins one of the most important epochs in the history of the mankind. Gold and copper objects appear in South Caucasus in the Neolithic period. Ancient metal artifacts of the 7^{th} – 5^{th} mill. B.C. were discovered on sites of Shulaver-Shumutepe, Lailatepe and Sioni cultures.

Along with copper work, human began bronze producing, this could be considered as the greatest achievement of the epoch. With its technological and mechanical features bronze was of better quality than copper and its introduction in metalwork was of great progressive importance. Introduction of metal objects in housekeeping and agriculture as well as in everyday life in general, raised work productivity and on another hand, bronze weapons strengthened military capabilities of population. Bronze metallurgy and development of mining contributed to wide spreading of the Bronze Age cultures over Eurasian continent. It is significant that ancient Greek poet Hesiod named the Bronze Age “Heroic Age”.

In Anatolia and South Caucasus the Bronze Age begins in 4^{th} millennia B.C. In J. Mellaart’s opinion, beginning of the Bronze Age is associated with the appearance of the Mesopotamian traders from Uruk period in Anatolia. First aim of these traders was to buy metal in Eastern Anatolia, which is rich with raw materials.

The concentration of South Caucasian Early Bronze Age culture sites near mines (generally near copper mines) or their situation on transit roads, as well as their high level of metal industry, shows that the formation and rise of the cultures in South Caucasus in the Bronze Age was connected with the metal manufacturing.

In the Central part of South Caucasus in the Early Bronze Age formed Kura-Araxes culture, which spread on the vast territory of Caucasus and Near East. This culture played a significant role in the ancient history of North Caucasus, Anatolia, North-West Iran and Eastern Mediterranean. No one of the Caucasian cultures, either before or after, had spread so widely or left such significant mark in the history of Near East.

One of the main characteristics of Kura-Araxes culture is significant rise of metallurgy. In this period appear objects of different purposes, made with metal casting technology. Metal jewelry became more diverse. Fast and intense development of metallurgy in South Caucasus could be explained with connections with ancient civilizations of Near East. Many times has been mentioned, that the objects of the Middle Eastern origin, got to North Caucasus through South Caucasus.

Economical bases of development of South Caucasus cultures in the Early and Middle Bronze Ages, as it seems, was intense exploitation of copper, antimony and arsenic mines. Exactly metallurgy guided South Caucasus into the international field.

The end of the 3^{rd} and the beginning of the 2^{nd} mill. B.C. are characterized by intense interactivity between Anatolia, South Caucasus, Eastern Mediterranean and inner regions of Middle East. This interactivity was expressed in different forms (trade, royal weddings, diplomacy, military conflicts etc.).

Cultural and historical processes in Early Metal period in South Caucasus and Anatolia were developing in light of close economical and cultural relations between the regions. This is indicated by archaeological data.

Study of the Early Metal period cultures in South Caucasus and Anatolia undergoes very intensively in the last years. Many new sites have been excavated and many new theories were expressed. Great attention is paid to such important realms of society development as introduction and development of metallurgy and agriculture, prehistoric religion and cult, architectural types and genesis of living and burial buildings, prehistoric trade and forms of exchange. Subjects of the study are also problems of topography, chronology and periodization of Early Metal period archaeological sites.

The main purpose of the international conference `Problems of Early Metal age Archaeology of Caucasus and Anatolia`, which was financed by Shota Rustaveli National Science Foundation, is discussing the issues of relations between the archaeological cultures of South Caucasus and Anatolia and the problems of early phase of metal producing (4^{th} – 2^{nd} mill. B.C.) as well as introducing the materials from the new archaeological excavations and exchanging the scientific opinions.

Archaeological cultures of the Early Metal period are detected on many archaeological sites in Georgia, Azerbaijan, Armenia and Turkey, where is a long tradition in studying problems of history and archaeology of this period. Despite this, there is no common position concerning several problems, so currency of the conference proceeds from this reality.

Goderdzi Narimanishvili,
Tbilisi, November 2014

AT THE BEGINNING OF CAUCASIAN METALLURGY

Prof. Dr. Tufan Isaakoglu Akhundov

Azerbaijan National Academy of Sciences
The Institute of Archaeology and Ethnography

Identification of the chronology and forms of establishment of metallurgy in the Caucasus has been one of the key problems of archaeology for many years. This issue was highlighted in different works, and a series of special works were published; however, the problem still remains. The beginning of the metal age in the Southern Caucasus is usually connected with the appearance of most ancient carriers of productive economy traditions in this region (Нариманов, 1987). These traditions were for a long period dated back to the Eneolithic or, in other words, Copper & Stone Age dated back to the 6^{th}-4^{th} millennia BC for this region (Абибуллаев, 1982; Нариманов, 1987). In our works, we, declining to change the age of these traditions, radically denied the existence of Eneolithic in the Southern Caucasus and thus dated these traditions back to the Neolithic (Ахундов, 2003). At present, the bigger part of researchers proceeding mostly from calibrated data of radiocarbon analysis also tends to date these traditions back to the Neolithic through deepening their age to the 7^{th} millennium BC. However, in contrast to us, their belonging to the Neolithic is being substantiated by not the nature of archeological complexes but through their artificial aging, which means they forget that the age of a monument alone is not an indicator of technical-cultural level predetermining the monument’s belonging to an epoch.

A small quantity of little copper items (copperware) was found during the research of monuments of these traditions. The copperware represents largely very small copper items made supposedly through cold hammering. However, there are also separate items supposedly made using a more complex technology. However, they either date back to the very end of this epoch (Абибуллаев, 1982) or their stratigraphic position on a monument is under question. Given that no traces of hot hammering have been identified and that many of the existing discoveries were made through cold hammering, it is groundless to assert genuine local metallurgy in the Southern Caucasus in the said period of time.

When does, like in the case of carriers of such a tradition, local metallurgy appear in this region?

Initial information about the existence of hot, i.e. genuine metallurgy in the Caucasus was obtained by Ideal Narimanov in 1988 under an archeological survey of settlement Leilatepe in the Garabagh region (Нариманов, 1988). This monument revealed, apart from metallic items of complex chemical composition made through hot hammering, direct traces of the process of metallurgic production. Based upon the complex of materials found from this monument, I. Narimanov outlined the Caucasus’ new archeological culture named the Leilatepe culture that he linked to population, which was genetically linked to carriers of the Ubeyd culture and had come to the Southern Caucasus from Mesopotamia (Нариманов, 1985), though he later did not rule out their Uruk origin (Нариманов et al, 2007). Thus, it for the first time became possible in the Caucasus to substantiate local metallurgy, whose habits were attributable to carriers of the Leilatepe tradition.
At present, the majority of researchers tend to link carriers of the Leilatepe culture to that of the Uruk culture depending on the methods of dating, through putting them in different phases of the 4 millennium BC (Ахундов-Махмудова 2008). We tend to date the core period of existence of monuments linked, to various extents, to the Leilatepe tradition, back to the second half of

the 4th millennium BC.

Over the passed time, there have been discovered some 40 monuments of Leilatepe tradition scattered over all regions of the Southern Caucasus. They are most densely represented in the Garabagh plain where more than 25 monuments are known (Ахундов, 2013). One of such monuments - the settlement Alkhantepe - was identified by us on the Mugan plain in the southeast of Azerbaijan in 2006.

Alkhantepe is located 4 kilometers north of settlement Uchtepe in the Jalilabad region, at the absolute height of 41 meters, having the coordinates of N 39º 21’607’’; E 048º 27’ 720’’. The monument occupies practically a flat territory without topographically expressed signs. The first stage of studies of the monument covered 2008-2010 and 2012. As a result, it has been identified that this is a one-layer, no less than 4-hectare settlement. The excavations covered an area of 200/10m/20 square meters. In addition, for the reasons of identification of the area and primary topography of the settlement, five stratigraphic prospect holes were laid within its territory, with each hole covering an area of 3.75/1.5 m/ 2.5 square meters.

Three-meter thick cultural sediments are located lower than the modern horizon. They consist of seven construction horizons, which in separate places are subdivided into thinner sub-horizons. At the same time, the whole cultural sediment is separated into two packs, between which there have still been conserved traces of tectonic shifts that were followed by a certain change in the culture of construction.

The study of this monument revealed, apart from the richest material of various categories, factual data indicating on the existence of metallurgic production in this settlement. Apart from separate metall things and their fragments, there were found implements, waste and devices of metallurgic production. There were also found remains of metallurgic and metalworking furnaces (Fig 1;2).

Thus, local metallurgy in the Caucasus is initially documented together with the appearance of Uruk tradition’s carriers represented in the Southern Caucasus by Leilatepe tradition’s carriers or, in other words, the Leilatepe variant of the Uruk tradition, who migrated to this area. They brought here their own skills of metallurgy that can be dated back to the middle-beginning of the second half of the 4th millennium BC.

What epoch did Leilatepe tradition’s carriers belong to and what happened next? Let’s turn back to the 1950s when we were not yet aware of the Leilatepe tradition and we were only making initial steps in the study of the Neolithic-Eneolithic in the Caucasus.

At the time, following the identification of settlement Kultepe-1 at town Nakhchivan, cultural sediments underlaying Kura-Araxes tradition’s sediments, which were previously referred to the Eneolithic, the newly discovered sediments were initially dated back, in accordance with the “compulsory” succession in the periodization of epochs, to the Neolithic and Eneolithic whereas the Kura-Araxes carriers were unfoundedly shifted back to the Early Bronze Age (Абибуллаев 1959; Абибуллаев 1982). Later on, having excluded the Neolithic, they dated the whole lower layer back to the Eneolithic, though it would have been corrected to do the contrary, i.e. wholly date them back to the Neolithic. One of the few reasons, for which the newly discovered cultural layer of settlement Kultepe was dated back to the Eneolithic, was that it was found in the latter’s top horizons bordering and partially mixed with Kura-Araxes sediments of some metall items. The Kura-Araxes layer was not the earliest one on this monument.

At the time, there were commenced longtime unsuccessful attempts to find certain transitional elements of links between “Eneolithic” traditions and Kura Araxes ones; these attempts took more than 30 years. The discovery of settlement Leilatepe and the subsequent distinguishing of the Leilatepe tradition partially resolved this problem. It became evident that there were no any successive rectilinear links between “Eneolithic” traditions and Kura-Araxes ones. In the chronological gap between them, being used in the Southern Caucasus was the Leilatepe tradition having no genetic links with either preceding Neolithic traditions or following Kura-Araxes ones. The new tradition, having found itself between the so-called “Eneolithic” traditions and Kura-Araxes ones, and also following the accepted rectilinear succession in change of the epochal belonging was “naturally”, without any argumentation, dated back to the Late Eneolithic, for the Early Bronze place had already been occupied by Kura-Araxes carriers that already could be shifted nowhere.

Thus, the Leilatepe tradition received the status of the Late Eneolithic one (Нариманов et al, 2007). In our opinion, this counters the real position of things. A proof of what we’ve said is the above-noted data about metallurgy of Leilatepe tradition’s carriers.
Analyses of metals and waste of metallurgic and metalworking production obtained from these monuments identified the existence in them of rather essential copper-based natural and artificial additives actually making some of these findings bronze items (Table 1). The found purely copper items, under the existence of at least minimal findings of items with additives, cannot be regarded as either dating or epoch-determining ones, for the purely copper items were also found in the very beginning of ancient metallurgy, and they exist today as well.

Leilatepe tradition’s carriers possessed all skills of metallurgy and metalworking, made rather large items, including implements and weapons that could influence on the process of production. In terms of technical-cultural level, they belonged to the Metal Age, were able to produce metal with additives, i.e. produced bronze, so they can no way be dated back to the Eneolithic, even Late Eneolithic.

The appearance of Leilatepe tradition’s carriers in the Caucasus marked the appearance of the first local Caucasian metallurgy. It emerged not on the basis and not in the entrails of the Caucasian Neolithic but was brought to this region by Uruk migrants from their ancestral home (Ахундов-Махмудова 2008).

Leilatepe carriers made the first step in the Metal Age in Caucasus, noteworthy straight in the Bronze Age. However, this step in the Southern Caucasus did not receive its further logical continuation, was interrupted without any further development and so was the Leilatepe tradition itself. There were reasons for this. Perhaps, this was connected with the movement of the Kura-Araxes carriers, who cut off all communication links of Leilatepe tradition’s carriers with their Central Asian ancestral home.

As has been noted above, the Kura-Araxes tradition, initially referred to the Eneolithic, was later on automatically shifted to the Early Bronze Age. Researchers already questioned that this whole culture’s dating back to the Early Bronze Age is true. Its beginning was dated back to the preceding epoch, “determined” for the Southern Caucasus as the Eneolithic (Кавтарадзе, 1982).

Our analysis of Kura-Araxes monuments in the territory of Azerbaijan also ruled out this culture’s whole dating back to the Early Bronze Age, to which we, like some authors did earlier, tend to date back only the final stage of its existence (Ахундов, 2004). The only difference between the previous authors and us is that we see the beginning of the Kura-Araxes tradition not in the Eneolithic, a period that we rule out, at all, from the epochal system of Southern Caucasus, but in the developed Neolithic (Akhundov 2004; Ахундов 2004). And we regard

TABLE 1

Results of quantitative spectral analysis of the remains of metallurgical production and metals of Leylatepe tradition and the burial mound of this circle.

№№	The name of the object its weight in grams (g)	Constituentelements in weight in %												Type of alloy
		Cu	Sn	Pb	Zn	As	Sb	Au	Ag	Bi	Ni	Co	Fe	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Alkhantepe settlement														
1	Awl, 2 g.	Base	0	0.32	0.15	1.2	0.31	0	0.01	0	0.35	0	0.2	Cu-As
2	Ingot, 26 g.	0.19	0	Base	0.11	0	0	0	0.07	0.02	0	0	0.005	Pb
3	Slag, 18 g.	Base	0	0.05	0.3	0.52	0	0	0.02	0.01	0.27	0	0.55	Cu-As
4	Ring, 10 g.	0.22	0	Base	0.12	0	0	0	0.05	0.02	0.01	0	0.011	Pb
5	Grains of the metal, 0,1 g.	Base	0	0.26	0.12	0.32	0.22	0	0.01	0.011	0.12	0	0.52	Cu
6	Fragment of a dagger, 10,5 g.	Base	0	0.21	0.11	0.95	0.12	0	0.01	0.02	0.03	0	0.37	Cu-As
7	Grains of the metal, 2 g.	Base	0	0.27	0.12	0.31	0	0	0.01	0.01	0.05	0	0.5	Cu
8	Slag, 20 g.	Base	0	0.05	0.02	0.55	0	0	0.02	0	0.32	0	0.51	Cu-As
9	Ore species, 22 g.	0	0	1.05	0.3	0	0.2	0	0.02	0.02	0.02	0	0.73	-
10	Drops of the metal, 2 g.	Base	0	0,12	0.2	0.57	0	0	0.012	0.01	0.05	0	0.3	Cu-As
11	Dagger, 41,5 g.	Base	0	0.02	0.021	0.85	0.001	0	0.003	0.002	0.002	0.005	0.17	Cu-As
12	Drops of the metal, 5 g.	Base	0	0.022	0.015	0.36	0.012	0	0	0	0.002	0.003	0.31	Cu
13	Ring	Base	0	0.032	0.015	0.33	0	0	0.03	0.003	0.003	0.002	0.32	Cu
14	Frag-ts of the smelting form, 38,1g.	Many	0	0.1	0	0.003	0	0	0.12	0	0.002	0.02	0.15	Cu
15	Metal from the crucible, 73.5 g.	Many	0	0.12	0	0	0	0	0.22	0	0.002	0.001	0.21	Cu
16	Metal from the crucible, 67,5 g.	Many	0.001	0.15	0/001	0	0	0	0.123	0	0.001	0.001	0.12	Cu
17	Metal of the smelting form, 35.5 g.	Many	0.002	0.21	0.001	0	0	0	0.21	0	0.002	0.002	0.31	Cu
18	Frag-ts the smelting form, 16.5 g.	7.38	0.003	0.370	0.001	0	0	0	0.003	0.007	0.015	0	0.002	Au-Ag
19	Frag-ts the smelting form, 124.6 g.	Many	0	0.144	0.02	0.41	0.02	0.003	0.008	0	0.002	0.001	0.32	Cu-As
20	Frag-ts the smelting form, 96.6 g.	Many	0.002	0.03	0	0.08	0.003	0	0.018	0.009	0.001	0.002	0.33	Cu
21	Frag-ts the smelting form, 41.5 g.	Many	0.005	0.17	0.03	0.05	0	0.02	0.001	0	0.025	0.005	0.31	Cu
22	Drops of the metal, 3,5 g.	Many	0.005	2.93	0	0.08	0.003	0	0.018	0.008	0.011	0.003	0.25	Cu-Pb
23	Fragments of the crucible, 11 g.	Many	0.002	0.03	0	0.05	0	0	0.021	0.005	0.012	0.001	0.17	Cu
24	Fragments of metallic object, 8,5 g.	Base	0	0.02	0	0.08	0	0	0.005	0.005	0.012	0.002	0.22	Cu
25	Drops of metal, 0,5 g.	7.25	0.005	0.22	0	0.3	0	0.001	0.055	0.015	0.003	0	0.03	Cu-Ag
26	Awl, 4,7 g.	Base	0.03	0.31	0.015	0.33	0.02	0.01	0.03	0.001	0.012	0	0.02	Cu
27	Drops of metal, 0,5 g.	8.72	0.001	0.27	0	0.22	0	0.1	0.053	0.005	0.001	0	0.15	Cu-Ag
28	Fragments of metallic plate, 4,2 g.	Base	0.03	0.25	0.17	0.31	0	0	0.01	0	0.01	0	0.12	Cu
29	Remains of metal, 1,2 g.	Base	0.003	0.05	0.07	0.32	0.005	0	0.003	0	0.01	0.001	0.1	Cu-As
30	Fragment of the awl, 5,2 g.	Base	0.021	0.32	0.02	0.35	0.03	0.01	0.03	0	0.33	0	0.03	Cu-Ni
31	Fragments of metallic object, 12,5g	Base	0.015	0	0.01	0.025	0	0	0.005	0.001	0.005	0	0.05	Cu
32	Fragment of the dagger, 3,7 g.	Base	0.022	0	0.01	0.05	0	0	0.005	0.001	0.003	0	0.03	Cu
33	Fragment of the dagger, 2,5 g.	Base	0.025	0.12	0.015	0.235	0	0.005	0.001	0	0.001	0.002	0.01	Cu
34	Awl, 2,5 g.	Base	0.03	0.27	0.017	0.32	0.03	0.001	0.003	0.002	0.21	0	0.05	Cu
35	Sparks of the metal in clay, 4,5 g.	Many	0.013	0.17	0.04	0.03	0.001	0.002	0.001	0	0.02	0.01	0.12	Cu
36	Awl, 18,7 g.	Base	0.02	0.02	0.02	0.32	0	0.03	0.01	0	0.003	0	0.11	Cu
37	Frag-ts of the smelting form, 30g.	Many	0.003	0.05	0.03	0.5	0.005	0.001	0.003	0.003	0.002	0.001	0.05	Cu
38	Frag-ts of the kiln wall, 35,4 g.	Many	0.005	0.12	0.05	0.035	0	0	0.002	0	0.02	0.01	0.31	Cu
39	Frag-ts of the smelting form, 10,1g.	Many	0.003	0.07	0.05	0.05	0.003	0	0.125	0	0.001	0.001	0.3	Cu
40	Frag-ts of the smelting form, 194 g.	Many	0.002	0.05	0	0.05	0.005	0	0.075	0.007	0.05	0.001	0.32	Cu-Ni
41	Frag-ts of the kiln wall, 46,5 g.	Many	0.005	0.035	0	0.07	0.005	0	0.011	0.007	0.001	0.002	0.37	Cu-As
42	Frag-ts of the kiln wall, 62,5 g.	Many	0.003	0.032	0	0.03	0.003	0	0.012	0.005	0.003	0.001	0.35	Cu-As
Leylatepe settlement														
1	Edge of the knife	Base	0.03	-	0.01	0.01	-	0.005	-	0.001	0.003	-	-	Cu
2	Awl	Base	0.03	0.3	0.015	0.3	0.04	0.03	0.02	-	0.55	-	0.03	Cu
3	Awl	Base	0.06	-	0.015	0.3	-	0.2	0.03	-	0.03	-	0.1	Cu
4	Awl	Base	0.05	0.2	0.015	0.3	-	0.01	-	-	0.01	-	0.1	Cu
5	Bar	Base	0.06	0.003	0.02	0.3	0.03	0.01	-	-	0.005	-	0.1	Cu
6	Bar	Base	-	0.05	0.02	1.35	0.015	0.01	0.003	-	0.004	-	0.1	Cu-As
7	Remains of the casting	Base	0.003	0.07	0.06	0.58	0.005	0.003	0.007	-	0.01	0.001	0.12	Cu-As
8	Remains of the metal in clay	Base	0.007	0.15	0.04	0.03	-	0.001	0.03	-	0.02	0.01	0.3	Cu
9	Exfoliated part in clay	Base	0.01	0.1	0.013	0.07	0.06	0.14	0.008	-	0.02	-	0.1	Cu
10	Grains of the metal	Base	0.015	0.04	-	1.15	0.007	0.018	-	0.009	0.46	0.001	0.03	Cu-As
11	Grains of the metal	Base	0.008	0.015	-	2.01	0.007	0.018	-	0.009	0.67	0.0005	0.03	Cu-As
12	Slag	Base	-	4.752	-	7.272	0.92	0.119	-	-	0.213	-	3.56	Cu-As
13	Oxide (from the awl)	Base	-	-	-	-	0.331	-	-	-	-	-	0.35	Cu
14	Oxide (from the awl)	Base	-	0.146	-	1.306	0.21	0.0087	1.486	-	-	-	0.091	Cu-As
Telmankent, burial mound №1														
1	Lance – head, 215 g	Base	0.1	0.5	-	4.6	0.02	0.052	0	0	0.01	0	0.2	
2	Dart - head, 42 g.	Base	0.1	0.1	-	2.4	0.3	0.12	0	0.003	0.1	0	0.1	
3	Awl, 2,4 g.	Base	0.35	0.03	-	1.8	0.02	0.1	0	0.005	0.03	0	0.37	
4	Awl	Base	0.2	0.01	-	1.33	0.15	0.08	0	0.01	0.03	0	0.3	
5	Axe – adze, 68 g.	Base	0.2	0.2	-	2.7	0.2	0.042	0	0	1.1	0	0.3	
6	Axe – adze, 50 g.	Base	0.2	0.08	-	4.75	0.04	0.025	0	0	0.01	0	0.3	
SoyugBulag, burial mound № 1/2006														
1	Dagger, 61,3 g.	70.21	0.37	0.05	0.21	1.27	0.25	0.05	0.05	0.03	0.01	0.3	0.2	
2	Bead, 0,4 g.	0.72	0.02	0.05	0.2	0	0.2	30.45	8.12	0.05	0.05	0.005	0.15	
3	Bead, 0,4 g.	5,32	0.03	0.02	0.02	0	0.21	50.02	41.03	0.05	0.01	0.03	0.12	
4	Bead, 0.45 g.	1,87	0.02	0.2	0.2	0	0.02	30.14	0.03	0.05	0.005	0.01	0.05	
5	Bead, 0.45 g.	1.58	0.02	0.05	0.05	0.05	0.2	34.72	6.95	0.03	0.02	0.01	0.15	
6	Bead, 0.47 g.	1,32	0.02	0.05	0.02	0	0	9.12	86.05	0.01	0.005	0.02	0.1	
Soyug Bulag, burial mound № 4/2006														
1	Awl in a case, 5 g.	90.05	0.3	0.2	0.2	1.2	0.2	0	0.05	0.03	1.48	0.2	0.12	
2	Temporal pendant, 0,5 g.	1.9	0.02	0.03	0.05	0.03	0.2	41,57	9,5	0.002	0.01	0.02	0.12	
3	Temporal pendant, 0,5 g.	2.5	0.02	0.05	0.02	0.03	0.05	81.85	5.7	0.01	0.005	0.02	0.12	

Materials of Alkhantepe settlement (A.M.Gasanova), №№ 1-15 settlement Leylatepe (I.R. Selimkhanov and A.M. Gasanova), burial mound Telmankent (I.R. Selimkhanov), and Soyug Bulag (A.M. Gasanova) have been analytically investigated at the sector of archaeological technology of the Institute of Archaeology and Ethnography of Azerbaijan National Academy of Sciences. Materials №№ 16-18 of Leylatepe settlement have been investigated at the Institute of Restoration and Conservation of Cultural Heritage in Spain.

only the end of its existance as a period shifting toward the Bronze Age due to the block of cultures of nomadic cattle-raisers that was being established in the Southern Caucasus at the time.

Metall (bronze) items found at early Kura-Araxes monuments in the territory of Azerbaijan consist, like the fore said Neolithic monuments (which, to be frank, reveal a large number of items), of small items only. Their number and mass lags behind that even of the found metall items from the preceding Leilatepe tradition. They are mostly decorations, which cannot anyhow influence on the processes of production, which, like before, were based upon stone-bone implements. In our opinion, this rules out dating these monuments to the Metal Age and makes it possible to regard them as Neolithic ones (Ахундов 2004).

Larger items, primarily, weapons appear, though in a smaller quantity than decorations, at Kura-Araxes monuments by the end of existence of this tradition, in context with then being established block of nomadic cattle-raisers, for whom weapons were one of the implements of "production". Thus, the Kura-Araxes tradition represented, on the whole, a stage of transition from the Neolithic to the Metal Age, the bronze metal age, which can be called, as a working model, Bronzelite (Akhundov 2004; Ахундов 2004).

This was the second step in the Caucasus, after the Leilatepe tradition, in the Metal Age that received its further logical development in the full-value transition toward the Bronze Age's successive cultures of nomadic cattle-raisers.

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fig. 1. Remains of kiln for ore melting

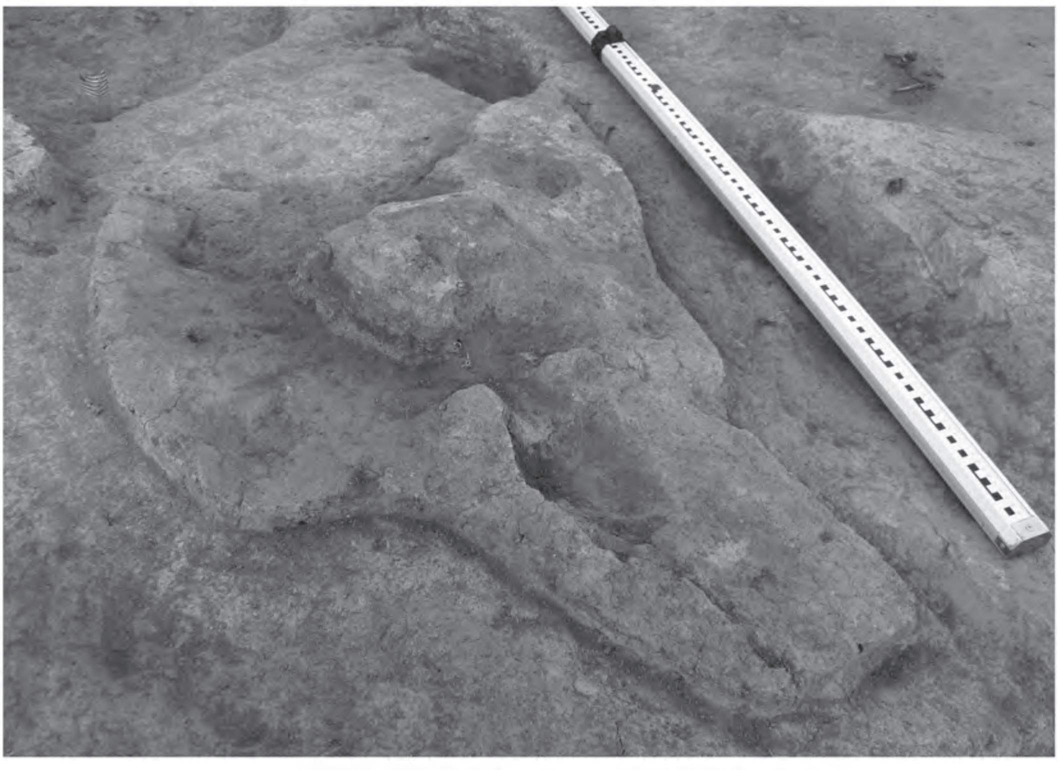

fig. 2. Remains of kiln for metal production

NEW NEOLITHIC AND CHALCOLITHIC SITES IN NAKHCHIVAN (AZERBAIJAN)

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INTRODUCTION

The south and southwestern limit of Nakhchivan's territory is the Araxes River, one of the major rivers of the Caucasus. Neolithic and Chalcolithic archaeological sites are generally located on tributaries of the Araxes River, such as the Nakhchivanchay and the Arpachay. Very few Chalcolithic sites have been excavated to date. Moreover, the Neolithic presents only at the Kultepe I settlement, where the bottom layer can be dated to the Neolithic period. The same site has the earliest Chalcolithic material found so far in this territory. However the research conducted by us in 2010-2014 in the neighborhood of the settlement to Kultepe I, revealed more than twenty monuments[1]. Our results demonstrate that the earliest agricultural settlements in Nakhchivan's territory have not yet received enough study. These sites are generally located in the valley of the Sirabchay River, which is a tributary to the Nakhchivanchay. Research indicates that many sites date to the late Neolithic and early Chalcolithic. Additionally, we noted the remains of copper, stone, and clay molds in some settlements (Marro et al. 2011: 70), which testifies to the development of copper metallurgy during the Chalcolithic Age, as these settlements were not inhabited after this period. These settlements, which extended along the river Sirabchay and its tributaries, were probably founded to exploit the natural resources of this region. Along the Nakhchivanchay, Dzhagrichay, and Sirabchay wild cereals grow today naturally (Абибуллаев 1982: 206; Мустафаев 1961: 56). Moreover, the Nakhchivanchay valley is home to a large number of wild plants, which are now cultivated. Additionally, Nakhchivan has rich deposits of metals and other minerals that were also important for the development of the earliest agricultural cultures. Finally, the distribution of ancient obsidian from a wide range of sources testifies to another important natural resources and provides another means to study interregional communications.

NEOLITHIC SITES

Monuments of this period are presented by some settlements. One of them is the settlement Kultepe I, which was first excavated more than fifty years ago, during the 1950s and 1960s. O.A.Abibullayev originally dated the bottom layer "1a" to the Neolithic period (Həbibullayev 1959: 14), but in a reevaluation of the evidence he later hypothesized that it was Chalcolithic (Абибуллаев 1982: 24). Several other archaeologists have concurred with the original Neolothic date (Нариманов 1987: 133; Кушнарева 1993: 32-34; Seyidov 2003: 21, 39-40), however no radiocarbon samples were taken from this layer to provide an absolute date. Therefore, in 2013, we opened two 5x5 m sounding at Kultepe I. In the areas chosen, O.A.Abibullayev's excavation completely removed the Bronze Age and Early Iron Age levels. The top layers of the sounding **A** contained Late Neolithic and Early Chalcolithic pottery. However, Early Bronze Age material also surfaced in the in Late Neolithic layers. Because the top layers of the settlement have been destroyed by erosion and a medieval garbage pit, establishing plans of buildings here

1. This work was supported by the Sience Developement Foundation under the President of the Republic of Azerbaijan – Grant № EIF-2012 – 2(6) – 39/28/5.

is impossible. However, the radiocarbon determination from the top layer of the settlement Kultepe I is dated to 5600 BC[2]. The majority of finds from this level are represented by pottery, which are generally made of chaff-tempered clay, and have been fired so that they are different shades red, sometimes with a yellow or gray core (Fig. 4).

Recent survey and museum research, however, indicates that Kultepe I is not the only Neolithic site in Nakhchivan's territory. Study of the material in the Sadarak museum revealed three stone tools (Bakhshaliyev-Seyidov 2013: 1, photo 1, photo 2), parallels for which are known from Neolithic monuments of the Caucasus (Abibullaev 1982: tablo IV, 1; Badalyan *et al*. 2010: fig. 3-1) and Eastern Europe (Археология Венгрии 1980: 387, рис. 238). V. G. Aliyev (Əliyev 1987: 61-67) has already published Chalcolithic pottery from this monument. However, our sounding did not provide much new information from this period, given the large size of the settlement, given its large size and the fact that it was intensively populated during subsequent periods, especially in Early Iron Age.

One of the sites that has been intensively surveyed and excavated is Shorsu. The settlement is located on the left bank of Shorsu River, a branch of the Sirabchay, on a natural hill (Fig. 1). On the southern part of the settlement, we opened a 10x10 m excavation unit. Excavation indicates that the occupation layer is not deep, only about 15-20 cm have been preserved. The matrix of this layer is defined by firm processed clay with white decayed inclusions and ceramics. There was no evidence of ash, signs of fire, or animal bones here. Pottery was the most common find, along with occasional chips of obsidian and flint. Excavation revealed three squared rooms of stone construction, which were arrayed in one row. In one of them, there were big storage jars, buried in the floor. Establishing the level of the floors was very difficult, since eroded plaster had collapsed onto the clay floors and become melded to the original floor as part of post-deposition processes. One storage jar was found outside of this structure. It seems likely that each of these rectangular rooms represented independent households or other economic units. Traces of fire and ash were not found within the rooms, although there was some evidence of fire outside of this structure.

The pottery from the settlement can be divided into two groups based on manufacturing techniques. The first group, consisting of four pottery sherds, is made of dense, chaff tempered clay. These ceramics have been fired until red color and have a yellow slip. Similar material is characteristic of a late stage of the Chalcolithic.

The majority of the pottery belongs to the second group. This pottery is made of clay that has been tempered with both chaff and sand (90,1%). In some cases, there is little chaff temper, while in others it is quite heavy. Mixed coarse sand is also used as temper. Some sherds only contain sand temper, although these represent an insignificant fraction of the pottery (9,9%). Many of the ceramics have rough surfaces, and in some cases evidence of rough molding as well, although others have been smoothed. All of the vessels have been made by hand and coil marks are sometimes visible. In addition, several of the sherds exhibit fingerprints. Although the pottery is in general, well-fired, some sherds have been fired unevenly, and several of them have dark cores as a result. Most ceramics in this group have been fired to different shades of orange or red, although four pieces are buff with yellow slip and three additional sherds are gray or black. In several cases, there is evidence of smoking (Fig. 5, 1, 3-5). The floral decorative pattern on several sherds resembles those previously excavated at Kultepe (Həbibullayev 1959: 58) and Haji-Firuz (Voigt 1983: 99).

The best parallels for the pottery come from sites in the South Caucasus and the Urmia basin.

2. Analyses were conducted by the CEDAD Laboratory at the University of Salento, Lecce, Italy.

Jars with non-everted rims, with cylindrical, and sometimes conic necks are well known from Kultepe I (Абибуллаев 1982: таблица IX, 1-4) and Haji-Firuz (Voigt 1983: 133-134, fig. 86-87). In addition, various conic or cylindrical-conic bowls may be connected to excavated examples from Haji-Firuz (Voigt, 1983: fig. 74-75). There are also parallels to sites in the Ararat valley. The clearest connections are to bowls with an uneven rim, occasionally decorated with a hole beneath the rim (Kushnareva 1997: Figure 10, 2-5). Bowls decorated in this way are also known from Kultepe I (Həbibullayev 1959: tablo 19, 3) and Shomutepe (Ахундов 2012: 56, таблица 203, 7-14; 9-3; 10-458). Similar ornamentation has been reported on pottery of the Byukk culture in Hungary (Археология Венгрии 1980: рис. 125, 2, рис. 130). This style of decoration continues on vessels from the Middle and Late Chalcolithic, demonstrating the persistence of this type of surface treatment. Finally, one sherd was decorated with auriculate relief, a pattern that is widespread at Neolithic sites from the South Caucasus, as to Shomutepe, Aknashen-Hatunarkh, to Geytepe, Arukhlo (Ахундов 2012: с. 56, таблица 209 и 210; Badalyan et al. 2010: fig. 9-2, 5-11; Kushnareva 1997: fig. 9, 1-2).

Perhaps the most chronologically sensitive feature of the pottery is the presence of husking trays, which testifies that the settlement was populated no later than the end of the seventh millennium BC (Fig. 2). However, a radiocarbon determination on charcoal taken from a fire-pit associated with this architecture returned a calibrated date from 3900-3800 BC. It seems likely, however, that the sample is either intrusive or was contaminated, given both the thinness of the cultural layer and the early parallels for the pottery. Given this, it seems likely that the settlement was used at some point during the VII-IV millennia, with the earlier date probably preferable.

The Yeniyol settlement is located near to Kultepe I, where the Sirabchay and Nakhchivanchay meet. This provides a favorable location for the settlement, which was probably a nodal point in a Neolithic site network. In 2014 in the settlement a 2x2 m sounding was placed at the site, which was taken down to virgin soil. The occupation layer was 1 m thick, and included the remains of brick constructions, ashy layers, stone tools, and ceramics. The sixth stratigraphic layer encountered in the excavation unit contained two construction horizons. It is clear that there were mudbrick structures in this area, however given the small size of the excavation, it is difficult to an establish an architectural plan. Most of the pottery can be dated to the Late Neolithic and Chalcolithic (Fig. 5, 2). They are fired in a range of colors, from gray to red and yellow. Some vessels show traces of fire blackening and soot. All the pottery is handmade and several are quite fragile. The majority of the ceramics are chaff-tempered, with smoothed and sometimes polished or burnished surface. One painted sherd was found here (Fig. 3, 1), while another was found during survey collection at Uçan Agıl, another settlement site (Fig. 3, 2). The decoration is similar to those found at Yanik tepe (Barney 1962: pl. XV, 4) and Yarim tepe (Merpert-Munchaev 1973: pl. XLI). In general, the best parallels for the Yeniyol ceramics come from the Late Neolithic and Early Chalcolithic. Several of the closed shapes have parallel from Haji-Firuz (Voigt 1983: pl. 19, g, h, f) while the bowls find parallels at sites in the Zagros mountains including Mahidasht, Choga Maran and Siahbid (Henrickson 1983: fig. 87, 15, fig. 89, 5).

CHALCOLITHIC SITES

Both the eastern and western halves of Nakhchivan contain Chalcolithic Age sites. In the west, most known Chalcolithic sites have been found in the Arpachay valley. Several different varieties of ceramics occur at sites in this area. At Xalac, ceramics are characterized by red slipped pottery, similar to that known from the Urmia basin. Of these sites, Ovçular Tepesi has been the best-studied. Materials from this settlement, particularly pottery find parallels in the Urmia basin, East Anatolia and the Ararat valley (Kushnareva, 1997. Figure 10, 2-5). The Chalcolithic levels of this site, which are characterized by rectangular mudbrick architecture with stone foundations, have been well published (Baxşəliyev et al. 2010, Marro et al. 2011). Most of the excavated material here dates to the Late Chalcolithic Age, however, excavations in 2013 demonstrates that the first construction horizon can be dated to sometime in the Middle Chalcolithic, roughly 4600 BC. These early houses are semi-subterranean. They have rectangular rooms with rounded corners and have usually been dug about 20-30 cm into the earth. Rooms tend to contain a hearth and big storage pits with depths of 1,8-2 m. Inside the rooms, there were household utensils including stone tools and ceramic vessels.

Archaeological survey has documented a range of Chalcolithic sites in the Sirab valley, although these have not been excavated. Descriptions of several of these sites have already been published, although new sites were catalogued during 2013. Among these new sites, are two particularly interesting settlements, Shorsu II and Kaleme Bulak. Both sites are located on the right bank of the Shorsu river. Kalemebulak is particularly deserving of attention. The site is located at the intersection of the river and a small mountain stream and covers no more than 100 sq. m, although its exact size is yet to be determined. Surface collections found stone tools and pottery. The ceramics were made of chaff tempered wares that had been fired to various shades of red to buff. Numerous obsidian flakes were found here, but no complete obsidian tools were collected. A flint sickle-blade, however, was found during the course of our survey. A radiocarbon determination taken at one of the settlements yielded a calibrated date between 3640-3580 BC. It seems likely, however, that these sites were occupied over a longer period. Given their proximity to Kultepe I and the various archaeological materials collected here, they probably date to the VI-IV millennia BC.

ECONOMY

The fauna and flora of Neolithic sites in Nakhchivan has not been thoroughly studied, given the recent exposures of many of these sites, making it difficult to draw too many conclusions as to the functioning of the Neolithic community. However, obsidian from Kultepe I has been analyzed. Research showed that the people who lived at this site (Бадалян, Кикодзе, Коль, 1996: 257) procured most of their obsidian from Geyhasar (50%) and Sunik (28%). Sunik is also the source of 90% of the obsidian found at another site called Kultepe, located near Marand in Iranian Azerbaijan. Similar obsidian distribution patterns have been recorded at sites in the Urmia basin. Recent research in the Urmia basin has suggested that the obsidian route from Sunik into Iran went through Nakhchivan (Farhang Khademi et al. 2013:1964). The sites along the Sirab river might well represent waypoints on this route; they were probably important participants in long distance obsidian trade.

Late Chalcolithic zooarchaeological and archaeobotanical samples have been studied from Ovçular Tepesi. These analyses demonstrate that sheep and goat were the dominant species raised at Ovçular, with very few cattle present. Several wild species were also present at the site, indicating that hunting remained important here. Moreover, given the location of the settlement on the banks of the Arpachay river, it is perhaps unsurprising that fish were also consumed here in quantity (Baxşəliyev et al. 18; Marro et al. 2011: 64). Animal manure, rather than wood, was the dominant fuel used in the houses.

Large quantities of barley were found at the site, demonstrating its use as the most important cultigens. Wheat was also present, however, quantities were limited, and it seems unlikely that it was grown in large enough quantities to provide for the population. We suppose that a certain amount of wheat may have been imported (Marro et al. 2011: 64). Certainly, the diet of the ancient inhabitants of Ovçular Tepesi included more than just barley. According to G. Willcox, grain was probably grown and processed nearby (Baxşəliyev et al. 2010: 19, 76, 99).

Metallurgy and metalworking occupied an important position within the Chalcolithic economy. Copper ore has been found at both Ovçular Tepesi and in the sites of the Sirabchay valley. A jar burial excavated at Ovçular Tepesi contained one perforated axe and two flat axes. Other examples of flat axes were also found outside of this burial, totaling five examples. In Zirincli settlement, we found casting molds for the mass production of flat axes (Marro et al. 2011: 70). Near the village Kakhab incidentally there was also stone casting mold for casting of perforated axes. At Ovçular Tepesi examples of tuyères were also found, attesting to local metallurgical production. Clearly, then the Ovçular Tepesi jar burial testifies to the existence of a developed metallurgy already in the second half of the fifth millennium BC (Marro et al. 2011: 69-72).

Further excavation and post-excavation analysis at sites in the Sirab valley has the potential to shed new light on the Neolithic and Chalcolithic culture of the Caucasus, periods that have not been well-known up to now.

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fig. 1. Settlement Şorsu

fig. 2. "Husking trey" style pottery

fig. 3. Painted pottery

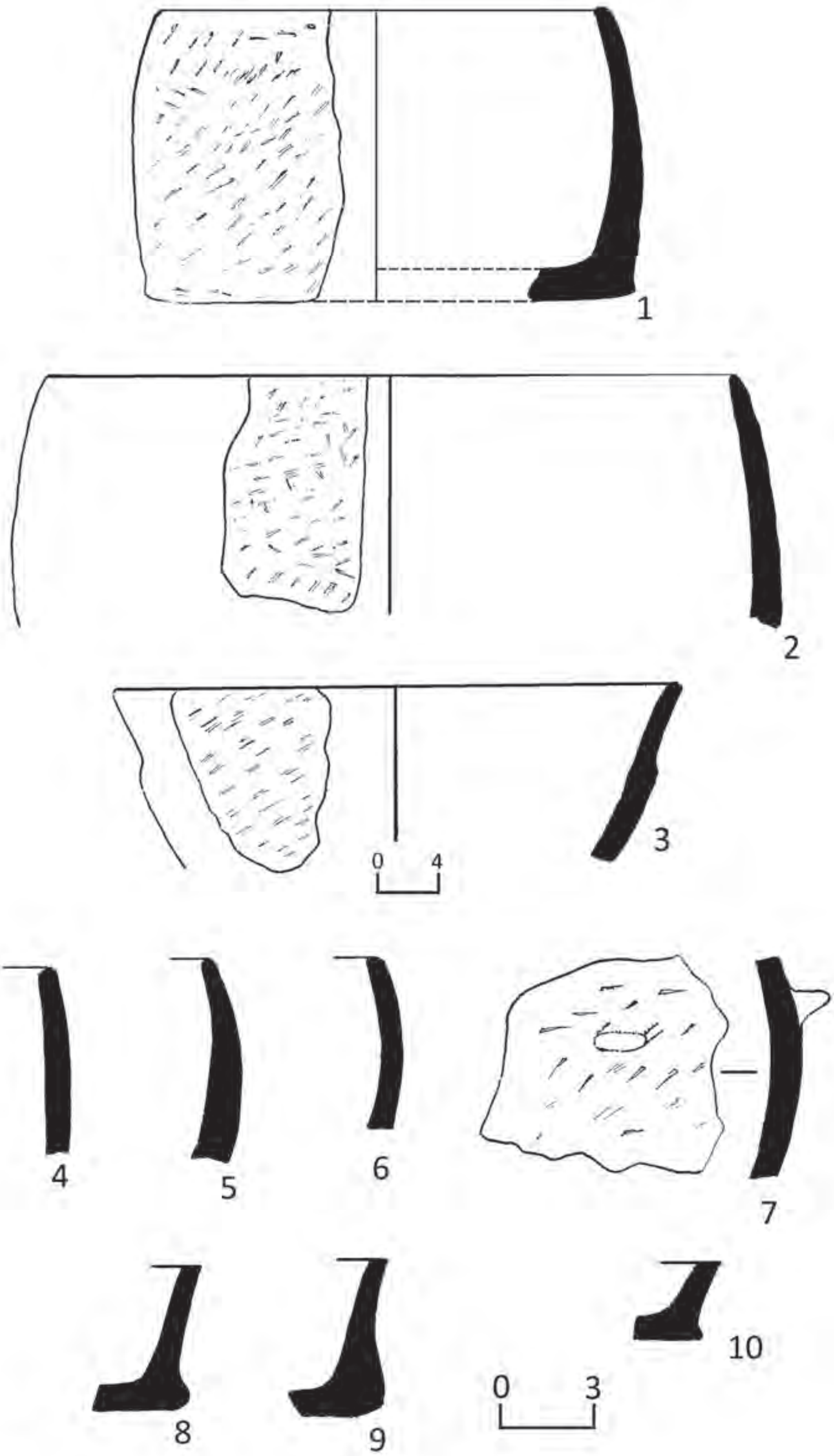

fig. 4

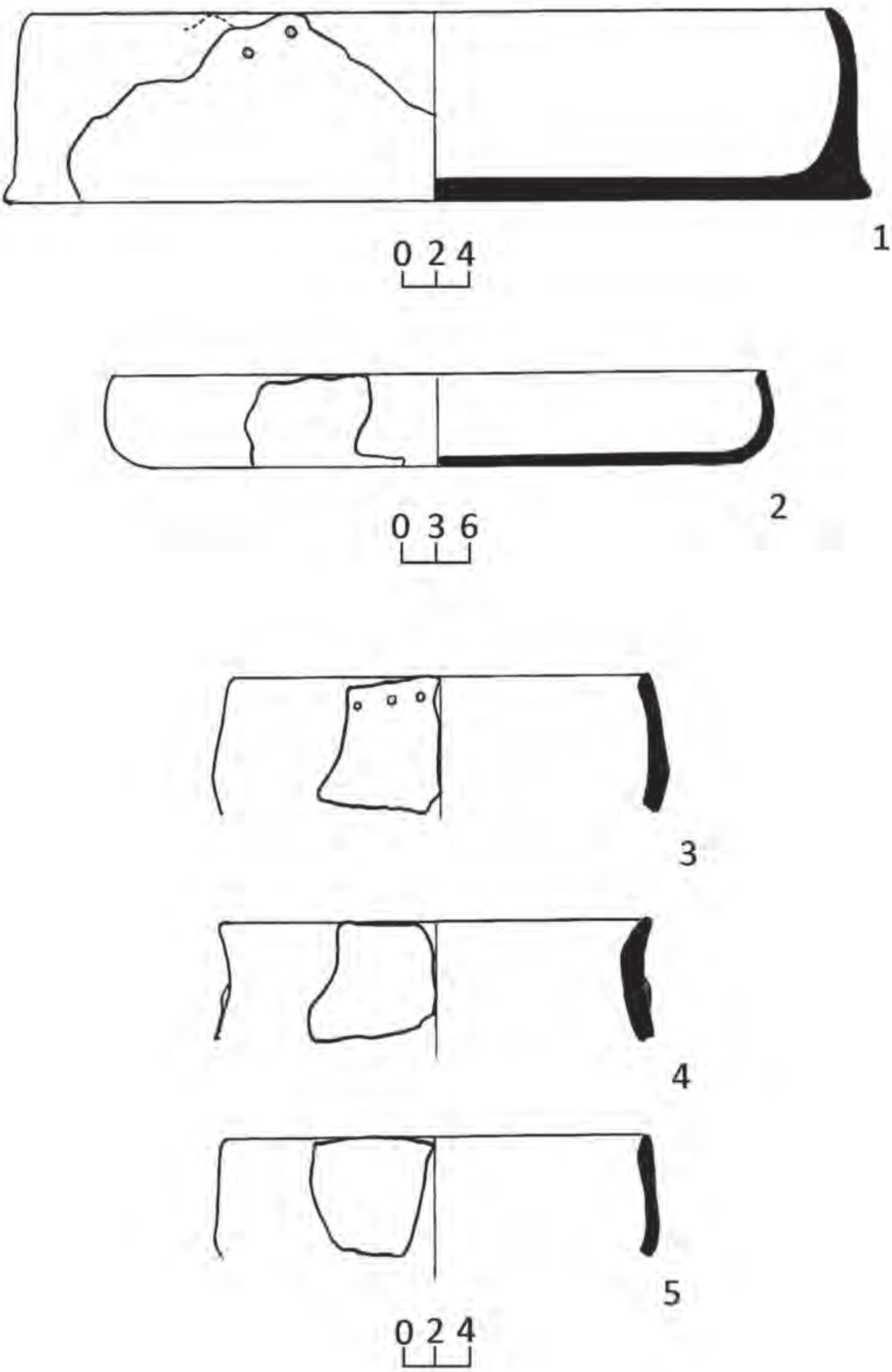

fig. 5

ARCHAEOLOGICAL COMPLEXES OF THE CENTRAL WESTERN PART OF AZERBAIJAN IN CONTEXT OF ARCHAEOLOGICAL CULTURES OF THE CAUCASUS

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South Caucasia comprised between the Black Sea to the West, the Caspian Sea to the East, and the southern slopes of the Greater Caucasus to the North, marks the geographical transition from Europe to Asia. This area, however, is at the same time also bound to eastern Anatolia by the Smaller Caucasus Mountains. Two major rivers, the Kura and the Araxes, flow through it, forming broad flood plains from West to East before they flow into the Caspian Sea.

In this regard, the archaeological complex called Mentesh which is investigated by Azerbaijan and French archaeologists have yielded unexpected results. Thus, the three main stages of ancient period are reflected at the archaeological complex that is supposed to belong to Chalcolithic Period. Therefore, Mentesh ancient settlement is considered archaeological site characterized by special feuaters in Caucasian region. This is because it was observed a long period of life dwelling without any interruption from Last Neolithic Period untill last Bronze Age at Mentesh. The Periods, respectivley, continued by sequance from the top layer to bottom layer. At the first stage of archaeological excavations carried out during the excavation it was studied Kurgan burial due to Early Bronze Age at the top layer of the site. This type of burial mound which is known as the tomb under Kurgan contributed highlight points about the main points of Kura-Araxes culture.

Menteshtepe is located in the Tovuz district of Western Azerbaijan along an old stream of the ZeyemChay, which flows into the Kura River on its right bank. The site was surveyed by I. Narimanov in the 1960s and described as a small mound that was already greatly damaged (ca. 45 m in diameter and 1 m high) (И. Нариманов: 82, 1987).

Narimanov divided the pottery surface finds into three groups, two allegedly belonging to the Shomu-Sulaveri culture with either mineral or vegetal temper, while the third group was not attributed to a culture, but only described as comb-decorated sometimes with applied pellets. Later on, during the 1970s, the site was totally leveled to give place to two dirt roads and to a vineyard equipped with long concrete poles embedded deep in the ground; they were finally removed in the 1980s. Later, in the 1990s, the land was divided between two different private owners. We rediscovered its approximate position during a survey conducted in 2006–2007, when we were exploring for Chalcolithic sites for excavations (B.Lyonnet: 41-47, 2009). A small sounding made in 2007 showed that architecture was still visible rather deep under the surface, while the pottery that we found in the gardens was mainly of the combed-type together with a few Kura-Araxes sherds. Although at first the site seemed earlier than the period we were interested in, we decided to open excavations there in order to get a better understanding of the Sioni culture, to which this combed material could be related and which was very poorly known until now.

For the first time in the Southern Caucasus, this will allow a comprehensive view both of the evolution from the local Somu-Sulaveri culture and on the important breaks caused by new relations with other areas. The only major interruption concerns the first half of the 4th millennium BCE (period of the Leilatepe culture) (V. Ollivier/M. Fontugne: in press.)

Period IV covers a long span of time, about one mill. (Fig. 1). Through the material finds it correlates with the Kura-Araxes culture. As this phase is at the level of the actual surface of the plain, all of the upper structures – if there were any – have been totally levelled for the cultivation of the vineyard; hence, what is left corresponds only to structures buried into the previous levels. This, of course, greatly affects our comprehension of the period. Nevertheless, two main phases can be distinguished. The earliest phase corresponds to a large collective burial under a kurgan (Fig. 2).

Several 14C dates place it within the second half of the 4th and very beginning of the 3rd mill. BCE.178 The Neolithic and Chalcolithic mound, already unoccupied for the last 500 years, was apparently taken as a readymade kurgan, within which the new population excavated a large and deep funerary chamber (5.1” 4.3”2 m) with a dromos (1.2 m wide) in the middle of its eastern side; the chamber was used for several centuries, until it was set on fire, probably deliberately. The chamber was delimited by wooden posts that maintained a rather thin wall (5–10 cm) made of perishable material, of which only traces were left (black charcoal and red clay). The sides were precisely oriented towards the cardinal directions. No remains of the roof have been found, but it must have been sufficiently strong to support a cap of large river pebbles, which were found scattered over a large area immediately under the surface during the first year of our excavations. The initial shape of this cap is unknown, both because of the destruction by fire which made the roof collapse, and because of the modern destruction of the mound. I. Narimanov does not mention a possible kurgan or pebbles or even Kura-Araxes sherds, so probably no remains were visible at the time of his visit. Two special long stones, probably of symbolical meaning, were found, one set at the entrance of the dromos into the chamber, the other on the opposite side. The fire caused very severe damages to the upper layers inside the chamber. The bones of the interred were transformed into ashes or were very fragile, although they were preserved apparently in a gangue of burnt clay, from which it was extremely difficult to extract them. A study of the remains made by two anthropologists is now almost finished and will be published separately. Altogether, ca. 40 persons had been buried in the chamber. Some of the skeletons, or at least parts of them, were still in anatomical order, while clusters of long bones and skulls were discovered along the walls. We can, thus, presume that the chamber was reorganized from time to time to give room for the next burials. Very little funerary material was discovered within the chamber. Aside from three animal skulls (one small bovid and two ovi-caprids), traces of two baskets, ten perforated bone items, and over 300 tiny black or white stone beads (probably steatite), the grave goods consist of in 21 ceramic vessels, none of which is black burnished (see below). If – as mentioned above – the final fire were intentional, we cannot exclude that metal ornaments or objects that may have accompanied the dead may have been collected for re-use prior to the burning. A few meters south of the chamber, a small symbolic tomb containing the same kind of odd, naturally faceted, stone ‘‘buried’’ in a stone cist and covered up by a pile of small stones like a kurgan was also discovered (Fig. 3). Until now, no other contemporary structure has been found that provides evidence that the population who buried their dead at Mentesh Tepe also lived nearby.

The later phase is evidenced either by individual burials or by pits and hearths (Fig. 4). Numerous 14C dates situate them between ca. 2800 and 2400 BCE. They are scattered throughout all of the excavated area, and no association can be made between them stratigraphically except through their ceramic content. The pits are extremely numerous, often very large (over 2”2 m), pear shaped, and some of them even reaching the Neolithic levels more than two meters farther down. Their function is not yet clear, although most may have been storage pits. Analysis of their botanical or faunal contents is in progress. They often contain almost complete pots broken into large pieces; in one pit a set of large querns as well as a small animal clay figurine were discovered. Besides these domestic pits, two individual pit burials were found: one contained a complete skeleton, while the other is a secondary burial with only parts of the skeleton. The openings of both burials were covered by an oval heap of large river pebbles. We should also mention here a second kurgan, located about 30 m away from the first one and covering an area of about 7”7 m. This second kurgan does not seem as damaged as the other, and no traces of fire are visible. At present, its cap of river pebbles has only been cleaned from the earth covering it, and will be opened during next excavation season; therefore, we do not know its date yet. Nevertheless, it clearly cuts into the Chalcolithic levels, and we can suppose that it is later than the first kurgan. It may be contemporary with the Kura-Araxes pits and individual burials, many of which are situated not far from it. Conversely, it could also date to a much later period, like the end of the Bronze Age/beginning of the Iron Age, as indicated by a few sherds found nearby. In addition to these pit structures, several small hearths belong to the Kura-Araxes period, and one of them shows the negative imprints of a three partite, possibly portable andiron, which curiously are otherwise not attested at the site. Besides these structures, no architectural remains can be related with certainty to this period, either because of the modern destruction to the site, or because the ancient populations only lived there seasonally in light or semi-subterranean constructions. Further studies on the botanical and faunal remains should help solve this question.

It should be noted that in the recent years, as a result of large-scaled archaeological investigations carried out by Azerbaijan archaeologists it was unrevealed such kind of Kurgan burials which belong to the same culture. These investigations has already obtained more information about the same burial traditons. In this regard, this make the situation noticable to investigate the assumptions were supposed before at the background of new researches. It makes some questions of if we can call this tomb kurgan burial or not tha is belong to Kura-Araxestribes? In general, is it possible to consider Kura-Araxes tribes as carrier of kurgan culture? These and other questions will be the subject of further investigations.

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TABLES

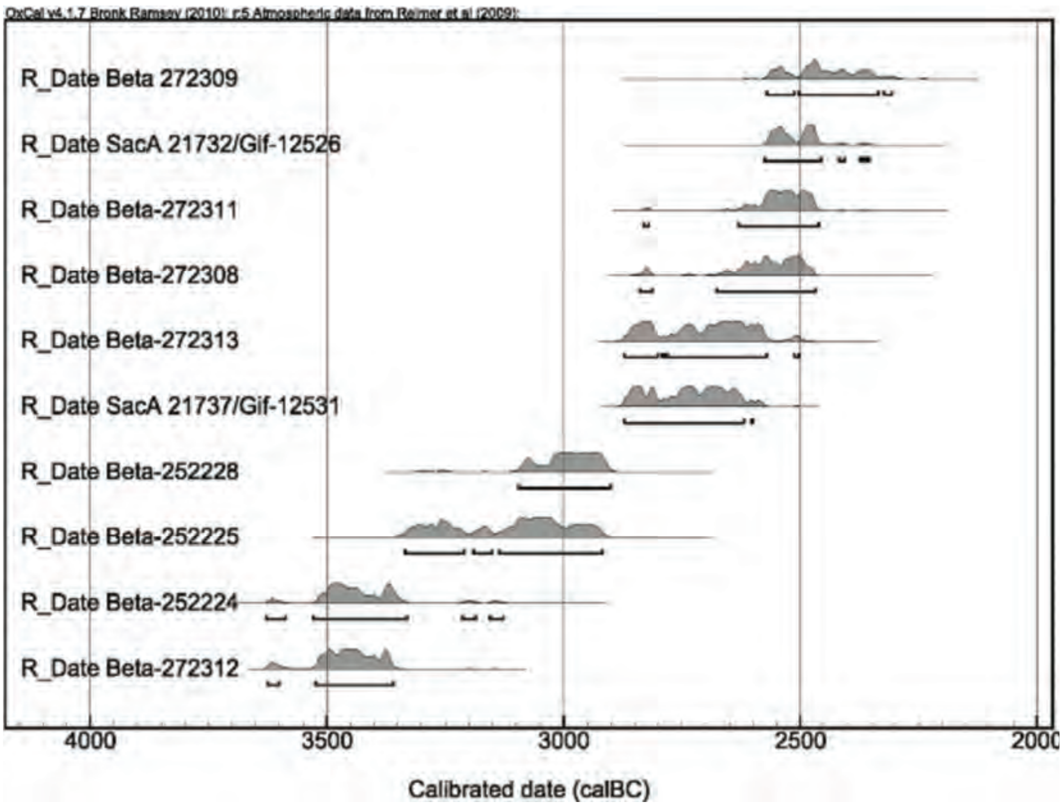
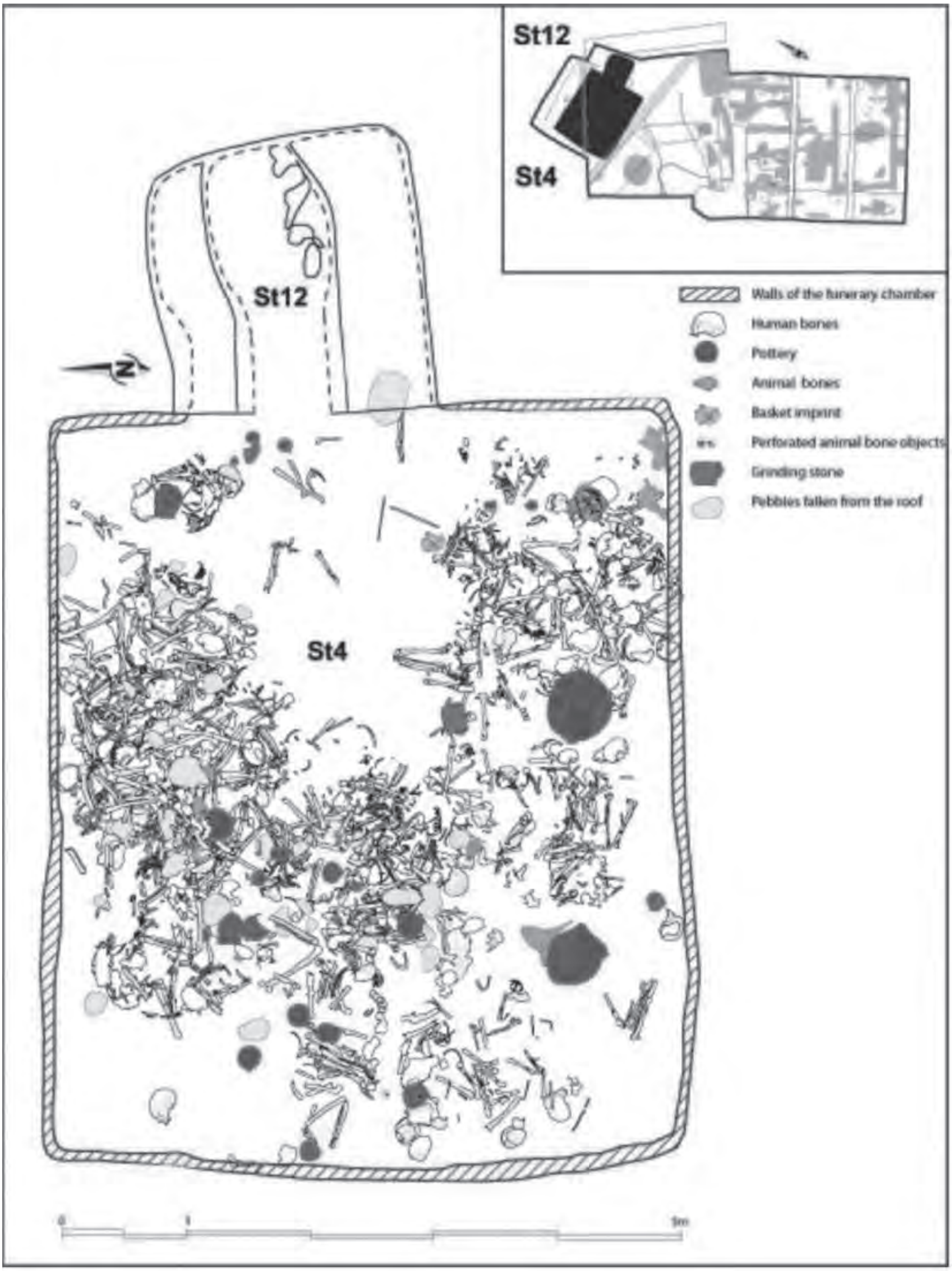


Fig. 1. Menteshtepe14C dates of the early Bronze Age period



'ig. 2. Menteshtepe. Plan of the Early Bronze age collective burial under the Kurgan

Fig. 3.

Mentesh Tepe. Early Bronze Age small symbolic burial.

1. bottom part during excavation;

2. the different stones found during the excavations (in the back: small pebbles from the cap, in the middle: the buried stone and around it and in the front the cist stones) (photo Mentesh Tepe Excavations)

Fig. 4. Mentesh Tepe. Early Bronze Age (Period IV) pits and burials

PHASE OF TRANSITION TO THE KURA-ARAXES CULTURE IN EASTERN GEORGIA

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The Caucasus, one of the centre of a producing economy, is the region lying at the Euro-Asian crossroads. The area has been serving as a connecting link of the old ancient cultures for millennia. Such contacts had become extremely strong since the 4th millennium BC, at the time when exclusively new, epoch-making changes were happening in the Caucasus. It is the period when there had already appeared the earliest metal objects and this remarkable event was followed by unprecedented economic and social changes. Scholars have called the period the Early Bronze and it happened to be the time when the Kura-Araxes culture stemmed from. The pre-existing Neolith-Eneolithic culture had as if disappeared giving way to a brand new and prominent archaeological culture that eventually spread over an enormous territory. Very soon the Caucasus became a substantial centre of metalworking. The territory is in an immediate neighborhood of the old ancient Near Eastern world and it is pretty natural that this promoted region of the world had played a certain role in the further material and mental development of the peoples inhabiting the Caucasus. This is why a problem of the Kura-Araxes culture is in the close organic relations with the origins and the ways of development of the pre-existent culture.

What had been happening in the eastern Transcaucasia before the turn of the Kura-Araxes culture?
A close examination of the Transcaucasian Early Farming period was started when there had already been unearthed Nakhichevan Kul-tepe 1. Nine point two meter thick cultural layer came to light after removal of an eight-meter- thick Kura-Araxes one and the excavator O. Abibulaev called it the “Eneolithic”. Similar artifacts belonging to the 4th millennium BC were uncovered in Mili and Karabakh valleys and they were dated by A. Jessen. Soon after several of new sites such as Shomu-Tepe, Toira-Tepe, Babadervish and Gargalar-Tepesi have come to light at Gandja-Kazakh district. Artifacts coming from these sites differ from those of Kul-Tepe. A group of similar habitation sites was uncovered in Kvemo (Lower) Kartli valley such as Shulaveris Gora, Imiris Gora, Gadachrili Gora, Araxlo etc and they were called as the sites of Shulaveri-Shomu-Tepe culture. Nowadays scholars quite properly ascribe the same culture to the period of Advanced Ceramic Neolith [Menabde M, Kighuradze T. 2001: 19-23]. O. Djaparidze believed that the culture of Shulaveri-Shomu-Tepe with its already established forms and substantial traditions, lacking any kind of pre-requisites, had supposedly arrived from the Asia Minor in an almost blank area of Kvemo (Lower) Kartli [Djaparidze O. 2006: 109]. T.Kighuradze thought that O. Djaparidze’s statement had contradicted to the presence of plant seeds, such as cereal crops, millet (Panicum miliaceum) and Sataria italica, coming from the sites as the plants had been quite common in the Caucasus and completely unknown in the Asia Minor world. He also pointed to an acculturated vine plant, domination of circular structures, absence of painted pottery etc [Menabde M. Kighuradze T. 2001: 21].

Shulaveri-Shomu-Tepe culture habitation areas are multilayer mounds created in the result of long established habitation at one and the same place. Shulaveri culture had been the only one of this kind in the Pre-Kura-Araxes setting during a certain period of time and scholars tried to find links between the two cultures that appeared a problem of an utmost difficulty. The only link, so to say, was circular structures of the Kura-Araxes period but the excavators saw that there only their foundations were circular and not the superstructures that were completely different. I. Narimanov explored new sites of the Early Farming period Ali-Kiomek-Tepe in Mughan valley in 1965 and later Chalagan-Tepe and Ilanli-Tepe lying in Karabakh valley. The sites were identified as the ones belonging to the stage that followed after Shulaveri-Shomy-Tepe culture. At the same time other team of scholars was excavating Leila-Tepe settlement which yielded the materials belonging to a completely different culture. High quality wheel-made pottery coming from this site was identified as the ceramics belonging to Ubaid culture [Aliev N. Narimanov I. 2001: 6]. Nowadays there are some more sites belonging to the same culture in Azerbaijan: Chinar-Tepe, Shomulu-Tepe, and Abdal- Aziz-Tepe. They are lying in Karabakh valley and their layers of Ubaid culture are very often covering the ones belonging to the earlier stages. Berikldeebi and a burial mound “Joram’s Gora” (near Kavtiskhevi village) uncovered in Shida (Inner) Kartli region of Georgia belong to Leila-Tepe culture. R. Munchaev considered that Leila-Tepe had belonged to Uruk culture and believed that it was the quest of metal ores that had been the aim of Uruk expansion in the Caucasus [Munchaev R. 2007: 8-9]. Sites of the Early Farming period came to light in Armenia as well and Tekhuta habitation area seems the most distinctive with the artifacts parallel to Leila-Tepe finds [Aliev N. Narimanov I. 2001: 7].

The Eneolith period sites have been explored in the north-east Caucasus. These are Ginchi, China, Regudja, Tialing in Chechnia, Shau Lagat, Mishtulag Lagat and Mardshadji Lagat in North Osetia [Chikovani G. 1998: 72-84].

T. Kighuradze had connected Sioni Early Farming period culture settlement to Tsopi one and identified them as so called “Sioni culture” [Menabde M. Kighuradze T. 1981: 28]. Sites of the same type Kvirias Tskali, Damtsvari Gora, Mtserlebis Mitsa, Shavtskala, Nadikari have been uncovered in Kakheti and Abanos Khevi, Bodorna, Akhali Zhinvali, Khertvisi, Chinti, Nichbisi, Kheltubani in Shida (Inner) Kartli regions of Georgia [Chikovani G. 1999]. Here also belong the sites lying in Kvemo (lower) Kartli: Arukhlo 6, Tsiteli Sopeli, Djavakhi, Abelia, Delisi. According to chronological and cultural characteristics of the sites just sited they are in a cultural unity to one another and make a transitional phase between the Sulaveri-Shomu-Tepe and Kura-Araxes cultures. At the same time the latter coexisted with the final stage of Shulaveri-Shomu-Tepe. Scholars point to certain contacts of Sioni culture to west Georgian Neolith-Eneolithic cultures [Djapariddz O. 2006: 271]. L. Nebieridze supposed that there might have been a certain Neolithic culture which should have been in close contact with the local western and central Transcaucasian Mesolithic period and Sioni culture was an advanced form of the previously mentioned Neolithic culture. O. Djaparidze believed in homogeneity of Sioni, the Aragvi river gorge, the Iori-Alazani river basin and west Georgian Eneolithic period settlements and supposed that Sioni culture had intruded in the eastern areas from west Georgia [Djaparidze O. 2006: 271]. At the same time there is an opinion opposing the previous supposition saying that Sioni culture is not the result of infiltration from the western part of the country. It is a result of cultural unity of western and central Transcaucasia at this very stage of development [Nebieridze L. 2001: 9].

Likewise the sites of the Kura-Araxes period, Sioni culture ones are common almost everywhere either in the valley floors or in the foothills and in the intermountain zones. The layers deposited on the habitation areas are rather thin that points to the uniformity of local lifestyle. There are sites where the layers of both of these cultures either cover Shulaver-Shomu-Tepe ones or they themselves are covered by the Kura-Araxes layers [Kighuradze T. 1998:19]. This kind of stratigraphy warrants a chronological place of the culture and it is the fall of the 5th and the earlier half of the 4th millennia BC. Radiocarbon dates coming from Berikldeebi (3955+3778 BC) and Leila-Tepe culture sites, namely Beiuk-Kesik and Poilo 1 (3960+3910 and 3940+3780). Radiocarbon dates coming from Zhinvali village settlement do not seem less interesting 4300+130 (calibrat± d 4937+322) [Chikovani G. 1999:8].

Scholars consider Azerbaijanian sites as belonging to the phase that follows after the Shulaveri-Shomu-Tepe culture and divide them into two groups. 1. Ilanli-Tepe/Alikiomek-Tepe and 2. Leila-Tepe cultural circles. The first group is considered as an earlier one that is strtigraphically attested at Abdal-Aziz Tepe settlement where Ilanli-Tepe layer is covered by Leila-Tepe one [Aliev N. Narimanov I. 2001:75]. Artifacts coming from Ovchular-Tepe and Khaladj are placed between the first and second layers of Kul-Tepe 1 and there are seen the elements of the Kura-Araxes culture among the artifact coming from them. At the same time Nakhichevan, Mughan and Karabakh Late Eneolith sites keep following the traditions of Shulaveri-Shomu Tepe culture while the sites of Leila-Tepe type strictly differ from them and they are attributed to the north Ubaid-Uruk cultural circle. There is nothing either pre-existent or subsequent of Leila-Tepe pottery in the Caucasus and scholars suppose that the culture moved to the north Caucasus and took part in the formation of Maykop culture [Aliev N. Narimanov I. 2001:94].

Mud brick-built habitation mounds had ceased to exist quite unexpectedly in the eastern Transcaucasia in the 4th millennium BC and the episode was explained by the scholars differently. Some of them believed that the climate had become arid and it was the reason. Others thought that it had happened because of exhaustion of the soil. According to one more opinion the reason had been destruction of communications and halt of earlier impulses coming from the mother land because the Kura-Araxes culture stoppered them. The excavators have quite pronouncedly stated that there is no sign of any contacts between Leila-Tepe group and Kura-Araxes culture. All the earlier habitation mounds had been abandoned for rather a long period of time but life continued well within Sioni cultural circle and there started a generation of the Kura-Araxes culture prerequisites. There is not any kind of firmly established conception concerning the origins of the Kura-Araxes culture among the scholars interested in the problem. They suggest that certain groups of population had moved from the south to the north Transcaucasia in the 4th millennium BC and this dislocation triggered the process of further development. In spite of the fact that certain characteristic features of the Kura-Araxes culture have turned up in the Asia Minor earlier cultures the impulses were so week that they seem unable to make a clear picture of a transitional process and it is rather impossible to consider them as a possession of intruded tribes. Pre-Kura-Araxes culture elements were uncovered in Mughan valley in the 1970s. The pottery, uncovered at the site, are mostly chaff-tempered that differ them from the pottery coming from Mili valley. There have come to light examples of polished pottery with long necks and globular bodies, basins with straight sides decorated with warts, lugs and relief ornamentation [Narimanov I. Makhmudov F.1976:88-94]. These Azerbaijanian finds and the artifacts coming from the first layer of Samshvilde site even made us to suppose that the sites could have been the basis from which the Kura-Araxeses culture had originally stemmed [Mirtskhulava G. 1975:66].

The Kura-Araxes culture is a new stage of development in the Caucasus and adjacent regions. Pottery developed further and acquired completely specific features. The Kura-Araxes period clay containers do not bear any signs of potter's wheel, the feature that had already been familiar in the Caucasian Eneolithic cultures, but at the same time it is almost impossible to imagine how to pot so exquisitely without any use of the equipment so important for potting. Agriculture and animal husbandry had been forming as the main activities of the local economic life, a practice of irrigation was developing, and the soil was cultivated twice in a year, in spring and autumn. As to the use of pulling power it is not based on logical conclusions any longer because there are not only clay models of wheels coming from the sites but also miniature ones of a two-wheeled Georgian-Caucasian cart [Mirtskhulava G. 2000:37]. Religion was becoming diversified and purposeful [Mirtskhulava G. 2005:100-107].

Nowadays scholars consider Kartli (Samsvilde 1st layer, Tetritskaro A layer, Khizanaant Gora E layer, Dighomi, Grmakhevistavi) and Kakheti (the Iori river Sioni, Gremi, Zemo Bodbe) region sites as the ones forming the earliest phase of the Kura-Araxes culture. The sites just mentioned have yielded the pottery with the earliest shapes distinguished with their archaic forms and potted in a slip-shod way but at the same time they bear features that have become diagnostic for the following stage of development. Namely, it is two or three layered fabric of pottery with polished surfaces, relief ornamentation etc. The containers of this earliest phase include examples not characteristic to the following to it Kura-Araxes culture on one hand but still there are typical earlier forms among them so common in the same Kura-Araxes on the other. It is worth noting that a pair of Eneolith period settlements that have remained extant in a form of three damaged pits have come to light while digging the pipe-line at the points of 74 and 77 km, in the vicinity of the same Tetritskaro district Samshvilde habitation area, in a distance of about two or three kilometers from it in 2004-5 [Mirtskhulava G. Demetradze I. 2006:131]. The pits have yielded pottery fragments and pieces of a large domestic animal's bones. A good size settlement Nachivchavebi dating to the same Eneolith period was explored at the point of 85 km of the pipe-line [Shatberashvili Z. Chikovani G. 2007: 230]. The area has yielded more than 40 pits and a burial. Four more burials belonging to the Kura-Araxes culture have been excavated next to them. The pottery coming from the Eneolith period pits are very interesting. These are typical artifacts characteristic to Sioni-Tsopi-Ginchi cultures but mostly with the features of the Kura-Araxeses. The pottery are pale and brown-grayish, spotted, well polished and if not typical Eneolithic shapes, decoration and relief zigzags resembling the artifacts coming from Samshvilde 1st layer and Chinti one could have easily considered them as similar to the ones belonging to Samshvilde 2nd layer and Samshvilde cemetery i.e. as the artifacts of the Kura-Araxes culture.

These finds, once and again, reinforce the opinion that Kura-Araxes culture had already been burgeoning within the area of the eastern Transcaucasia and generally within a cultural sphere of Sioni-Tsopi [Kighuradze T. 1998:6]. The latter (Sioni-Tsopi) has appeared as a certain substratum in the further formation of the Kura-Araxes culture

The problems connected with the genesis of the Kura-Araxes culture, fixation of the centre of its origination, determination of ethnical origin of the people who had created it and eventually became the bearers of the culture itself are extremely important and very interesting. The basin of the Kura (Cyrus) and Araxes rivers was considered as one of the main regions where a society of certain people had been creating the Kura-Araxes culture [Djaparidze O. 2006:287]. The earliest sites of this culture are concentrated in Kvemo (Lower) Kartli region of Georgia. At the same time, as we had already noted, the forerunner Early Farming culture materials include the examples characteristic to the subsequent Kura-Araxes culture pointing to the fact that the native Caucasian Eneolithic culture was eventually acquiring the features characteristic to the Kura-Araxes beginning from the earlier half of the 4th millennium BC. This is the moment that enables us to suppose that the Kura-Araxes culture had stemmed in the Transcaucasia with the implication of certain southern impulses [Djaparidze O. 2006:287; Mirtskhulava G. 1975:66] and later it resulted in an already established cultural and historical unity based on the Caucasian cultural entity bearing its own distinctive features either regional or local.

Scholars suppose that the tribes bearing the Kura-Araxes culture should not have been too contrasting from one another that in its turn eased infiltration of the both the culture and the population. R. Munchaev believed that the Kura-Araxes culture had been brought to the northern regions of the Transcaucasia from its southern parts and it was not only the process of spreading the culture itself but also opening up of new territories by the bearers of the Kura-Araxes culture [Munchaev R. 1975: 189-191].

And now emerges a pretty natural question: Who are the bearers of this original culture and is it possible to consider them as the progenitors of the modern Caucasian aboriginal population? O. Djaparidze assumed the presence of certain links between Kartvelian (Georgian) ethnic groups and the Kura-Araxes culture itself [Djaparidze O. 1961]. R. Munchaev supposed the presence of certain possibility that this 3rd Millennium BC surprising unity of the Transcaucasian and north-eastern Caucasian cultures, connected to one another with the Caucasian-Iberian language family, is the very basis of the Caucasian ethnic substratum [Munchaev R. 1975:410]. E. Krupnov believed that the Kura-Araxes culture had been developing in certain coherence in the regions of the Caucasus inhabited by Caucasoid anthropological groups of people that gave him an opportunity to suppose that the bearers of the culture were, so to say, far ancestors of the Caucasian aborigine population [Krupnov, 1964]. N. Marr had singled out the Kartvelian (Georgian) languages, added to them the north Caucasian and Mediterranean groups and declared all of them as the family of Japethian languages [Marr N. 1933]. A 19^{th} century linguist, the member of St. Petersburg Academy, P. Uslar believed that the Kartvelian (Georgian) and north Caucasian languages had been kindred ones. Later the statement had been held and eliminated by Iv. Djavakhishvili [Djavakhishvili Iv. 1937:622] and A. Chikobava [Chikobava A. 1979] who created a theory of the Iberian-Caucasian Languages. From this point of view there is one more, not less interesting, supposition belonging to a well-known 9th-10th century Georgian historian Leonti Mroveli [Grigolia, 1971] who believed in the unity of the Caucasian peoples and thought that they had been rooted in with Biblical Noah. It is worth noting that Georgian reality had given a rise to the birth of this idea [Djanashia S. 1952:238] which never lost its importance and is alive even today [Djaparidze O. 2006:68]. According to Leonti Mroveli's text included in the old ancient Georgian written record of "The Life of Kartli" the Caucasians' progenitors had come from Japheth. In the result of the Babel there sprung up various languages and Thargamos, together with his eight children, settled in the Caucasus. Chronologically it is the 4th-3rd millennia BC when, according to the same Leonti Mroveli, a stream of a genetically unified people came to the Caucasus from the south and settled in the territory among the Black and Caspian seas and northern Iran. This period of time coincides with the period of origination of the Kura-Araxes culture in the Caucasus. As for the geographical borders of the territory the distribution zone of the culture coincides with the territory occupied by Thargamos and his people.

Anthropological data attest to homogeneity and local roots of the old ancient Caucasian population. M. Abdushelishvili believed that the Bronze period population of the whole Caucasus had belonged to one and the same anthropological type [Abdushelishvili M. 1976:47] and modern ethnic groups of the Caucasians were the immediate descendants of the population that had inhabited the region in the most ancient times.

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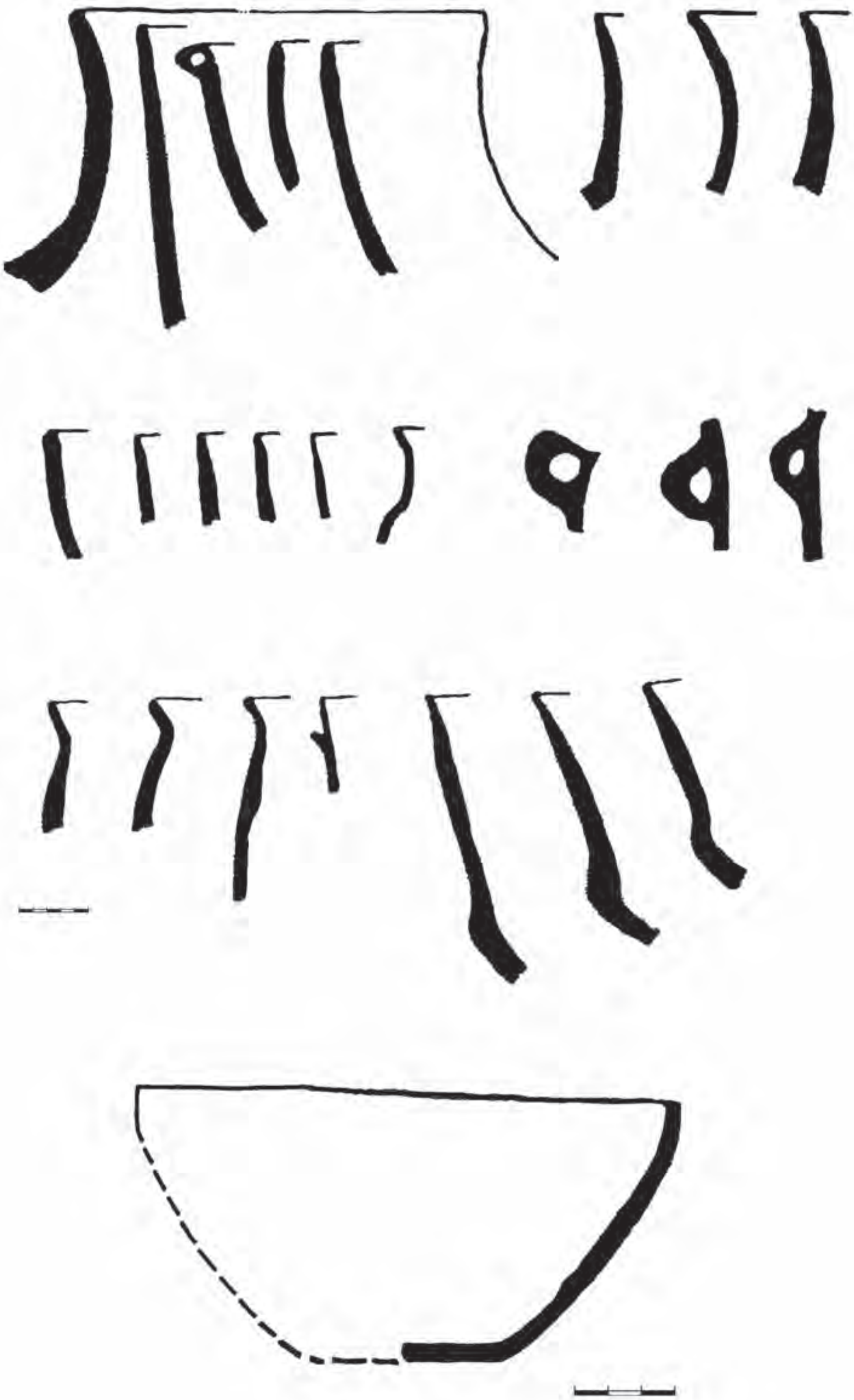
Description of Plates

Tab. 1 Samsvilde settlement 1st layer pottery

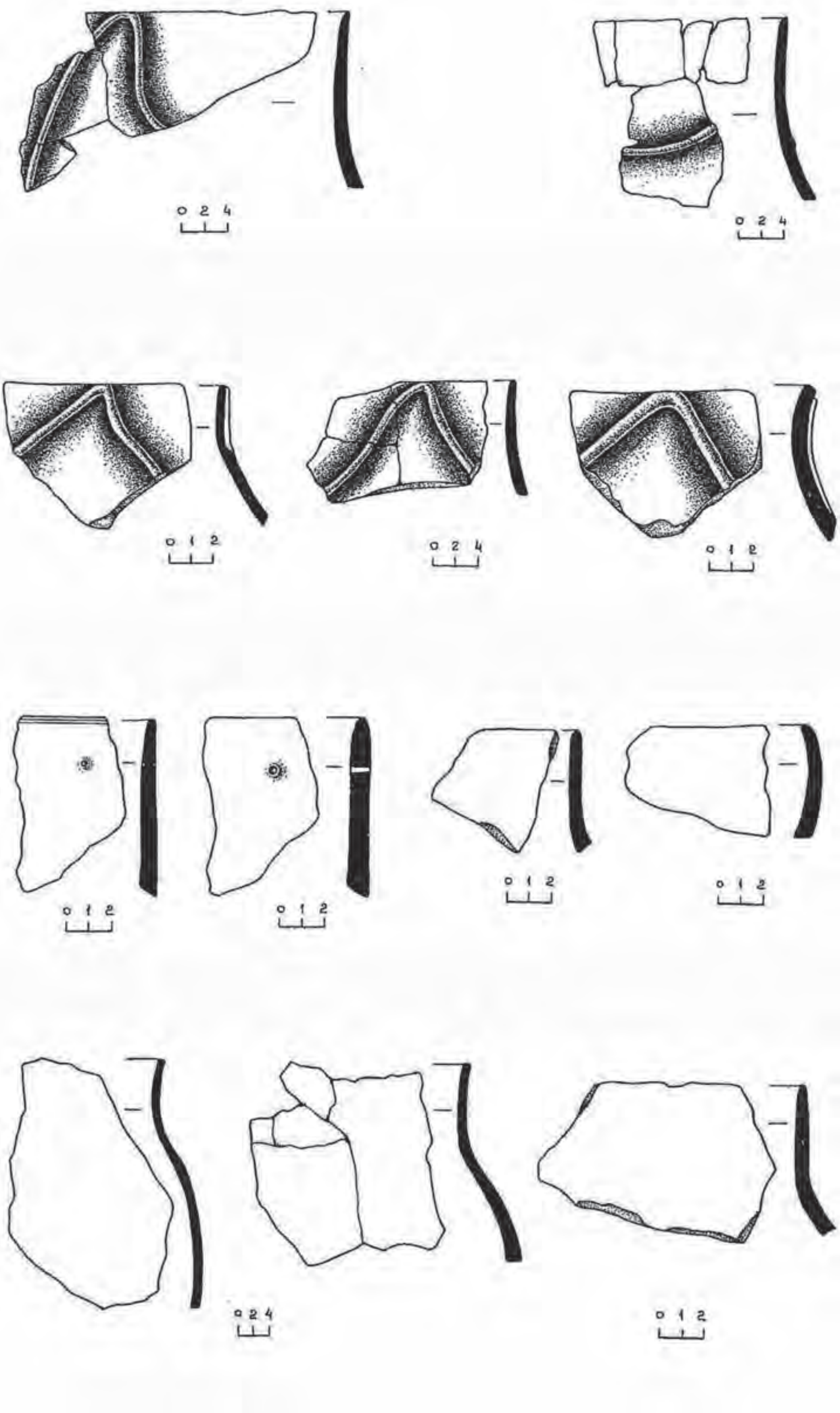
Tab. 2. Samshvilde Eneolithic period settlement pottery, 74th and 77th km of the pipeline

Tab. 3. Bodorna Eneolithic period settlement pottery

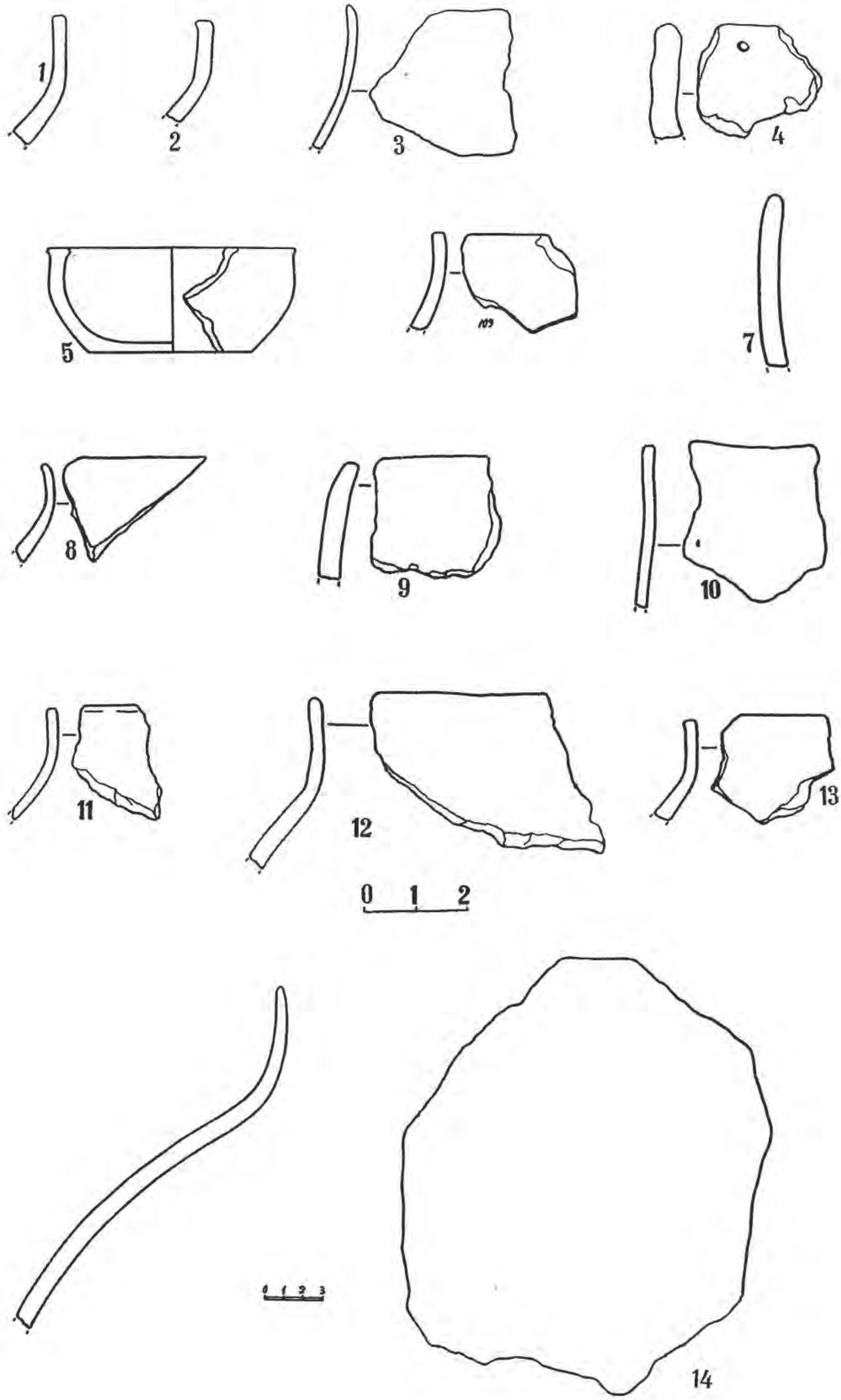
I



II



III



EXCAVATIONS AT METSAMOR

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The Metsamor archaeological site is situated in the Ararat Valley, 35 km southwest of Yerevan. It is placed at the edge of Taronik village quite close to the marshy sources of the Metsamor River. The exact historical name of the site is still obscure. The name "Metsamor" (from Old Armenian (Grabar) "big marsh") is rather conventional, just given to the site by the specialists after the Metsamor River.

The site occupies the territory of volcano conical hills formed round 150 000 years ago and the adjacent plane. Three prominent volcanoes are mainly singled out within the borders of the site. The highest one (Mets Blur) rises 27–28 m above the plane, whereas the Pokr Blur and the Karmir Karer tower 8–10 and 2–3 m respectively over it.

Being located between the Metsamor and Araxes rivers and having excellent land and water routes, this settlement periodically established close economic, cultural, political and ethnical links with numerous historical and cultural Bronze Age–Iron Age centres of both the Armenian Highlands and the Ancient Near East.

The first information referring to this site was recorded by Gh. Alishan, the Abbot of the Armenian Venetian Mkhitarist Order (Alishan 1890: 202). The first ever excavations at the site were carried out by archaeologist L. Barseghyan in 1959 –1962 (Barseghyan 1962).

In 1963, during the examination of the smelting waste found at the site, a geologist, K. Mkrtchyan, discovered arsenium and tin within the old remains of the bronze slag. This allowed the scientist to make preliminary assumption about the presence of an ancient smelting workshop on the spot. In 1965 a Metsamor expedition team was formed to verify this assumption, as well as other noticeable facts concerning this material culture. Archaeologist Emma Khanzadyan was the unchallenged leader of the team in 1965–2007 (Tab. 1).

In this course, the expedition excavated and examined the remains of the Early Agricultural site of the Early Bronze Age period (the 2nd half of the 4th mill. BC–the 1st half of the 3rd mill. BC) on the upper part of the Mets Blur and the adjacent planes. Those remains comprised the round houses with hewn bases and upper walls built of adobe (Chanzadjan 1980: 34–40; Dézélus 1993: 20–21). Numerous artifacts of the Kura–Araxes culture (obsidian and flint tools, black polished ware, fragments of hearth stands, stone burnishers, mortars, millstones, bone implements, etc.) were unearthed here (Tab. 2). A clay three-dimensional figurine of a squatted naked woman with pointed hat of sharp ends (probably, horns) is quite notable among the findings (Tab. 3, fig. 2).. The latter attests to the ritual character of the figurine and makes it possible to compare the Ancient Near Eastern goddesses (Ishtar, Lilitu) and the feminine divine images. Among the Kura–Araxes cultural artifacts the funeral of a 5–6 year-old child uncovered within the borders of the settlement are especially remarkable. A golden hairpin with one and a half twist, which is very typical for the Early Bronze Age funerals of the Armenian Highlands, South Caucasus and the Ancient Near East.

The further excavations at Mets Blur and the adjacent territories proved that this site with a settled population fell into decay in the 2nd half of the 3rd millennium BC, circa 24th–23rd cc.

BC, and the territory in question was mainly abandoned for about 400 years. Only from time to time it was temporarily inhabited by the Middle Bronze Age (mainly Trialeti–Vanadzor) pastoral, nomadic tribes and groups.

The excavations carried out at Metsamor site in 1970–1980s indicate that the ethnic bearers of Sevan – Artshakhian and Karmir-Berd cultures again inhabited the settlement from 14th–13th cc BC on, i. e. in the Middle Bronze Age period. According to E. Khanzadyan, in this period the settlement occupied about 20 ha. It was enclosed by high outer walls flanked by the grave field. The main occupations of the natives were farming, cattle breeding, hunting, stone-working. They were skilled builders and produced various types of pottery, bronze tools and weapons, bone implements, ornaments, etc. (Khanzadyan 1987: 12–13) (Tab. 4). The Middle Bronze Age graves were mainly on the ground level and had stone box structure. The main funeral custom was inhumation; the corps was put either on the right or on the left side. Painted, as well as black polished pottery with stamped geometrical ornaments comprises the major part of the grave goods (Khanzadyan 1995: 5–37, plates 1–12). The detailed examination of the Middle Bronze Age layer in Metsamor settlement proves that in the period from 19/18th cc up to the 16th c BC the settlement was reconstructed and beautified at least five times. Particularly, in this period the rock-cut underground hall was constructed.

The Metsamor settlement reached its full flower in the Late Bronze period (16th/15th cc–13/12 c BC). The citadel was enlarged, the outer walls were fortified, some large sanctuaries, administrative and utility rooms were constructed. This is the period when a huge bronze-smelting workshop was founded here with multifunctional industrial complexes of ore processing, ore dressing and smelting. It is indicated by the discovery of smelting furnaces, copper slag, numerous clay and stone moulds, clay crucibles and other bronze-smelting accessories. In all likelihood, the production of the Metsamor bronze-smelting workshop was in popular demand in both domestic and Ancient Near Eastern markets. The Egyptian scarab stamps (Tab. 6, fig. 5,6) and Kassite (Tab. 6, fig. 4) and Mitannian cylinder seals found in the Late Bronze Age structures and contemporary rich tombs of the site attest to this statement. There are cuneiform and hieroglyphic inscriptions on these objects mentioning the names of Egyptian Pharaohs of the New Kingdom Thutmose III (1479–1425 BC) and Ramesses II (1279 –1213 BC) and Kurigalzu II of the Kassite Dynasty of Babylon (ca. 1346–1324 BC). Among the findings from the Late Bronze Age burial mound № 8 noteworthy is the sardonyx figurine of a frog with a Middle Assyrian cuneiform inscription mentioning Ulam - Burariash, the son of Burna - Burariash, king of Kassite Dynasty of Babylon (Tab. 8). On the stomach of the frog there is a short inscription deciphered as “1 *siqlu*”. Siqlu is a Near Eastern weight unit, approximately equal to 8, 4 ~ 8, 6 grams. The sardonyx frog weights 8, 64 grams, thus it might have been used as a weight. Such tiny units were generally used to weight precious metals – gold, silver or tin. It is not excluded that the rulers of the Late Bronze Age Metsamor, taking into consideration the current political and military situation, joined the alliance with Egypt, Mitanni and Kassite ruler of Babylonia against the Neo-Hittite kingdom (Piliposyan 1998: 101-102; Piliposyan 2000: 43-44). Thus, it also entered the sphere of Mesopotamian system of measurement. In this period, golden attributes of power and jewelry became unprecedentedly widespread in Metsamor (Tab. 9, fig. 1-7). This is attested by the findings from local rich Late Bronze Age burials as opposed to the previous and following periods. Most probably, part of the gold was given by the allied countries in response to commitments of the treaty of alliance.

The unprecedented expansion of bronze-melting, as well as the hundreds of various tin objects (Tab. 7, fig. 1-3) discovered in the burial complexes of the Mid-2nd millennium BC indicate that as there were no local deposits of tin, at this stage Metsamor started participating in Ancient Eastern transit trade of tin and imported some amount of tin for the industrial purposes from the exporting areas. Since the Asian Minor route of tin trade was blocked by the Hittites, it is most probable that tin was imported either from the Eastern Mediterranean area (namely Levant controlled by the Egyptians) or Central Iran (in all likelihood, from the Badakhshan).

To all appearance the economic and cultural rise of the site continued also in the Iron Age (12th/11th c–9th/8th c BC). At this stage, the territory of the citadel was again enlarged and fitted out with the second row of outer walls. Outside the citadel city quarters were formed. This attests to the effect that the 2nd mill. BC is characterized by the active urban processes and Metsamor gradually evolved into a city with appropriate administrative, religious, economic and military quarters. In the judgment of some of the explorers, Metsamor might be one of the administrative centres of Etiuni country located in the Ararat Valley and adjacent territories. The social and economic character of the developing city also changed in the 11th – 9th cc BC. At this stage, in the southern interspace between the outer walls numerous stone constructions were built. During the excavations of one of those structures in the late 1990s archaeologist E. Khanzadyan unearthed a burnt iron-working workshop with the artifacts characteristic of that period – blowers for the furnaces, the remains of the ashes and half ton of iron slag. These findings attest to the effect that the smiths of Metsamor gradually retrained to forge iron instead of casting bronze to fit the times. Iron ware became dominant in the economy, everyday life and military science.

Judging by the results of the archaeological studies the unassisted political, economic and cultural rise of Metsamor continued up to the 1st half of the 8th c BC, a period, when by the efforts of Arguishti I the major part of the Armenian Highlands (including the Ararat Valley, the central part of Etiuni) was incorporated into the Van Kingdom (Urartu). In the 1st half of the 8th c BC the Urartians made some reconstructions within the Metsamor settlement. Thus, the outer walls of the citadel were strengthened with new massive buttresses. The excavations carried out in the northern part of the citadel indicate that the Urartians settled down here and built a peristyle yard in the northern part. This is also testified by the Urartian tomb excavated in the Metsamor grave field (Khanzadyan and others 1973: 175–185, fig. 170, plates XLII–XLIII). This is also attested by the circular basalt and hard tufa plinths thrown into the underground building, as well as numerous shards of Urartian ware found in this area. Nevertheless, the presence of Arguishtihinili, a city built by Arguishti I in 776 BC, in this area prevented Metsamor from regaining its importance in the Ararat Valley. These functions were taken up by Erebuni (782 BC), Arguishtihinili (776 BC) and Teishebaini built in the mid-7th century BC. Metsamor remained as a town of local importance up to the Achaemenid and Antique periods and, judging by the results of the study of the archaeological findings, survived as a small settlement up to the end of the 18th c.

P. S. In 2011, four years after the death of Archaeologist E. Khanzadyan, the excavations were restarted by a new Metsamor archaeological expedition (Piliposyan and others 2013: 27–28). The team of the Institute of Archaeology of the Warsaw University joined the expedition. Currently the co-leaders of the Armenian–Polish joint archaeological expedition are Prof. A. Piliposyan and Prof. K. Jakubiak. In 2011–2013 the territories of the tombs excavated in 1970–2005 were cleaned out, the inner side of the citadel intended for the further excavations was put to rights, as well as two sondages were made in the northern part of the site – in the citadel and the city quarters. In the citadel where the Polish archaeological team works, remains of huge hard tufa walls were discovered. Under those walls, successive layers of Early Iron Age above the Late Bronze and Early Bronze periods with corresponding material culture are quite noticeable. In the city quarters, the Armenian expedition revealed the successive strata of the Antique, Achemenid periods and Early Iron Age, among which the latter is the most remarkable one (Tab. 2). In the Early Iron Age layer, fragments of hewn stone buildings damaged in the fire were unearthed. Under the carbonized remains of the burnt-out and collapsed roof, broken black polished pottery without any missing pieces that used to be placed on special stone pedestals, fragments of a rectangular cultic object and other artifacts have been preserved. In October–November 2014 the excavations at the site will be continued.

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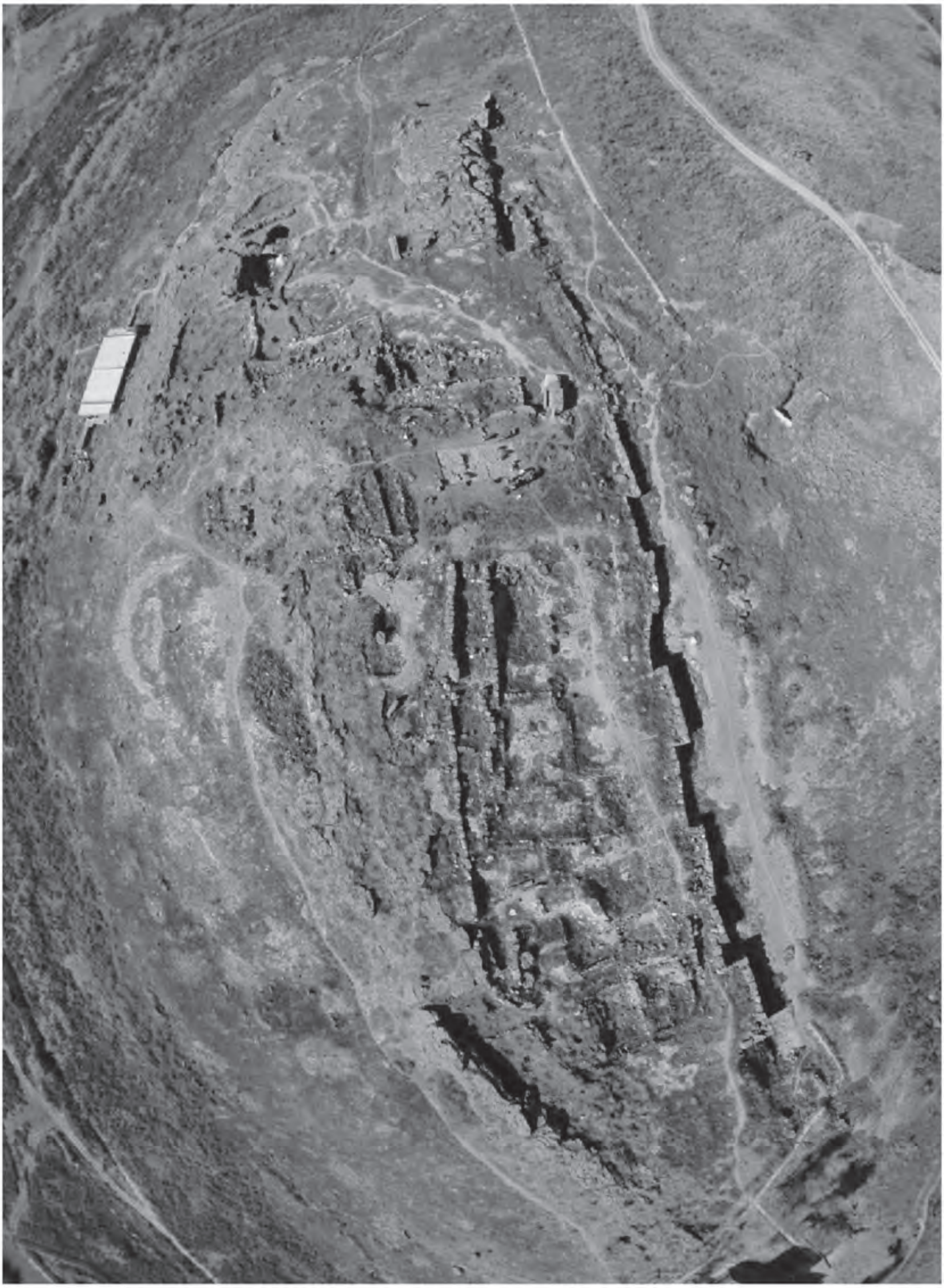


Tab. 1 General view of Metsamor citadel

Tab. 2 Excavations in city quarters of Metsanor

1 2 3 4 5 6 7 8

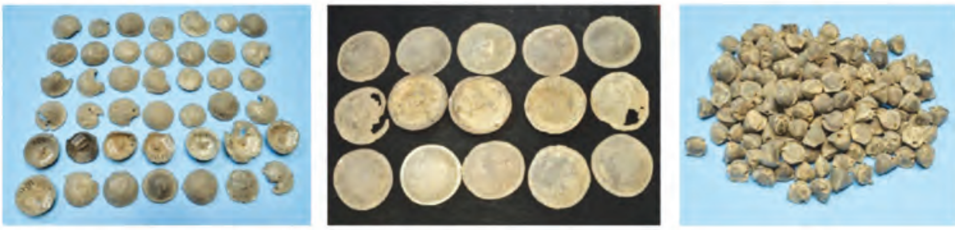
Tab. 3 Early Bronze Age (Kura-Araxes culture) artefacts

1 2 3 4 5 6 7 8 9

Tab. 4 Middle Bronze Age artefacts

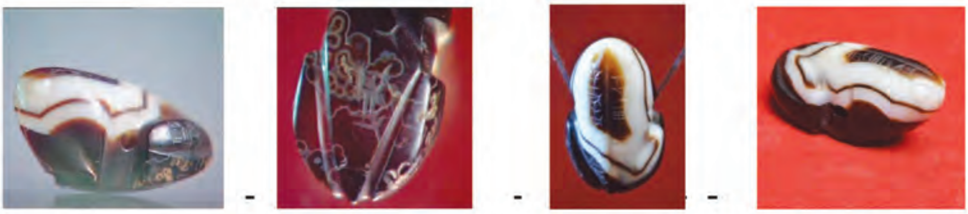
Tab. 5 Late Bronze Age (Lchashen-Metsamor culture) pottery

Tab. 6 Late Bronze Age stamp and cylinder seals



1 2 3

Tab. 7 Late Bronze Age tin objects



Tab. 8 Sardonyx frog figurine. A weight of the Babylonian King Ulam-Burariash, son of Burna-Burariash

1 2 3 4

5 6 7

Tab. 9 Late Bronze Age and Iron Age gold objects

THE PROBLEMS OF KURA-ARAXES CULTURE IN THE LIGHT OF RECENT ARCHAEOLOGICAL EXCAVATIONS IN NAKHCHIVAN

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A group of monuments of the Kura-Araxes culture that covered the greater part of the Caucasus and Central Asia in the 4^{th}-3^{rd} millennia B.C is located in the territory of Nakhchivan, which served as a bridge between these two geographical destinations. The site Kultepe I that started to be studied in 1951 by O.A.Habibullayev shows the importance of this region in the specification of historic chronology of archeological cultures spread in the Southern Caucasus.

Nakhchivan borders upon the Araxes River in the south and southwest, and the Minor Caucasus Mountains in the north and east. The Rivers Arpachay, Nakhchivanchay, Alinjachay, and Gilanchay flowing southward run into the River Araxes. The Araxes valley consists of a narrow steppe area, while the rest of the territory consists of the foothills and mountainous areas. The geographic conditions predetermined the nature of monuments.

Numerous settlements have been discovered in the territory of Nakhchivan, such as Kultepe I and Kultepe II, Makhta I and Makhta II, Sadarak, Arabyengija, Khalaj, Ashagy Dasharkh, Ovchular Tepesi, Shortepe, Shahtakhty, Gulaly Tepe, Plovdag, as well as burial monuments such as Garabulag, Ovchular Tepesi and Hornu. Among these monuments Kultepe I and Kultepe II, Makhta I and Makhta II, Sadarak, Ashagy Dasharkh, Garabulag kurgans, as well as graves at Ovchular Tepesi and Hornu have been studied.

At Kultepe I the Kura-Araxes cultural layer is 9.5 m thick, at Kultepe II -6.8 m thick, at Ashagy Dasharkh -7.8 m thick, and at Makhta I is 4.6 m thick. The total thickness of the Chalcolithic and Early Bronze cultural layers at Ovchular Tepesi is to 1.5-2 meters.

Kultepe II is located at 965 meters above sea level, Ovchular Tepesi - 906 meters, Makhta I - 803 meters, and the necropolis Hornu at 2,300 meters above the sea level.

Early Bronze Age Nakhchivan monuments have common and distinctive traits.

At Kultepe I, Chalcolithic layers have rectangular and round constructions put separately, but in the Early Bronze layers they are adjoined to each other.

Round houses were discovered at Kultepe II. Mud bricks were used for the construction of these houses. The houses were built on the earth's surface and had no foundation. The inner floor was plastered in a thick layer.

At Ovchular Tepesi Early Bronze Age buildings have been excavated. This is a round house. The foundation was made of stones. There were bricks at the stone foundation of the round house.

There were also household storage bins among Early Bronze constructions at Ovchular Tepesi. The storage bins were between the round houses beneath the living surface. Remains of animal bones are usually found inside of such bins.

Buildings excavated at Makhta I are mostly round and rectangular houses made of mud brick and cob. Only mud brick was used for the construction of some walls. Cob was used at some of the cross walls. A round hearth commonly seen in Early Bronze buildings at other site was installed inside of each roundhouse.

Researches carried out at Early Bronze Age sites confirm that the forms of houses and outhouses usually depended on the peculiarities of location of a monument and on the availability of building materials.

Research of Makhta I confirms that from the historical period of Early Bronze Age round houses and rectangular houses in some settlements were built near one to another. Sometimes, round houses were adjoined by rectangular outhouses.

Axes, knives, needles, pendants and other metallic items dating to the Early Bronze Age were discovered at Kultepe I, Kultepe II, Makhta I, Ovchular Tepesi, and Ashagy Dasharkh.

During the excavations in Makhta I has been found a stone mold which was connected with the metal production including hearth for preprocessing metal casting. Apart from clay molds relating to the Kura-Araxes culture, we found at Makhta I stone mold which was practically impossible to transfer anywhere. Casting of several axes on the stone mold is the evidence to series of production of metal implements at the settlement of Makhta I.

Early Bronze Age ceramic wares in Nakhchivan have sand and grit temper. In Ovchular Tepesi, Kultepe II and Arabyengija were used chaff-tempered clay, too.

Early Bronze Age ceramic wares were grey, brown, black and red polished. Polishing is characteristic for many ceramic wares in the mid and late stages of this period. In some cases a grey core is visible. Black vessels can be classified into the following groups:

The first group includes vessels like cooking pots. The black color of the vessels was achieved by burying the pots in ashes and firing them in a smoky atmosphere. Though much time has passed, the soot is still visible.

The second group includes jugs, bowls, jars, pot stands etc., that were painted with black color.

The third group includes black vessels. This type of vessel is frequent in the sites dated to the IV-I millennia BC.

Spectral analysis of the ceramic wares from Kultepe I and Makhta I confirm that the color of the vessels depends on the content of the clay. While analyzing it became clear that there is high concentration of iron and lead.

By the end of the last stage of Early Bronze Age red polished vessels became common. Only bowls and little jars with red color were present among the ceramic wares in the ancient sites of Nakhchivan.

One of the characteristic features of Early Bronze Age ceramic wares is semi-circular handles or lugs. This type of handle was made by applying a circular lump of clay to the vessel. To make the handles firm the ancient potters made incisions on the vessels attaching the lug. Though these handles underwent changes in different stages of Early Bronze Age they have still kept their general form.

In other stages of development the bases of these handles become oval. The vessels decorated with such handles were excavated in the early periods of the Bronze Age at Kultepe I and Kultepe II in Nakhchivan.

In the third stage this type of handle was common at Makhta I, and in the upper levels at Kultepe I and Kultepe II. It is interesting to observe that these handles in terms of their shape resemble the ox nose.

In the fourth stage semi-circular handles were rudimentary. These types of handles were found at the sites relating to the last stage of the Kura-Araxes culture. There are many handles in the first and second horizon from the surface at Makhta I. At the end of Early Bronze Age, ceramic wares were characterized by tubular lugs with one vertical perforation on the rim. It is interesting to observe that this type of handles originated during the Early Bronze Age, but then they were rudely spread at the Late Bronze and Early Iron Age sites. In most cases bowls have such handles at all stages of the Early Bronze Age.

There are circular dimples or triangular holes on the upper part of Nakhchivan lugs during the Early Bronze Age.

In the Early Bronze Age potters used the following methods to manufacture vessels:

Vessels that were manufactured by pressing into the middle of a circular lump of clay are not symmetric. In most cases these are small and coarse vessels. A large number of such vessels are found in the beginning of the Early Bronze Age and they resemble the vessels of the Chalcolithic period.

Medium or large vessels were manufactured according to a different method. Ancient potters overlapped clay strips and smoothed them both inside and outside the vessel. In order to make the vessel solid the strips were laid so that one strip was covered with the hollow of the other.

Vessels manufactured on potter's wheel belong to the third group. Some pottery revealed at Kultepe I and Makhta I were wheel made vessels. There were concentric incised circles on the bases and inside walls of the vessels left by potter's fingers. Traces of a wheel can be observed on the colored rims of the vessels.

Pottery vessels manufactured on rough cloth form the fourth group. Traces of cloth are visible on the inner surface of a potsherd found at Kultepe II.

Most of the Early Bronze Age vessels were decorated with incised combed lines. Combed lines in different directions were probably used to smooth junctions on the vessels. The vessels of the second stage have combed incisions that were decorative elements.

In the third stage the rims and necks of the vessels were decorated with combed incised ornamentation.

Analyses of material culture from Nakhchivan sites confirm that some vessels were made by one and the same potter. So specialized craftsmen worked as potters and they met the demands of all the members of tribes.

The Early Bronze Age vessels that have simple decorations concern to this type of decoration. Definite parts of the vessels (rims, necks from the inside) have combed incised decoration in the last stage of the Early Bronze Age and differed from the ceramic wares of previous periods for neater making.

The Early Bronze Age vessels were decorated with incised ornamentations, dimples, depressions, etc.

Some vessels were circled with stripes of clay. In some cases they were decorated with incisions or finger-tip impressions. In most cases large vessels were decorated with such ornamentation. They resemble snakes or animal horns.

Decoration motives of ceramic wares of the Early Bronze Age in Nakhchivan can be divided into the following stages.

Spiral decorations are very frequent in the Early Bronze Age vessels in Nakhchivan.

In the last stage of the Early Bronze Age spiral decorations were made in different ways. It’s interesting to observe that in addition to spiral decorations there appeared incised spiral decorations and their compositions too.

Decorations with geometric incisions are often observed in the Early Bronze Age. They were done on wet clay with a pointed tool. In some cases this type of decoration appears on burnished vessels. Such decoration appears on the neck of bowls, jars etc. Decorations in geometric motives like triangular, rectangular, diamond-shaped, straight lines are frequent in the Early Bronze Age.

Hearths occupy an important position among Early Bronze pottery of Nakhchivan. Apart from round braziers, horned shape constructions, there have also been identified various forms of horseshoe shape hearth constructions. Makhta I, is distinguished for a variety of such constructions.

Other archeological findings at Nakhchivan archaeological sites are miniature vessels, and small clay figures of humans and animals. It is interesting that these figures are sometimes found not throughout the excavated area but only inside some houses.

Though the Early Bronze Age ceramic wares in Nakhchivan have general characteristics, each of the sites and cultural layers differ from the other. It is possible to establish the chronology of the site just on the basis of these characteristic features.

The stone and bone tools which discovered in the Early Bronze Age remains of Nakhchivan are identified with finds from different remains of the same period, and depending of time we couldn't talk about it generally.

Analysis of specific aspects of the construction and architecture of Nakhchivan's Early Bronze Age monuments and archeological materials leads to the following conclusions:

First, each settlement was initially built at a specific altitude, in compliance with its own economic needs. Settled populations used to live along rivers while semi-nomadic people lived in the Caucasus foothills. Round braziers stationary hearths found at Kultepe I, and Kultepe II and Makhta I sites were not found at Ovchular Tepesi. That's no hearths and small-sized pots were found inside Early Bronze Age Ovchular Tepesi houses suggests that people who lived there were engaged in semi-settled cattle-raising and returned to Ovchular Tepesi in the hot summer months only.

Second, despite the existence of common construction methods, each of the settlements is also distinctive, manifesting local traditions.

Third, compared to the Chalcolithic period, when there were no distinctions among construction methods and equipping of houses in each settlement, in the Early Bronze Age every house had specialized functions. The excavated houses, various equipment at Makhta I confirms that our assumption is true. At the same time, a sanctuary excavated here confirms the existence of common temples.

None of the studied Early Bronze monuments of Nakhchivan was fully preserved. Graves at Ovchular Tepesi and Hornu happened to be studied after they were destroyed. While at Garabulag Late Bronze burial mounds were destroyed and Early Iron Age graves were built on them.

Analysis of a carbon-14 sample taken from a depth of 8.5 meters at Kultepe I dated to 2930 BC. Carbon-14 sample from upper layers of Kultepe II dated to 3335-2093 BC; samples from lower layers dated to 3316-2931 BC. Marks found at Makhta I also support this date. This type of marks remained in use at neighboring sites until 3200 BC. As the cultural layer at Makhta I continue at least 2.5 meters deeper from the layer where the sample for analysis was taken we suppose that the Early Bronze Age began in the first half of the 4th millennium BC.

Researchers date the ancient settlement at Khalaj to the first half of the 4th millennium BC and the settlement at Damlama to the second half of the 4th millennium BC.

Researchers note that the settlements at Ovchular Tepesi and Damlama chronologically correspond to two upper layers of Kultepe I, i.e. the Late Chalcolithic and Early Bronze Ages.

Investigation of Ovchular Tepesi Chalcolithic pottery indicates that some of the vessels contain vegetable inclusion, chaff and fine sand in the composition of clay. The appearance of fine sand in the clay is most likely a sign of the Early Bronze Age. On the other hand, the forms of some of the vessels, especially bowl-shaped, resemble Early Bronze Age bowls. Instead of cone-shaped vessels of Chalcolithic Kultepe I vessels of Ovchular Tepesi include primitive semispherical handles, evidence to the fact that the Kura-Araxeses culture emerged from the preceding Chalcolithic culture.

Ovchular Tepesi is essentially related to early Kura-Araxes culture. Pottery of the Kura-Araxes culture was found under the floor of a Late Chalcolithic house at Ovchular Tepesi. This pottery includes part of the glazed red-black jug, fragments of bowls and some typical ceramic vessels of the Kura-Araxes culture.

The dating of these findings can be identified through stratigraphic and radiocarbon method. The pottery typical for the Kura-Araxes period was found in two construction layers dating back to the Late Chalcolithic period.

Two radiocarbon analyses of the upper, lower layers are indicative of the same dating: 4230-3940 BC. This dating indicates their belonging to the same period.

The earliest ceramics of Kura-Araxes culture in the Caucasus and in surrounding territories were found exactly at Ovchular Tepesi and date back to the end of the 5th millennium BC. It is interesting that these findings were discovered at Ovchular Tepesi in developed form, with no traces of their initial forms.

But whether Upper Chalcolithic and Kura-Araxeses communities coexisted in the territory of Nakhchivan remains unclear. Though the discoveries confirm the coexistence of both communities at the regional level, no their coexistence in the same area can be alleged. No single Kura-Araxes house dating back to the end of the 5th millennium has so far been found at Ovchular Tepesi. For this reason, it would be appropriate to speak about the joint existence of both communities.

As a result of development of cultural-economic links between highly-developed tribes of the Middle East and tribes residing in the territory of Nakhchivan in the second half of the 3rd millennium the Kura-Araxes culture reached its apogee.

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VII

INFLUENCE OF TECHNOLOGICAL ANATOLIAN TRADITIONS SMELTING ANCIENT TIN BRONZE ON THE DEVELOPMENT METALLURGY III MILLENNIUM BC ON THE TERRITORY OF AZERBAIJAN

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Problem ancient origin of tin, which located in a part of ancient bronze of Azerbaijan, is one of the most obscure chapters in the history of metallurgy of Azerbaijan.

Metallurgy on the territory of Azerbaijan linked with the development of metallurgy on the Caucasus. Therefore, a review of possible deposits of tin should be begin with the Caucasus.

Iessen A. A. to the tin-bearing areas of the Caucasus includes the following areas: Kartli, Imereti and Borchali areas (Georgia), as well as in the West Azerbaijan, between the villages of Allahverdi and Tartar river, river Shemkir near Shakhdag and granitic massifs between Dashkesan and Gedabey. He believes that these areas can discover tin stone cassiterite, as well as the opening of primary deposits of tin (Iessen 1935: 103). However, this has not been confirmation in further of research geologists.

In Georgia tin ore installed in about 20 different locations. They are located in Svaneti Upper Racha, Abkhazia, Adjaria and near Dzirula granitic massif (Bejanishvili 1958: 94-96).

Primary, the main display of cassiterite in Georgia discovered in three places Abkhazia river gorge Zemoshhaparti, on the northern slope of Aslanhera, in the tract, near the West Ankvaty mountainside Ahupach. In these points, not only found cassiterite, but slag containing tin, indicating an ancient smelting tin in these locations.

Display of cassiterite found in the gorge Kelasuri, river gorge Amtkeli in Svaneti (Negara river gorge and its right tributary), in Guria (in the gorges and rivers Bzhuzha Vakisdzhvaris - Tskali). Existing in all these places cassiterite display as well as finding the slag residues indicates that in Georgia, these deposits were use. However, these displays are thin, and exhausted (Tavadze - Sakvarelidze 1959 53, 102).

In the geological publications there is information about the display of tin on the North Caucasus in Kabardino-Balkaria. It is Tirniauz deposit of cassiterite in the granites rocks in association with wolfram and molybdenum ores (Minerali - spravochnik, 1960: 271-273).

Arapov Yu. A. notes that cassiterite, the North Caucasus; when necessary could easily be used for the needs of bronze metallurgy Caucasus (Arapov 1945: 1-28). However, if this deposit was used in the III or II millennium BC in the North Caucasus tin bronze would have, appear earlier and the number of bronze artifacts from the archaeological monuments of North Caucasus must should have been more than from monuments of Azerbaijan. Because ancient mines of tin (Asia Minor - Kestel, Iran - Deh-Hossein), were located nearness to the territory of Azerbaijan, (Gasanova 2009: 510). In fact, we observe the opposite picture. In Azerbaijan, the artifacts of tin bronze more than and appeared earlier than in the North Caucasus (Gasanova, 2007: 94 - 96). It's hard to argue that this deposit by using in the early (III or II millennium BC) period.

Display of tin found in western Azerbaijan in the Nakhchivan and in ores Allaverdi - Gafan areasş In the same area in the sediments of the river Axtev found sulfide ore. Its analysis (in weight%) showed the following:

Pb	Cu	As	Sn	Sb	Ni	Fe	Ag	Co	Zn
10.0	10.0	10.0	3.0	2.3	1.75	0.85	0.15	0.15	0.03

The analysis is made in the laboratory of the Institute of Archaeology RAS, a method of quantitative spectral analysis (Karapetyan 1982: 207 - 208).

It should be noted that the early use of low-powered tin from local display is somewhat problematic, as cassiterite is in granites intrusions, that making it difficult to extract. These minor display have no industry meaning, they have only the mineralogical interest.

TABLE 1

The results of quantitative spectral analysis of metal artifacts from archaeological sites of Azerbaijan, dating to the first half and the middle of the III millennium BC.

№	The name of the object, the weight in grams	Content of elements weight %											Dating	Type of alloy
		Sn	Pb	Zn	As	Sb	Ag	Au	Bi	Ni	Co	Fe		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Hook 2.15 g.	0.99	0.02	0.05	1.5	0.05	0.005	0.02	0	2.4	0	0.2	3000-2500 BC	Cu – Ni Sn - As
2	Axe 175 g.	0.85	0.05	0.3	1.7	0.2	0	0.005	0.01	0.05	0	0.15	2800-2400 BC	Cu-As- Sn
3	Suspension 2.2 g.	0.52	0.3	0.02	0.3	0.1	0.05	0	0.05	0.02	0.001	0.12	middle of the III millennium BC	Cu - Sn
4	Suspension 1.1 g.	0.37	0.3	0.3	0.1	0,1	0.03	0.1	0.01	0.05	0.002	0.15	- « -	Cu - Sn
5	Dagger 78 g.	3.2	0.16	0	1.03	0.02	0.16	0	0	0.089	0.002	0.64	- « -	Cu -Sn -As
6	Spears head 36 g.	3.35	0.04	0.01	0.64	0.2	0.002	0.05	0.03	0.007	0	0.2	- « -	Cu–Sn-As
7	Awl 3.2 g.	3.12	0.27	0.12	0.9	0.05	0,	0.05	0.01	0.04	0.004	0.1	- « -	Cu-Sn-As
8	Ingot 7.5 g.	1.55	0.77	0.1	0.03	0.02	0	0.05	0.007	0.003	0	0.33	- « -	Cu-Sn-Pb
9	Knife 25.7 g.	2.82	0.72	0.30	0	0,2	0.005	0.004	0.03	0.01	0.005	0.35	- « -	Cu-Sn-Pb
10	Dagger 63.5 g.	2.03	0.07	0.35	0.15	0.05	0	0.004	0.03	0.01	0	0.05	- « -	Cu - Sn
11	Knife 27.4 g.	3.2	0.3	0	0	0	0	0.11	0.03	0.01	0	0.05	- « -	Cu - Sn
12	Dagger 1.3 g.	0.53	0.2	0.03	0.1	0	0	0.12	0.03	0.22	0	0.15	- « -	Cu - Sn
13	Dagger 32.5 g.	0.3	0.28	0.55	0.5	0.2	0	0.12	0.05	0.38	0.006	0.1	- « -	Cu-Zn-As
14	Button 0.8 g.	1.18	0.3	0.015	0.2	0	0.03	0.2	0.03	0.01	0.007	0.05	- « -	Cu - Sn

Note: All artifacts are copper-base. 1 - Babadervish I, Gazakh district, author excavation I. G. Narimanov; 2 - Machta, Nakhchivan. AR, V. Aliyev, S. Ashurov; 3, 4 - barrow, village. Garabulag, Nakhchivan. AR, S. Ashurov. 5, 6 -kurgan, Gobustan, D. Rustamov; 7, 8.9 - barrow, village Gurgan – Apsheron, G. Aslanov; 10 - 14 - barrow, village Dubendi - Apsheron, I. Aliyev.

deposits of the Caucasus (Kashkay - Selimkhanov 1973: 148).

The single tin bronze appear on the territory of Azerbaijan in the first half of the III millennium BC. (table 1). It is hook of settlement Babadervish (Narimanov - Selimkhanov 1965: 76 - 79), and axe from the settlement Machta I (Ragimova -Ashurov 2005: 155-156). It is 4 subjects of bronze dated the first half of the III millennium BC. (see. table 1).

Analysis made in the laboratory of Institute of Archaeology and Ethnography National Academy of Sciences of Azerbaijan. Research made of quantitative spectral analysis.
The results of analyses to determine the type of alloy interpretation of adopted by I..R. Selimkhanov. Natural metal impurities it is - 0.5 % (Selimkhanov 1960: 31; Kashkay - Selimkhanov 1973: 51, 52, 84).
Studies have shown that the early products (Table. № 1), containing tin, divided according to the type of alloy into three groups:

Group I: Arsenic - tin bronze (Cu-As-Sn) - 1 piece
Group II: tin bronze (Cu-Sn) - 2 pieces
Group III: four component (Cu-As-Sn-Ni) - 1 piece.

Hook from the settlement Babadervish contains increased admixture of nickel. Ophiolite belt containing nickel passes through the territory of Azerbaijan Small Caucasus: Lachin, Kelbajar Kedabek, Jabrayil areas and hiding under r. Araks. In the north west direction continues on the territory of Turkey (Abdullaev et. all. 1961: 10).
Therefore, does not exclude the possibility of getting nickel in alloy of ancient handicraftsman. In the geological publications notes, that in ofiolites places of Kelbajar and Lachin areas, nickel content 1.5 %, sometimes more. (Baba-zade 2005: 135). But the copper ore deposits of Azerbaijan are few nickel mineralization (Selimkhanov 1960: 58). Therefore, I. R. Selimkhanov, rightly points out that the hook from Babadervish containing 2.4 % nickel, imported in to Azerbaijan (Selimkhanov 1996-97: 952).
Interpretation of early artifacts shows the next diagnostic chemical groups:

group Ni> 0.04 Pb> 0.02 Sb> 0.01 3 items
group Ni <0.04 Pb> 0.02 Sb> 0.01 1 item

Metal of early artifacts containing tin of diagnostic features are research and showed that the not homogeneous.

The next group of articles of tin bronze, dated the second half of the III millennium BC.

The results of analytical study of metal artifacts from archaeological monuments of the second half of the III millennium BC, are shown in the table number 2, which discovered of burials Dashsalahli – Gazakh area, Gakh area, district Kyudurli, Sheki area, Khankendy, Hachinchay - Karabakh as well as the findings in the village Alhasly of Lachin area. Total of 19 subjects, which represented mainly weapons: daggers, spears and arrows.

The results of analytical studies have shown that among the 19 subjects, 9 made of arsenical bronze. 8 are of tin bronze with minor natural impurities of arsenic. The remaining artifacts made of 3-and 4-component alloys. Alloying elements, addition arsenic, tin, lead and antimony (table number 2).

The largest part of the collection of non-ferrous metals, of study period it is artifacts of the monuments of Karabakh (9 artifacts), more than half of whom are represented from tin bronze (5 artifacts). One subject made of arsenic-bronze in various combinations of impurities arsenic, lead and antimony. Metallurgical interpretation shows, that in the beginning stages of the Middle Bronze Age continued to smelt arsenical bronze most of the test collection consists of these alloys. The arsenic content in the investigated artifacts contain from 0.03 to 3.7%.

Analyses the artifacts by type of metallurgical alloy divided into two main groups and four conditional groups:

1. arsenical bronze - Cu-As - 9 subject
2. tin bronze - Cu-Sn - 7 subject
3. Lead - tin bronze - Cu-Sn-Pb - 1 subject
4. Antimony - tin bronze - Cu-Sn-Sb - 1 subject
5. Four component alloy - Cu-Sn-As-Pb - 1 subject

The first two groups are the main groups, where the alloying elements in group 1 is arsenic, in the second - tin.

The remaining groups - is conventional groups in each group by only one subject.

It should be noted that in three component alloys presence ‘exists tin and lead, in another subject, tin - antimony. This groups is conditional possible with further research, it will increase and show the factors that can make informed conclusions.

Studies have shown that in the first stage continued to melt arsenical bronze mainly in the northern regions of Azerbaijan (Gazakh, Gahsky areas). However, in the southern monuments found more tin bronze that seems connected of tin deposits in the territory of Iran and Turkey (Helwing 2009: 209; Yener 2000: 89, 91).

The study of the metal of the first period, the Middle Bronze Age in of Azerbaijan, show that handicraftsman boldly began to use tin. Eight artifacts of tin bronze with no other impurities, a measure of the bold introduction of tin smelting recipes where its content reaches 8.8% (see. Table number 2).

TABLE 2

The results of quantitative spectral analysis of metal artifacts from archaeological sites of Azerbaijan, dating to the second half III millennium BC.

№	The name of the object, the weight in grams	Content of elements weight %												Type of alloy
		Cu	Sn	Pn	Zn	As	Sb	Au	Ag	Bi	Ni	Co	Fe	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Spears head 35.2 g.	Осн.	0.03	0.04	0.2	0.7	0.2	0	0.01	0.01	0.004	0	0.05	Cu-As
2	Dagger 211 g.	Осн.	0,015	0.1	0.2	1.4	0.15	0	0	0.025	0.007	0	0.05	Cu-As
3	Arrow head 5.7 g.	Осн.	0.001	0.04	0.2	0.75	0.15	0	0.01	0.025	0.01	0	0.07	Cu-As
4	Axe 377.5 g.	Осн.	0.025	0.3	0	0.42	0	0.02	0.11	0	0.05	0	0.1	Cu-As
5	Dagger 215 g.	Осн.	0.03	0.05	0.05	0.53	0.2	0.015	0.12	0.02	0.005	0	0.1	Cu-As
6	Dagger 373.2 g.	Осн.	0.03	0.22	0	0.47	0	0.012	0.01	0.03	0.003	0	0.15	Cu-As
7	Dagger 375.1 g.	Осн.	0.03	0.21	0	0.57	0.05	0	0.011	0	0.001	0	0.11	Cu-As
8	Spears head 310.2 g.	Осн.	3.72	0.05	0.23	0.03	0	0	0.01	0.007	0.005	0.002	0.41	Cu-Sn
9	Spears head 35.5 g..	Осн.	8.8	0.03	0	0.32	0.03	0	0.61	0	0.26	0.013	0.15	Cu-Sn
10	Spears head 20.4 g.	Осн.	8.7	0.03	0	0.3	0.035	0	0.17	0	0.3	0	0.05	Cu-Sn
11	Spears head 13 g.	Осн.	0.06	0.05	0.05	1.64	0.03	0.003	0.048	0.10	0.02	0	0.2	Cu-As
12	Unknown subject 4.7 g.	Осн.	5.8	0.48	0.01	3.7	0.05	0	0.19	0.004	0.121	0.018	0.68	Cu-Sn-As-Pb
13	Dagger 41 g.	Осн.	0.005	0.03	0.005	2.11	0.03	0.044	0.0015	0.10	0.006	0.006	0.35	Cu-As
14	Suspension 2 g.	Осн.	0.97	0.7	0	0.3	0.2	0.002	0.1	0.015	0.02	0.003	1.0	Cu-Sn-Pb
15	Dagger 225 g.	Осн.	1.0	0	0	0.4	0.7	0.	0.01	0.01	0.06	0.004	0.1	Cu-Sn-Sb
16	Arrow head 13.5 g.	Осн.	3.15	0.42	0	0.3	0.3	0	0.04	0	0.05	0	0.1	Cu-Sn
17	Beads 2.2 g.	Осн.	0.81	0.20	0	0.2	0.3	0	0.037	0	0.05	0	0.1	Cu- Sn
18	Rod 2.6 g.	Осн.	8.3	0.05	0	0.2	0.3	0	0.049	0.002	0.05	0.01	0.1	Cu - Sn
19	Beads 2.2 g.	Осн.	8.05	0.05	0	0.2	0.3	0	0.045	0	0.05	0.01	0.1	Cu- Sn

Note: 1, 2, 3 From the barrow of district Dashsalahli, Gazakh area, J. N. Rustamov, F.M.Muradova; 4, 5, 6 from the barrow of district Minberek, Gakh area, N.M. Mukhtarov; 7, 8 from the barrow of district. Kyudurli Sheki area, N. M. Mukhtarov; 9 -11 from the barrow of Gobustan, J. N. Rustamov, F. M. Muradova; 12 - 14 from the barrow Khankendy Garabakh, 15 from the barrow Hachinchay, Garabakh E. Resler; 16 - 19 from the mould district Alhasly Lachin area, Garabakh - find, V. G. Aliev.

This shows that the metal in the territory of Azerbaijan, begging the second half of the III millennium BC there are new fundamental changes that are characterized as a new and higher stage of development of metallurgy.

Begins receiving new types of copper-based alloys, where applicable, such ligatures, such as lead and antimony in combination with tin.

It should be noted that the selection of chemical groups product of the first period was conducted in the same manner as for the previous collection of metal which is given above.
Chemical Group Stage I:
Group I Ni> 0.04 Pb> 0.02 Sb> 0.01, 7 subject
Group II Ni> 0.04 Pb> 0.02 Sb <0.01, 1 subject
Group III Ni> 0.04 Pb <0.02 Sb> 0.01, 1 subject
Group IV Ni> 0.04 Pb <0.02 Sb <0.01, there is no
Group V Ni <0.04 Pb <0.02 Sb <0.01, there is no
Group VI Ni <0.04 Pb <0.02 Sb> 0.01, there is no
Group VII Ni <0.04 Pb> 0.02 Sb <0.01 2 subject
Group VIII Ni <0.04 Pb> 0.02 Sb> 0.01 8 subject

At the first period diagnostic Interpretation are the two chemical groups - I and VIII. The remaining groups are conditional. Here, almost the same amount of metal to be conditional. high and low percentage of nickel.

It should be noted, that the archaeological survey of copper ore deposits of Azerbaijan, show Gedabey (Siniyyar), Agyurd and Yashyllyg display of Nakhichevan of diagnostic belongs to VIII group. These products are probably of local production. Noted In areas (Kelbajar, Lachin, Djabrail), where localized nickel rock, there is evidence of antimony - Levchay, Deveboynu (Baba-zade 2005: 403 - 406).
In the archaeological publications, there is evidence that the early artifacts of tin bronze, appear in Iran at the end of the IV millennium BC. at Tepe Sialk and Susa (Selimkhanov, 1996: 952). However, that is single artifacts.

Bronze artifacts dating from the end of the IV millennium BC discovered in settlements Jemdet Nasr - adze, in Havra VIII - pin containing 5.6 % tin (Mesopotamia). Here, the mass production of bronze objects begins with the first half of the III millennium BC. (Avilova 2008: 140).

Last arhaeometallurgical studies have shown that in Asia Minor tin bronze appears at the end of IV millennium BC and its the widely use since the beginning of the III millennium BC. Confirm is the discovery of tin bracelet in the settlement of Therm, dated 2750 - 2550 BC. (Kashkay - Selimkhanov 1973: 32). E lot of tin bronze artifacts discovered from the archaeological monuments Tulin-tepe, Alishar, Troya I (Yalçın 2011: 75 - 77).

However, in the South Caucasus single artifacts of tin bronze, appearing the beginning of the III millennium BC their mass production begins with the end III millennium BC (Ragimova-Ashurov 2005: 155 - 156; Narimanov- Selimkhanov 1965, 76 - 79).
The data show that tin bronze first appeared and began to be widely used systematically in the neighboring regions of southern Asia Minor, Iran and Mesopotamia. This once again confirms

that Near Eastern countries influenced by the development of bronze metallurgy on South Caucasus (Gasanova 2009: 507 – 512).

Proceeding from this ancient mining of tin must to be found on the territory of Asia Minor Iran. It should be noted, the earliest mining of tin in Asia Minor. That is Kestel mine (Yener -. Vandiver 1993: 207 - 238). Researchers marked-out, it's a display of tin could be used for metallurgy Asia Minor and Mesopotamia beginning of the III millennium BC, but could not demand of tin across of Anatolia and Mesopotamia (Weisgerber-Cierny 2002: 180). Radiocarbon analysis showed ore mine Kestel 3700 - 2133 BC, ore is cassiterite (Yener 2000: 89, 91).

Increased natural impurities nickel accompanying increased admixture of antimony. It graphically shows the analysis of artifacts from the Lachin district, village Alhasly (Table. 2). It should be noted that by Persian, Turkish and Georgian languages, tin called a Galay. This suggests that the tin in the Caucasus was the Asian origin. Summing up, it should be noted that single bronzes artifacts appear on the territory of Azerbaijan, for the first half of the III millennium BC, but in Turkey at the end of IV millennium BC.

The extensive development of bronze metallurgy in Turkey begins with the beginning of III millennium BC (2800 BC). At this time in Anatolia observe the direction centralized mining - metallurgical industry. On the ancient mountain works of Kestel, mine found slag, tools. On the pleases found crucibles for metal smelting molds, ingots. The extensive development of bronze metallurgy in Azerbaijan observed in the second half of the III millennium BC, later more 500 years than in Anatolia. This indicates that the technology of smelting bronze came on the territory of Azerbaijan from Asia Minor primarily in the western regions of Azerbaija

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SOME OBSERVATIONS ON RELATIONSHIPS BETWEEN SOUTH CAUCASUS AND NORTH-EASTERN ANATOLIA BASED ON RECENT ARCHAEO-METALLURGICAL EVIDENCE

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Introduction

During the late prehistoric period, the Erzurum-Kars Plateau, which is our area of investigation, has been a junction point between the Southern Caucasus and Northern Mesopotamia in terms of cultural and metallurgical activities. Inventories of wealthy metal objects held in regional museums like Erzurum and Kars show the remarkable potential of the region; however unfortunately most of these metal objects have been obtained from illegal or non-systematic excavations. Also, there has never been any systematic investigation of ancient metallurgy and mining in North-eastern Anatolia. This essay includes a general evaluation of the results of XRF analyses performed on a group of metal weapons being studied in the context of a PhD project entitled "Metal Weapons dated to the pre-Urartian period in the Erzurum and Kars Museums"[2]. It is in this framework that we will discuss those relationships between North-eastern Anatolia and Southern Caucasus which depend on metallurgical activities. In terms of typology, the weapons being studied have conspicuous similarities with samples from the Southern Caucasus, and the results of analyses support this state. Because of the unproductive conditions, our XRF analyses results have been evaluated taking into account results from the Upper Euphrates and Southern Caucasus, which, in terms of metallurgy, are better known.

The Geographical Outlines and Mineral Potential of North-eastern Anatolia

More than half of North-eastern Anatolia, referred to as the Erzurum-Kars Plateau by modern geographers, is comprised of mountainous landscape above 2000 m., and this geography is formed by high mountain ranges, upland plateaus and the depressions lying between them. Since prehistoric times these river valleys and plains have been the main occupation zone for societies living here, and archaeologically, the Erzurum and Pasinler plains are the most well-known. The waters of the Erzurum plain drain towards the Persian Gulf by way of the Kura River, which is one of the main branches of the Euphrates River, and the waters of the Pasinler Plain drain eastwards to the Caspian Sea via the Araxes River, making this highland zone the main water reservoir of the Near East. The Kars-Selim-Oltu-Göle and Ardahan plains within the Araxes Basin form the main natural roadways which interconnect the region into Anatolia and the Southern Caucasus[3] (Fig.1).

There are abundant mineral deposits in North-eastern Anatolia and its adjacent territories, and

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3. Atalay 1978, 35 vd.

modern mining activities are prosperous across the region. The Artvin area in particular, in the eastern part of the Black Sea region, is very rich in terms of copper deposits. However, lack of systematic investigations about ancient mining in the region is a problem, and so we do not know if these prime mineral deposits were used in ancient times or not. The analyses on some metal finds such as those from Çoruh-Balıklı Village show that some mineral deposits in the area might have been known and used during the Bronze Age[4].

When we look at the whole of Eastern Anatolia – apart from the eastern part of the Black Sea region – the area most prominent in terms of mineral deposit reserves is the Upper Euphrates Valley (the Elazığ-Malatya region) and Erzincan-Gümüşhane[5]. At least we have some evidence that these deposits were used in the Medieval Age[6] (Fig.1).

The Archaeological Background and Brief History of Research in the region

The Erzurum-Kars region is at the crossroads between South Caucasia, Northern Mesopotamia and North-western Iran, as well as being a transition zone between cultures. Even though it is in a special location, the region is not well known archaeologically[7], despite the fact that it has been host to many civilizations throughout thousands of years and it has rich archaeological potential. First attempts to bring this potential to light were by the archaeological expeditions in the 1940s. Because of some systematic research the Erzurum sector of the region is more well-known than the Kars area[8]. It was during this time that H. Z. Koşay started to excavate on Karaz Höyük[9]. The Karaz excavations were followed by excavations on Pulur and Güzelova Höyük in the 1960's[10]. After a long period of silence, excavations on Sos Höyük began in the 1990's – the first systematic excavation in the region – and this project, undertaken by A. Sagona from Melbourne University, introduced a well stratified and chronological record of the Erzurum-Kars region[11](Fig.1).

The available archaeological evidence shows that settled life began in the highlands in the Chalcolithic Age[12]. These two regions (the Southern Caucasus and the Erzurum-Kars Plateau) appear as a single region in terms of geography and culture, and this situation can be observed throughout the historical periods. Apart from the Bronze Age when the region hosted the Kura-Araxes Cultural phenomenon[13] and the Kurgan Peoples[14], these highlands shared a cultural association with the Caucasian world, with continuous development through the LBA and the EIA[15]. With the establishment of the Urartian State, which was the first political unit in the highlands, this association was discontinued[16]. After the Urartian State, the Median

4. Prezeworski 1939, pl. III,4; Esin 1969, 39

5. The formal website of Mineral Research and Exploration Institute: http://www. Mta.gov.tr/v1.0/ index.php; MTA,1997, No:168, 43-66,106-156, 168-169, 216-237

6. Belli 1991, 14-4; Pamuk 2006, 167-184

7. For more info about archaeological research in the region see Işıklı 2011, 40-41.

8. Işıklı 2011,40

9. Koşay-Turfan 1959, 349-413

10. Koşay-Vary 1967

11. Sagona 2000, 329-373

12. Pulur sounding in 2002 presented earliest dates for Chalcolithic period for Erzurum Region. For more info see: Işıklı 2006, 13-30; Işıklı 2008, 267-290.

13. Sagona 1984; Palumbi 2008, Işıklı 2011

14. Puturidze 2003, 111-127.

15.Badalyan et al 2003, 144-165; Işıklı 2008, 267-290.

16. Işıklı 2000, 49-71; Sevin 2003, 185-195; Ozan 2006, 31-42; Işıklı 2008a, 61

and Achaemenid kingdoms were effective in the region, even though there is much less archaeological evidence for these periods[17].

The General Features of Metal Weapons which were analysed

As a part of this Project, a total of 122 metal weapons held in the Erzurum and Kars Museums were studied, of which only ten samples are known to have come from systematic excavations in the region (Fig.2). The rest have come from illegal excavations, and their source is unknown (Fig3). Because of this reason, these weapons have had to be classified primarily based on typological features, and according to this classification, the group consists of daggers, axes, spearheads, arrowheads and swords (Fig.4).

Typologically, the weapons appear to have been used from MBA to EIA, especially during the transition between the LBA-EIA, and most of the group dates to the LBA-EIA transition period. Those weapons dated to EBA are very few (Fig.5)[18]. According to the results of analyses, the samples of EBA weaponry are made of copper and arsenical copper. As will be shown in our discussion, this state is well matched with results from the Southern Caucasus and Upper Euphrates Valley.

Techniques used for Analyses, and the Chemical Structures of the Metal Weapons

As previously mentioned, a total of 122 metal weapons within this project were analysed using the XRF mobile analyser (Table 1-2). Samples for analysis were taken from more than one point on each object, especially from the handles (hilts), blades and rivets. Also taken into consideration were the corroded and non-corroded areas. Four main groups have been determined, based on chemical structures and according to the results of analyses (Fig.6).

Group 1: Cu (Pure copper)
Group 2: Cu+As (Arsenic copper)
Group 3: Cu+Sn (Bronze)
Group 4: Cu+Sn (Cu+As+Sn, Cu+ Pb+Sn) (Bronze and alloys including other elements)

The results show that arsenic copper and bronze were used predominantly in the production of the metal weapons (Fig.6). Group 4 weapons made of alloys, including other elements, are numerous, while the samples made of blister (Pure) copper are few in number. An interesting and striking result of the analysis work was the discovery of a large amount of antimony in the weaponry of Kars Museum[19] (Table 2), whereas antimony, surprisingly, has not been determined in the weapons from the Erzurum Museum (Table 1). A slight amount of silver has been determined on the handle of a dagger from Erzurum Museum (Fig.8) and also on an arrowhead from Kars Museum . Another interesting result revealed a gold plated handle on a dagger from Erzurum Museum (Fig.9). The rate of arsenic in the Kars group is not as high as the Erzurum group and this rate is at a maximum of 4 or 4.5%. The use of arsenic copper alloy in the Erzurum Group is more common (Fig.6., Table 1-2).

General Evaluation

Developing technology enables us to find which mineral resources and production techniques

17. Kalkan (publishing);

18. Chernykh 1992; Badalyan-Avetisyan 2007

19. Meliksetyan-Pernicka 2010, 56; Işıklı-Altunkaynak 2013, 104-116.

are prominent in ancient mining and metallurgy. The aim of analysis is to reveal the sources of the minerals; however, although the analyses of elements have effectively demonstrated the types of alloys used, they have failed to determine satisfactorily the sources of minerals[20].

Eastern Anatolia has a special place in the development of ancient Anatolian metallurgy, and this determination is more valid for the Upper Euphrates Valley. Evidence from key sites of the region like Norşuntepe, Tepecik, Tülintepe, Korucutepe, Değirmentepe and Arslantepe shows that metallurgy has been a branch of economic activity since the Chalcolithic period. Metallurgical activities were important features in the formation of the socio-economic structure of settlements, and of interrelationships among the cultural groups in the region.

In terms of our subject the results of analyses of the Upper Euphrates Valley are extremely important. Analyses have been made on a total of 15 metal objects from Tepecik, and they show that copper ore might have come to this settlement from more than one source. Also, the results show that these metal objects have been manufactured from blister copper and alloys including copper, arsenic and antimony[21]. The most striking result of the analysis on the metals from Tepecik is that the Ergani copper deposits in Diyarbekir, which are closer to Tepecik, were not used; instead, copper ores were brought to the site from deposits at Artvin-Küre in the Eastern Black Sea region[22]. This situation is a striking example of inter-regional relationships and the trade in ore-based raw material during the late prehistoric ages[23].

Analysis of metals from Norşuntepe indicates that the craftsmen at the site used multi-metal ore beds in their production, and they preferred to use alloys which included a high incidence of arsenic and antimony. A different result from analyses of some metals at Tülintepe shows that these objects included a small amount of tin – the rate of which is 0.016. But analysis of a round-headed pin from this site showed that the rate increased to 5.27%[24]. The result is remarkable for demonstrating how tin was used apart from other alloys. These results indicate clearly that the craftsmen at sites of the Upper Euphrates Valley had been known to use tin in alloys[25].

The other key site of metallurgical activity in the Upper Euphrates Valley is Arslantepe in Malatya. Analysis shows that the metals of Arslantepe VII, dating to the Late Chalcolithic period, were produced from copper alloy which had a low rate of arsenic, antimony and nickel[26]. The metal objects from Arslantepe VIA, contemporary with the Late Uruk Period of Mesopotamia, were made of multi-metalliferous ores. These metals were made up of alloys (except for arsenic, nickel and silver). As for Arslantepe VIB1, this level presented mostly Kura-Araxesian materials, which, according to analysis of the metals at this level, were produced from alloy including 4.66% arsenic, not nickel[27]. At the same time, at this level, the amount of slag increased, thereby demonstrating that the production would have been increased too. The analysis of metals from VIB1 shows that the craftsmen of Arslantepe might have used different deposits for obtaining ores. According to a theory recently proposed, it was the mobile pastoral groups of the Kura-Araxian communities who played an active role in expanding and

20. Muhly 2011, 860
21. Kunç and at all. 1994, 90-95
22. Çukur-Kunç 1989,111-120
23. Yakar 2002, 18
24. Yalçın-Yalçın 2009, 128
25. Muhly 2011, 866
26. Caneva-Palmieri 1983, 637-654; Palmieri et al. 1999, 143, Fig. 5
27. Kavtaradze 1999, 76, Figs. 3-7

distributing metallurgical technologies, raw materials-based ore and finished metal objects. At the same time there were mobile craftsmen and merchants among these mobile pastoral groups[28].

The alloys of the metals from Arslantepe VIA contained antimony and iron, as well as 9% arsenic. Analysis of slag from the same level shows that alloys included copper-lead-arsenic and copper-nickel-arsenic[29]. According to analyses, in the production process the craftsmen had not used the copper mineral deposits at Ergani, which is located in Diyarbekir, and is closer to Arslantepe; however indications are that copper ore and other minerals such as antimony and arsenic might have been brought from deposits in the North-east or Caucasus regions[30]. According to archaeo-metallurgic evidence from sites in Altınova and the Malatya plains, there was no specific ore-smelting procedure[31]. In the light of analysis of metals from Arslantepe, we can say that during the VIB1 and VIB2 periods, at this site, usage of copper-based alloys containing arsenic, antimony, lead and silver have been continued[32].

In the Chalcolithic period, the other region which became important in regard to metallurgical development was the Southern Caucasus. The prominent sites are Shulaveri-Shomu Tepe, Gargalar Tepesi in Western Azerbaijan, Didi-Gora in Southeastern Georgia, Tsopi, Shulaveri, Delisi in Central Transcaucasia and Kultepe I in Nahkcıvan. Analysis of the metal objects from these sites proves that alloys-based copper, including arsenic, was used widely in metal production[33]. Nickel has been determined on some metal samples from Kültepe I, and it was probably brought from the other side of the Near East because nickel is not be found in the Caucasus[34].

During the Bronze Age metal objects from sites on the Armenian Plateau and Central Caucasus were widely produced from copper with arsenic. This situation is very similar to the one in Eastern Anatolia[35]. In Eastern Anatolian metallurgy, while copper with arsenic was used widely in the production of metals during the EBA, towards the end of the Bronze Age and during the MBA alloys-based copper containing tin has been prominent in production, and this usage of copper with arsenic has continued during the MBA. During the Bronze Age the heart of Caucasian Metallurgy was the Circumpontic, which was an important metallurgical province of the Ancient Near East[36]. The Caucasian craftsmen were able to prepare special alloys to enhance the features of their objects. For example in the production of ornaments they could increase the rate of tin from 6% to 22% to obtain more brightness[37]. In Caucasian Metallurgy the other significant site is Velikent in Daghistan. The graves in particular, dating to the middle of the 3rd Millennium B.C., contained rich metal objects. The alloys of metals from the Velikent graves include 8% tin[38]. According to P. Kohl, who excavated Velikent, the ores of Velikent's metal might have been brought from deposits outside of the region[39]. Pigott pointed out those

28. Yakar 2002, 22; Palumbi 2008, Işıklı 2011,
29. Palmieri et al 1993, 575; Yakar 2002, 20; Muhly 2011, s. 864
30. Palmieri et al 1999, 147; Fangipane 2001, 2 vd.; Fangipane et al 2001, 105-139
31. Palmieri et al 1993, 576
32. Palmieri et al 1999, 145; Yakar 2002, 20
33. Kavtaradze 1999, 72–73
34. Kushnareva-Chubinishvili 1970, 120–129; Abesadze 1980, 148
35. Kuşnareva 1997, 203; Nocera-Palmieri 2011, 152
36. Chernykh 1992, 7-10.
37. Kuşnareva 1997, 202-203
38. Kuşnareva 1997, 210; Abramishvili 2010, 167
39. Kohl 2003, 2003, 9-21.

tin deposits in Afghanistan could have been an outside source regarding this issue[40]. From the 2nd Millennium B.C., usage of alloys containing lead, antimony and zinc, as well as copper including arsenic, and also bronze alloys with tin and antimony have become widespread[41].

According to results of our analyses on metal weapons from the Erzurum-Kars Museum, 75% of the weapons dating to EBA were made of copper with arsenic, and the other 25% were produced from blister copper[42]. U. Esin, who studied our materials, had previously suggested that a group of metals from Karaz and Güzelova sites had been produced from pure copper ore, depending on isotopic analyses[43]. The results of her analyses match up substantially with results of our XRF analyses. The bulk of our material, which mostly dated to the LBA-EIA transition period, has been manufactured from copper with arsenic and bronze alloys (Figs. 4-6, 7-10).

As said previously nickel, which is generally not seen in metals of the Caucasus, can be seen widely in the Erzurum group; however for the metals from Karaz and Güzelova the situation is different because nickel is not seen here. Arsenic is found in almost all of the metals which have been analysed. When considering the common usage of copper with arsenic, the question of the use, or not, of arsenic deposits in the Kars and Sivas regions is brought to mind[44]. As mentioned earlier, these results of our analyses are largely in accord with results of analyses in the Caucasus as well. The usage of copper with arsenic increased continuously from the Chalcolithic to the MBA in both the Caucasus and Iran. During the EBA usage of pure copper and bronze alloys, including different kinds of elements has been more common in Anatolia than the Caucasus[45]. Lastly we should mention that typological evaluation of our material coming from sites in the Erzurum region is well matched with results of analyses. Researchers who studied metals of the Erzurum region previously have tended to date them to the Martkopi-Bedeni period and the LBA-EIA transition period of Caucasian Archaeology[46]. This dating is in accord with the results of our analyses.

Conclusion

In conclusion metallurgic activities played an active role in the interrelationships between the regions and in the development process of societies of the Ancient Near East. There were some regions which became prominent in ancient Near Eastern metallurgy, such as Anatolia, Mesopotamia, Iran and Caucasus. North-eastern Anatolia, which is neighbouring on the Southern Caucasus, is not well known as one of the sub-regions of Eastern Anatolia in terms of Ancient Metallurgy. For the present the available limited evidence cannot present a clear picture concerning regional metallurgy of North-eastern Anatolia. There are two essential reasons for this state: one is lack of systematic research, and the other is that the bulk of the metal objects which are held in regional museums have come from non-systematic or illegal excavations. In this regard the evidence from the Southern Caucasus, which is better known, can help us. The available data shows that these two regions, namely Southern Caucasus and North-eastern Anatolia, had relationships in terms of metallurgical activities. As mentioned previously, these relationships included interregional circulation of raw materials (mostly ores), finished objects and technologies. Thus the recent analysis project presented results that support this suggestion.

40. Pigott 1999, 118
41. Kuşnareva 1997, 212
42. Altunkaynak (publishing)
43. Esin 1969, 15-17.
44. Palmieri et al 1993, 590; Yakar 2002, 16
45. Palmieri et al 1993, 594-596
46. Yakar 2002, 16; Işıklı 2008b, 97-118

In particular our results pointed to the sharing of technologies. Undoubtedly we need more systematic investigations and more data to present a clearer picture regarding this subject, with future systematic research being performed on ancient metallurgy and ore deposits in the region to enable us to show a more comprehensive overall picture.

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Table. 1: The Results of XRF Analysis on Metals from Erzurum Museum

Weapon Name	No	Ti	Cr	Fe	Co	Ni	Cu	Zn	Mo	Ag	Sn	Sb	As	Pb
Dagger	613.			0,1675			89,2143		0,0088		10,0265	0,0969	0,4463	0,0397
Dagger	230-97	0,2943		2,7732	0,0274	0,0388	75,6733	0,0657	0,0175		16,7013	0,353	3,7573	0,2982
Dagger	2007-265			0,1878			85,2567		0,0193		14,4619			0,0743
Dagger	41-97			3,1599			90,7879	0,4278	0,0148		5,1958		0,2883	0,1255
Dagger	35-97	0,0746		0,8662			86,4666		0,0175		12,2287		0,3035	0,0429
Dagger	29-92	0,1174		0,2119	0,0341	0,04	86,7368		0,0137		12,235		0,6111	
Spear Head	979.			0,081			97,9154		0,0164				1,9873	
Dagger	1425.			0,0204			98,5021						1,4461	0,0313
Dagger	1424.			0,0285			99,0567						0,8903	0,0246
Dagger	2007-20			1,0749		0,0555	96,521		0,009		0,1176	0,1744	1,8756	0,1719
Dagger	2007-21	0,1139		0,6622		0,0945	85,7662		0,0101		10,8407			2,5124
Dagger	2007-22			0,8071		0,1204	93,9833		0,0137		3,6627		0,7593	0,6534
Dagger	2007-23	0,1565		1,4726		0,3039	73,1377	0,073	0,014		22,4991		1,5756	0,7675
Dagger	2007-71			0,0493		0,069	94,2644		0,0083		5,2146		0,3436	0,0508
Spear Head	2007-293		0,0136	0,7124			97,9913						1,2827	
Dagger	2007-100	0,5473	0,0613	4,3878	0,0967	0,6754	54,2152	0,0807	0,0106	2,4509	34,0968		1,6437	1,7335
Dagger	2007-101			0,3086	0,0142	0,2015	89,0396		0,0095		9,1725		0,3248	0,9293
Spear Head	2007-102	0,1619		0,4239		0,1175	75,9973	0,1419	0,0161		21,692		0,9076	0,5419
Dagger	2007-103	0,0771		4,9079		0,071	78,3101		0,0095		3,2435		10,5747	2,8061
Dagger	2007-114		0,0192	1,3697		0,0521	96,9788		0,0147		0,1687	0,2645	0,9817	0,1506
Dagger	160-2003	0,0403		0,9081		0,0321	98,5381		0,0131				0,2084	0,26

Weapon Name	No	Ti	Cr	Fe	Co	Ni	Cu	Zn	Mo	Ag	Sn	Sb	As	Pb
Dagger	161-2003	0,1691		1,1713		0,3118	74,212		0,0147		22,994		0,6982	0,4288
Axe	612.			0,1148	0,0278	0,0515	90,0465		0,0151		9,3725		0,3141	0,0577
Dagger	127-94	0,0355		0,2101		0,0698	93,8479					1,0668	3,3986	1,3713
Spear Head	37-97			0,1206		0,0465	88,7266		0,0091		9,0433		0,6303	1,4238
Dagger	38-97			0,4087		0,0699	93,6451		0,008		5,4722		0,1723	0,2238
Dagger	13-2002			0,0242		0,0548	94,5511		0,006			0,1994	5,1644	
Dagger	14-2002	0,0811	0,0189	0,3898		0,0371	82,0148		0,0131		10,4612		6,5562	0,4278
Spear Head	36-97	0,1308		0,9575		0,1001	80,1338		0,0114		13,8866	0,2341	3,3962	1,1496
Dagger	15-2002	0,0763		1,5484			75,0085	0,096	0,0105		20,9161		1,392	0,9521
Dagger	81-89			0,2856	0,0183	0,0223	94,5011		0,0087			0,4235	2,2354	2,4455
Dagger	19-86			0,2297			97,7209		0,0097		2,0218			0,0179
Dagger	7-28-76					0,0918	96,9555	0,3429	0,0071		1,4233	0,1089	0,8675	0,2031
Dagger	7-29-76			0,2714			76,0704	0,2713	0,0079		18,1028		1,2873	3,9889
Arrow Head	1601.	0,0547		0,0815			85,9056		0,0153		13,8274		0,0713	0,0441
Dagger (blade)	379-83			0,032		0,9819	97,6569		0,0053			0,6455	0,6784	
Dagger	2006-109			0,4634	0,2001	0,1663	98,6688		0,0085				0,4733	0,0197
Spear Head	2006-106	0,1251		0,5965	0,0452	0,1022	75,6328		0,0149		21,3317		2,1516	
Dagger	2006-107	0,0719		0,1516	0,0146	0,2667	82,7367		0,0082		13,6699		1,3206	1,7599
Dagger	2006-108			0,4342	0,0329	0,0221	97,2786					0,3452	1,5652	0,3219
Spear Head	2007-99			0,3545		0,2103	83,0265		0,0173		12,8236		1,1278	2,4401
Spear Head	2009-39	0,0509		0,4808			94,2007		0,0105		5,2319			0,0251
Spear Head	2009-19	0,0846		0,469	0,0351	0,3491	86,1012		0,0128		11,2521		1,6961	

Weapon Name	No	Ti	Cr	Fe	Co	Ni	Cu	Zn	Mo	Ag	Sn	Sb	As	Pb
Spear Head	614.			0,5246		0,0499	94,6061		0,0236		2,8957		1,5832	0,317
Dagger	45-98	0,1025		0,5113		0,0449	86,9555		0,0108		9,2293		1,6686	1,4772
Spear Head	8-2001.			0,052			95,0327						4,9153	
Dagger	11-2001.			0,4756		0,0495	98,2763						1,1986	
Spear Head	9-2001.			1,1569		1,0247	95,2676		0,0077				2,5431	
Dagger	170-93	0,2901		3,0417		0,0487	74,9539		0,0127		20,5052		0,5155	0,5332
Spear Head	169-93	0,1262		0,4013	0,015	0,0487	79,1086		0,012		19,2891		0,7209	0,2783
Spear Head	20-96	0,3181		2,7356			96,5114		0,0323				0,2551	0,0626
Arrow Head	2007-256	0,1621		1,7256		0,1203	79,9388		0,0178		16,1979		1,3099	0,5276
Arrow Head	130-90			99,537			0,44							
Arrow Head	131-90			0,1964			93,2286		0,0273		5,6788		0,6171	0,2517
Arrow Head	260-2003	4,3967	0,0787	1,1974		0,0445	83,5647	0,7835	0,0173		6,8273		0,6902	0,304
Arrow Head	2007-112	0,0441		0,0653		1,8738	95,0798		0,0091				2,9279	
Arrow Head	2007-320	0,0461		0,1685		0,454	99,2917		0,0058					0,0339
Arrow Head	285-78	0,1708		1,2136			82,3396	0,1545	0,0173		15,7926			0,3116
Arrow Head	9-2002.	0,7182		96,1997	1,5445		0,7866	0,4706	0,0181					
Axe	1356.			0,0258			99,175						0,7992	
Arrow Head	19-2002			0,2488		0,0475	97,9436		0,0176				0,4026	1,2337
Arrow Head	154-77	0,1838		0,5284		0,0787	98,3597		0,0136		0,7429			0,0209
Spear Head	2004-3			0,4338		2,2905	92,9811		0,0111				4,2392	
Dagger	2004-2			0,0321		2,3932	94,4875						3,0872	
Axe	2004-1					3,4984	92,259		0,0082				4,2344	

Weapon Name	No	Ti	Cr	Fe	Co	Ni	Cu	Zn	Mo	Ag	Sn	Sb	As	Pb
Axe	1423.			0,0207			98,7113		0,0055				1,2626	
Axe	69.	0,0906		0,6769			96,5104		0,0121				2,6883	
Axe	406.			0,1844			96,5293		0,006				3,2803	
Axe	1424.			0,0176			97,7666						2,2158	
Axe	21.1.74.			0,118			94,8003		0,0086		3,3792	0,8721	0,662	0,1599
Axe	1577.			0,027			98,1744		0,0073				1,4156	0,3271
Dagger	31-92.	0,2269		0,9086		0,1416	62,1538	0,0625	0,0132		33,4848		2,929	
Dagger	31-92.	0,1004		0,4793		0,0784	74,9552		0,0145		22,3639		1,9698	
Dagger	20-86.			0,2675			93,8761		0,0101		4,4731	1,0148		0,3585
Spear Head	11-89.			0,4465			98,2932						1,2485	
Spear Head	90-81.			0,289		0,1271	97,5175		0,0079			0,0958	1,9625	
Spear Head	157-2003.	0,1036		1,1835		0,0285	85,5317		0,0226				13,1178	
Dagger	62-84.	0,0557		0,2146	0,0799	0,2567	91,0671		0,0089		7,875		0,4421	
Spear Head	2010-110.	0,2077		4,1815	0,037	0,1024	88,3909		0,0219		5,551		0,6068	0,9008
Dagger	7-86.	0,0532		0,3622			89,5985		0,0098		9,7255		0,2509	
Dagger	158-2003.			0,3057		0,0718	93,1824		0,0109		5,3891			1,0402
Spear Head	61-84.	0,0778		1,3071	0,093		87,9953		0,0147		10,2647		0,2475	
Dagger	159-2003.	0,087		0,7635			84,7188		0,0164		13,9123	0,1643	0,1031	0,2345
Dagger	8-1-73.			0,1253	0,1137	0,5121	84,7159		0,0119		12,7467		1,6074	0,1671
Spear Head	2007-58	0,0644		1,9675		0,284	82,2815		0,0161		15,0472		0,2479	0,0915
Axe	2004-48.	0,2261		0,2644		0,0751	63,612	0,1233	0,0143		34,5031		0,6985	0,4405
Axe	180-97.					0,0461	95,6281					0,0969	4,2289	

Weapon Name	No	Ti	Cr	Fe	Co	Ni	Cu	Zn	Mo	Ag	Sn	Sb	As	Pb
Arrow Head	30-96.	0,1791		0,4415		0,0684	56,9687	0,0519	0,0087		27,1684	0,8006	8,3687	5,944
Arrow Head	53-88.			0,4183		0,0285	99,3711		0,0101					0,1216
Arrow Head	54-88.			0,3641		0,1177	99,4796		0,0111					0,0275
Arrow Head	128-90.			99,5421			0,3816	0,0356						
Arrow Head	129-90.	0,1061		99,2215	0,3228		0,2834		0,0081					
Arrow Head	2007-319.	0,1309		0,9973	0,0537	0,0369	85,5897		0,0135		12,1505		0,9888	0,0387

Table. 2: The Results of XRF Analysis on Metals from Kars Museum

Weapon Name	No	Ti	Fe	Ni	Cu	Zn	Mo	Ag	Sn	Sb	As	Pb
Dagger	34-4-2008		0,5924	0,0296	84,3588		0,0105		9,9542	0,1375	3,5889	1,328
Dagger	8-6-2003.	0,1365	1,1293		85,5793		0,0149		9,5058	1,7509	0,3748	1,5084
Arrow Head	33-4-2008		0,3828	0,0436	85,7777		0,0092		8,9066	0,136	3,5739	1,1702
Arrow Head	5.6.2003.	0,0736	0,3969		97,706		0,0083				1,6445	0,1707
Arrow Head	2-6-2003.		0,2912		94,4181		0,0163		0,3533	0,409	3,9205	0,5917
Arrow Head	3-6-2003.	0,1094	0,5647		97,8679		0,0198			0,2218	0,7065	0,5099
Arrow Head	4-6-2003.	0,0958	0,7463	0,0323	97,2876		0,0155			0,1563	1,6272	0,0391
Arrow Head	1-6-2003.	0,2034	1,3271		96,0978		0,018		0,5072	0,2648	1,3434	0,2384

Weapon Name	No	Ti	Fe	Ni	Cu	Zn	Mo	Ag	Sn	Sb	As	Pb
Arrow Head	6-6-2003.	0,0476	0,2688		96,4837		0,0122		0,1299	0,2012	2,2657	0,5908
Arrow Head	7-6-2003.	0,0681	0,5344	0,0167	89,1571		0,0104				4,7816	5,4317
Arrow Head	6-7-92. ccccccccccc	0,0638	0,2841	0,0356	94,6105		0,0071		1,4849	0,4137	1,951	1,0963
Arrow Head	4-1-94.	0,2146	1,2878	0,0306	82,3858		0,014		11,4216	0,2511	2,4101	1,9844
Arrow Head	1-4-83.	0,0848	0,2438	0,0505	78,9505		0,0134		14,1336		2,3849	4,1248
Arrow Head	1-2-84.	0,1632	2,4636	0,0901	68,6723		0,015	0,7912	19,7916	0,4577	4,3703	3,1687
Arrow Head	1-10-81.	0,2238	0,3145	0,0892	62,3974		0,0135		34,3483		2,2518	0,3616
Arrow Head	15-8-74.		0,2725	0,0306	93,4913		0,0156		5,0022	0,1259	0,9883	0,0736
Arrow Head	7-1-68.		0,1993		94,6964	0,6543	0,0095		2,0121	0,2008	0,4464	1,7811
Arrow Head	2-1-64.	0,04	1,0357	0,0587	94,4732		0,0091				3,9314	0,3981
Arrow Head	4-2-64.	0,0717	0,8511	0,0175	94,2521		0,023		3,8694	0,1777	0,3303	0,4072
Arrow Head	5-2-63.	0,0898	0,1357	0,0545	96,8606		0,0094		1,5588	0,1428	0,8755	0,273

Weapon Name	No	Ti	Fe	Ni	Cu	Zn	Mo	Ag	Sn	Sb	As	Pb
Arrow Head	6-2-63.		0,3463		97,4867		0,0272			0,2027	1,6187	0,3185
Arrow Head	7-2-63.		0,0867	0,0283	81,0934		0,0217		8,9032		3,5208	6,3459
Arrow Head	8-2-63.	0,0907	0,6514	0,0376	97,3951		0,0159		0,9788		0,2481	0,5823
Arrow Head	9-2-63.	0,088	0,5311	0,1481	96,7869		0,0202		2,0018			0,3369
Arrow Head	11-2-63.		0,0654	0,0212	97,5724		0,0137			0,3021	1,974	0,0512
Arrow Head	12-2-63.		0,3327	0,033	94,8667		0,0193		1,9143	0,4362	1,7042	0,6936
Arrow Head	3-3-63.		0,375		89,4662	1,3116	0,0117		6,9838		0,3508	1,5009
Arrow Head	2-3-63.		0,1657	0,023	96,7899	1,3119	0,011		0,0858		0,5527	1,0599
Arrow Head	1-5-65.		0,0217		97,7243		0,0156		0,2622	0,3166	1,5961	0,0634
Arrow Head	6-2-88.		0,2538	0,0285	88,9142		0,0134		9,9911		0,7226	0,052
Arrow Head	7-2-88.	0,0611	0,5281	0,0429	91,6222		0,0151		7,1357		0,523	0,0718
Axe	1-3.1994.		0,0309		98,0921						1,877	
Axe	37-7-974.		0,0821		99,1988						0,7192	

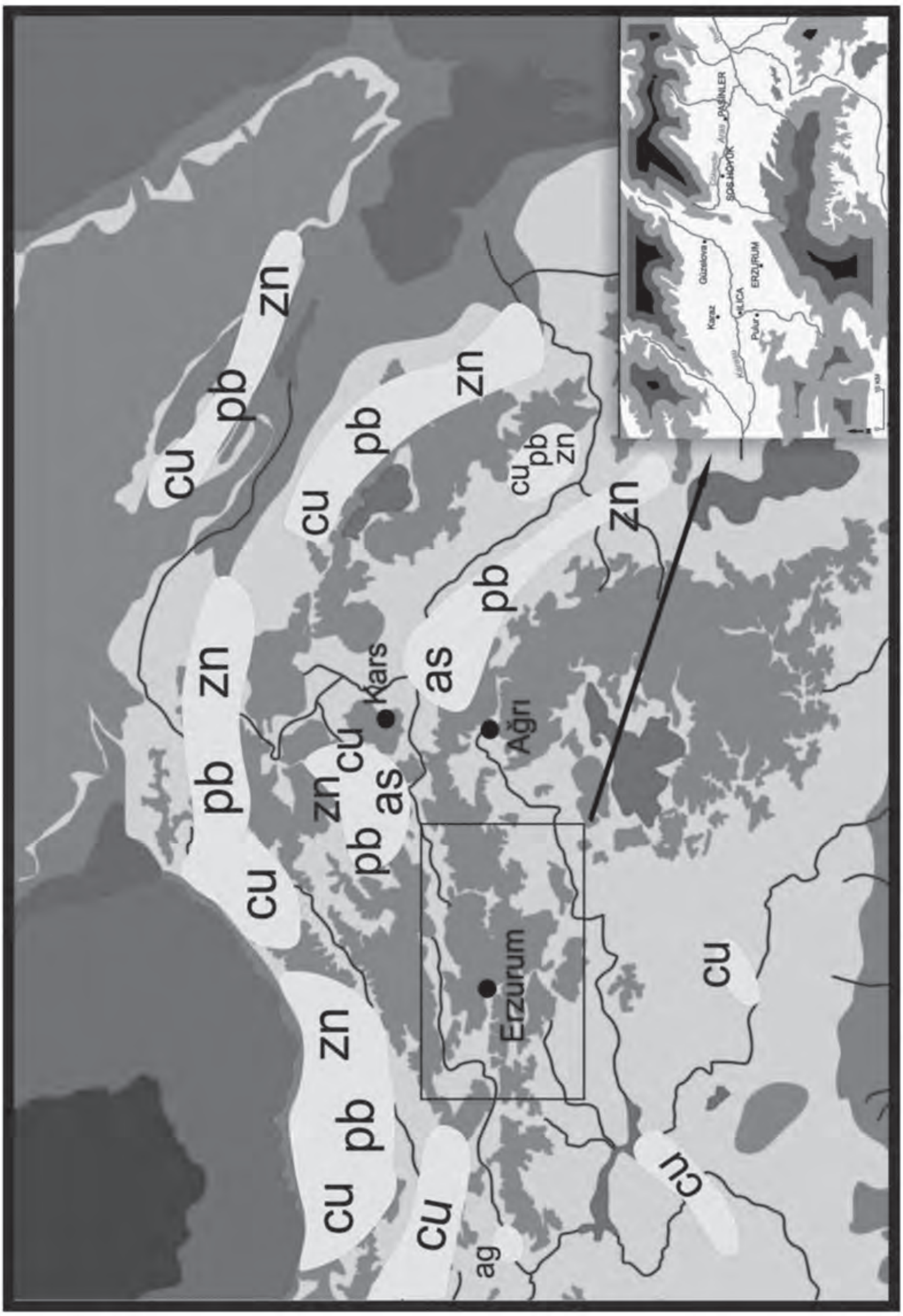


Fig.1: Map showing mineral deposits of East Anatolia and its adjacent regions, and excavated sites in Erzurum Region.

Fig. 2: Metal Objects from excavated sites in Erzurum Plain

Fig.3

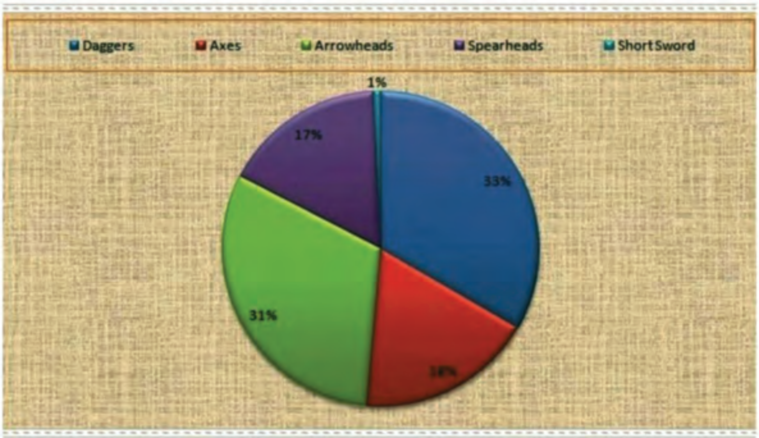


Fig.4

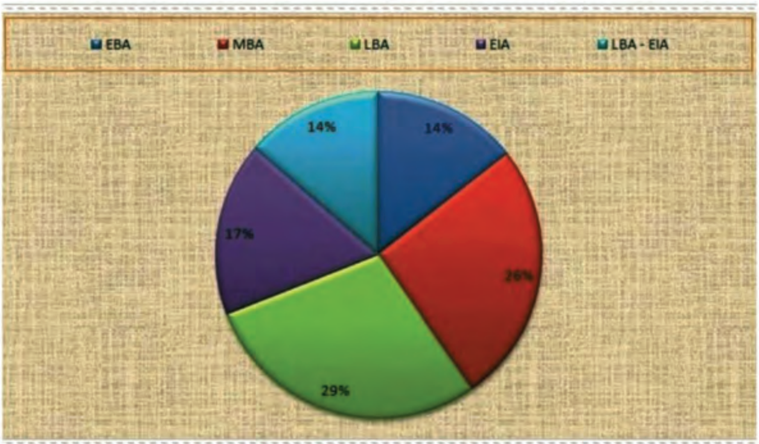
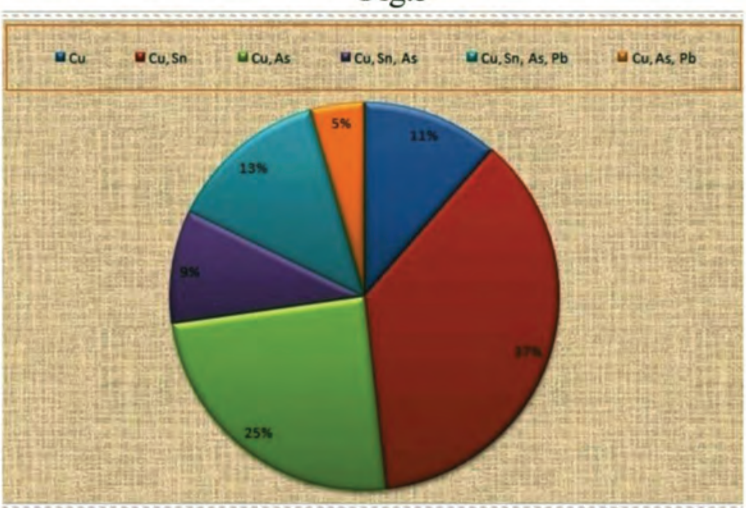


Fig.5



Figs. 4 – 6: Graphics showing results of XRF Analyses on metals from Erzurum-Kars Museums.

Fig.7

Fig.8

Fig.9

Fig.10

Figs. 7-10: Samples of Metal Weapons mentioned in text

OX-CARTS AND THE KURA-ARAXES MIGRATIONS

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The forthcoming publication (Paz 2014, Nos. 56–65) of ten model wheels from the 1933–1986 excavations at Tel Bet Yerah, in the Jordan Valley, Israel, offers an opportunity to review the evidence for wheeled transport in the early 3rd millennium BCE southern Levant and its possible connection to Kura-Araxes migrations. Neither model wheels nor wheeled transport were exclusive to the Kura-Araxes culture; their juxtaposition with Khirbet Kerak Ware at sites like Tel Bet Yerah may, however, be significant.

The Finds

The wheels are relatively large, ranging from 5.6 to 10.5 cm in diameter with axle-perforations of 0.6–0.9 cm. Nine of the ten are made of fired clay and have a rhomboid or lentoid profile with a prominent round hub or nave (Figure 1). One large stone wheel has a broad, flat rim and carved, nearly symmetrical nine-sided hubs (Figure 2). This soft limestone object was reshaped and used, apparently, as a burnisher before being discarded – hence its present asymmetry. The size, weight, and pronounced hub of these objects preclude their identification as spindle-whorls, which usually took the form of pierced ceramic or stone discs.

Six of the ten wheels from Tel Bet Yerah are attributed to Early Bronze III contexts and the remainder lack clear context and appear to be EB III objects redeposited in post-EBA fills. Recent work on EBA radiocarbon chronology of the southern Levant places the beginning of EB III within the 29th century BCE – a date consistent with preliminary assays from Bet Yerah itself (Regev et al. 2012; Greenberg 2014). This places the appearance of model wheels in the southern Levant at a relatively early stage in the diffusion of wheeled transport, some two centuries after the earliest model wheels found in the Near East (Bakker et al. 1999) but several centuries before the widespread appearance of model wagons and carts in northern Syria (Raccidi 2013).

As noted above, all the published wheels from Bet Yerah can be attributed to Early Bronze III (ca. 2850–2500 BCE) contexts, at the earliest. Moreover, these contexts are associated with the presence of Khirbet Kerak Ware, although not exclusively so. Recent excavations in an area with a high concentration of finds associated with Khirbet Kerak Ware producers/consumers – including typical andirons (portable hobs), plastered installations, stone processors and more (Greenberg, Shimelmitz and Iserlis 2014) – have yielded an additional wheel-fragment. No model wheels occur in EB I (ca. 3600–3050 BCE) or EB II (ca. 3050–2850 BCE) contexts at Tel Bet Yerah.

Comparisons: The ‘Ox-cart Ensemble’

Looking beyond the site, no model wheels have been published at any EB I or EB II site in the southern Levant. Their earliest appearance in the southern Levant is in EB III, and in very limited numbers: two model wheels are reported from Khirbet Kerak Ware-rich strata at Tel

Beth-Shean (Mazar and Rotem 2012: 353–354; Fig. 9.1:4, 5) and three from EB III strata at Megiddo (Loud 1948: Pl. 257:1, 2; Blockman and Sass 2013: Fig. 15.17: 605). The latter site has a minor presence of locally produced Khirbet Kerak Ware (Zuckerman, Ziv-Esudri and Cohen-Weinberger 2009: 150). No model wheels have been published from other major EB III sites such as Tel Yarmuth, Bab edh-Dhra‘ or Khirbet el-Batrawy.

In the northern Levant, a red-black burnished model wheel is recorded in Khirbet-Kerak-Ware-rich deposits in the ‘Amuq Valley (Braidwood and Braidwood 1960: Fig. 289:1). In the Upper Euphrates and SE Anatolia, a lone model wheel first appears in Arslantepe Str. VIA (Frangipane and Palmieri 1983: Fig. 64:4), a stratum associated with a significant red-black burnished ware presence. By the early third millennium, model wheels, all of the same type as that found in the Levant, appear regularly in contexts associated with red-black burnished wares at sites such as Norsuntepe (Schmidt 2002) and Korucutepe (van Loon 1978).

At Norsuntepe, no less than 35 model wheels are catalogued (Schmidt 2002: Pl. 36), ranging in size from 1.7 – 11 cm and in context from putative EB I (Schmidt suspects they are intrusive: 2002, 34) to the latest EBA phases at the site. All are of the rhomboid section with protruding naves. More important is the discovery of an actual model cart-bed or chassis (Schmidt 2002: Pls. 37: 497 and P. IV: 497). It consists of a rectangular plaque, about 5 x 4 cm with 28 small perforations along the edges of the dorsal side, representing post-sockets, and two cylindrical perforations, pierced through the body of the plaque before firing, one transversal, allowing the insertion of an axle, and one longitudinal, allowing for the insertion of a shaft, or draught-pole (Figure 3). The object therefore represents a two-wheeled cart with wattle sideboards. The projecting naves on all the wheels appear to represent the insertion of a reinforced cylinder to allow the wheels to turn freely on a fixed axle. An apparently identical object is reported from Arslantepe, where it is attributed to the late 3rd millennium (Frangipane 1993: 88).

The two-wheeled cart, or oxcart, with a single shaft would have been drawn by a pair of draught animals, usually oxen. There are dozens of ox-figurines at Norsuntepe, particularly of a type termed “gezäumte Rinder” (bridled cattle), characterized by a transversally pierced muzzle. These may be imagined to have been set up in pairs, with the model carts and wheels, forming an ‘ox-cart ensemble’. These appear to have been quite common in Norsuntepe (at least the oxen and the wheels), but the ensemble turns up at most SE Anatolian sites. At Korucutepe, for example, there are pierced-muzzle figurines, wheels, and what appears to be a clay yoke (van Loon 1978, Pl. 133). Two ‘bridled cattle’ –type figurines can be identified at Tel Bet Yerah (Figure 4).

Although published sources detailing small finds are rather scarce, the two-wheeled model cart does appear to be fairly common in Kura-Araxes sites of the southern Caucasus and northwestern Iran. For example, Kushnareva illustrates a bull figurine and model wheel found in Baba-Dervish, Azerbaijan (Kushnareva 1997: Fig. 24:2, 3); Kohl cites a two-wheel plaque-type model cart (without a frame) from Arich, Armenia (Kohl 2007, Fig. 3.17); and Burney has published a wheel (Burney 1961: P. 74:62) and what appears to be a fragmentary cart model of the plaque type (Burney 1961: Pl. 74:61) from Yanik Tepe. Wheels are reported to be a common find in 3rd millennium sites of Daghestan as well (Gadzhiev et al. 2000: Fig. 9). A cart (Figure 5) from Badaani (Mirtskhulava 2008: Fig. 10) is identical in conception to that of Norşuntepe, and unpublished cart-models are reported from Kvatskhelebi (S. Paz and M. Jalabadze pers. comm.).

To complete this very preliminary survey of ox-cart ensembles of the early to mid-third millennium, I will note the intriguing presence of the flat-bed cart in a region quite distant from its apparent origin – the Indus Valley. In a comprehensive survey of cart models of the Harappan culture, Kenoyer (2004) notes that the ‘basic’ flat bed with post-holes and a single draught-pole is a fairly common find in Harappan sites. The ox-cart, together with clay wheels (usually with one protruding hub) and ox figurines, develops typologically from flat to curved frame-beds, which become increasingly ornate and distant from the prototype.

Discussion

Andrew Sherratt (2006) speculated that the first four-wheeled vehicles emerged with the late-fourth millennium ‘traction complex’ as a design improvement devised in the northern Mesopotamian steppe for the earlier roller-sledge used for threshing in Uruk Mesopotamia. The two-wheeled cart, he suggested, would then have emerged as a more maneuverable vehicle for carrying loads in difficult terrain, becoming the vehicle of choice amongst self-sufficient communities of the hills. Thus, if I understand Sherratt correctly, the beginnings of the ‘traction complex’, involving the yoking of paired oxen to ploughs, sledges and wagons, should be associated with urban communities and large agricultural tracts. The ‘traction complex’ soon extends, still within the fourth millennium BC, toward central Europe. Once adopted by smaller, highland communities, in the form of ploughs, threshing-boards and two-wheeled carts, the association of the traction complex with urbanism or with extensive agriculture is no longer necessary.

The regular co-occurrence of wheels, cattle figurines and, occasionally, model carts in the Upper Euphrates sites and in the Kura-Araxes homelands suggests that the co-occurrence of model-wheels and Khirbet Kerak Ware at south Levantine sites is not accidental: the wheels may well have belonged to cart-models, as part of an ox-cart ensemble.

If this is, in fact, the case, we may hypothesize that the two-wheeled ox-cart was an important mode of transportation throughout the Kura-Araxes world, giving the carriers of the tradition two potentially important assets: possession of draught animals and possession of a relatively advanced transport technology. While the advantages of cattle and oxen are clear enough in agricultural settings, the possible role of carts in the Kura-Araxes expansion seems to open a range of heretofore unexplored possibilities. Perhaps the most immediately attractive of these is the prospect of bridging the conceptual gap between the mobility that is often ascribed to Kura-Araxes communities and the agricultural base that is actually attested in their excavated remains. As long as they maintained possession of their carts and oxen, ‘Kura-Arax people’ could maintain a mobile, seasonally sedentary or even a fully sedentary life-style while participating in the agricultural economy either seasonally (as hired labor) or all year round. Where migration is posited, as in the Levant, carts could be maintained as ‘mobile homes’, either at campsites or even within settled communities (in open or abandoned spaces – see Greenberg, Shimelmitz and Iserlis 2014). Once a suitable destination was reached, a sedentary existence could be adopted.

This hypothesis is open to refutation through studies of zooarchaeological assemblages at south Levantine sites, in search of evidence for a cattle bias in the species distribution and for pathologies associated with their use for traction. Stable-isotope analysis could provide evidence for both animal and human migration. Also, closer attention might be paid to the artifact assemblages for objects that can be associated with mobility.

No less exciting is the prospect of a cross-regional study of the spread of the two-wheeled ox-cart itself. Assuming, with Sherratt, that the four-wheeled wagon was principally an innovation of the plains, associated with estate agriculture and later adopted as a form of overland transport in the Eurasian steppes, the two-wheeler with a fixed axle and freely rotating wheels should be seen as an innovation that was promoted by people living in the hilly flanks. The ox-cart has remained an incredibly durable artifact, surviving to this day in many rural regions, with only the solid wheels undergoing any significant change (the early 2nd millennium introduction of spoked wheels) since Early Bronze Age times.

Acknowledgments

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Figures

1. Two clay model wheels from Tel Bet Yerah

2. The stone wheel from Tel Bet Yerah

3. The model cart chassis from Norşuntepe (after Schmidt 2002: Pl. 37:497)

4. Ox-figurines from Tel Bet Yerah

5. A model cart from the settlement at Badaani (after Mirtskhulava 2008)

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fig. 1. Two clay model wheels from Tel Bet Yerah

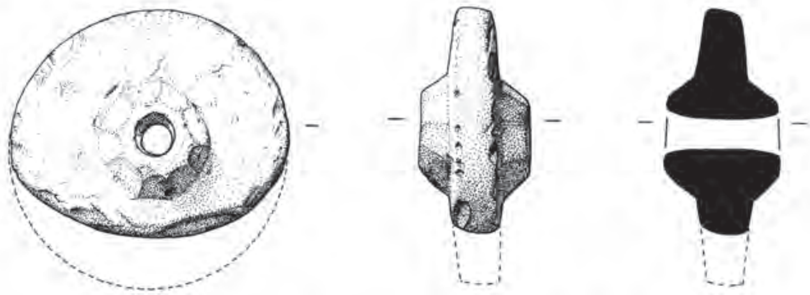

fig. 2. The stone wheel from Tel Bet Yerah

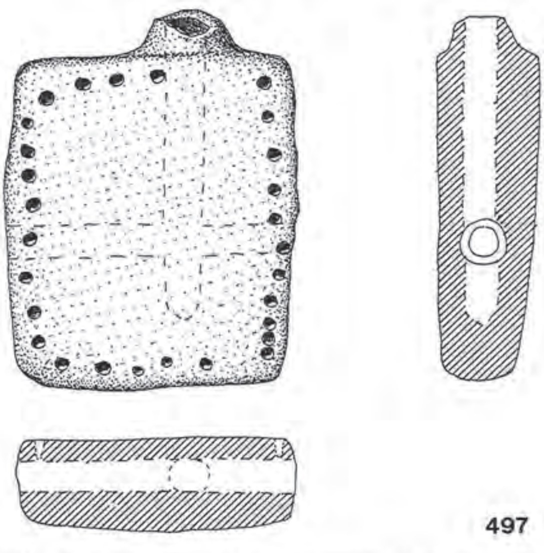

fig. 3. The model cart chassis from Norşuntepe (after Schmidt 2002: pl 37: 497)

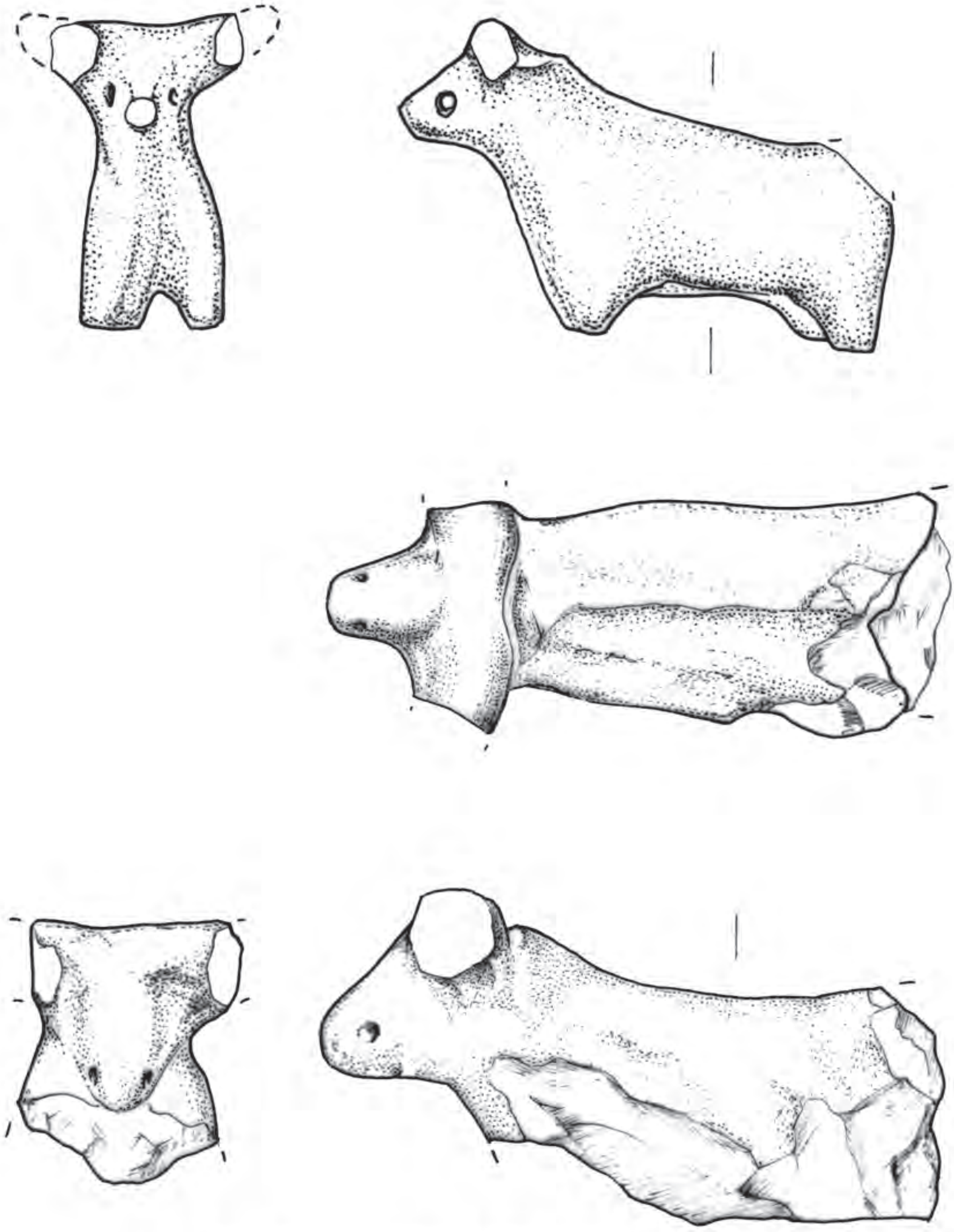

fig.4. Ox-figurines from Tel Bet Yerah

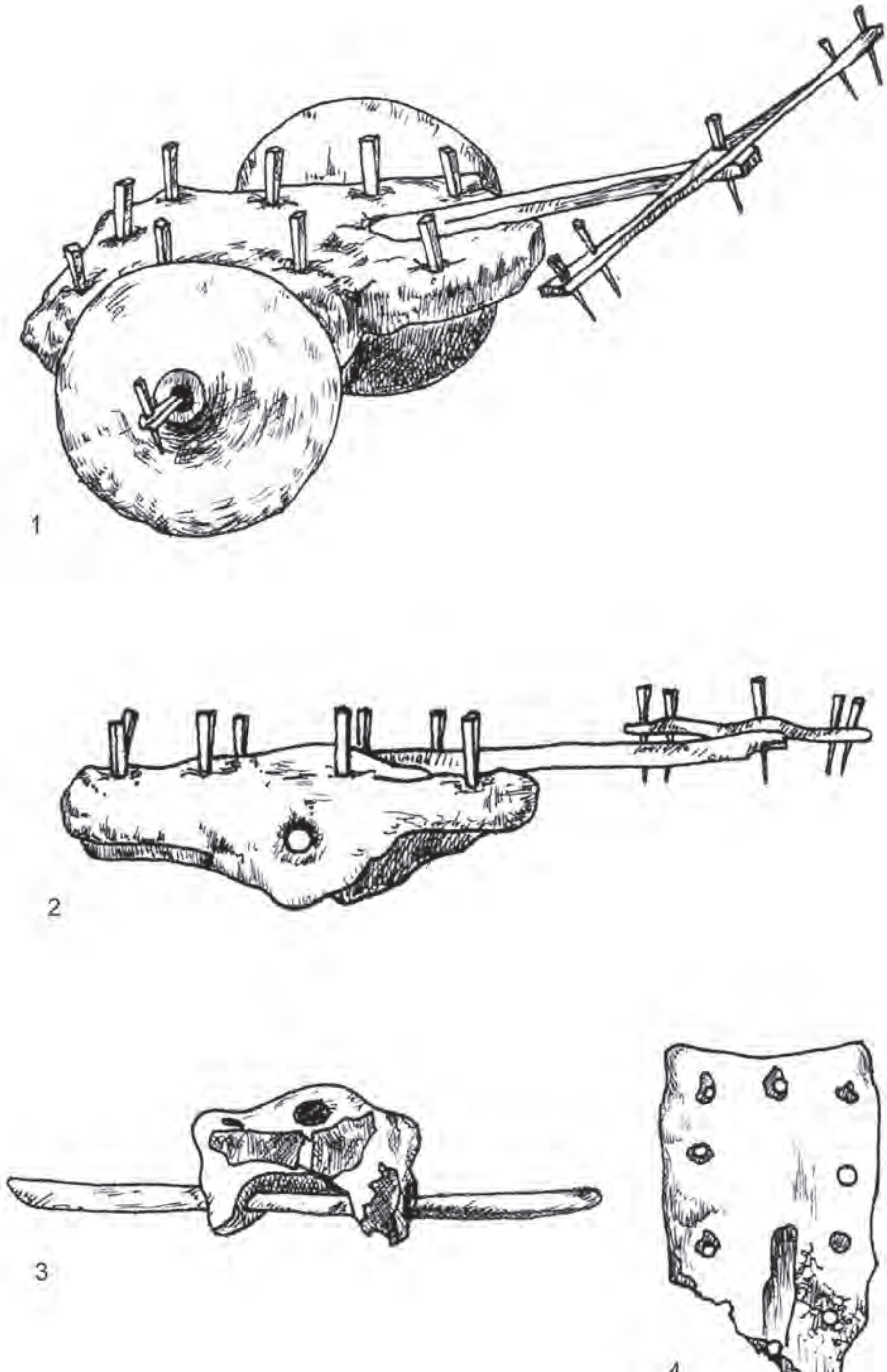

Fig. 5. A model cart from the settlement at Badaani (after Mirtsckhulava 2008)

THE GOLD MINE OF SAKDRISI AND EARLIEST MINING AND METALLURGY IN THE TRANSCAUCASUS AND THE KURA-VALLEY SYSTEM

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1. Introduction

When the German-Georgian expedition has discovered the real age of the Sakdrisi-Kachagiani gold mine for the first time nearly ten years ago it was a surprise: and it is still as many scientists are asking what about the metal that has been won at this mine: how was it consumed and where it was transported to? These questions are still a matter of scientific debate and they may perhaps stay as such for a longer time in future. Archaeology has many mysteries that cannot even be solved even by one scientific generation. But sometimes a lucky scientific find provides us with first clues to understand the treacherous archaeological record.

During the recent investigations on Caucasian gold it was possible to work on golden spiral-rings from a rich Kura-Araxes-tomb found near Hasansu in West Aserbaijan (Museyibli *et all.* 2012)[1] (Fig. 8.5); the grave dates to the later stages of Kura-Araxes culture and was therefore a hot candidate to prove the usage of Sakdrisi gold as it is chronologically contemporaneous with the younger phases of the gold mining in Sakdrisi (recently Stöllner *et all.* 2014: 80-82): the sampling and geochemical investigation did indicate strongly the probability that the gold derived from the Sakdrisi deposit (see M. Jansen et al. in: Stöllner *et all.* 2014: 106-107).

This evidence is not a conclusive result but more the beginning to raise further questions: Why is the metallurgical record especially of the early Kura-Araxes culture before 3000 BC so sparse? How does this fit to the appropriation and cultural use of metals within the early EBA-societies in that region; how and why prestigious metals came into use and what kind of cultural aspects was interwoven with the practice of producing and consuming these metals? These are far-reaching questions that need to be considered from the side of metallurgy and metal use and from the side of production. While the discussion on the earliest metal use has been going on for some time now (for the research history: Courcier 2014: 580-584) it is different with the production of which we have one well studied example in the Mashavera valley near the famous metal deposits of Bolnisi and Madneuli.

2. Early Metals and Metallurgy in the Caucasus

Besides the very early metal objects that have been discovered in layers of the Neolithic Shulaveri-Shomutepe-culture (e.g. Kawtaradze 2001; recently new finds from Aruchlo; S. Hansen in Lyonnet *et all.* 2012: 84-85) we realize that from the beginning of the 4th millennium metals became used to larger extend in East Georgia and the whole Transcaucasian region. But still metals occur seldom in late Chalcolithic settlements of the Sioni/Tsopi group (recently

Nebieridze 2010) and they do even to a lesser extent at the beginning of the Kura-Araxes culture. An increase of metals is particularly visible in contexts of the later Kura-Araxes culture after the turn to the 3rd millennium (Fig. 1). When looking this sequence in more detail it is apparent that the appropriation of metals and metallurgy has not developed in a straight line. After a first invention phase in the 6th and the 5th millennium with a comparatively limited use of metals and ores (Kawtaradze 2001) their use slightly increased in the 1st half of the 4th millennium, with a first emphasis on the younger stages the late Chalcolithic cultures (Leilatepe-cultural complex); in east Georgia but also in Azerbaijan Kura valley we find first metallurgical inventions that became so common later during this millennium (in general: Courcier 2014: 623-636; Gambashidze *et all.* 2010). First heavy metal tools also occurred (e.g. a Mesopotamian shaft-hole axe from Orchosani) and first arsenical bronzes and Nickel rich bronzes as well as first precious metals such as gold and silver (Courcier 2014; Gambashidze *et all.* 2010). It is certainly not by mere chance that these metallurgical innovations were in line with others (chaff tempered, brownish wares, and "wheel turned" pottery of Uruk/Leilatepe style: in general recently summarizing: Helwing 2012). This horizon of - in the widest sense - "Mesopotamian" innovations can be observed in various parts both in the northern Caucasus (Maykop) and in the eastern plains of the Kura and Arax-rivers (Murgab, Mil-Steppe, e.g. the so called Leilatepe-culture: Akhundov 2004; Museyibli 2007; older concepts: Munchaev 1975; for metallurgy: Courcier 2014). It is interesting to note that especially the later phases of the chalcolithic Sioni/Tsopi group as recently discussed by Nebieridze (2010) produced also the first evidence of tumulus-graves in the Kura-valley and its tributaries (Soyuq Bolaq: Lyonnet *et all.* 2010; Boyuk Kesik N4: Akhundov- Makhmudova 2008; Kavtiskhevi: Makharadze 2007). This stands in line with other already mentioned innovations and may indicate the rise of higher demand of metal products. As recently discussed for West Azerbaijan especially the late chalcolithic levels of settlements like Berikldeebi (Javakhishvili 1998; for the metals: Gambaschidze *et all.* 2010, Nr. 17-27), Mentesh Tepe (A. Courcier in Lyonnet *et all.* 2012: 109-113), Poylu and Boyuk-Kesik (Museyibli 2007) produced a larger amount of copper and arsenical-copper artefacts and especially also metallurgical implements like crucibles and moulds. These finds are parallel to 4th millennium technical ceramic that is well known in a large area between the Upper Euphrates, Northern Mesopotamia and the Iranian plateau (recently Helwing 2012). Best examples for this metallurgical tradition were recently discovered by T. Akhundov at the site of Alkhantepe: Several moulds, crucibles and interestingly also litharge strongly remind on parallels from Tappeh Ghabrestan (Majidzadeh 1979; recently the finds: Stöllner *et all.* 2004) or Arisman (Helwing 2010)[2]. As recently Helwing (2012) and Ivanova (2012) have underlined, there might have been direct connections that especially contributed to the rising metallurgical tradition at the beginning of the 4th millennium in the Lesser Caucasian regions. And as the graves of Seh Girdan in North-Iran indicated even a long time ago: these contacts had several facets and were vice-verse (Muscarella 1969; 1972). It is therefore rather likely to hypothesize the introduction of technical knowledge by specialists alongside the large river streams of Kura and Araxes to the Lesser Caucasian highlands.

In contrast it is astonishing that metal from second half of the 4th millennium is not as abundant as one might expect especially in the archaeological record; one is surprised how little the amount of metals in the archaeological record is. In Georgia we have only a few dozens of metal findings from the early Kura-Araxes period and they do not differentiate from the earlier late Chalcolithic in principle. There were arsenical copper alloys but most abundant copper that contains a broad impurity pattern and traces of various chemical elements. This shows that this copper was smelted likely from regional poly-metallic ores-deposits (for Mentesh Tepe see: A. Courcier in: Lyonnet *et all.* 2012: 109-119). But the archaeometallurgical record does not show any special metallurgical innovation before the end of the 4th millennium BC neither in East Georgia nor in Armenia or in West Azerbaidjan. It seems the central Transcaucasian area remained on a rather late chalcolithic metallurgical tradition. This rather reluctant relation to metallurgy and the deposition of metals of metals suddenly changed during the end of the 2nd stage of Kura-Araxes. The time around 3000 BC saw an enormous increase of metals. This makes clear what E.N. Chernykh already stated years ago: the difference between metal-rich Maykop and the metal-poor Transcaucasian Kura-Araxes in the later 4th millennium does certainly not mirror their actual metallurgical activities but rather their ritual practice with metals (Chernykh 1992: 73; in a similar sense in regard of gold: Japaridze 2013, 13).

From the time around 3000 BC and the first half of the 3rd millennium BC we earn more than ten times as many metal objects as in the 2nd half of the 4th millennium. But not only has the quantity increased but also the variation in alloys: as in other regions of the Near East we find a lot of new metal compositions during that time; it seems that the experimental use of metals (and colors respectively) did result in various metal compositions: the “rich” tomb of a socially significant woman at Kvazchela (N2) (Javakhishvili- Glonti 1961; Fig. 2) is a very good example: like the famous “royal tomb” from Arslantepe (Frangipane *et all.* 2004) the whole grave was furnished by a high variety of metal-alloys of several kind: the diadem and the bracelets are both consisting of arsenical copper, an alloy that was already known in the 4th millennium but now came to an ubiquitous level of use: in the contrary to the late Chalcolithic and early Kura-Araxes period arsenical copper was now used at nearly the same level as copper. While the bracelet and the diadem had rather low arsenical level we see the contrary with a number of beads that consists of an arsenical component up to 25%. This resulted in a shiny greyish, silvery color (Gambashidze *et all.* 2010, Nr. 118). It is quite likely that the high arsenical alloys that have occurred in the Transcaucasus during that time originally were intended to imitate silver. A good example derives from the Armenian Kura-Araxes settlement of Gegharot where a necklace with conical and cylindrical beads, bag-shaped pendants and double volute pendants had been found: All of them consist of high arsenical alloys of which the bag-shaped ones had even high additions of lead (Meliksetian *et all.* 2011: 208, Fig. 8). A special note should be given therefore to silver in general that also occurred for the first time during that period in the archaeological record of Georgia: earlier evidence is known from Soyuq Bulaq (Lyonnet *et all.* 2010; Courcier 2014: 623-626; Gambashidze *et all.* 2010) in west Azerbaijan but these examples remained rather unique. The question certainly arises with the silver if it was cupellated either from rich polymetallic ores or if native silver was used: In regard to the evidence of Alkhantepe (see above) it would be logical to assume the cupellation technique and its transmission via the Kura-valley-system from the east. In Georgia there is no litharge found yet neither in the 4th nor in the 3rd millennium’s record. But there are interesting indications for a possible application of this technique from the famous site of Amiranis gora. There the excavators discovered lead and silver spirals (Chubinishvili 1963), the latter also containing lead to a minor content (unpublished results). The sudden rise of silver certainly and high arsenical bronzes goes together with another regional specialty: the antimony. Most of the time it is allotted to arsenical copper alloys but very seldom it is known as a pure metal. Antimony beads also have been found in the already mentioned grave of Kvazchela. However, quantitate level of the antimony component in metals but also the evidence of pure antimony objects indicate its deliberate use at least since the first half and mid of the 3rd mill. (Hauptmann-

Gambaschidze 2001; Gambashidze *et all.* 2010, Nr. 363-364): it has been often underlined that regional Antimony deposits especially those from the Ratcha area in Western Georgia played an important role (for the mining: Maisuradze-Gobedischwili 2001): the 3rd millennium examples do indicate their exploitation already by late Kura-Araxes communities: it may be noted that Kura-Araxes settlements expand into the valleys of the Greater Caucasus already in the later 4th mill. BC: it is therefore not astonishing to find antimony especially in Imeretia –Satshkhere and in Kura-Araxes settlements in Shida Kartli -Dzaghina, Kvazkhela, Tvlepias Zkharo (Gambashidze *et all.* 2010. pp.123-127).

These prestigious alloys go together with the first gold-objects and especially their shiny equivalent, the first tin-bronzes; both occurred still rather rarely. There are only a few gold "spiralrings" (so called "Schläfen- or Lockenringe") from this period discovered in the surrounding of Satchkhere in Imeretia (Gambaschidze *et all.* 2010, Nr. 277; 427). They derive from graves and so does the pair of golden spiral-rings from the metal rich grave in Hasansu in West Azerbaijan (Museyibli 2012). This stands in a line with tin-bronzes that we only know from further few sites in East Georgia, West Azerbaidjan and Armenia: besides older finds from Delisi[3] a spiral-ring from tomb in Talin (a tin-bronze with a comparatively high Ni amount) that can also be dated at the end of the 4th millennium has to be mentioned especially (Meliksetian *et all.* 2011, 204): according to its Pb-isotopes at least one of the alloying components should derive from an geological older deposit: as such deposits are not known in the TEMP (Tethyan-Eurasian metallogenetic belt) the tin or even the copper should have been imported from abroad (Meliksetian *et all.* 2011, pp 208 Fig. 16): it often has been discussed if such "old" deposits can be connected with Central Asian tin sources but this discussion has not come to an end right now (Pernicka 1998; Pernicka *et all.* 2003).

Finally we have to add some words about the subsequent Martkopi/Bedeni stages of the Early Bronze Age that either can be understood as final stage of the Kura-Araxes-development that now is characterized by variations in ceramic styles and the occurrence of a new group of socially significant tombs, the early Kurgans. According to recent dating it is likely to envisage the transition around the mid of the 3rd millennium somewhat between the 27th to 24th century BC (Kavtaradze 2004; Kohl 2007: 108). However, it is interesting to look also to the abundance of metals that are known from this period: Arsenical coppers were dominating the record during this period while copper and tin-bronzes were represented on a rather limited degree: what is surprising is the high ratio of precious metals that were discovered in many of the extraordinary rich kurgan tombs from the Trialeti plateau, from Martkopi and from the Alazani valley (for the gold-finds see e.g. Gambaschidze *et all.* 2010, pl. 1-6).According to recent studies of M. Jansen and A. Hauptmann many of the gold artefacts are characterized by a higher level of silver: one might discuss if especially the silver rich gold artefacts of this period were either alloyed or products from placer or rock-gold deposits that contained a high silver portion (such as the Armenian Masrik district: Wolf *et all.* 2013)[4].

Besides the strong dominance of prestigious metals it is obvious that the Martkopi and Bedeni metals followed the later Kura-Araxes metallurgical traditions: still there are various alloys and metals which are typical for the region such as objects of antimony. What has been found in Georgian metals is a higher level of lead in tin bronzes what makes it likely that lead was used to enable easier casting.

If we summarize our knowledge so far at hand it became obvious that there are several phases of metallurgical inventions during the fourth and third millennium BC: at least the rise of metallurgy during the Late Chalcolithic period at the beginning of the fourth has to be mentioned. But even the transition from the late 4th to the early third millennium showed new alloying techniques that found its climax during the period of the early kurgans. But what is less clear is the provenance of these metals and how these inventions and their social background triggered a demand to exploit regional sources or even were driven by the use of regional sources. Especially if we look to the earlier phases of the Kura-Araxes culture the extreme scarcity of metals is striking: if we look for instance on mining sites from that period we can resume that this rather may result from a filter of transmission; it may not directly reflect the real use of metals in the second half of the 4th millennium. One should not forget that even the Martkopi/Bedeni kurgan's metal furnishings do provide us with a blurred picture. Therefore it may be useful to look again to the production of gold at the central Mashavera-valley in Kvemo Kartli and discuss its consequences for our discussion.

3. Sakdrisi – state of research: Production of early precious metals and a possible model

The prehistoric mine of Kachagiani-hillock was first described by the engineer and geologist T.P. Mujiri; the site was then called Abulmug and Mujiri made valuable observations about the stratigraphic contexts of stone-hammers within refilled mining galleries (Mujiri 1987, 57 pp, 91 pp, 111 pp; commend Stöllner *et all.* 2010, 109). He was also the first who hold possible a prehistoric gold mine. In 2004 the ongoing modern research started by a joint Georgian-German team; the group that consisted of mining archaeologists and archaeometallurgists continued an interdisciplinary field research until 2013 within 8 field seasons (Fig. 3). Excavations were commenced mainly at two mining structures (mine A and B) (in general already Stöllner *et all.* 2010; 2014); these mining structures can be characterized as refilled opencast mines that led once to underground parts; in the case of mine A it was possible to excavate these mining parts also in the underground where the ancient galleries were intersected by the galleries of the modern exploration mine. Excavation and subsequent dating of mining debris establishes a clear chronology: the mines had been used during two phases: the older phase can be dated by several 14C-dates to the 2nd half of the 4th millennium and to the beginning of the 3rd millennium (Fig. 4) (Stöllner *et all.* 2014: 79-81 Fig. 7). It has reached depths of 24 to 31 m below surface and was refilled in the lower parts completely by contemporary mining debris; the younger phase in the contrary can be described as a reopening of the old mines: the activities reached depths of around 8 to 9 m below surface (in detail: Stöllner *et all.* 2014: 76-80 Fig. 8). According to single charcoal-dating from those younger debris it is likely that this secondary work step took place between the 5th and beginning of the 7th century AD.

Considering the fact that nearly all the debris had been refilled after the mining process it is interesting that the Kura-Araxes miners refilled their galleries carefully with different beneficiation debris from up the ground. This conclusion is cogent as the single gallery followed the single ore veins nearly without interconnections so the access once was only possible from the mine mouth. At the current state of evaluation a general 3D model allows to follow the various underground structures: in principle all the mining cavities had been developed by removing the original ore-body (ores and gangue) and the accompanying host-rocks; the mining technique can be described as a "following the vein"-system which was advanced in a diagonal way: the underground mines 1 and 2 provide good examples for this technique which mainly applied the principles of fire-setting. The fire always had to be lid at the working-edge within the ore body and as the miners are forced to follow the veins to the depth the mining process led to diagonal galleries that went down in steps and pedestals. When analysing all the available mining parts of the Kura Araxes period it is clear that the ancient miners followed most of the richer veins to the depth by creating horizontal and slightly inclining working levels; the most demanding working step was the sinking of the initial gallery part in order to construct a new working level that later could be advanced easier to the lateral.

The reconstruction of the "chaîne opératoire" is an ongoing process requiring a trans-disciplinary approach of material sciences, archaeology, ethnology and experimental archaeology. The process reconstructed so far can be compared with techniques described for antique and younger periods (Agricola 1556; see also Tylecote 1987; Bachmann 1999). Despite this empirical approach many questions remain open that pertain to technical solutions and quantitative aspects such as the time-span and the yield of different production steps; together with the estimate of the gold once produced these questions are essential to understand the social impact that the gold exploitation once had (see in detail Stöllner *et all.* 2014). Besides the ore-production the gold-production consisted of several steps that had been documented by archaeological observations, by artifacts and by features (Stöllner-Gambashidze 2011: 196; Stöllner *et all.* 2012; Stöllner *et all.* 2014). Three of those procedural steps mentioned above can be located at the gold mine of Sakdrisi: especially those steps have been also simulated by experiments to understand single technical solutions (e.g. Stöllner *et all.* 2012). They were undertaken in 2011 and 2013: the focus was particularly set on the mining, sorting and crushing and milling process of ores as well as the panning of the gold concentrate.

Once the ore was crushed and sorted most of the high quality gold bearing coarse sands were transported to locations where this material was fine grinded. The results of Dzedzvebi house 3/2009 made apparent that this ore milling was done in large workshop rooms at the settlement (Stöllner *et all.* 2014: 95-100 Fig. 24). Having found also gold contents of about 1 ppm in this workshop room (and being considerably elevated in comparison to the surrounding) proves the workshop and milling theory. The abundance of mill-stones found there does this also in general. Whether the sands got washed and fire-assayed in crucibles in the end is till now a likely but unproven hypothesis. Till now no gold containing crucible was found. 2010 a crucible was found in a pit of the early 4th millennium (together with late chalcolithic pottery) (Stöllner *et all.* 2014: 102 Fig. 21). The metallurgical crust of the crucible shows a slight enrichment of silver; the levels are similar to the silver content of the ore-deposit in Sakdrissi, while the copper is not enriched (Fig. 5). An even more interesting site has been unfolded in 2014: in a workshop of the Kura-Araxes period dozens of milling and anvil-stone were found in context with crucible fragments and several pits: on pit even contained the original ash filling in which a crucible was still embedded (Stöllner *et all.* 2014: Fig. 21). It seems likely that the whole feature represents a non-permanently used workshop area in which gold ores were grinded and subsequently smelted. Further investigations will show not only the metallurgical details but also if such sites represented a typical pattern of work-organisation within the Kura-Araxes settlement occupation of Dzedzvebi.

4. An estimate of the gold contents once being exploited at the ore-deposit of Sakdrisi-Kachagiani – The "Paravani" calculation

In order to understand the social impact that the gold production once had, we had to calculate as well as the general gold-production and the societal and technical efforts of the gold production. Let us start with the estimation of the gold production: as the mines were refilled again with mining debris we were calculating the amount of gold that once left behind and sum it in comparison to the amount of gold that we found still in the single veins that have been exploited. According to our investigations several data could be achieved: first of all there was information about debris ores above ground and refilled mining debris underground (Fig. 6); there the gold-grade allows insight into the cut-offs of the gold-productions; a general mean of 1 ppm Au can be regarded as a minimum-number of which could not be removed from the deposit (calculations in detail: Stöllner *et all.* 2014, Tab. 3-4). On the other hand there is the average gold amount per each of the gold bearing quartz-hematite veins: a case-example will be given here for the lowest mining part of mine 1/2 (called the North-extension): besides the volume and the general ore-content (approximately a third of the volume: 32 m3 with 85 t of rock/ore results in roughly 28 t of pure ores) we were also able to measure the gold content in some parts of the deposit. Au ranges between 10 ppm and 180 ppm at various parts of this area (in the mean-rate: ø 130 g/t Au; ø 70 g/t Ag). Such an estimate would end in a yield of 3.46 kg of gold and roughly 1.96 kg of silver. In general and according to the partly very high gold amounts we estimate at the moment a general output of something between 500 to 1000 kg of gold that once had been produced in Sakdrisi. According to about 700 to 800 years of production in Sakdrisi the calculation would end with an annual output of something around 1 kg.

Further investigations have been performed by fire-setting experiments which allowed estimating all the efforts that very made with the single steps of gold-production from the preparation of the ore mining to the panning and smelting of the gold concentrates (Stöllner *et all.* 2012; 2014). If we take the earring of Paravani with a weight of 9.4 g of Au/Ag as an example, we could calculate its production efforts (further called the “Paravani” calculation”; named after the earring of Paravani-Khulgumo, see list Nr. 13). According to our experiments we could estimate 3.46 min for the production of 1 kg of ore/rock; for the separation and beneficiation work the value is much higher and can be estimated with 224 min for 1 kg (this is the real effort!). All these working steps take the same time whatever gold enrichment is in the ore-concentrate. But none the less the gold grade influences directly the amount of time to produce 1 g of gold: if one calculates the amount of time according to the enrichment of Ag/Au found in mine 1/2-N-extension, one could end up with 42 h to produce 1 g of gold. By considering these data we also get an impression how many people might have been involved to the production. If we take the Paravani-earring as an example: the heavy ring (9.4 g) would have needed at least 3 days by a group of 16 persons to be produced. Without integrating other data one could argue that expeditions could have sporadically reached the mining site to produce such items on special occasions (e.g. funerals, festivals, gifts and social processes of negotiation). But if one look to the general estimate of an annual yield of 1 kg of gold one would estimate the need of 16 workers to produce this amount within 330 working days with eight hours of permanent work. This is not little in a way that other parts of the community also had to provide the subsistence of the mining people. Such a sedentary group perhaps in a size of a larger village can be evidenced at the plateau of Balitschi-Dzedzvebi (Stöllner-Gambashidze 2011; Stöllner *et all.* 2014): But looking at the current evidence we do not know if the gold milling and smelting activities were carried out there seasonally or permanently and in which way of labour-division this was done.

5. Conclusions: Early precious metals in the Kura-Araxes and the early Kurgans: New grave rites of a renewed social complexity?

Finally we may ask what has driven the Kura-Araxes societies in Transcaucasia and their neighbouring areas to appropriate metals to such larger extend at the end of the 4th mill. BC.? At the one hand it is easy to assume that spreading Kura-Araxes communities came in contact with pre-urban large scale settlements and their complex societal organisation at the upper Euphrates. It has been known for a long time that people with Kura-Araxes cultural tradition settled nearby and within the settlement in the Altınova (e.g. Norşuntepe) or at period VI B1 at Arslantepe but even get involved into the societies as part of them (see the inspiring discussion: Kohl 2009: 248-249): How else we should interpret the extraordinary funerary furnishing with Kura-Araxes vessels and other Caucasian elements in the so called "princely tomb" of Arslantepe (Frangipane *et all.* 2004)? However we interpret the evidence it cannot be denied that people from the north had contact with those societies and perhaps got stimulated by them. Though this may be an easy explanation for the renewed interest in metals and items of social prestige it is not convincing as the one and only reason. Perhaps we also have to look for the internal developments within the Kura-Araxes-communities.

Let us look to the earliest items of prestige first. In the wider surrounding of the Sakdrisi gold mine there are only few prestigious metal artefacts of which the gold and silver beads of Soyuq Bulaq are the earliest from the early 4th millennium (Fig. 7). Till now they are outstanding and it certainly would be of interest if they can be connected with the Madneuli/Sakdrisi deposits (for a silver enriched crucible from Balitshi-Dzedzvebi: Stöllner *et all.* 2014, 102 Fig. 21b; in general for the silver: Courcier 2014: 623-636). But it is interesting that the next wave of precious metals (gold, silver and tin-bronze as well) appeared at the end of the 4th mill. BC: most of the time these were spiral-rings ("Locken-/Schläfenringe"), a type that interconnects many societies especially in the 3rd millennium as a symbol (Primas 1995); spiral-rings of this shape are not known from the Near East but there is a considerable concentration in Transcaucasia (Fig. 7-8, see also catalogue), in the North Caucasus and furthermore in Eurasia and East Europe (Primas 1995). These golden items stood obviously at the beginning of a longer lasting tradition that had its climax with the Kurgan graves of the Martkopi-Bedeni stage in later Early Bronze Age and at the beginning of the Middle Bronze Age: it is interesting to see that – although many more expressions of social and ritual significance were added to the graves (adornment plates, discs, needles) later on – the spiral rings were still in use during that period. It is a symbol rather than just an adornment that stood in a longer regional tradition. It therefore seems rather likely that also the wish to use precious metals has evolved within the regional societies and was not mainly stimulated from outside. This observation does not only meet the spiral-rings but also other items of social prestige. If we look to graves like those of Kvazchela, Hasansu or Sachkhere (see catalogue) of the beginning of the 3rd millennium it seems that they stood at the beginning of the funeral tradition that found a further development and ritual variation in the Martkopi-Bedeni kurgans. We can only speculate if this development was paired with an increased social complexity and a higher societal competition that forced societies to increase their efforts for the "eminent dead". However we explain this development it is convincing to think that such had its consequences also to the procurement of metals and metal ores like antimony, tin, silver and gold. If we look at the metal record of 3rd millennium Transcaucasia (Fig. 1) it is rather striking that most of metal that were found in graves had more a symbolic than a functional use. Most of the finds are special in concern of their formal but also their alloy-composition. This makes it again obvious how limited our knowledge is in regard of the common metal use in those days.

If perhaps the access to the gold deposits was rather limited and occasional at the beginning is open; but it may have changed at the end of the 4th millennium and during the first half of the 3rd. millennium when for instance the mines of Sakdrisi get exploited even more intensively. It seems that a part of the Mashavera communities were involved to something which now developed more and more as a regular social activity, perhaps even a "business". And this may be true also to other mining areas such as the Racha-region where the Antimony was won for the first time. But still these questions await our further investigation to understand this fascinating period of change in socio-economic and technical access to new resources and ideas (in general: Hansen 2011).

Catalogue of Transcausian gold-earrings of the late 4th and 3rd mill. (Georgia, Azerbaijan, Armenia)

1. Anaga, Kacheti, Kurgan N1, deepened grave, spirals are made of a thin gold sheet; diameter: 1,1cm; unknown weigth; further finds: jug of Bedeni culture; further ceramical fragments; Literature: Pitskhelauri 1980; Gambaschidze *et all.* 2010: Nr. 782.

2. Ananauri, Kacheti, Kurgan N2 (Fig. ??), massive spiral ring, weight: 8.09 g (86,4 Au; 12,9 Ag; 0,65 Cu); further finds: gold: pectoral, three needles with double volutes; 22 beads (double-conical); 33 biconical ones; 2 spherical ones, 23 cylindrical; two adornment discs; two grooved rings five rings with one groove; silver: two bracelets; two perforated pendants; 110 massive and 9 spherical beads; carnelian: 54 cylindrical and rhombic beads; copper: sheet-fragment; ceramic: sherds of different vessels; Literature: Picxelauri/Orthmann/Qvavadze 1994: 12 Fig. 3; Gambashidze *et all.* 2010: Nr. 595.

3. Dalismta, Kacheti, Kurgan N4, spirals are made of golden sheet around a copper core, weight: 4.65 g, as inventory further 15 golden beads also made of sheet gold covering over copper core, six adornment plates and a dagger blade (copper), three beads of carnelian; a bead slider, eight ceramic vessel; literature: Asatiani-Maisuradze 1992: 154. Taf. I,11; Gambashidze *et all.* 2010: Nr. 736.

4. Enamta, Kacheti, Kurgan N1, massive spiral-ring of gold, unknown weight; further finds: arrow head, copper, 15 ceramical vessels, sherds of small vessels, four carnelian beads, three carnelian pendants, eight frit-beads, bone pendant; literature: Rusischvili-Maisuradze 1984, 122-136, Taf.III,6; Gambaschidze et al. 2011: Nr. 913

5. Hasansu, Agstafa region, grave, two spiral rings; weights: 3.9, 4 g of gold (93.52 Au; 6.41 Ag; 0.04 Cu); further finds: two daggers/spearheads, chisels, four rings; fat axe and shaft-tube-axe (copper); two ceramic vessels; Literature: Museyibli *et all.* 2012: 97-108.

6. Irganchai, Kurgan N21, two spiral rings of gold sheet (89,50; 72,99 Au; 7,74, 19,29 Ag; 2,68, 7,70 Cu); further finds: ten ceramic vessel;; 14C-dating; 2578-2285 BC; literature: Kachiani-Ghlighvashvili 2006: 207, Taf. III1; Gambashidze *et all.* 2010, Nr. 787-88 Tab. G V-77,a-c).

7. Karashamb,Kotayk region, Armenia, great Kurgan, end of 3rd mill., 4 grooved and hollow giold spirals; further finds: silver, large shaft-hole axe of Bedeni type, gold-sheets, disk with spiral decoration, five gold/silver, electron-needles, necklace with spherical gold beads, carnelian beads and pendants; necklace with adiornment plates, beads, carnelian beads and agate beads and conical pendants (agate); literature: Ognesian 1992; Gold of Ancient Armenia 2007: Tab. 6-11; Simonyan 2012.

8. Khankent, Stepanakert , Karabakh region, Kurgan 125; spiral-ring; from a Kurgan of the 2nd

half of the 3rd mill.; literature: Akhundov 2001, 79 Tab.5,3.

9. Koreti, Sachkhere, Imereti, outside of the Kurgan, various graves; massive spiral-ring, gold, weights; closed complexes (?), finds from the first half of the 3rd mill. literature: Japaridze 1961, 137, Tab. XVIII-8; Gambashidze *et all.* 2010, Nr. 277.

10. Martkopi, Kacheti, Kurgan N3, deepened grave; copper with golden sheet (Au 52.3, Ag 39, Ag, 7.3 Cu); diameter: 1,5; weight: 6.2 g; further finds: arrow-head; flag of copper; three ceramic vessels; Literature: Japaridze 1998, 35, Fig. 24,45, Tab. XXII; Gambashidze *et all.* 2010, Nr. 713.

11. Martkopi, Kacheti, Kurgan N3, main grave, spiral ring of copper and a golden sheet, weight 0,93 g (75.1 Au, 24 Ag, 0.8 Cu); further finds: copper, shaft-tube axe, chisel, awl, a spiral and two broken ones; bronze: flag; frit beads, carnelian pendant, jet ring, mother of pearl-plate; eight ceramic vessels; literature: Japaridze 1998, 35, Fig. 24,45, Tab. XXII; Gambashidze *et all.* 2010, Nr. 719a.

12. Metsamor, Armavir region, Armenia, child's grave, mid of 3rd mill.; massive gold-silver spiral, literature: Gold of Armenia 2007, Tab. 11,5.

13. Paravani, Akhali Khulgumo, Javacheti, Kurgan N1, massive spiral, weight 9,4 g (80.4 Au; 16,846 Ag, 2,478 Cu); further finds: two ceramic vessels; literature: Kvavadze *et all.* 2007, 100; Gambashidze *et all.* 2010, Nr. 580.

14. Sachkhere-Modinakhe, Imereti, grave N41, two spirals, one massive, the other hollow (71,09 Au, 26,37 Ag, 2,33 Cu), six silver spirals, sheeted with gold; further finds: socketed axe, two needles with disc-shaped head, two further needles, two bracelets, fragments of golden beads, beads of shell, frit, and carnelian; sherds of ceramic vessels; literature: Lomtadze 1997, 3-11, Fig. III-1; Gambashidze *et all.* 2010, Nr. 768-769, 772

15. Sagarejo, Tetri Qvebi, Kachetia, Kurgan N4, hollow spiral-ring, diameter: 1.5 cm; further finds: spiral of silver, copper; bracelet, flag, arrow-head, bone arrow-head; jug, bowl and ceramic sherds; literature: Chabashvili 2004, 62-65, Fig. II,5; Gambashidze *et all.* 2010, Nr. 803

16. Shengavit, Armenia, grave 1 (old excavations), two massive gold spirals, mid of 3rd millennium; literature: Gold of Armenia 2007, Tab. 11,3; for the site: Simonian 2002; Areshian 2006.

17. Zarzisgora, Sachkhere, Imereti, grave 1945, excavation B. Kuftin; massive gold-spirals, diameter: 1.2 cm; further finds: axe, dagger (copper), carnelian bead, literature: Japaridze 1961, 132, Tab. XVI,10; Gambaschidze *et all.* 2010, 427

18. Zilicha, Kacheti, Kurgan N2, two massive spirals of gold, further finds: three adornment disks, dagger, 352 beads and three pendants (Au); macehead (stone); three arrowheads (obsidian); three arrowheads (flint); frit beads, sherds of four vessels; literature: Asatiani-Maisuradze 1992, 151-164; Gambashidze *et all.* 2010, 746

Tin-bronze

19. Talin, Aragatsotn region,Armenia, grave 11, spiral-ring (Cu+Sn (Ni), Sn=11% Ni=0,34%); further finds: not known to us; dating, 3330-2936 cal BC (2σ); literature: Meliksetian *et all.* 2011.

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Figures:

Fig. 1: Georgia, record of metals and metal alloys between the Neolithic and the end of the 3rd millennium, after the catalogue given in Gambashidze et al. 2010; graphics: authors.
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Delisi: Gambashidze et al. 2010, Nr. 12, 14; Miron- Ortmann 1995, 318, Kat.Nr. 335; recent Pb-Isotope studies in Bochum (pers. Comm. A. Hauptmann) of these two awls indicate that the tin containing ores (probably stannite) might have derived from the Lesser Caucasus and their polymetallic deposits; it therefore should by regarded as a natural alloy that was perhaps deliberately chosen but unlikely deliberately composed.

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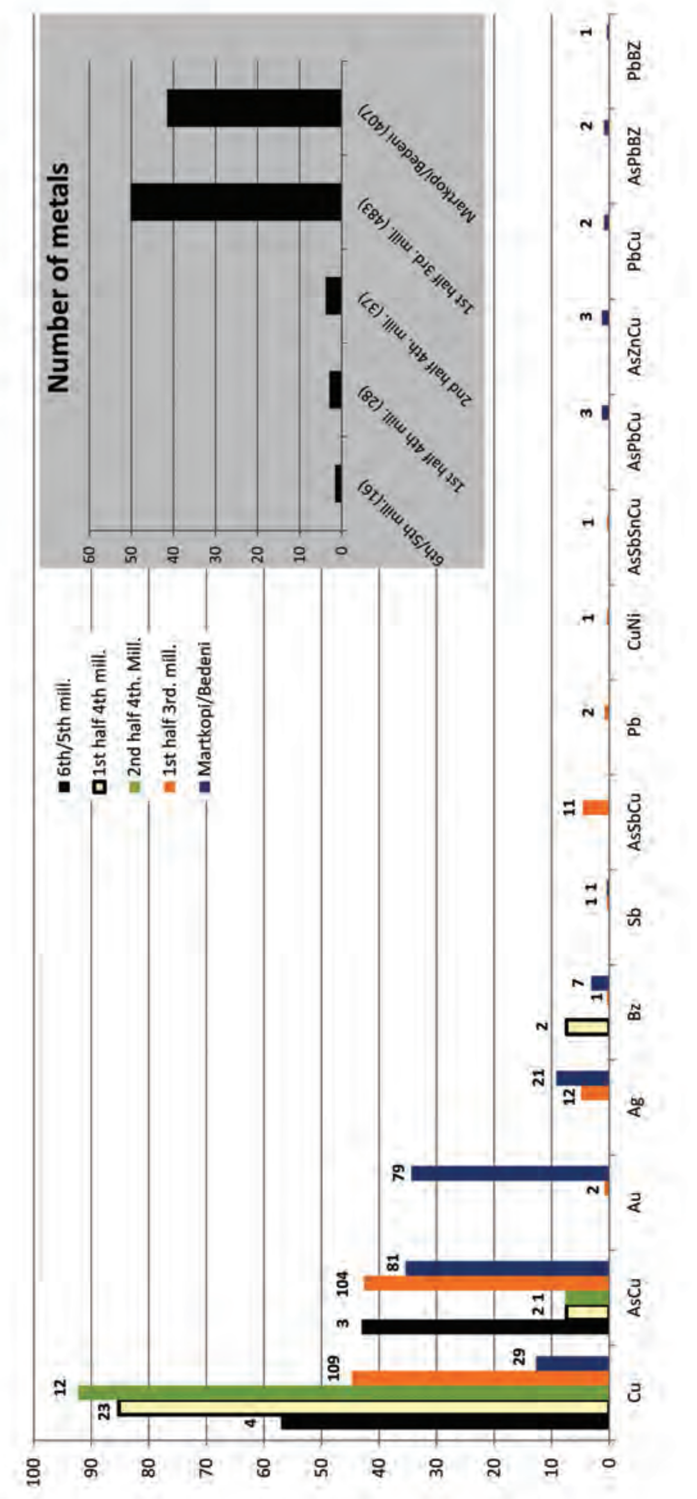
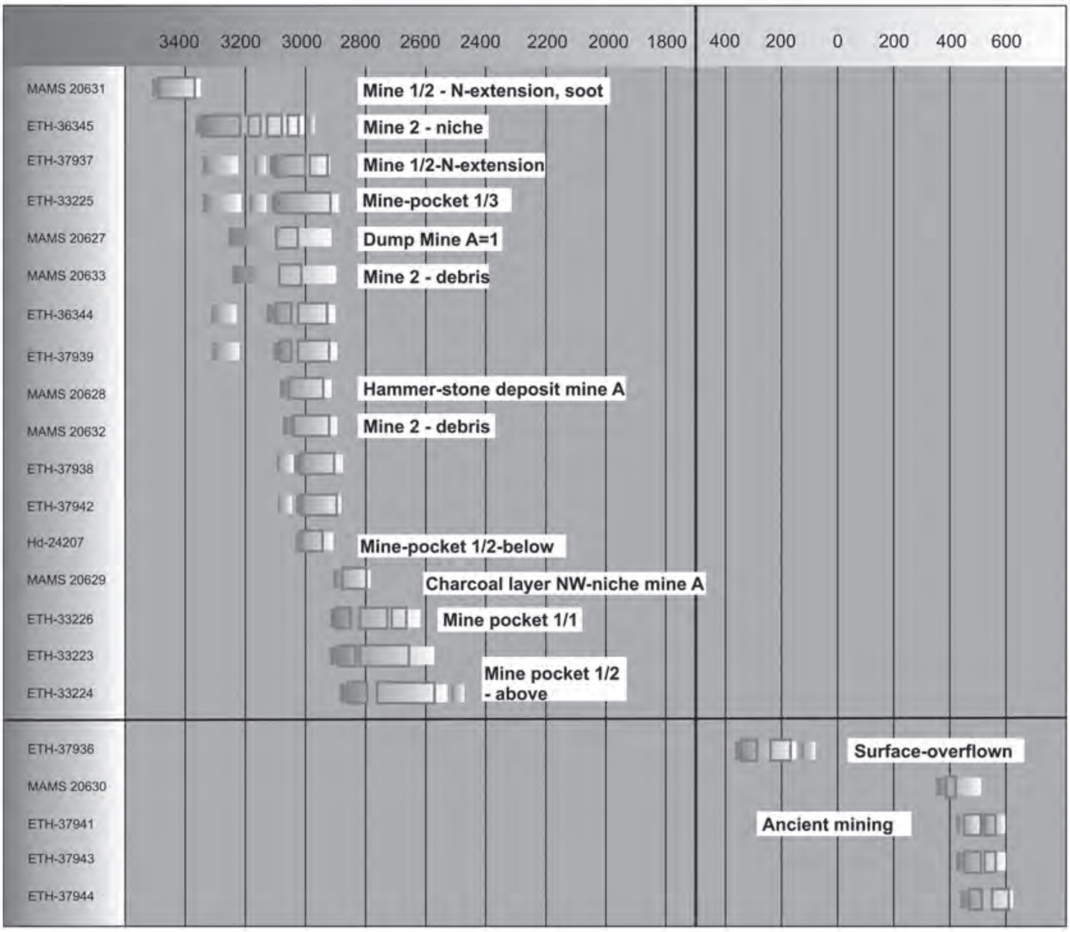

Number of metals
6th/5th mill.(16)
1st half 4th mill. (28)
2nd half 4th. mill. (37)
1st half 3rd. mill. (483)
Martkopi/Bedeni (407)
6th/5th mill.
1st half 4th mill.
2nd half 4th. Mill.
1st half 3rd. mill.
Martkopi/Bedeni
Cu
AsCu
Au
Ag
Bz
Sb
AsSbCu
Pb
CuNi
AsSbSnCu
AsPbCu
AsZnCu
PbCu
AsPbBZ
PbBZ

Fig. 1.

Fig. 2.

Fig. 3.


3400 3200 3000 2800 2600 2400 2200 2000 1800 400 200 0 200 400 600
MAMS 20631
ETH-36345
ETH-37937
ETH-33225
MAMS 20627
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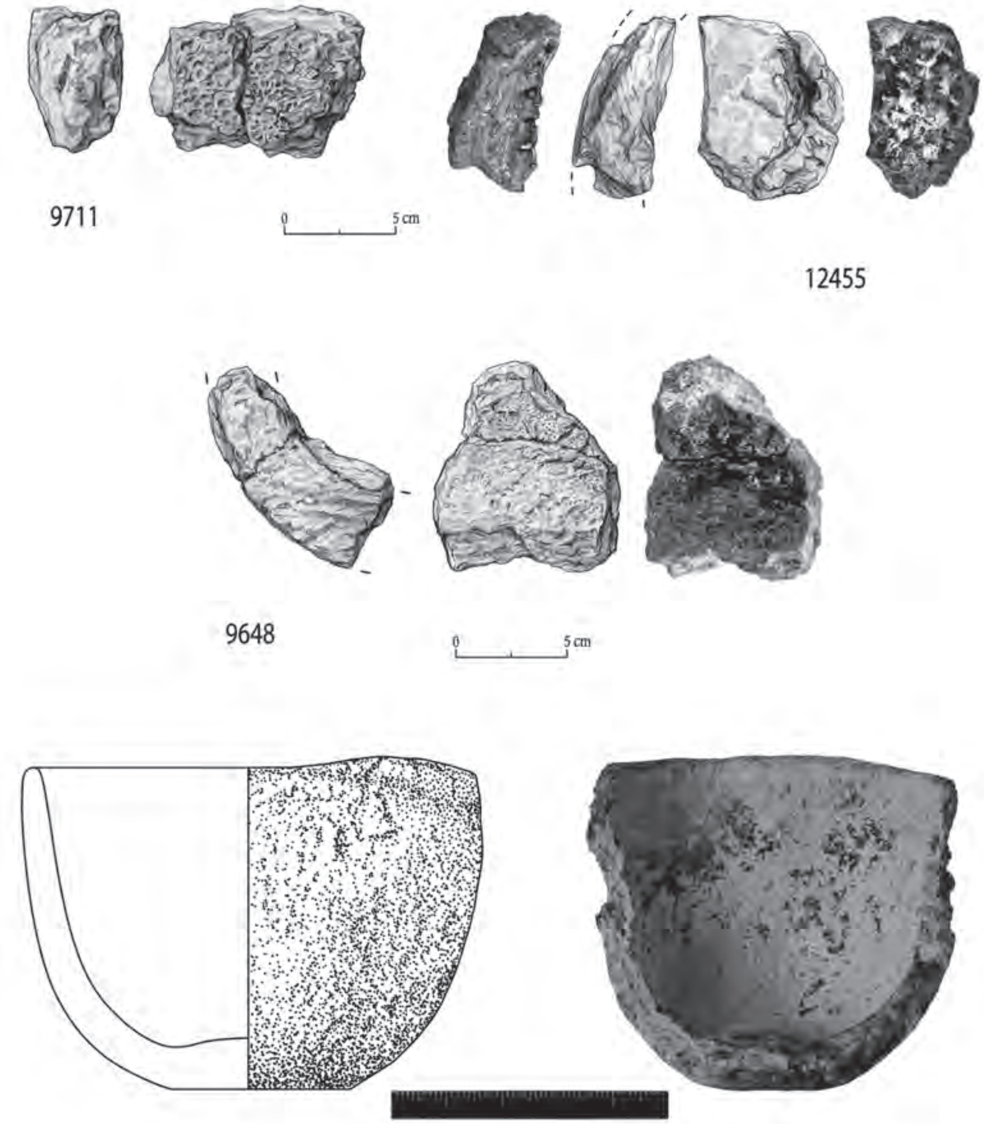
ETH-36344
ETH-37939
MAMS 20628
MAMS 20632
ETH-37938
ETH-37942
Hd-24207
MAMS 20629
ETH-33226
ETH-33223
ETH-33224
ETH-37936
MAMS 20630
ETH-37941
ETH-37943
ETH-37944
Mine 1/2 - N-extension, soot
Mine 2 - niche
Mine 1/2-N-extension
Mine-pocket 1/3
Dump Mine A=1
Mine 2 - debris
Hammer-stone deposit mine A
Mine 2 - debris
Mine-pocket 1/2-below
Charcoal layer NW-niche mine A
Mine pocket 1/1
Mine pocket 1/2
- above
Surface-overflown
Ancient mining

Fig. 4.



Tiegel 22434	Ag [ppm]	As [ppm]	Zn [ppm]	Cu [ppm]	Ni [ppm]
außen	< LOD	20	80	50	60
innen_Messung1	80	< LOD	50	140	< LOD
innen_Messung2	140	< LOD	< LOD	130	< LOD

Fig. 5.

Work pattern	Commends	Time consumption (min)
Wood work/wood transport	16,62 kg wood	90
Preparation of tools	(1 to 3 hammer tools' wastage each process, general estimate	60
Extraction/fire-setting	7,7 kg ore; 15,4 kg country rock	80
Beneficiation/ore separation	Separation of the ore/gangue and country rock	30
Crushing/Sorting/Milling	7,7 kg ore	1725
Wet beneficiation	27 % of 7,7 kg=2,079 kg	462
Smelting of the Au-concentratewith 1g Au	Crucible-smelting	60
Entire time consumption		2507 min; Ca. 42 h
Expenditure of time estimated for the production of one gold earring (Paravani = 9,4 g)		395 h → 16 miners → 3 labor days (8-9 h labor days)

Fig. 6.

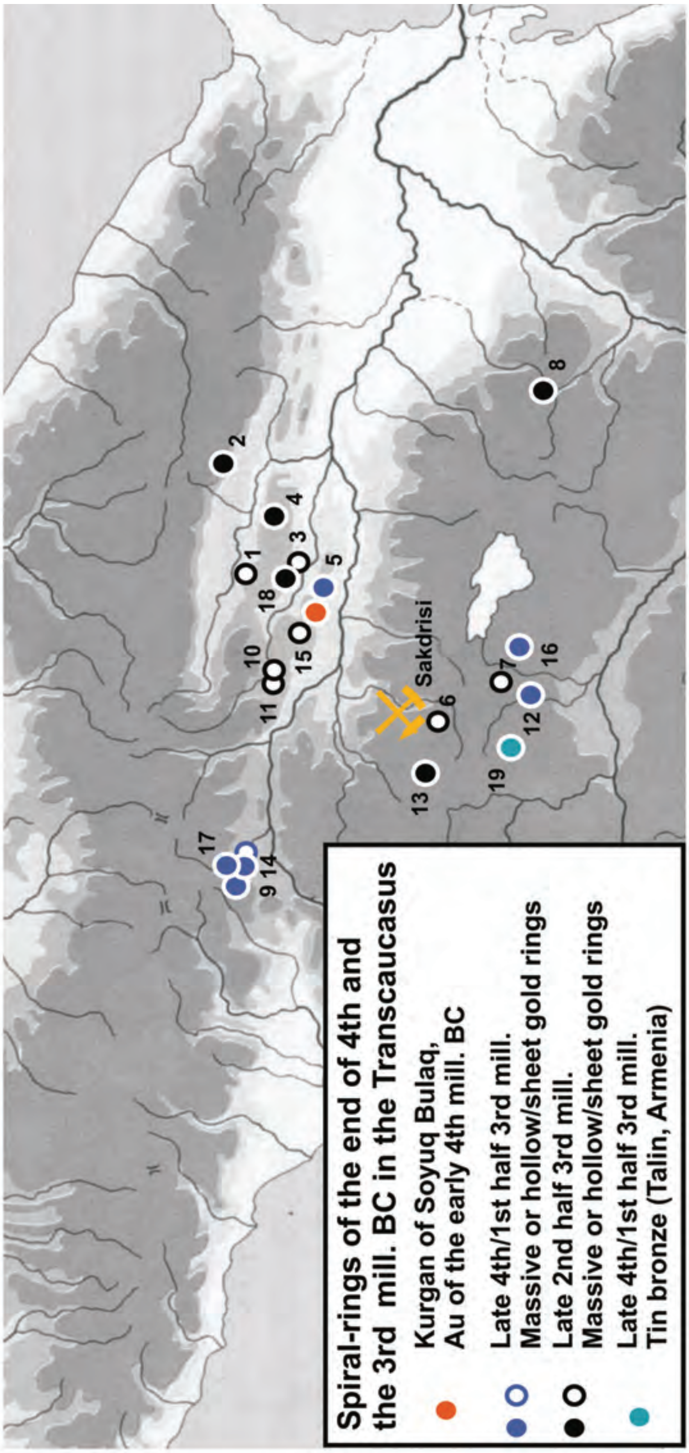

Spiral-rings of the end of 4th and the 3rd mill. BC in the Transcaucasus
Kurgan of Soyuq Bulaq, Au of the early 4th mill. BC
Late 4th/1st half 3rd mill. Massive or hollow/sheet gold rings
Late 2nd half 3rd mill. Massive or hollow/sheet gold rings
Late 4th/1st half 3rd mill. Tin bronze (Talin, Armenia)
Sakdrisi
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19

Fig. 7.

Fig. 8.

A TRANSCAUCASIAN PERSPEKTIVE: SEARCHING FOR THE EARLY BRONZE AGE NORTH AEGEAN METALLURGY

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In recent decades, the archaeological record has so strikingly demonstrated that migrations moving from the Pontic-Caspian steppes and Southern Caucasus in the later sixth millennium BC into the lower Danube region are responsible for main important changes among the local communities (Dergachev 2002; Anthony 2007). Along this 'royal road' (Ivanova 2013: 268-269), connecting southwest Asia to Europe, some technological developments in the field of farming, pottery-making and metallurgy provide an interesting perspective on the process of diffusion of complex innovations.

The North Aegean, which includes the important islands of Lemnos, Lesbos and Samothrace, as well as the mainland North-western Anatolia and East Thrace, is situated at the crossroads of the main axes of long-distance interaction across Eurasia.

In this paper I re-investigate the archaeological evidence from the island of Lemnos, where the largely explored site at Poliochni gives an important documentation of the long-term connections between North Aegean and the coastal region of Southern Caucasus during the fourth and third millennium BC. When L. Bernabò Brea (1964, 1976) published the reports of the oldest Italian archaeological excavations at Poliochni, has convincingly argued that the widespread metallurgy in transitional levels Late Chalcolithic-early Bronze Age (Black Period and Archaic Blue Period according the Italian terminology for the Poliochni's stratigraphical sequence), provides some elements which can be originated in Transcaucasia (Bernabò Brea 1964: 691-699). The Italian scholar focused on the Caucasus region which becomes, during the Early Bronze Age, one of the main suppliers of arsenical bronzes to the nomadic peoples of the steppes, particularly to those communities identified in the pit or catacomb grave groups. Successively, the shift of archaeometrical investigations on metal objects has confirmed that the northern Caucasus from the emergence of the Maykop culture, which now is dated to the second half of the fourth millennium BC (Ivanova 2013: 53-54), played as central role as 'critical intermediary' (Chernykh 1992: 159-162) for receiving metals and producing bronze artefacts to the steppes communities.

Changes on metallurgy, however, represent one of the pivotal questions in the perspective of long-distance relationships between Eurasia and South-East Europe, but other aspects can be taken in the present study, as the introduction of innovations in several craft domains and complex expressions of material wealth.

The aim of my contribution is not to attempt a general overview of the possible contacts between Caucasian and Aegean regions during the Bronze Age, for which I refer to some recent papers on this topic (Abramishvili 2010; Rahmstorf 2010). Instead mostly I focus on those indications of such possible long-distance contacts which are related to the metallurgical and metalworking sphere.

The main features, generally taken into consideration in the traditional hypothesis by Bernabò Brea about the long-distance contacts between the Caucasus region and the Northern Aegean, are the following:

Innovations in the manufacturing technologies: shaft-hole axes

The stone polished hammer-axes with a shaft-hole provide a good evidence for reconstructing specific activity connected to the metallurgical activity (Figs. 1, 5). Since the first investigations carried out by E.N. Chernykh (1992: 61, fig. 18), this category of artefacts, which include stone, metal finds and moulds, has been connected to the metallurgical activity of the Circumpontic Metallurgical Province (CPM). Strong similarities in the shape and dimensions suggest a possible morphological interrelation between stone polished axes and copper shaft-hole ones ("*Nackenschaftlochaxt*") in terms of tools connected to the metallurgical craftsmanship. Shaft-hole axes in arsenical copper characterize the metallurgy of the Maykop culture in the North Caucasus (Courcier 2010: 79, fig. 4; Rahmstorf 2010: 265-266, fig.2), where is largely reported a wide variety of types with a curved profile, according to the moulds and to the finished examples (Fig. 4a). However, it remains an open debate whether some morphological differences varied in time or are contemporary.

The better evidence in this perspective is provided the Early Bronze Age tumulus graves cemetery at Velikent, on the Caspian plain, Daghestan. The burial goods show the coexistence of the copper shaft-hole axes with their polished stone counterparts (Kohl *et all.* 2002: 123: figs 7.8-9) (Fig. 5).

Turning back to the North Aegean, this category of stone polished tools is largely known at Poliochni from the Early Bronze Age (Blue Period), where there is evidence of stone polished products (Fig. 1b-d), as well as of copper and/or copper-tin shaft-hole axes. In the case of stone finds, unfinished axes and fragmented finished examples found in different areas of the settlement, indicate a local production and probably a part of them was for export (Bernabò Brea 1964: 671) (Fig. 1a). Moreover, a large variety of stone examples occurs in Poliochni, and the their concentration in specific workshop buildings into the settlement indicate that these stone hammers were utensils connected to the metallurgy, probably used for the final process of cold-hammering (Doumas 2011: 176).

I want to focus on two important findings coming from different levels of the stratigraphy at Poliochni. The first one is a clay mould for casting a metal shaft-hole axe, which has been found in the Megaron 605, levels related to the Blue Period (first quarter of the third millennium BC) (Bernabò Brea 1964: 66-67, 590, pl. 85.d; Doumas 2011: 174, fig. 17.19) (Fig. 2). The mould was found associated to some copper slags and a crucible (Bernabò Brea 1964: 590, pl. 85a-c). The mould was used for casting a type of shaft-hole axe that is attested in the Green and Red Periods at Poliochni, as the example from the hoard in Room 829 (Bernabò Brea 1964: 661-662, pl. 173; Doumas 2011: 174, fig. 17.20) (Fig. 3).

According to the first editor, the bronze axe and the clay mould show a mixture of influences from the Balkans and from Near East (Bernabò Brea 1964: 662). In fact, the lower end of the shaft tube, which is cut away at an angle, can be related to a category of bronze axes known as *Pădureni type* (Vulpe 1970: pl. 11; Maran 2001: 279), or alternately to the *Veselinovo type* (Nakou 1997, fig. 3), largely documented in the Balkans during the third millennium BC. These typological features also occur in a bronze shaft-hole axe from the Tomb 1, Mound IV at Velikent, which has been dated to the first quarter of the third millennium BC (Gadzihev *et all.* 1997: 199-201, figs. 8.1-2.4: 17-18) (Fig. 4.b). However, despite of these similarities, the mould and the copper axe from Room 829 are without parallels in the Early Bronze Age North Aegean. Moreover, the mould implies the knowledge of the lost-wax-technique, demonstrating a possible link with the sand-casting technique (*Sandgusstechnik*) used in Mesopotamia (Rahmstorf 2010: 268).

In order to understand in a wider perspective the emergence of hybrid morphologies in North Aegean, a possible investigative tool is to re-analyze the diffusion on stone polished shaft-hole axes, because they represents a counterpart of the copper examples.

Although the analytical typological and chronological arrangement of the early shaft-hole axes in Chernykh's CPM still holds many difficulties, there is no doubt that the Caucasus district and the Northern Aegean, including also Western Anatolia, were part of comparable tradition in metalwork, either in technology and in typology.

If the typological development and subdivision of the bronze shaft-hole axes in the Caucasian region (Vulpe 1970) needs to be reassessed at the light of other datable evidence, the diffusion of the stone polished variety can contribute to better define the possible interconnections between both categories. New data again are reported from the tumulus cemetery at Velikent, mentioned above.

In the Tomb 11, Mound III, many stone objects were found, particularly four polished shaft-hole stone axe-hammers (Fig. 5). They are made of marble limestone and pear-shaped, with a slightly raised lip encircling well-drilled hole (Kohl *et all*.2002: 123, fig. 7.8). In this perspective Ph. Kohl (2007: 109) has correctly proposed for the ground polished industry from Velikent a possible connection with the production of ceremonial shaft-hole axe-hammers which frequently occur in the early Kurgans on the Caspian Plain, dated to the Novotitorovskays culture.

Polished stone axes with a shaft hole are widely distributed in many Bronze Age contexts of Eurasian world (Bátora 2003; Kaiser 2003: 294-303), but the distribution map has to include additional districts in Anatolia, Syria, as well as southeast Europe (Maran 2001; Schmidt 2002; Kaiser 2003).

In the valley of lower Koban, among the finds of the Maykop period, occur polished stone hammer-axes with a shaft-hole, particularly in the lithic artefacts from the settlements of Psekup and Chernyshev. In two cases, in the looted cemetery at Taujkhabl/Chishkho, there is evidence of stone polished shaft-hole hammer-axes among the burial goods, probably related to individual of high rank (Rezepkin 2000: 71, pl. 77.4). In the Kura-Araxes culture metallurgy there is evidence of a variety, either polished stone or metal, of a long and narrow shaft-hole axe, which can be compared with the examples from North Aegean (Courcier 2010: 85, fig. 8).

Conversely, in the lower Dnepr plain and Crimea peninsula this category of stone artefacts are very rare finds, as in the case of the early Bronze Age site at Mikhajlovka II (Ivanova 2013: 149, fig. 5.10.4).

According to this preliminary map of distribution, we can conclude that stone polished shaft-hole axes are one of most characteristic class of artefacts strictly connected to the metallurgical activity in the vast region of Chernykh's CPM. Nevertheless, the typological similarities can indicate a large network of long-distance contacts, but it remains hard to prove that the development in different regions was following a linear way. The main obstacle to the linear and direct diffusion is the different techniques in casting. According to the model of Chernykh (1962: 61, fig. 18), in the case of copper axes the first stage of production implies examples made in an open two-part mould and later there is evidence for two-part mould with a casting channel. The archaeological record from Poliochni clearly demonstrates the exceptional early usage of the lost-was technique and that copper and stone polished shaft-holes axes become to be made since the early centuries of the third millennium BC.

Although the chronology of shaft-hole axes contexts in Aegean needs to be re-discussed, the archaeological record from Caucasian region confirms that the earliest examples come from Maykop graves. The Kurgan 30, grave 1, at Novosvobodnaya/Klady, where is attested a small copper axe, gives one 14C date which falls between 3508-3128 BC in the 2-sigma range (Rezepkin 2000: 22, pl.47.11). Most striking is the evidence from Lebedi in the Koban (Fig. 4c), where the two-part mould, which is very similar to the bronze axe from Poliochni, should be dated earlier than the examples from the Maykop culture, probably to the earlier third millennium BC (Chernykh 1992: 80-83, pl. 7-9, fig. 27); Kaiser 2003: 166-168, fig. 65).

Development of tin metallurgy in North Aegean and Eurasia

In the Aegean the combination of archeological data and results of Lead Isotope Analysis has revealed that tin bronzes (Cu-Sn alloy) increase at the beginning of the second half of the third millennium BC (EBA II 2600-2500 BC) (Pernicka *et all*. 1990). In the case of Poliochni, the earliest metal artefacts of tin bronze come from the Red Period and these include a pendant and a pin (Bernabò Brea 1964: 434, pl. 177-28; Cultraro 2008: 453-454). This is the same chronological context to which is dated the shaft-hole bronze axe from an hoard in Room 829 discussed above.

A recent reassessment of the stratigraphy of the oldest Italian excavations at Poliochni suggests to propose a new periodization of the tin bronze artefacts into a wider sequence (Cultraro 2008). Although there is the possibility that tin bronzes become since late Troy I, as the evidence from Besiktepe suggests (Begemann *et all.* 2003: 177-183), in North Aegean the use of tin continues during the middle of third millennium BC. In case of Poliochni, during the Yellow Period, corresponding to the EB IIlate—III, tin bronze is the dominant alloy type, with almost 60% of the analyzed items. The maximum concentration of Sn is documented in a dagger found in Room 623-624 (Bernabò Brea 1964: 525, pl. 171.d); this artifact consisted of 19.08% Sn, which is a percentage higher than one identified in bronze items from Troy I late and II (Cultraro 2008: 455).

Looking at the neighbouring regions, in Western Anatolia the use of copper-based bronze objects is largely known in many sites within the first half of third millennium BC (Muhly 1985: 290). This evidence is comparable with the archaeological data recorded in the Northern Aegean, but the lead isotope ratios invite us to explore other ways, such as a possible connection with the Caucasian metallurgical province.

The earliest evidence of tin-bronzes in Caucasian region is related to the Martkopi kurgan tombs n.3 and n.5, where were found a curl-ring and a standard (Kavtaradze 1999: 84). Moreover, an tin bronze awl is reported at Telebi, east Georgia, in a context of late Kura-Araxes culture (Rahmstorf 2010: 279). This evidence is of relevant interest because such chronology is comparable with Mesopotamia, where tin bronze artefacts appear at many sites within Early Dynastic III (Lutz 2004). More in general, the Caucasian tin-bronzes begin to appear in very small quantities in well-stratified and dated contexts of late Kura-Araxes culture time, and then gradually increase in proportion to arsenical bronzes in the second half of the second millennium BC.

New evidence comes from the results of lead isotope analyses on a wide groups of Armenian Early Bronze Age copper-based artefacts (Meliksetian-Pernicka 2010). The first aspect concerns the exploitation of the same copper ores for production bronze artefacts found in the Armenian Highland during the Kura-Araxes culture. Moreover, some of these artefacts do not match isotopically Armenian ores and in this case the lead isotope characteristics are comparable to most of the Early Bronze Age tin bronzes from the Persian Gulf and Daghestan (Meliksetian-Pernicka 2010: 86). Some artefacts from the Gyumri Museum of Shirak region shows close isotopically affinities with a complex of bronze-tin found in the tumulus cemetery at Velikent mentioned above. The metal artefacts from Tomb 1, Mound III, which contained c. 1500 examples and many of them analyzed, prove to be deliberately alloyed tin-bronzes (Kohl *et all.* 2002: 124).

It is worth to note that lead isotope ratios, which can suggest the exploitation of local ores sources in northeastern Caucasus (Courcier 2010: 76-77), show many affinities with the composition and isotope fingerprint of the tin bronzes from North Aegean, particularly those found at Poliochni, Lesbos and Troy (Weeks 2002: 181, fig. 15). The analyzed tin-bronzes from Velikent suggest a possible origin from ore sources located in same place in Eastern regions, as show the affinities with the tin-bronzes found at Tell Abraq in the Arab Emirates (Weeks 2002; Kohl 2007: 108).

At the light of the archaeological record above reported, it is hard to believe that the way connecting maritime southern route (Arabian Peninsula) and Caucasian region was the main trade route during the early third millennium BC. However, if we accept the argument that origin of tin should be sought in southern central Asia (Muhly 1985: 290), it was possible that the connections between these long-distance areas was not as linear as assumed. As P. Kohl has clearly argued (2007: 108), the evidence from Velikent is "…consistent with the notion of the long-distance sporadic exchange of semiprocessed tin-bronzes and/or prestige good", across the Eurasian steppes and Caucasus, and eastwards the rich tin sources in Afghanistan.

This intriguing picture needs to be much more investigated, but there is no accidental that the affinities in the lead isotope ratios are closely related to affinities of different kind, as the presence of similar classes of artefacts, as the shaft-hole axes. Of particular interest is the evidence given again from the metal artefacts found at Poliochni. In the level of the Red Period a silver disk pendant, has been reported from the Rooms 811-844 (Bernabò Brea 1964: 376, pls 170.3, 177.28) (Fig. 6a). The pendant, with a characteristic bent loop for suspension, is isolated among the ornaments of the Early Bronze Age in North Aegean and can be compared to a category of bronze disk or medallions, some elaborately decorated, which occur in the tumulus graves at Velikent, i.e among the burial goods in the Tomb 11, Mound III (Kohl *et all*. 2002: 123, fig. 7.11) (Fig. 6b). Moreover, at Velikent, where is also attested a variety of disk pendant without decoration (Kohl 2007: 109. Fig. 3.26), this category of ornaments has been compared to a class of bronze or copper medallions which are repeatedly found on the steppes cultures (Kohl 2007: 109 with references). These affinities of the Poliochni's pendant with the metal ornaments from Eastern Caucasus are more tantalizing that definitive, but the absence of this category in the early Bronze Age Aegean, as well as the affinities with the Caucasian ornaments, can be interpreted as a further indicator of long-distance contacts.

Conclusions

The excavations at Velikent and other large tumulus cemeteries in Northern Caucasus provide the emergence of rich communities, particularly during the Maykop culture, from the later fourth to the beginning of the third millennium BC. The 'Caucasian Metallurgical Province' does not show an isolated character which paradoxically contrasts with the picture related to Anatolia or North Mesopotamia (Chernykh 1992: 192), but such district at this early stage played an important role in the transmission and wider circulation of common elements from the Caucasian communities until to the steppe groups, also at the borders of the Aegean world.

The correspondences between the Aegean and southern Caucasus in terms of technology of metalwork, as well as regarding the similarities in some features (shaft-holes axes and tin bronze artefacts) are too convincingly strong to reject the hypothesis of an coincidental phenomenon. In this perspective the cemetery at Velikent represents an important litmus paper for open up a debate on the 'royal road' (Ivanova 2013: 268-269) connecting Caucasus and southeast Europe in the third millennium BC. For example, this cemetery revealed not only tin-bronzes with lead isotope ratios comparable with ones from North Aegean, as mentioned above, but it also has given us evidence for another category of artefacts, totally unknown in the Caucasian district. I refer to the decorated bone tubes, which largely occur in Eastern Mediterranean and Aegean during the early third millennium BC (Saliari-Draganits 2013). At Velikent an example of this category occurs in the tumulus cemetery (Gadzhiev *et all.* 2000: 64, fig. 16.14) (Fig. 7), and a second object has recently reported in the early Bronze Age at Shirakavan, Armenia (Rahmstorf 2010: 279). Although on this category of bone tube there is an open debate on the origin and possible functions, I want to point out that a large number of tubes found in Aegean, especially in Cyclades, reveal pigments of color in them. For this reason, the bone tubes have been interpreted as cosmetic tools related to the 'toiletry kid' (Saliari-Draganits 2013: 186). It is worth noting that these pigments of colors are strictly connected to the metalworking sphere. The presence of malachite and azurite into these color mixture indicates that these minerals are the results of smelting and roasting activity. In this perspective the decorated bone tubes too can be interpreted as pigment containers for substance obtained by the metalworking. Moreover, the evidence of Velikent confirms that these category of items occur in high elite contexts, as well as the circulation of tin bronzes and shaft-holes axes.

The convergence of the lead isotope ratios from Velikent with samples of tin bronzes from Aegean and Arabic Peninsula needs to be explained in a wider perspective, focusing on the possibility that in Caucasian region could be identified some metallogeneous zones characterized by tin deposits (Courcier 2010: 87). These are associated with arsenic and niobium, and both minerals could be serve as a tracer element in future chemical analysis. The exploitation of this tin deposits in the Caucasian area, and especially their implication in the development of the metallurgy of the tin bronzes in North Aegean and Anatolia, remains for discussion on another occasion.

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FIGURES

Fig. 1 Polished stone shaft-hole axes from Poliochni, Lemnos (Greece), levels of the Blue and Green Periods (adapted from Bernabò Brea 1964 and Doumas 2001)

Fig. 2 Poliochni, Megaron 605 (Blue Period level): Clay mould for casting metal shaft-hole axe (adapted from Bernabò Brea 1964).

Fig. 3 Poliochni, metal hoard in Room 829 (Red Period level): bronze shaft-hole axe (adapted from Bernabò Brea 1964).

Fig. 4 a. Bronze shaft-hole axes from different sites in North Caucasus (Maykop and Kura-Araxes cultures); b. bronze shaft-hole axe from Velikent, Tomb 1-Mound IV; c. stone mould for casting metal shaft-hole axe from Lebedi (a. adapted from Courcier 2010; b. from Gadzhiev *et all.* 1997; c. from Chernykh 1992).

Fig. 5 Velikent, Tomb 11, Mound III: stone polished shaft-holes and mace-heads (adapted from Kohl *et all.* 2002).

Fig. 6 a. silver disk-shaped pendant from Poliochni; b. bronze disk pendant from Velikent (a. from Bernabò Brea 1964; b. from Kohl 2007

Fig. 7 Velikent, bone tube with incised decoration (from Gadzhiev *et all.* 2000).

SUMMARY

The paper aims at focusing on the problems of interpretation and chronology of relationships between North Aegean and Caucasian region during the early Bronze Age.
It has long been know that arsenical bronze metallurgy makes its appearance in the Caucasus region during the late forth millennium BC. In the same period evidence of arsenical bronzes occurs in North Aegean, either in islands or in Mainland Thrace, where it is possible to identify some pottery typologically connected to the Kura-Araxes and Maykop cultures.
The recent exploration of the Catacomb cemetery at Velikent, Daghestan, suggests new and intriguing evidence for re-examining some technological affinities between the metallurgical production of both areas. A group of tin-bronzes chemically investigated from Velikent shows a 'isotopic similarity' with some metal artefacts found at Poliochni (Lemnos) and Thermi on Lesbos. The isotopic concordance may be explained in terms of exploitation of the same ore sources. Indeed, other affinities can be identified in the category of bronze shaft-hole axes from Poliochni, which show a Caucasian origin. This category of metal artifacts has closest affinities with the stone hammer-axes widely distributed in North Aegean, which are identify as metal-

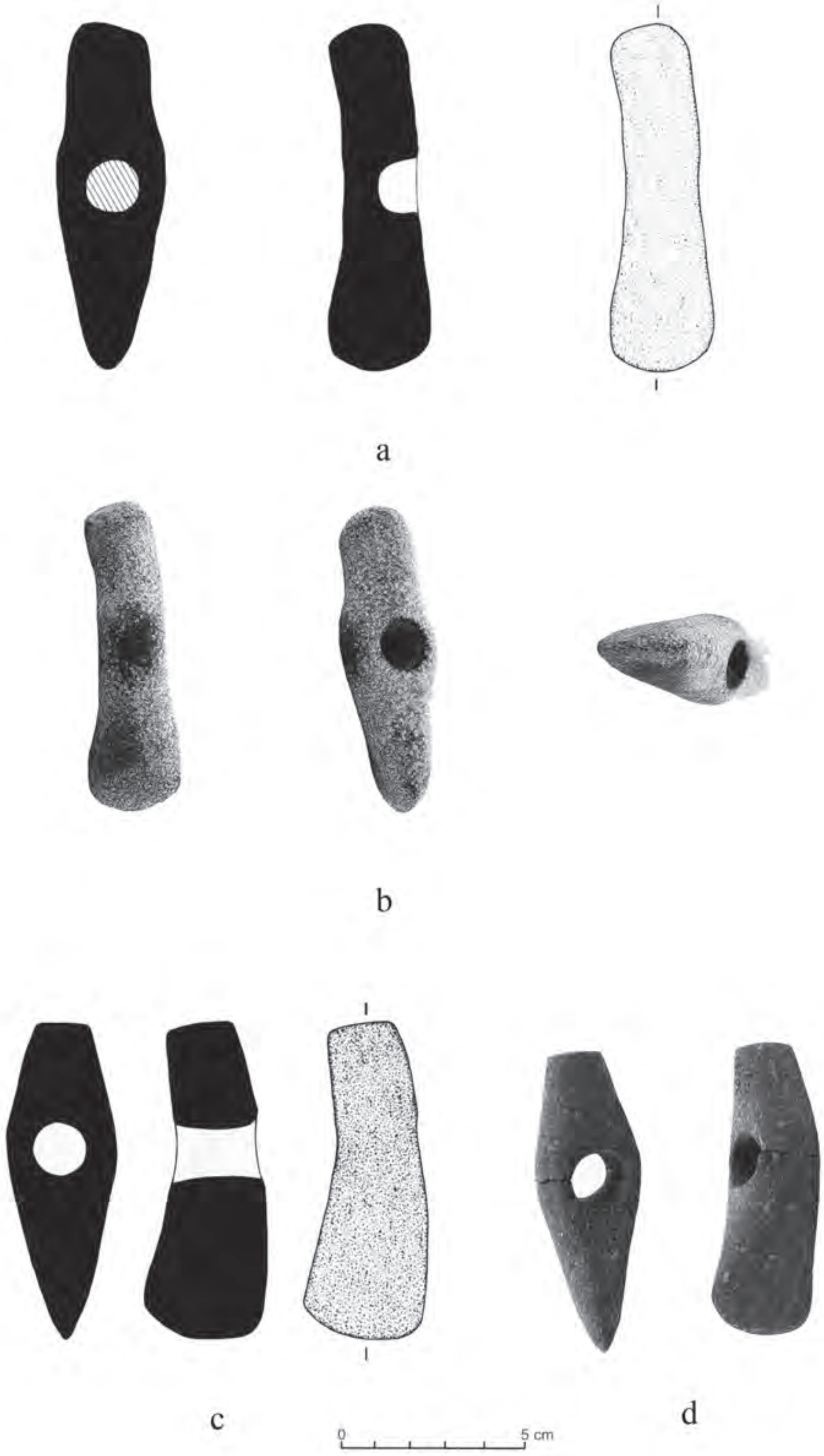

Fig. 1.

Fig. 2.

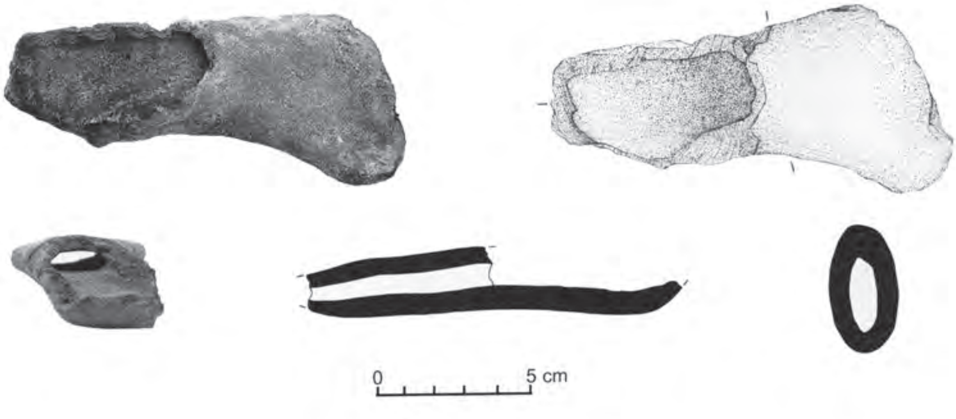

Fig. 3.

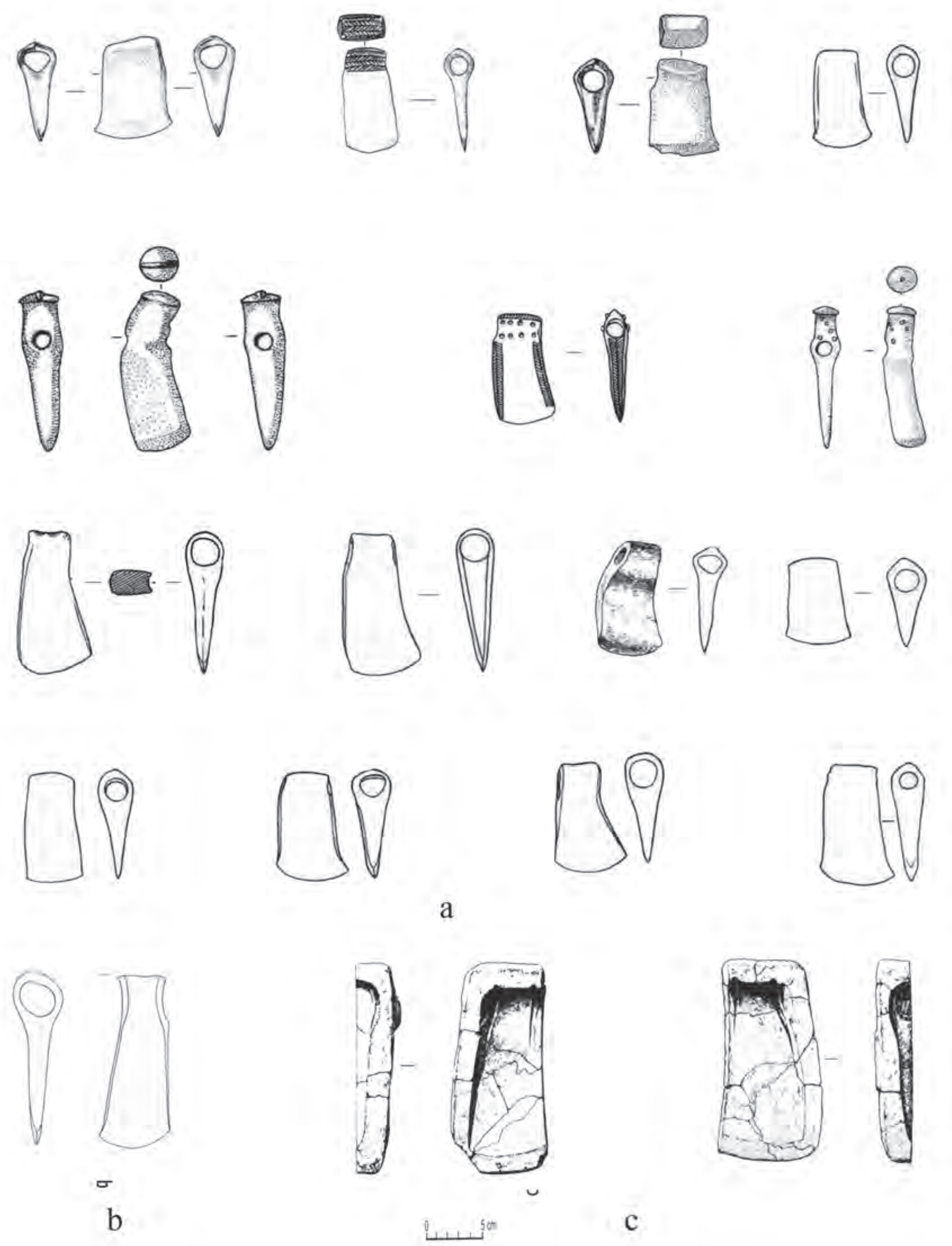

Fig. 4.

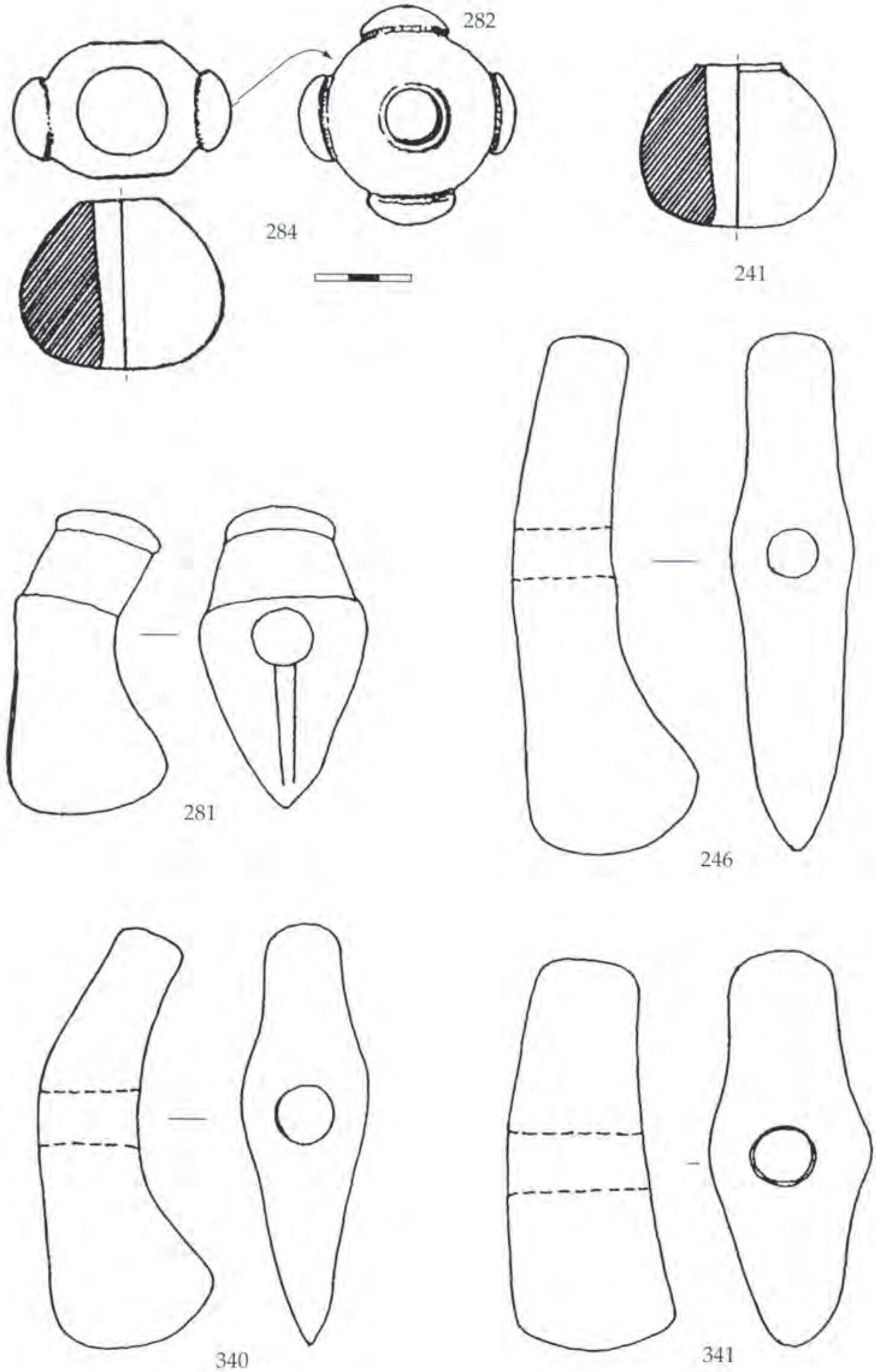

Fig. 5

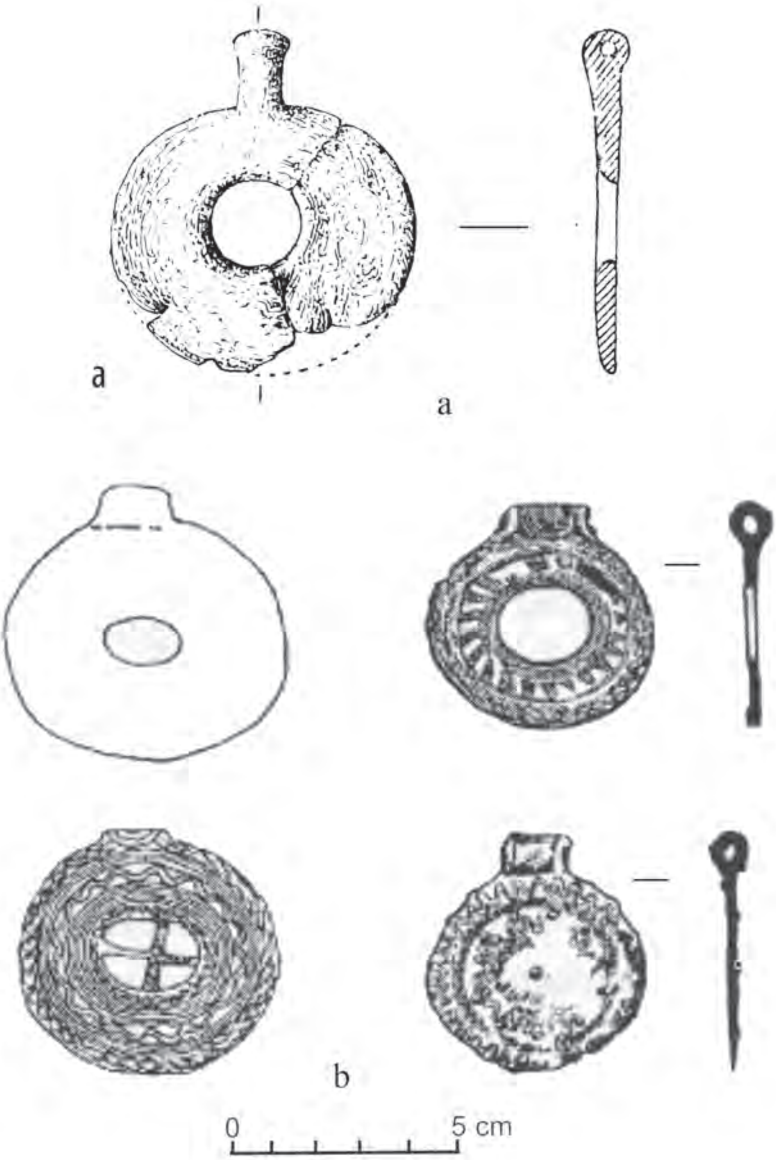

Fig. 6.

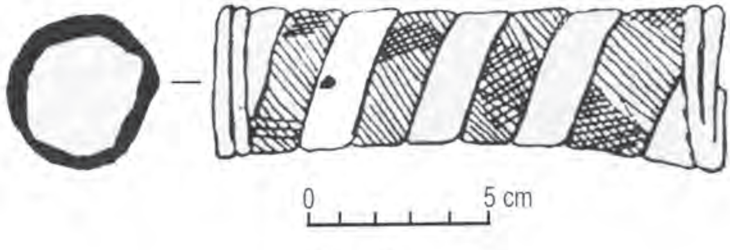

Fig. 7.

EARLY BRONZE AGE FORTRESSES
OF VAN LAKE BASIN

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Mustafa Kemal Üniversitesi,

Investigations of Van Lake Basin explored fall in the range from the Late Chalcoltithic through the Late Iron Age. The results of our survey indicate that the region intensively settled in Early Bronze Age and Middle Iron Age (Urartu) between in that timespan. This article contains an introduction to Early Bronze Age fortresses of the basin which is found in the survey.

Evidence of the Early Bronze Age (ca. 3400-2300/2200 BC) has been found mainly on the mounds which lies in the plains and valleys. The second type of settlement is fortresses or rocky settlements which is situated mountain slopes which bordering of these plains. These settlements are located on low or high rocky hills of the slope of mountains surrounding plains. They are mainly multi-strata settlements or fortresses which is usually settled from the Early Bronze Age through the Middle-Late Iron Age. Consequence of it is difficult to date the fortresses more precisely. Architectural features in this region do not change much until the Middle Iron Age (Urartu), and it seems that the local fortresses continued to be used during the Urartean period as well.

Fortresses which were settled only in the Early Bronze Age are as follows **(Fig. 1)**: Kalecik in the Karasu valley; Şehirtepe on the north coast of Lake Erçek beginning from northeast of Van Plain; Şehitlik on the Çaldıran plain.

Kalecik (N72/3) fortress is located on top of a high hill in the Karasu Valley which is one of the fertile land in the Van Lake basin. Karasu Valley is also main road between Van Lake basin and Iranian **(Figs. 1-2)**. The fortress has a square layout and only a 70 m long stretch of the walls is extant, thus, its layout is not clearly discernible **(Fig. 3-4)**. The walls were built with roughly worked Stones, no architecture was attested inside.

Şehirtepe (O71/5) fortress is situated on the northern shore of Erçek Lake which lies east of the Van Lake and on the Memedik-Özalp delta of Erçek Lake. Memedik-Özalp Valley is second main road between Van Lake basin and Iranian **(Figs. 5-6)**. The fortress is close to Karagündüz mound which is one of the most important Early Bronze Age site in the basin **(Fig. 7)**. Şehirtepe fortress has an oval shaped building (30 x 20 m) surrounded by rectangular planned walls (41 x 58 m) **(Figs. 5, 8)**. The walls built medium-seized facing stones without evidence of intervening rubble fill, thickness of walls is 3.30 m.

Şehitlik (M72/6) fortress lies on the Tendürek lava hill which is dominated Çaldıran plain **(Figs. 9-10)**. It is also situated on the road between Van Lake and Mt Ağrı-Southern Caucasia. Fortress with a rectangular plan is made of small semi-processed stones **(Figs. 9,11-13)**. Surrounding wall is 150 m in the northeast, 50 m in the south and its thickness is 2.50 m. Traces of buildings with rectangular and square plans can be seen inside.

The pottery from these fortresses is in the Kura-Araxes tradition which is known well from Eastern Anatolia and our surveys in the region. Four groups were identified: Grey-black burnished ware **(Figs. 14)**, Red-brown ware **(Figs. 15-16)**, Bichrome burnished ware **(Fig. 17)**, Cream slipped ware. Shersds mostly have a slip of the same colour as the paste, which has a coarse or medium sand temper. Badly fired, burnished and handmade. Bichrome burnished ware comprises black-looking vessels with their necks and mouths of red or cream colour due to firing. Forms are similar, in general, bowls are dominated by those with simple rims and open mouth and those with everted rims and globular body, jars have vertical rims, long necks and oval bodies, pots are closed mouths and globular bodies. Cream slipped have same characteristic both ware and form except for its slip colour. The decoration comprises geometric patterns made with incision, impress and grooving, concentric circles, spirals and Nakhichevan type handles.

In conclusion, with these recent findings, we reached more definite results regarding our arguments stating that Early Bronze Age settlement pattern which take place on rocky hills on hillsides, which seems to us familiar to mounds in the plains or valleys in the entire region, constituted the settlement pattern in the region in this period.

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Figure Captions

Fig. 1. Survey Map
Fig. 2. Kalecik (N72/3) Fortress
Fig. 3. Kalecik Fortress
Fig. 4. Kalecik Fortress
Fig. 5. Şehirtepe (O71/5) Fortress
Fig. 6. Şehirtepe Fortress
Fig. 7. Karagündüz Mound
Fig. 8. Şehirtepe Fortress
Fig. 9. Şehitlik (M72/6) Fortress
Fig. 10. Şehitlik Fortress
Fig. 11. Şehitlik Fortress
Fig. 12. Şehitlik Fortress
Fig. 13. Şehitlik Fortress
Fig. 14. Kura-Araxes Pottery: Grey-black burnished ware
Fig. 15. Kura-Araxes Pottery: Red-brown ware, Bichrome burnished ware
Fig. 16. Kura-Araxes Pottery: Red-brown ware, Bichrome burnished ware
Fig. 17. Kura-Araxes Pottery: Bichrome burnished ware


Kars
Horom
Sarıkamış
Sevan
Gavar
Tsovak
Kra
Tsovinar
Aragats
Oşakan
Aramus
Armavir Blur
Argiştihinili
Karmir Blur
Teişebai URU
Erivan
Arinberd
Erebuni
Tuzluca
Karakale
Kalaca
Karakoyun
Iğdır
Karakoyunlu
Minuahinili
Kasımuğı
Luhiuni
Artaşat
Toprakkale
Harabepazar
Eleşkirt
Ağrı
Uti
Aktaş
Korhan
Kızıltepe
Ömerbey
Bozkurt
Büvetli
Tutumlu
Murat
Ömerağa
Doğubeyazıt
Ziyarettepe
Verahram
Dorukdibi
Sangar
Makü
Nahçıvan
Oğulkale
Patnos
Bostankaya
Kamışlı
Gönlüaçık
Dizginkale
Gavurkale
Mino
Erciş
Madavank
Çolpan
Yağlık
Ketkalesi
Adilcevaz
Arınçküs
Güveçli
Ayanis
Rusahinili
Van Gölü
Şehitlik
Soğuksu
Yukarı Mutlu
Aşağı Mutlu
Çaldıran
Muradiye
Teketaş
Alacahan
Deliçay
Yukarı Keçikıran
Körzüt
Yukarı Kalecik
Aşağı Koçkıran
Suretta
Dorutay
Kalecik
Şehirtepe
Karagündüz
Seydibey
Hatap Göleti
Kızbulak
Saray
Erçek Gölü
Gülsünler
Aşağı Mollahasan
Kalecik
Van Kalesi
Tuşpa
Toprakkale
Rusahinili
Anzaf
Kavuncu
Yeşilalıç
Bastam
Rusai-URU.TUR
Gavurkale
Evoğlu
Kızkale
Hoy
Livar

Fig. 1

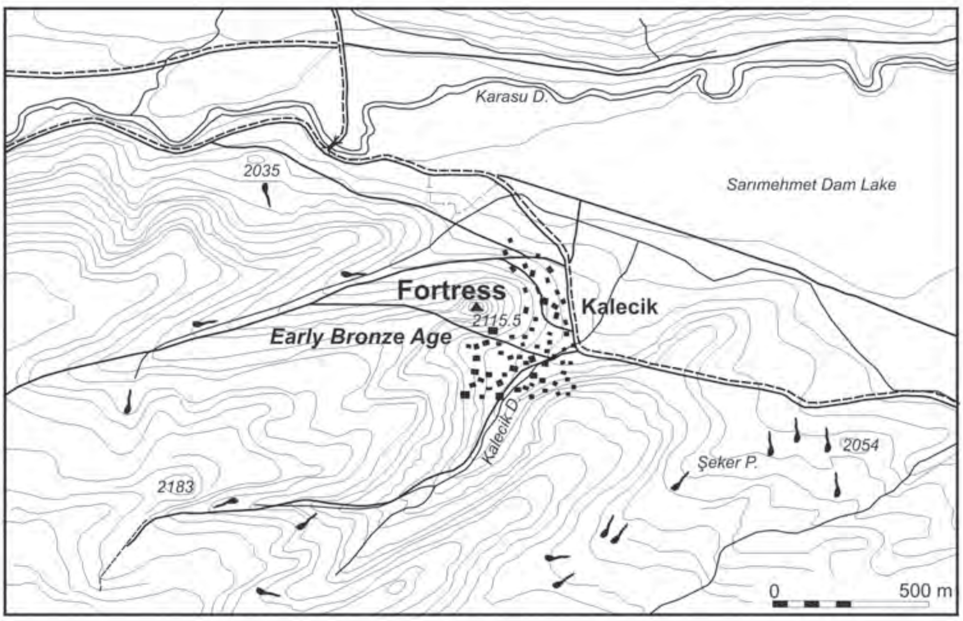

Karasu D.
2035
Sarımehmet Dam Lake
Fortress
Kalecik
2115.5
Early Bronze Age
Kalecik D.
2054
Şeker P.
2183
0
500 m

Fig. 2.

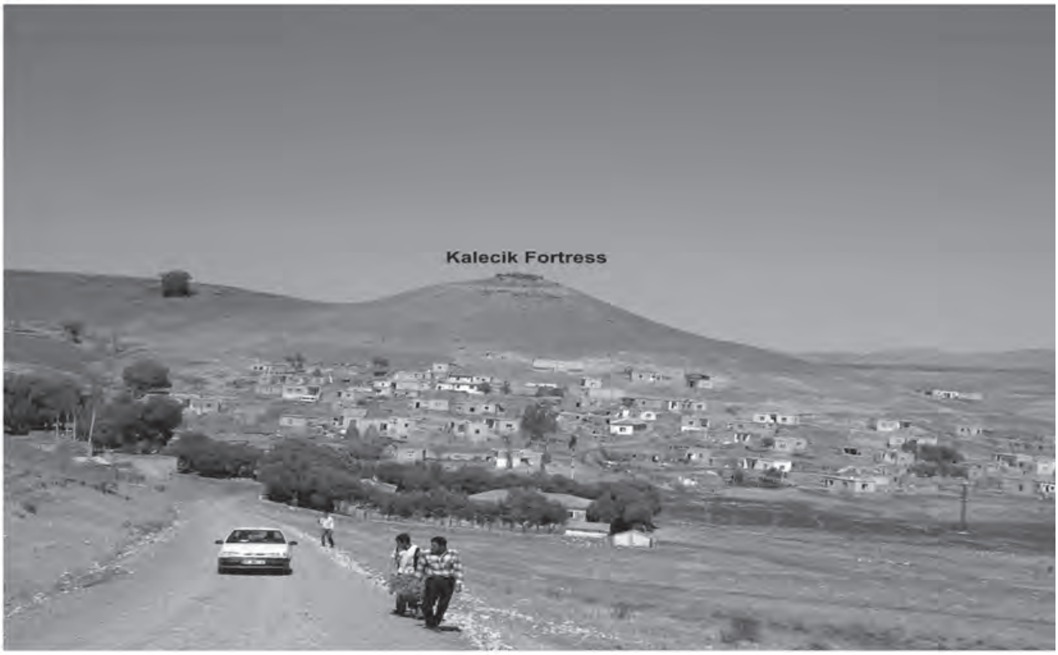


Fig. 3.

Fig. 4.

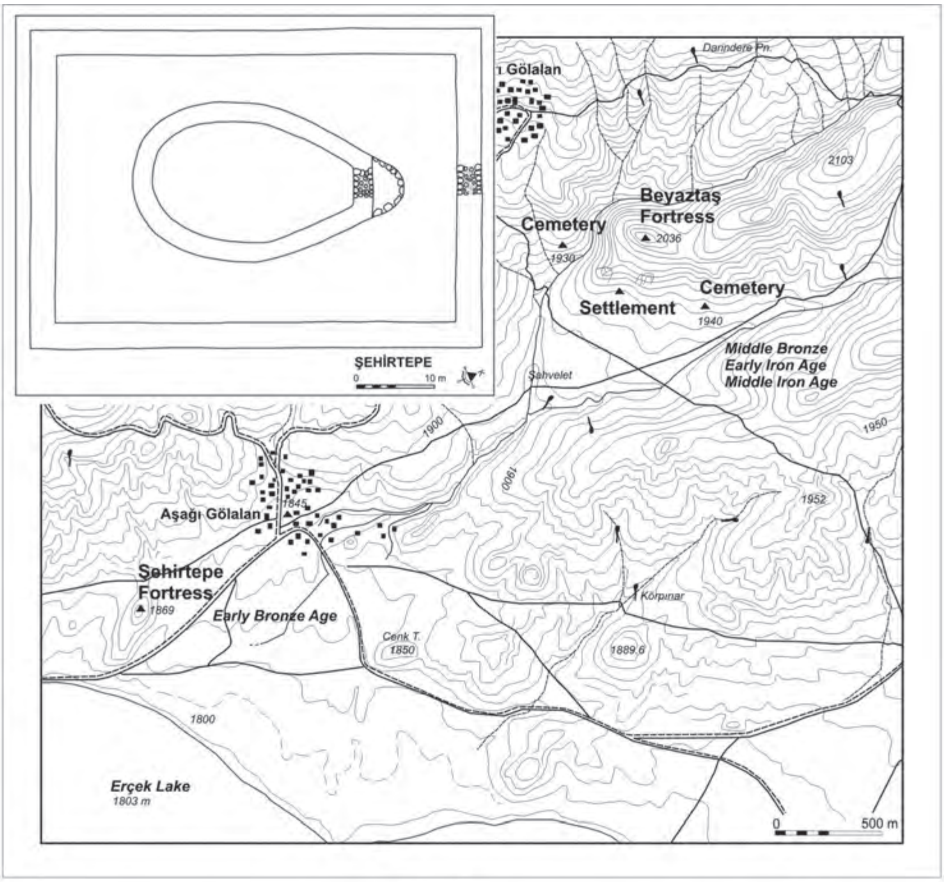

Gölalan
Darındere Pn.
2103
Beyaztaş
Fortress
2036
Cemetery
1930
Cemetery
Settlement
1940
Middle Bronze
Early Iron Age
Middle Iron Age
ŞEHİRTEPE
0
10 m
Şahvelet
1900
1950
1952
1845
Aşağı Gölalan
Şehirtepe
Fortress
1869
Early Bronze Age
Körpınar
Cenk T.
1850
1889.6
1800
Erçek Lake
1803 m
0
500 m

Fig. 5.


Şehirtepe Fortress

Fig. 6.

Fig. 7.

Fig. 8.

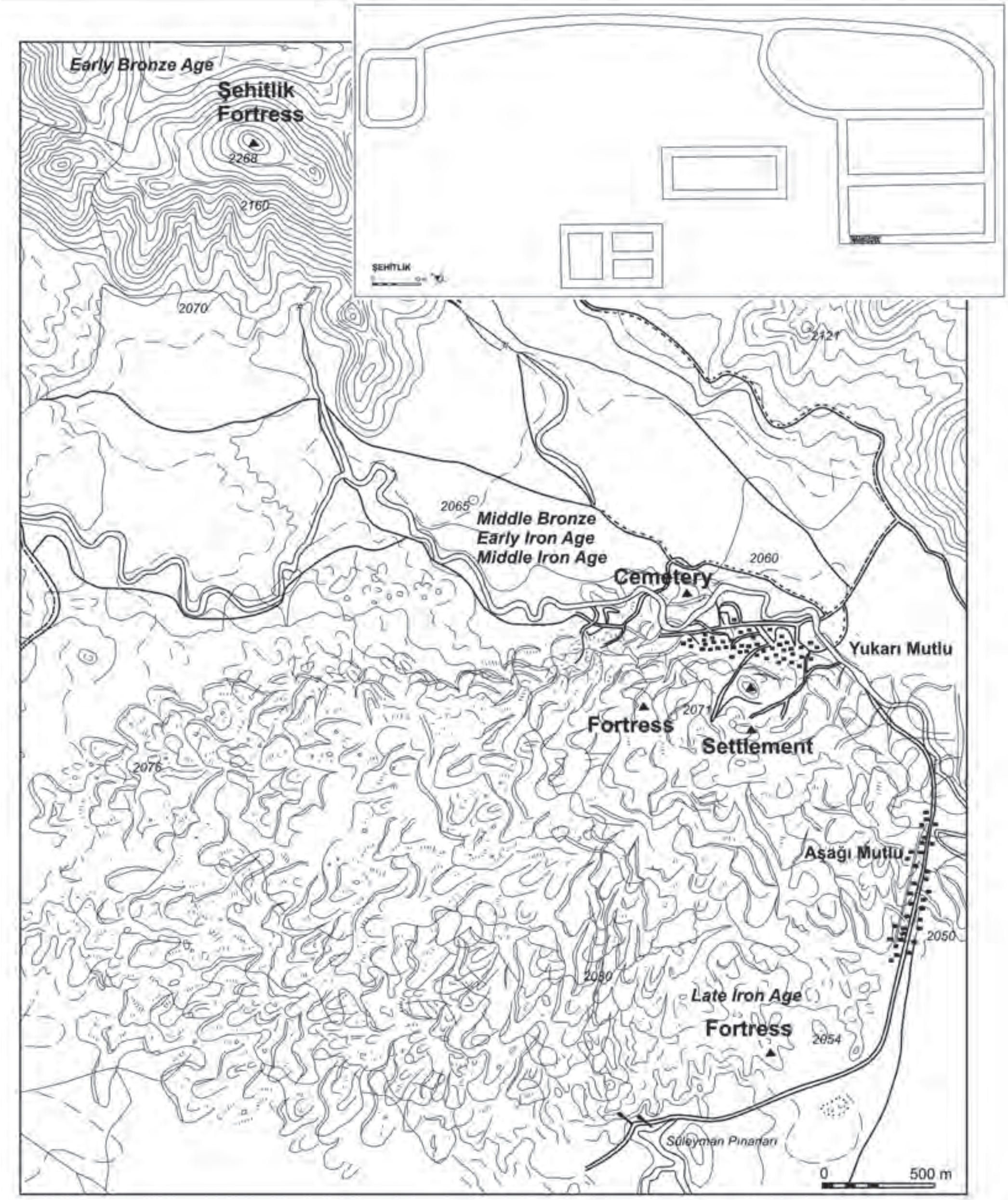

Early Bronze Age
Şehitlik Fortress
2268
2160
2070
2121
2065
Middle Bronze
Early Iron Age
Middle Iron Age
2060
Cemetery
Yukarı Mutlu
Fortress
2071
Settlement
2076
Aşağı Mutlu
2050
2030
Late Iron Age
Fortress
2054
Süleyman Pınarları
0
500 m

Fig. 9


Şehitlik Fortress

Fig. 10.


Early Bronze Age
Şehitlik Fortress
Middle Bronze Age
Early Iron Age
Middle Iron Age
Yukarı Mutlu Fortress-Settlement

Fig. 11.

Fig. 12.

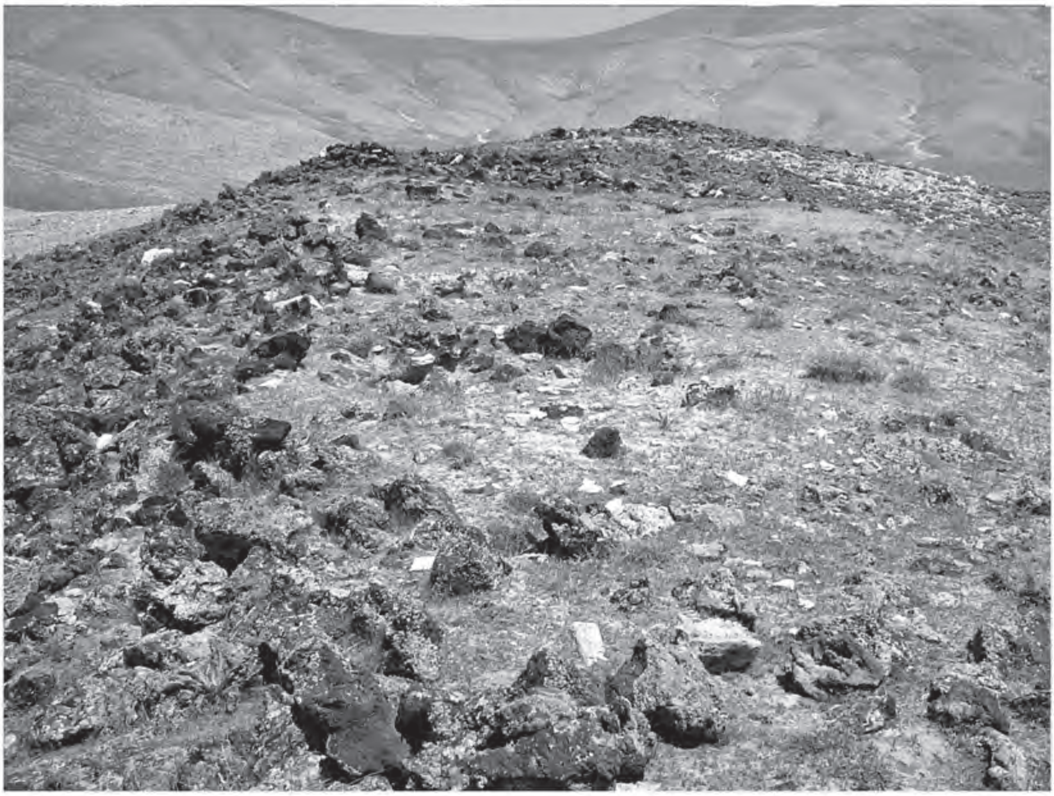


Fig. 13.

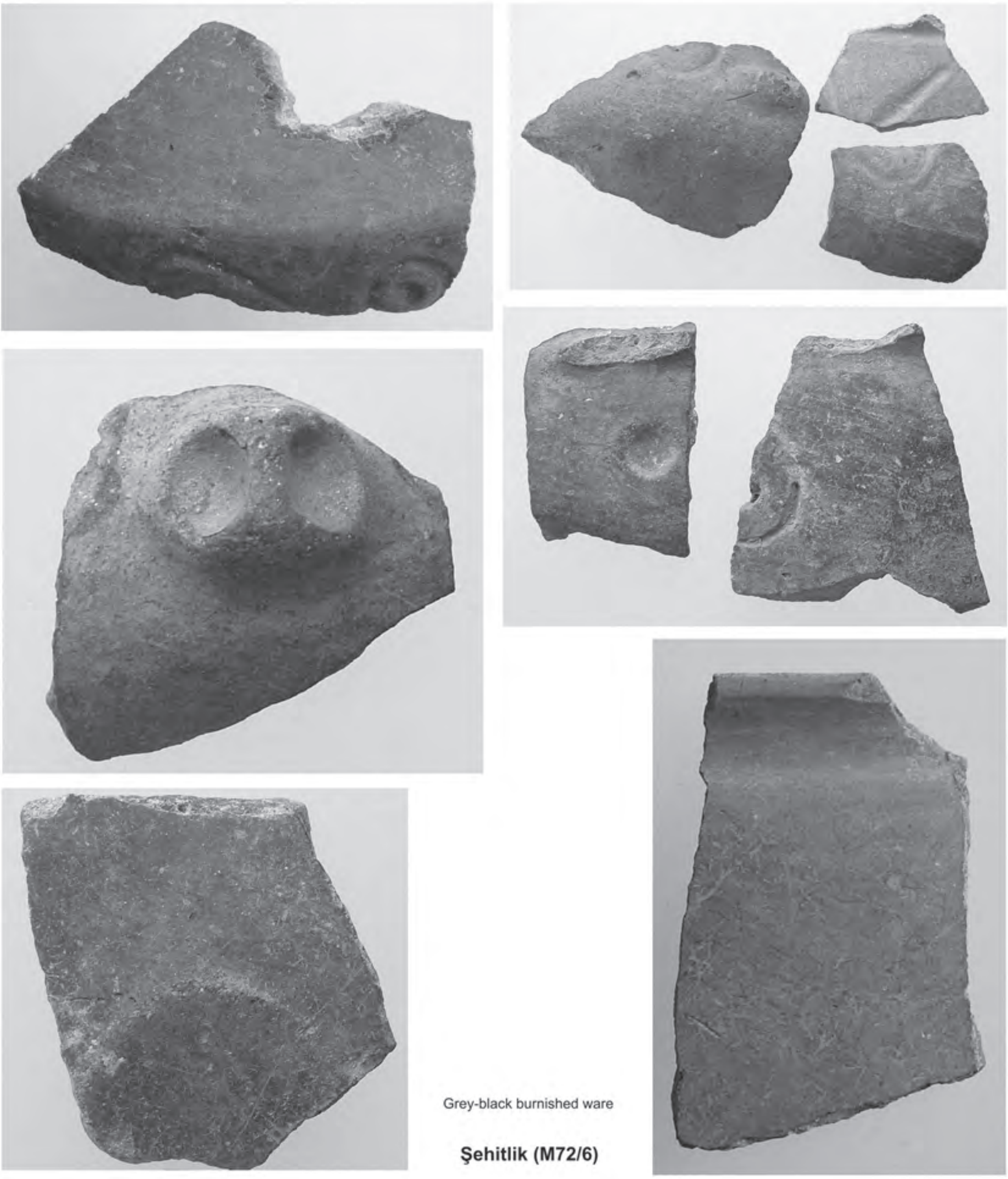
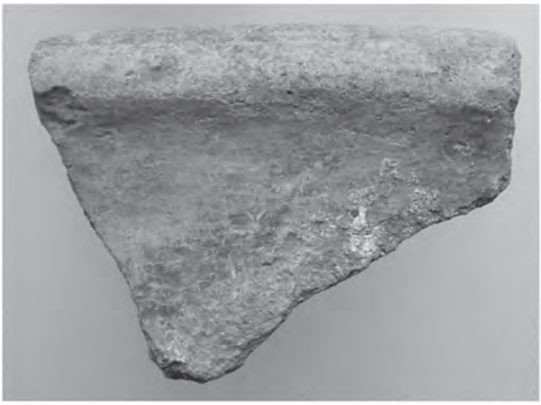
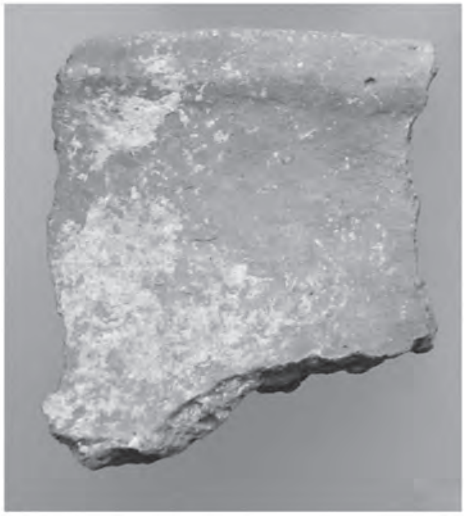


Fig. 14




Bichrome burnished ware

Red-brown ware

Kalecik (N72/3)

Fig. 15

Fig. 16

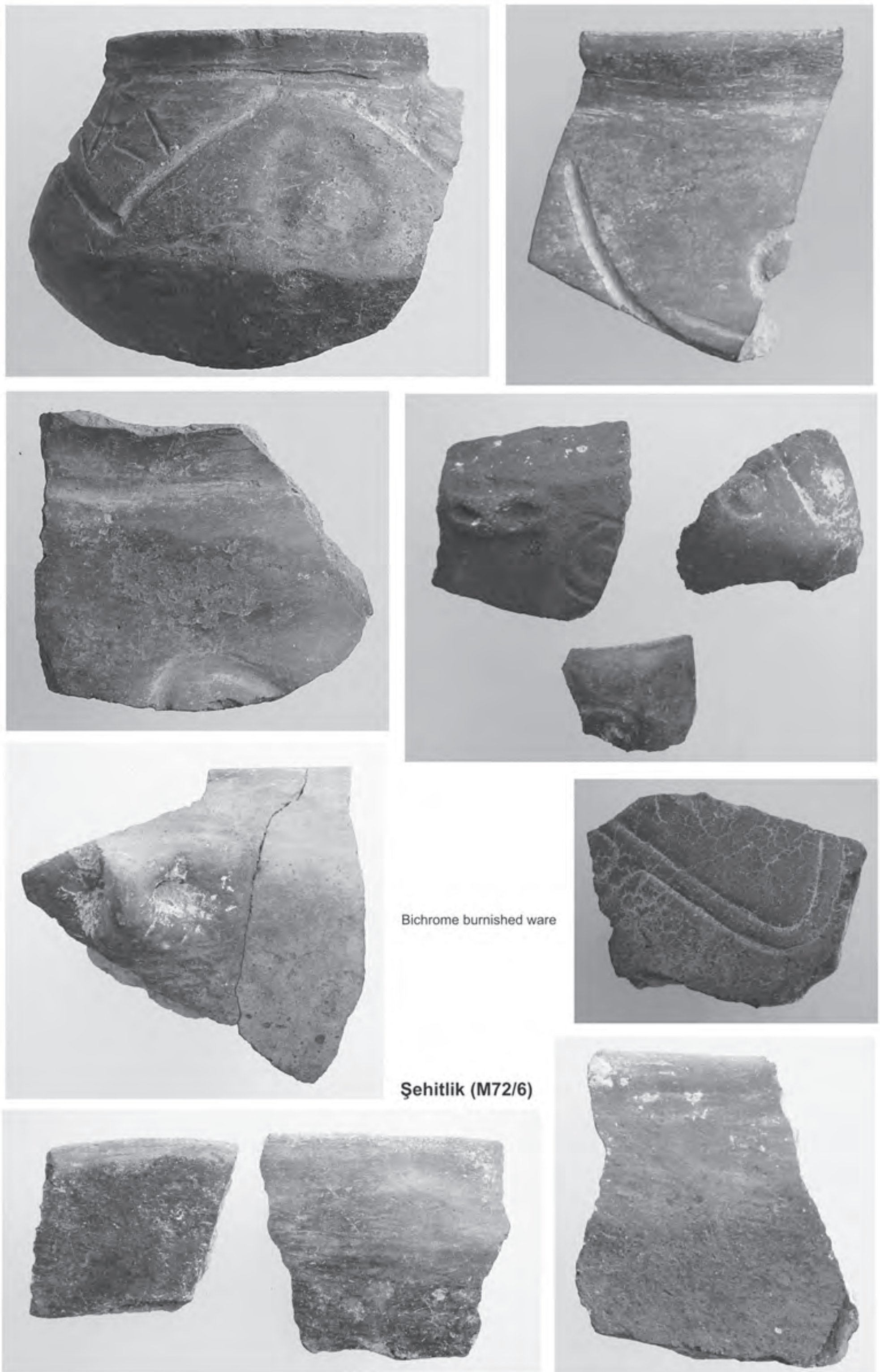


Fig. 17

BONE AND ANTLER TOOLS FROM SAKDRISI GOLD MINE

Ketevan Tamazashvili
Georgian National Museum

Investigating prehistoric mining tools is very important in order to understand and reconstruct the mining process. Working tools of Bronze Age mining sites are very various and different by their function and utilization. First of all there are stone tools that are used for exploitation of the ore. For concentration ore, such as anvils, grinding stones, pestles are often discovered at Bronze Age mining Sites; very rarely there are also evidence of bone and antler tools which are utilized directly in mining work.

Caucasus is famous for its physical-geographic and geological characteristics. The verified tectonic and geological development led to very profitable conditions for exploiting ore and producing metal during ancient times. This is likely the background for the beginning of ore exploitation in 4^{th}-3^{th} millenniums B.C. in South Caucasus and Georgia (Gambashidze *et. all*. 2010).

Prehistoric mining sites discovered in Georgian are from two main districts such as Aphkhazia, Svaneti and Racha on Major Caucasus mountain range, and Bolnisi-Dmanisi and Achara-Guria on Minor Caucasus. Mining stone tools are discovered on the most of these sites (Gambashidze *et. all.* 2010:33).

In South Caucasus and generally in Georgia bone and antler mining tools are discovered only in the Sakdrisi gold mine.

Sakdrisi gold mine is located in South Georgia (Tab. I), on the territory of Historical Kartli, in a favorable traffic position in the Mashavera valley that directly links Tbilissi/Kura river valley with the Ciscaucasia and Armenian mountain in southeast (Stöllner et. all. 2008:272). Sakdrisi (Tab. II,1) is dated to the 4^{th} millenium and early 3^{th} millennium B.C.; it is therefore the oldest gold mine known so far in human history; it was worked by miners of the Kura-Araxeses culture. (Stöllner *et. all.* 2014:71). From 2004 until now the Georgian-German expedition has discovered a lot of stone working tools including bone and antler tools (Tab. III).

Bone and antler tools were discovered in the underground prehistoric mines 1/2 and 1/3 (Stöllner *et all.* 2014:81). But they are not so numerous and count eight bones which are made mostly of cattle ribs. One driller made of young cattle tibia and further tool of deer antler[1].

These tools where investigated especially in regard with their use-wear in the laboratory of Georgian National Museum.
Investigations conducted on bone tools discovered in Sakdrisi underground mines (1/2, 1/3) (Tab. II,2) show that tools that are made of cattle rib bones (Tab. III, 1-6) are similar, as by the form and likely by the function.

1. Paleozoology was done by Dr. Oleg Bendukidze†

They are made with the use of a single technique. In order to flatten the surface of the bone, they are scraped off with stone tools. The long, parallel (slightly wavy) lines which are separated by intervals on the surface of the tools show the procedure of preliminary trimming. Trimming was conducted by scraping with stone tools, perhaps with obsidian scrapers; such tools are handheld.

Traseological studies[2] showed that the rib tools had two functions. One utilization is related to scraping the rock with the edges of the rib tools. And a secondary use was scraping or shaving the wood or rough leather.

The bone driller (3369) (Tab. III,7), made of a young cattle tibia bone, was used for shaving wood or rough leather.

The antler tool tip (5160) (Tab. III, 8) has been cut with very sharp tool, and the surface of it is sculled very unsystematically. There is no visible traces on that tool. Tool had not been used yet. This is very interesting, because antler picks were very widely used not only in metal but also in flint mines from Neolithic times (B. Jovanović 1978:1-11, fig 6-7). In 2011-2014 years in Sakdrisi several experiments were conducted to answer several questions. Some of those included the selection for the stone hammers and crushing mallets, the hafting of the tools to the handles; the experiments confirmed that besides the hammer-stones also picks of deer antler were used and proved effective to remove the loosened rock parts after the fire-settings (Th. Stöllner et. all. 2014:85). Regarding the fact that Sakdrisi hematite-quartz lodes are extremely hard (Th. Stöllner et. all. 2014:85), we can consider that the antler tool discovered here (5160) was broken after the first use and then was prepared again for the second use. The cut tip of the antler confirms that too.

Another interesting observation are red sediments that can be seen on the edges of some of the rib bone tools (Tab. IV). This sediments are likely the remains of hematite which are the part of ore mined in Sakdrisi (Stöllner et. all. 2014). The same remains were left on the experimental antler picks after they were used in order to remove the loosened rock parts after the fire-settings.
On the world prehistoric mining sites tools made of different animal bones are discovered in a big amount and they are confirmed to be used in mining work in many cases.

Nowadays there are many prehistoric mining sites where gold, copper, tin-bearing ore veins were exploited. Prehistoric mining sites are known from Great Britain, Spain, Italy, Anatolia, Middle Asia and etc.

Rudna Glava is an Eneolithic copper mine which is in south Serbia and belongs to the late stage of Vinča Culture. This mining site was discovered during modern geological works (B. Jovanović 1986:1-2). Antler tools (Tab. VII,1; VIII,1) were found there together with the stone and wooden tools. The usage of such kind of tools is known also from in Neolithic and Eneolithic flint mines (B. Jovanović 1978:12-13).

In 1997-2000 German Mining Museum has conducted archaeological excavations in Uzbekistan and Tajikistan to follow the question of Bronze Age tin mines. In Karnab and Mušiston about

2. Traseological investigations was done by Ketevan Esakia

2700 animal bones were discovered. While the preservation of most of the bones is very bad and most of them are the kitchen remains (Doll 2003:113-126) some can be assigned to the mining work. Those are represented by the horns of sheep, goat and gazelle, which are used as mining tools (Garner 2013).

A most interesting region is Great Britain and its islands. Here almost 20 prehistoric mines are investigated so far. Metal processing started from 2000-1650 B.C. and continued until the Late Bronze Age Iron Age (1100-650 B.C.) (Timberlake-Craddock 2013:33). From the beginning of the first half of XX Century intensive archaeological excavations were conducted and still continued in the Great Orme in Northen Wales. The mining site is dates back to 1740-770 B.C. (Dutton., et. all. 1994: 245-286). There are two major factors that are likely to have governed the early mining on the Great Orme: it is special geological and mineralogical condition of the ore deposit. Firstly the actual visual outcrop of the ore must have been obvious, with vivid green and blue colorations due to copper carbonates in the oxidized zone. The second and more important factor is the weathered nature of the dolomitized limestone host rock that results in greatly softened and rotted gangue material. Some dolomites adjacent to veins of copper mineralization have altered to produce a rotted deposit that could have been worked with minimum effort using sample tools (Lewis 1993). Such simple geological factors are the reason that Great Orme is very rich with bone and antler tool finds particularly in comparison to other prehistoric mining sites.

Several thousand fragmented pieces and occasional complete components of bone are recorded. Originally, as it was the case in the last century, all items of bone were considered to have been remains of food consumed by early miners within the workings. Studies now indicate this is only partly true - the remnants of bones exhibit wear and fracturing consistent with their use as primitive chisels, scrapers, gouges and levers (Tab. VI; VIII,2) to remove the loose and rotted parts of ore bearing material (Lewis 1994:33-35).

Andrew Lewis remarks that bone tools were basically used for the surface working. W. O’Brian thinks that tools which were made of cattle rib bones were used in order to sort the ore (O’Brian 2005).

Bone and antler tools are also discovered in Ecton Hill mines (Barnatt-Thomas 1998:74-75). Bone tools are found in the mines along with the hammer tools. They are also dated very well (1800-1700 B.C.), but most of them are not preserved. (S. Timberlake., B. Craddock 2013).

The bone tools which are used in mining in Great Britain are basically made of sheep, goat, horse, red deer and sometimes dog bones. Most of them are covered with the green colour, because of the copper rust (Lewis 1991).

Antler tools are also known from the Copa Hill Bronze age mines, but they are very fragmental (Timberlake 1987:18-20).

Bone and antler tools are also discovered in the mines of Ross Islands. Tools found here are basically made of cattle ribs and radius. They were used as scrapers and shovels (O’Brian 2005).

In the fundamental investigations of B. Ottoway it was clearly shown that the description of systematical workflows is essential to develop a working tools’ classification in mining (Ottoway

1994). Such classification shows the mining working stages and the functions of tools. They were used in the process of the ore explotation, as in the underground also on the surface. With the help of antler scrapers, bone shovels and scrapers the borders of vein containing ore could be cleaned thus escertaining the extension of the ore body.

While the ore exploiting antler scrapers and wedge-shaped tools were used. Taking the ores from the mines were done with help of shovels made of animal shoulder blades.

B. Ottaway remarks that bone and antler tools were basically used during the working in the narrow veins. Most of the bone tools which are discovered on prehistoric mining sites are made of cattle ribs, which are the typical mining working tools (Ottaway 1994).

The bone and antler tools discovered in Sakdrissi Gold mine were found in the cultural layers of the underground mines (1/2 and 1/3). Because of that it seems that they were used for scraping bad rock from the gold containing ore and also to ascertain the borders of the ore veins. Traseological investigation showed that rib bones have served as scrappers; they are handheld, combined tools. The edges of the scrapers were used on the rough material/rock, perhaps on the ore (Tab. IV,1). If we consider the fact that Sakdrissi hematite-quartz lodes are extremely hard we can think that those rib scrapers were used in order extract the remains of the ore from the exploited veins. Hematite sediments on the edges of some of those tools confirm that too. One side of the tool was used on the leather (Tab. IX,2) or wood, and the other side is very polished due to holding it for a long time.
If we observe the bone and antler tools discovered at prehistoric mining sites, it will get obvious that the rib tools which are discovered in Sakdrissi are used directly in the mining process. They can be therefore considered as typical mining tools. These tools do not have any parallels on sites discovered in Caucasus what has its reason in fact that not a single mine has been excavated in a similar way like Sakdrisi. .

The typology of the bone and antler tools discovered in Sakdrisi is not so rich, but their place in common typology of mining bone tools is quite well represented.

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Illustration captions:

Tab. I: Location of Sakdrisi gold-mining district within Transcaucasus region (Th. Stollner etc. 2014:73).

Tab. II: 1. Sakdrisi-Khachagiani hillock (photo by: Irina Gambashidze); 2. Prehistoric underground mines 1/1-3 (Stollner et.all. 2008:286).

Tab. III: Bone mining tools from Sakdrisi (Stöllner *et. all.* 2014).

Tab. IV. 1. Rib scraper (3132) (photo by Thorsten Rabsibler, drowing - Eleonora Sakhvadze); 2. Hematite seddiments on the working edges of rib scraper (3132).

Tab. V. Microscopical photos of bone tools: 1. Crystals in the working edges of rib tool (5265); 2. Charcoal remains in the working egdes of rib tool (5261).

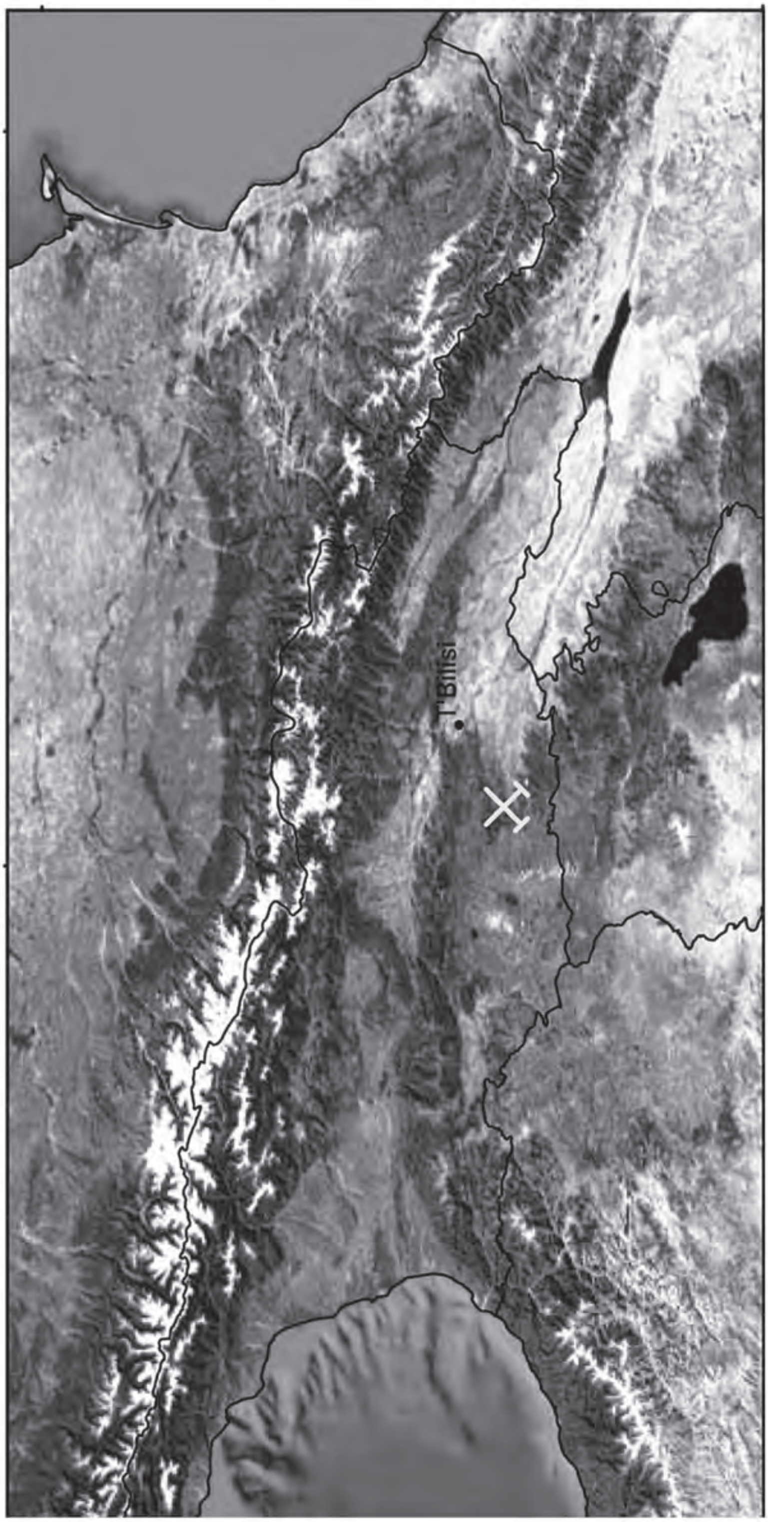
Tab. VI. Great Orme mines: 1. Bone shovels; 2. Bone and antler drillers;

Tab. VII. 1. Antler tool from Rudna Glava (Jovanović 1978); 2. Bone tool marks preserved in rotted dolomitic formation at Great Orme (Lewis 1994:35)

Tab. VIII. 1. Antler pick from Rudna Glava, Serbia; 2. Bone scraper from Great Orme Mine, Wales, Great Britain.

Tab. IX. Working process reconstructions by bone scrapers (Drawing by Inga Esvanjia): 1. Ore explotation; 2. leather shaving.

I



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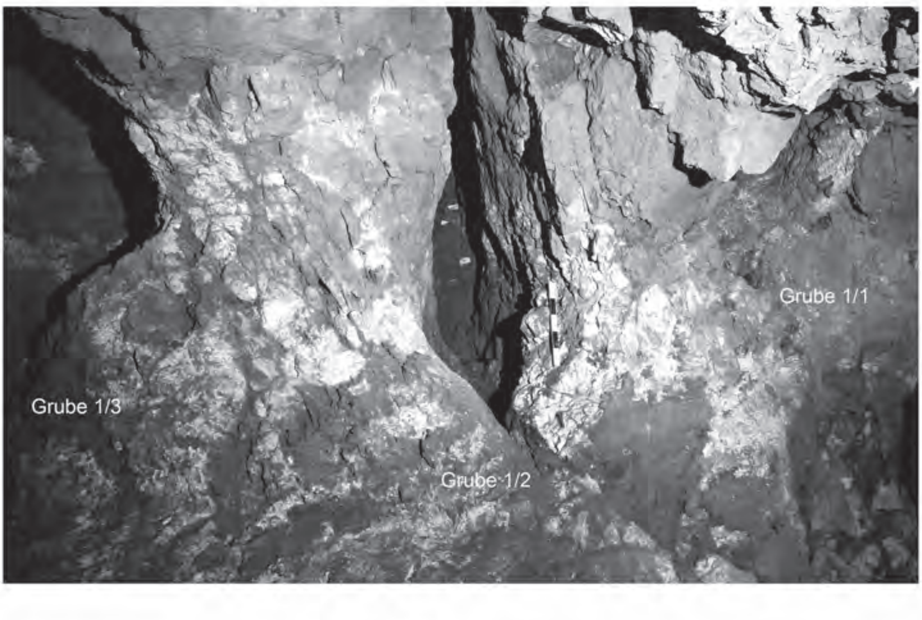

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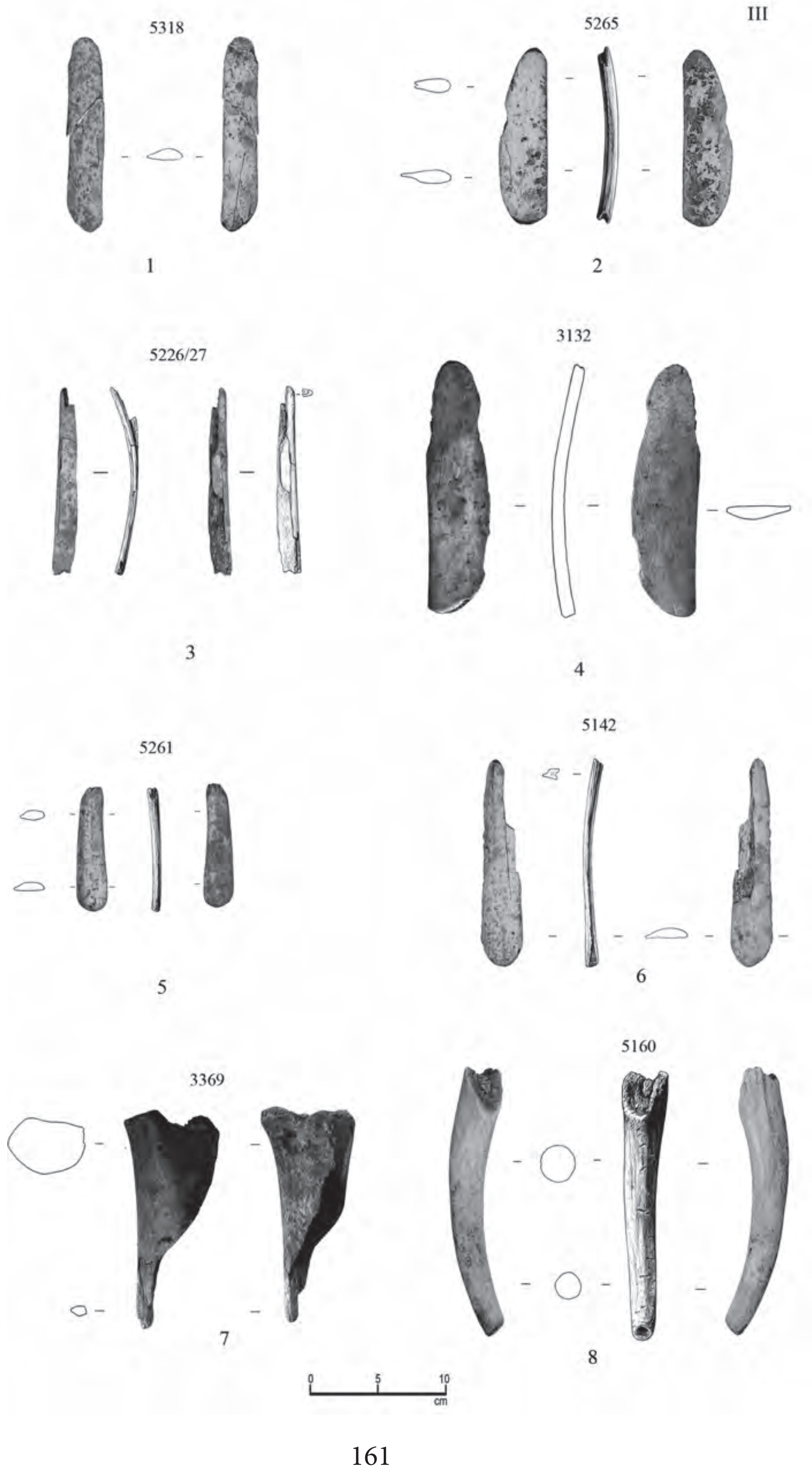
III
5318
1
5265
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IV

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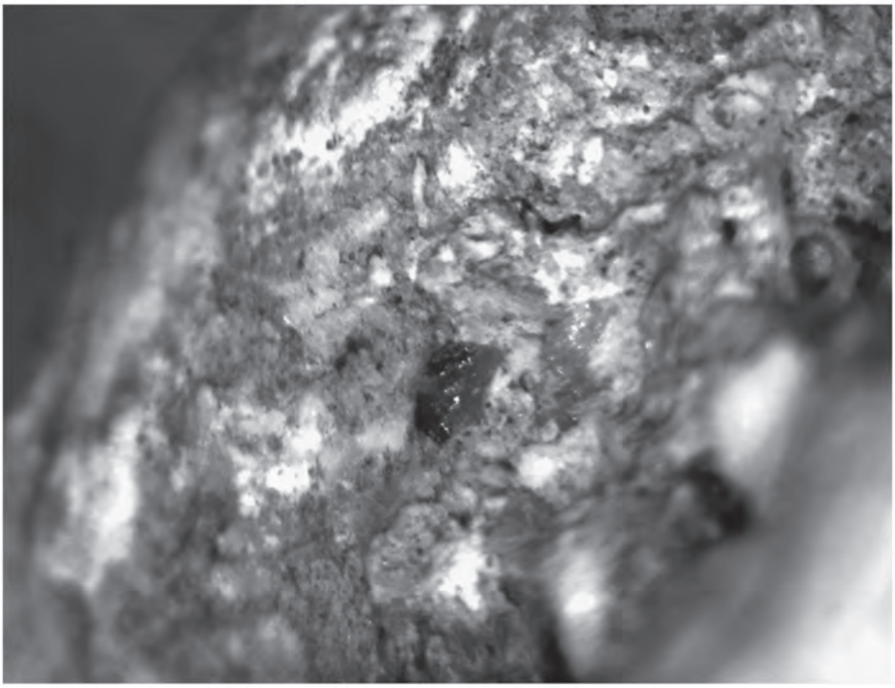
V



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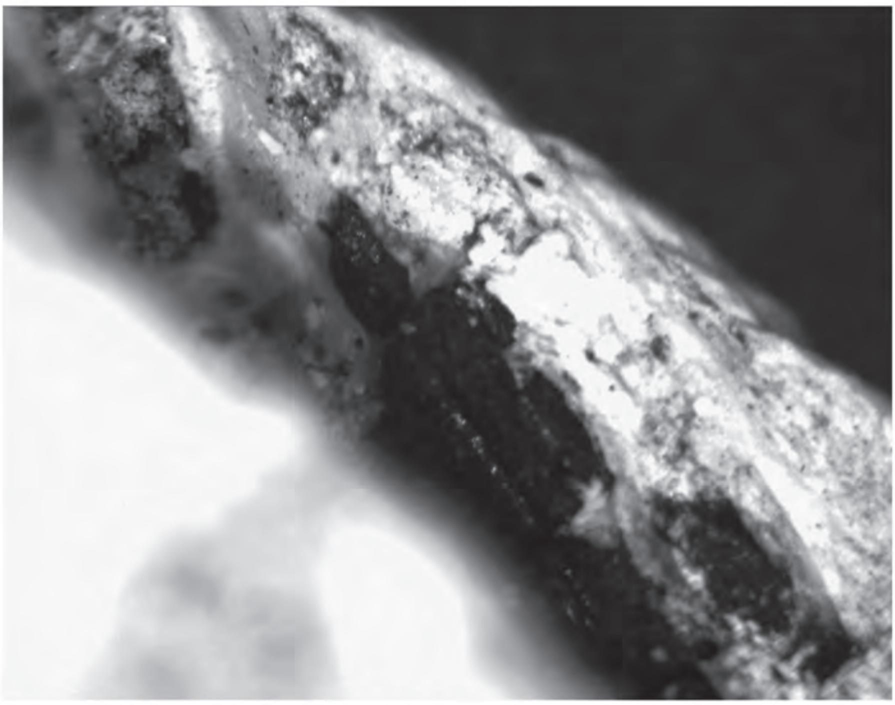

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VI

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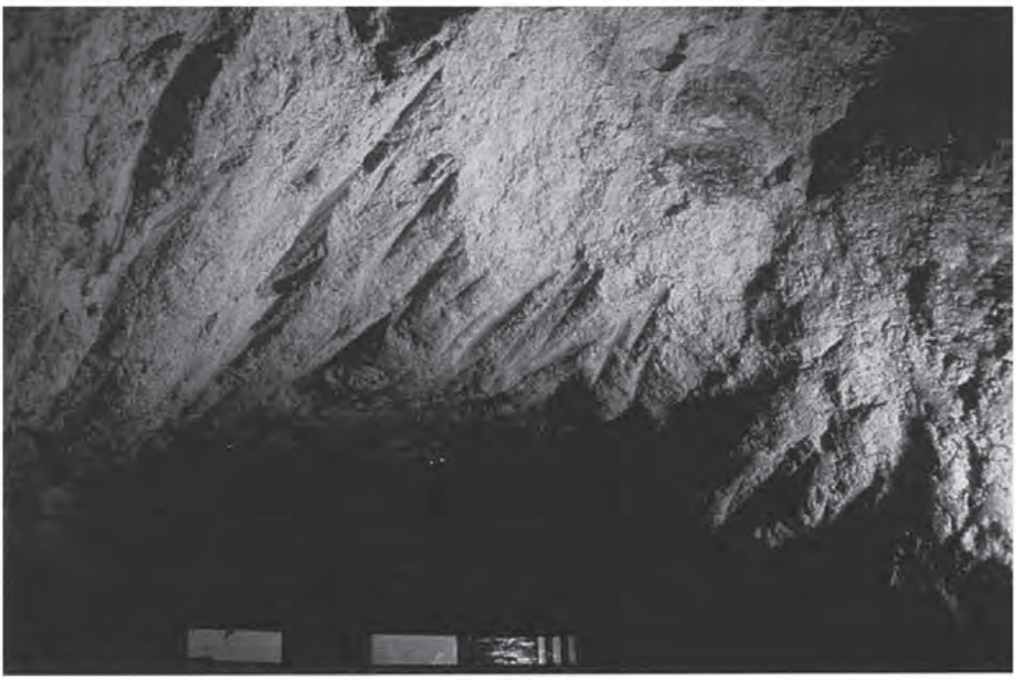

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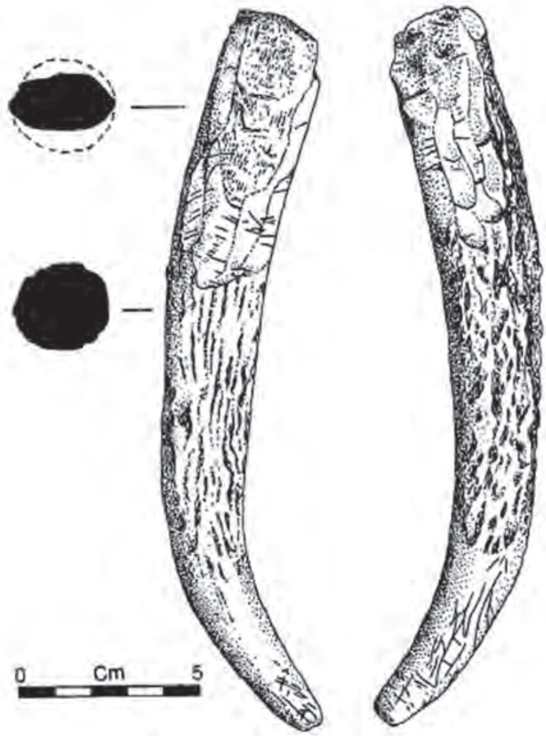
VIII



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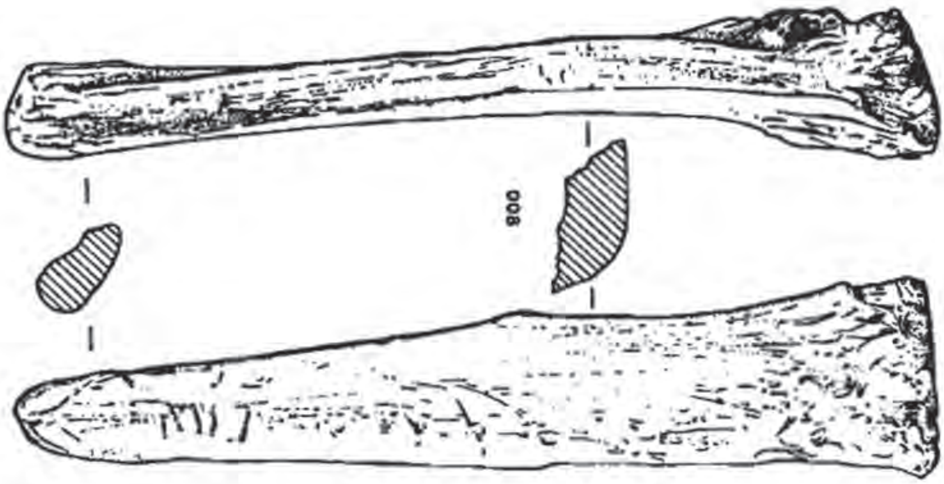

2.

IX

1.

2.

THE EARLY BRONZE AGE KURA-ARAXES CULTURE SEALS FROM GUDABERTKA SETTLEMENT

Zviad Sherazadishvili

Tbilisi State University
Prof. Sergi Makalatia Gori
Historical-Ethnographical Museum

On the territory of South Caucasus, in the Early Bronze Age Kura-Araxes Culture sites, seals are one of the rarity finds. Nowadays their number amounts to not more than ten ones, (Talin, Kachaghbiur, Aranisi, Chobareti[1], Gudabertka). In this regard Gudabertka settlement, where four seals close to each other were found, is of special significance (fig. I).

Gudabertka hill-settlement is situated in Eastern Georgia, 7 km North-East from Gori, on the northern slopes of range Kvernaki, on the left side of Tbilisi-Senaki-Leselidze highway. There are detected cultural layers, which are dated from the Early Bronze Age to the Early Medieval Period.

The most exact and earliest information about seals has been received from the photo archive of Gudabertka excavations, which is kept in Prof. Sergi Makalatia Gori Historical-Ethnographical Museum as well as from the articles of the first excavator of the site, S. Nadimashvili, which was published in 1961 in field-researches (Amiranashvili-Nadimashvili 1961: 18-19) and in 1963 in journal “Liahkvi” (Nadimahsvili 1963: 148-152). He mentioned two seals: one with schematic images of deer and triangles and the second, which had a square shape, with broken handle. The first one was published by M. Lortkipanidze in the “Corpus of Glyptic of Ancient Georgia” in 1969 (Lortkipanidze 1969: 70). In last two referred publications only textual descriptions are given. So far, only one seal has been published by N. Shanshashvili and Z. Sherazadishvili (Shanshashvili-Sherazadishvili 2013: 7-25)

In Gori historical-ethnographical museum stocktaking and processing of archive is going on permanently. During such kind of process another three seals: conical, pyramidal and round base stamp have been found.

The goal of our work is to introduce three unpublished and unknown seals. Therefore, it seems to be the most important to provide scientists, who have a special interest, with a detailed description and finding circumstances. This current paper represents all the four seals from Gudabertka (two conical, and one-by-one pyramidal and stamp), with photos and graphic illustrations, and also with photos from the field archive. For now we bring only analogues. To determine the general date we base on analogues, as well as on comparative analyzes of pottery. So far, due to goal and object of the paper, statement of a more precise date is not possible. Also, we refrain to research the semantic of the ornamental motives further and deeper, which is the subject of our future work.

1. Round base stamp seal was found by Georgian-Australian international archaeological expedition in Chobareti in 2013. For the information we are very grateful to the co-head of the expedition Dr. Kakha Kakhiani.

Two conical seals have been discovered on Gudabertka settlement. The first one was found in the so called Kura-Araxes "temple" (fig. II/1). It had an elongated shape of square and was oriented EW. On the northern wall there were two niches (fig. II/2). In the right niche there was a dark yellowish pot, in the left one a reddish-brownish basin. Behind it was found a conical seal (fig. III/1). It should be marked, that in the paper published in "Liakhvi" in 1963, S. Nadimashvili does not mention this fact.

The seal is made from sky-bluish-grayish stone (fig. IV). In the upper part it is slightly salient. The height is 6.3 cm. On the surface horizontal circular zigzag lines of short grooves are incised (V/1-2). On the height of 2.7-2.8 cm it has 0.6-0.7 cm diameter draught hole, which is a bit inclined. The ends are slightly widened, but the inner part has one diameter along the hole (fig. V/3). The zigzag lines are deeper and wider in the lower part of the seal (fig. IV; V/1-2; VI/6-7). The bottom (Dm 3.6-3.8 cm) can be divided into three parts. It is flat from the edge to the center (0.5-0.7 cm width). Then, it is inclined down to the center (0.5-0.7 cm width). In the middle there is a deep hole, with the width and depth of 1.1 cm (fig. IV/3; V/4)

Across the top of the head of the seal there is a lip shape detail (fig. VI/3-4). The middle part- is wider, than the ends. After positioning the seal horizontally, it looks like fish head (fig. VI/1-2). In this case zigzag lines could be scales, holes eyes and the detail on the head of the seal a mouth. It should be mentioned that the holes and the end of the lip shape detail on the head of the seal are not oriented symmetrically to each other. It makes the seal further more similar to the fish head.

The second conical seal was found in the plastered small pit, which was cleaned to the south of the so called temple (fig. III/2). It is made from grayish stone (fig. VII). The height is 6 cm, diameter of the bottom is 3.7-3.9 cm. On the bottom there is a hole 1.4 cm in diameter and 0.9 cm deep at the height of 1.8-2 cm from the bottom there is a 0.7 cm diameter through hole for the rope. With horizontal, circular, deep and wide 5 grooves the surface is divided into six unequal and disproportional parts. Our description starts from the top (fig. VIII/3-4).

The first frieze is full of depicted images, which cause great interest. On the slightly flattened top representation with seven rays is incised. The beams are oriented so, that they imply the eighth, which is, unfortunately, missing. On each end of the rays little semilunar shape grooves are incised, only three of which are connected to the beams. One of them is exactly above the head of the incised animal and makes an impression that the horns of the animal are transferred into celestial image. The animal is very stylistic and schematic. The body is depicted with one inclined line, directed from left to right, which ends with a tail. The legs are also incised and directed opposite than the body.

In the second frieze another animal is depicted, similar to the first one, but a bit bigger in size. The tail of the animal is turned down. From both sides it is surrounded by grid, made of small squares.

In the third frieze triangles are incised. The fourth frieze is similar to the third one, though one of the triangles contains a depiction of a smaller triangle with vertical groove both of which are divided in two parts. In the fifth frieze are incised triangles (this frieze is the highest). In one triangle a smaller one is depicted. In the six friezes there are only usual triangles.

The third seal has a pyramidal shape, whereas the bottom has an octagon form. It is made from light reddish stone. Only the bottom and the lower parts are preserved (fig. IX). It was also found to the south of the so called temple. The preserved height is 2.2 cm, the length 2.9 cm, the width 2.7 cm. On the flattened bottom there is a 1.5 dm cm and a 1.3 cm hole. The hole for the rope is at the height of 1.4 cm from the bottom and is 0.7 cm in diameter.

Only one side of the seal is ornamented. The left part of the side contains four diagonal (directed from right to left) wide and deep grooves. They touch one long oppositely directed (from left to right) diagonal wide and deep groove, which has three more grooves on the right made by the same technique.

The fourth specimen is brownish-reddish round base stamp seal. It is made from clay (fig. X). It was found to the south of the so called "chapel". In the area where the bronze diadems were discovered. Only half of the seal is preserved, the end of the handle is missing. On the flattened bottom there is a cross made from three wide and deep grooves. In between the cross wings, there are intersecting wide and deep grooves are made triangles. The preserved height is 2.9, the dm of the bottom 4.2 cm (fig. X/1, 3).

Among South Caucasian material, conical seals from Gudabertka have analogues only with one specimen found on Grakliani Hill. According to prof. Samsonia it is very similar to the fourth group of Jemdet Nasr seals and dates back to the 3000-2800/3000-2334 BC. Although, it was discovered in the altar dated back to the 1100-900 BC. V. Licheli (the head of the expedition) thinks that a discovery of earlier seals in later altars is characteristic for this period. He admits that in spite of the similarities with early dated Near Eastern material, this seal should become the subject of particular research (Licheli 2010: 28-29; Licheli-Samsonia 2010: 182-183; fig. 6; Licheli, 2011). So far, among South Caucasian materials the analogue for paramedical seal has not been found.

Very similar and close parallels with the round base stamp seal from Gudabertka, are found in Kachaghbiur and Talin (Shanshashvili-Sherazadishvili 2013: 8-9, fig. II). Both of them have the same kind of ornament. A round base stamp seal was found in Aranis which has three circular deep and wide grooves on the bottom (Shanshashvili-Sherazadishvili 2013: 8, fig. III/1).

We think that the sacral function of Gudabertka seals is determined by place where they were found (so called temple and chapel) and the ornamental motives. Probably, two conical seals were to carry specific information. As for their dates, from the so called "temple", area VI and area A excavated in 2005 and 2009, material similar to the level C of Kvatskhela settlement was found (Mindiashvli et all 2012: 234-250; Mindiashvli et all 2013: 146-178).

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Description of the Plates

I. 1. The Location of Gudabertka hill-settlement. 2. The photo of Gudabertka hill-settlement.

II. 1. So called "Temple" with niches. 2. Niches in the northern wall of the temple.

III. The conical seal behind the basin, in the right niche of the wall. 2. Conical seal in the plastered pit.

IV. The seal with fish image. Photo.

V. The seal with fish image. Drawing.

VI. The details of the seal with fish image. Photo.

VII. Conical seal with frizzes. Photo.

VIII. Conical seal with frizzes. Drawing.

IX. Pyramidal seal. Photo and drawing.

X. Round Base stamp seal. Photo and drawing.

I


RUSSIA
GEORGIA
GUDABERTKA
ARMENIA
AZERBAIJAN
TURKEY
IRAN
AZERBAIJAN
IRAN
100 km
60 mi
© d-maps.com

1

2

II

1

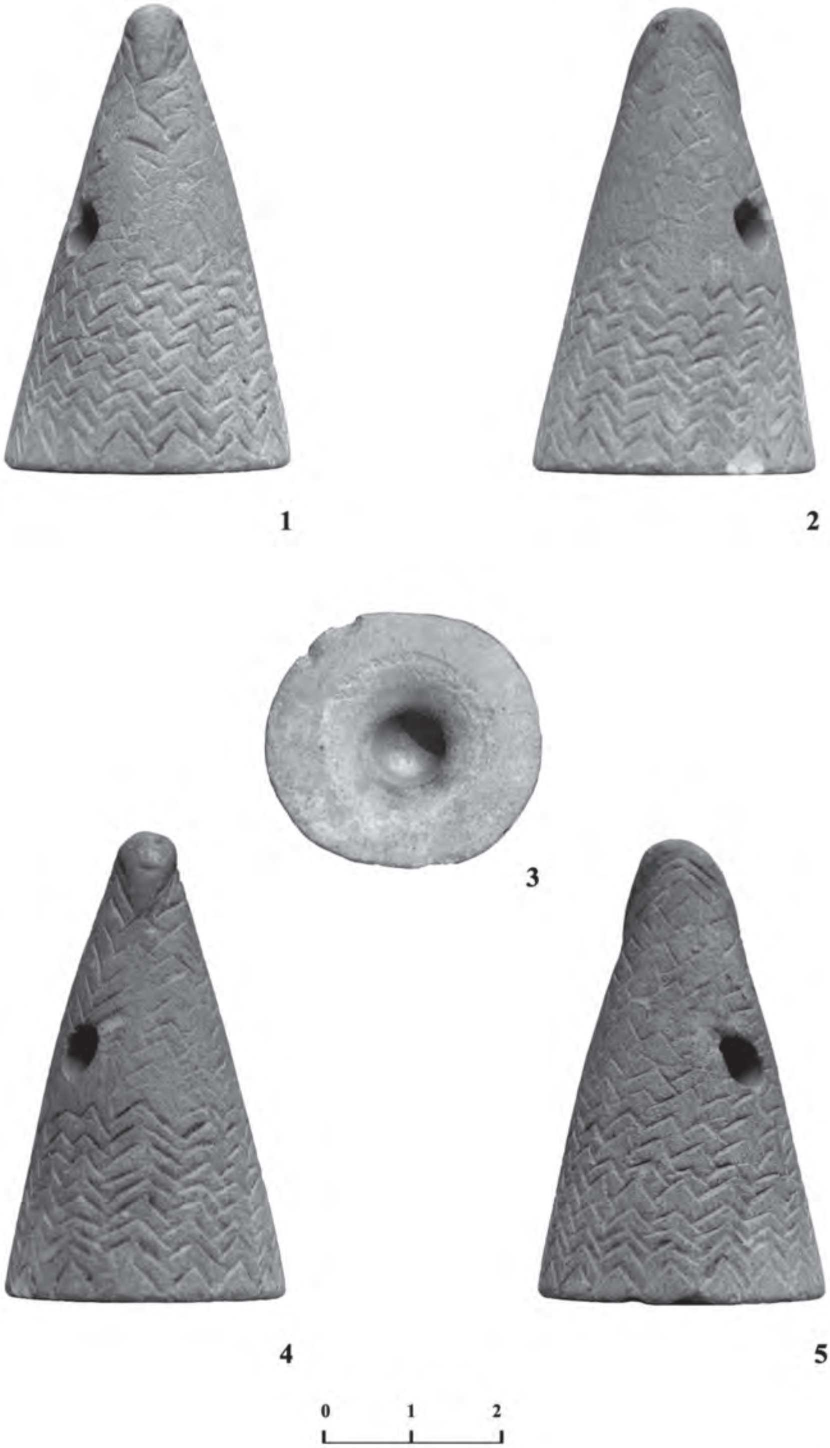
2

III

1

2

IV



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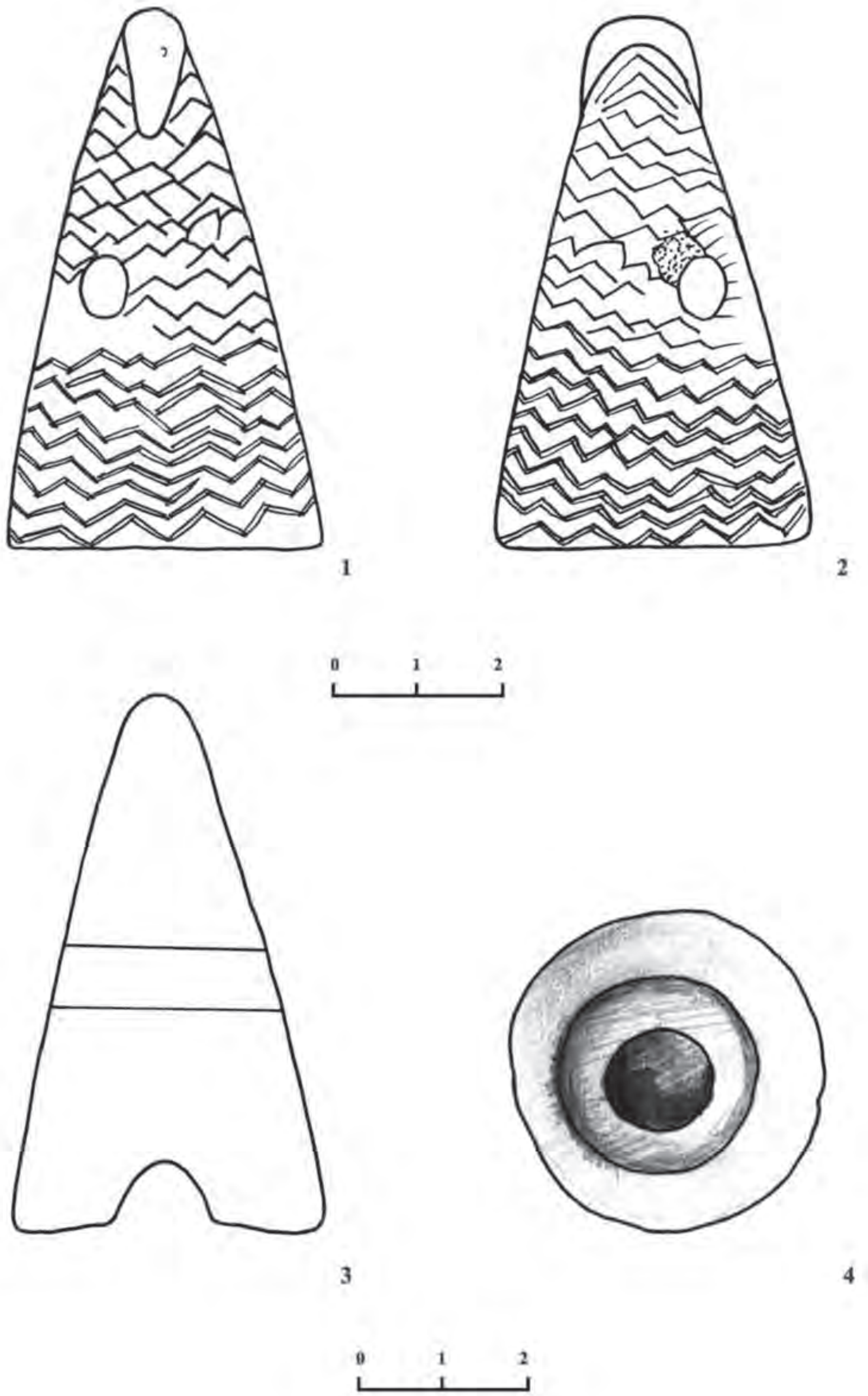

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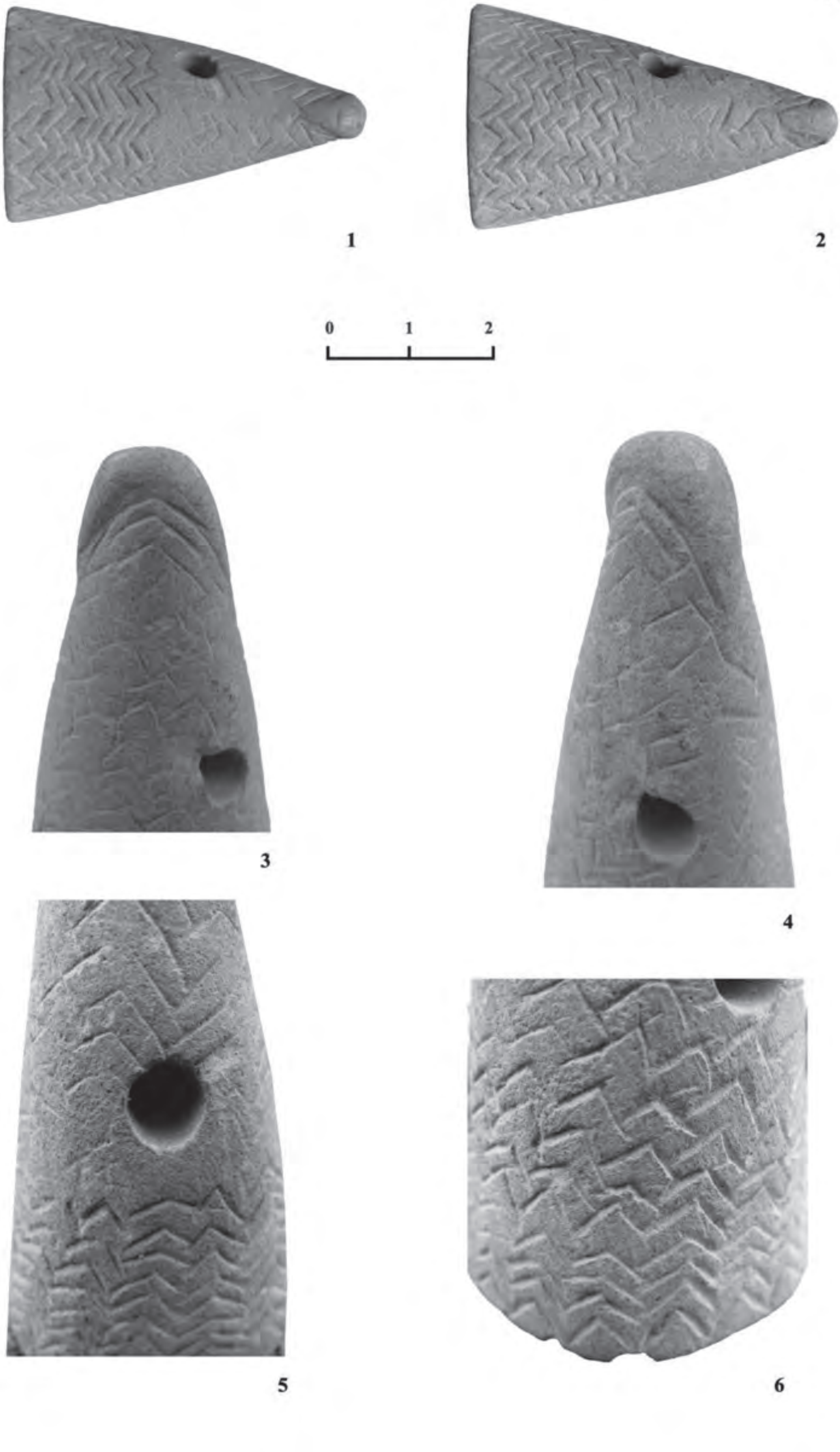

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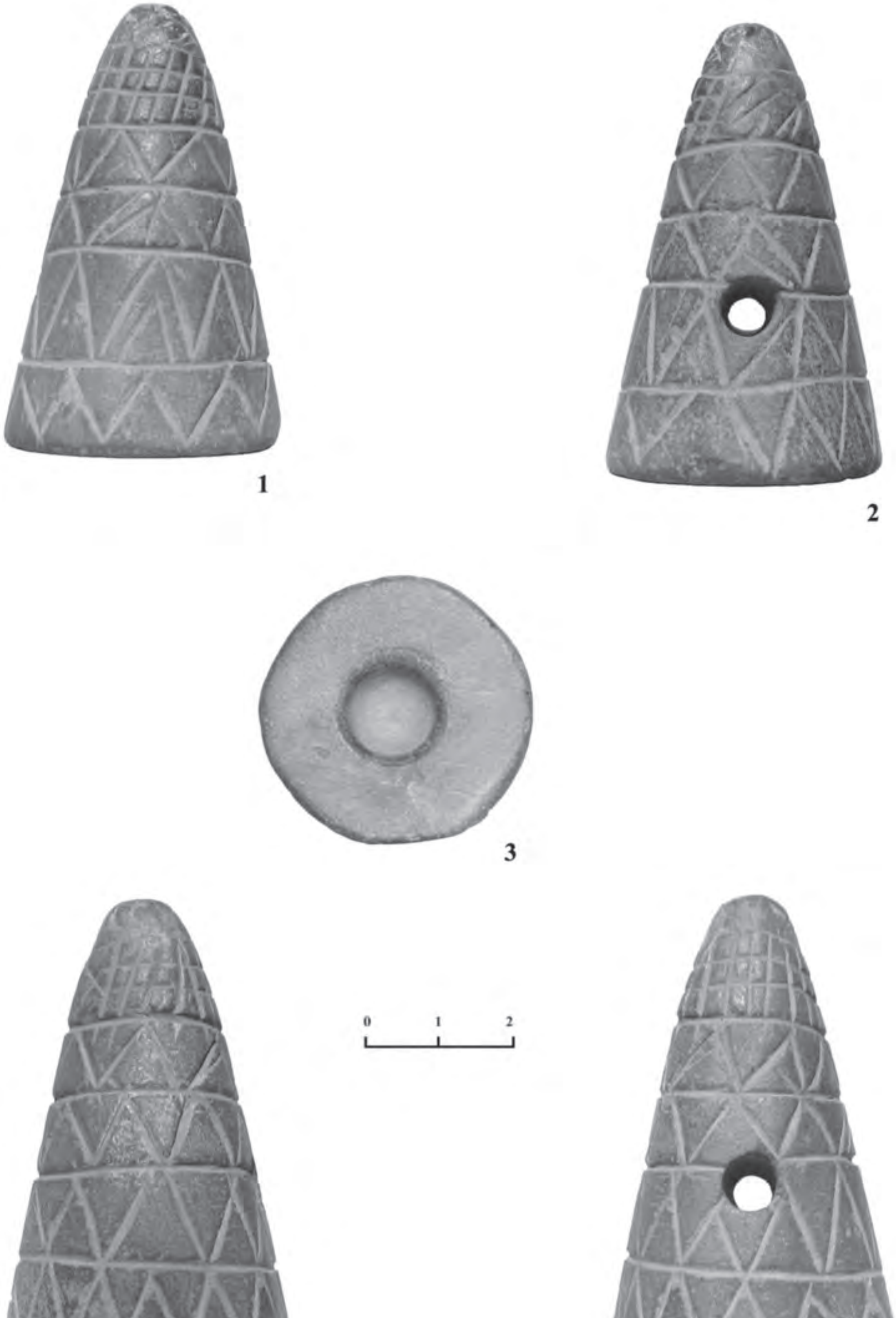

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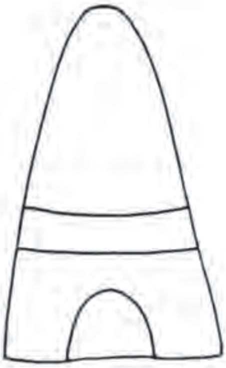

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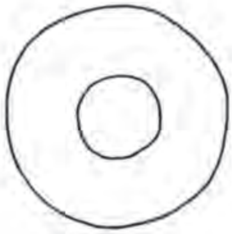

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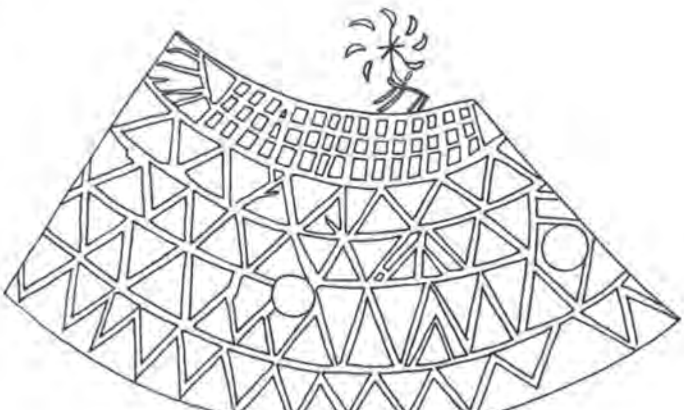

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IX

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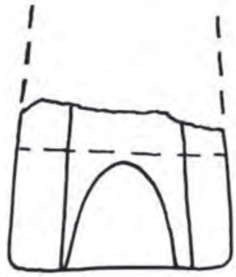

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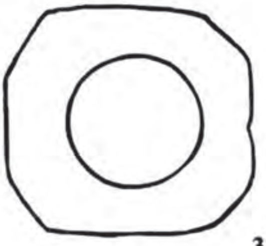

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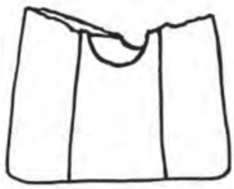

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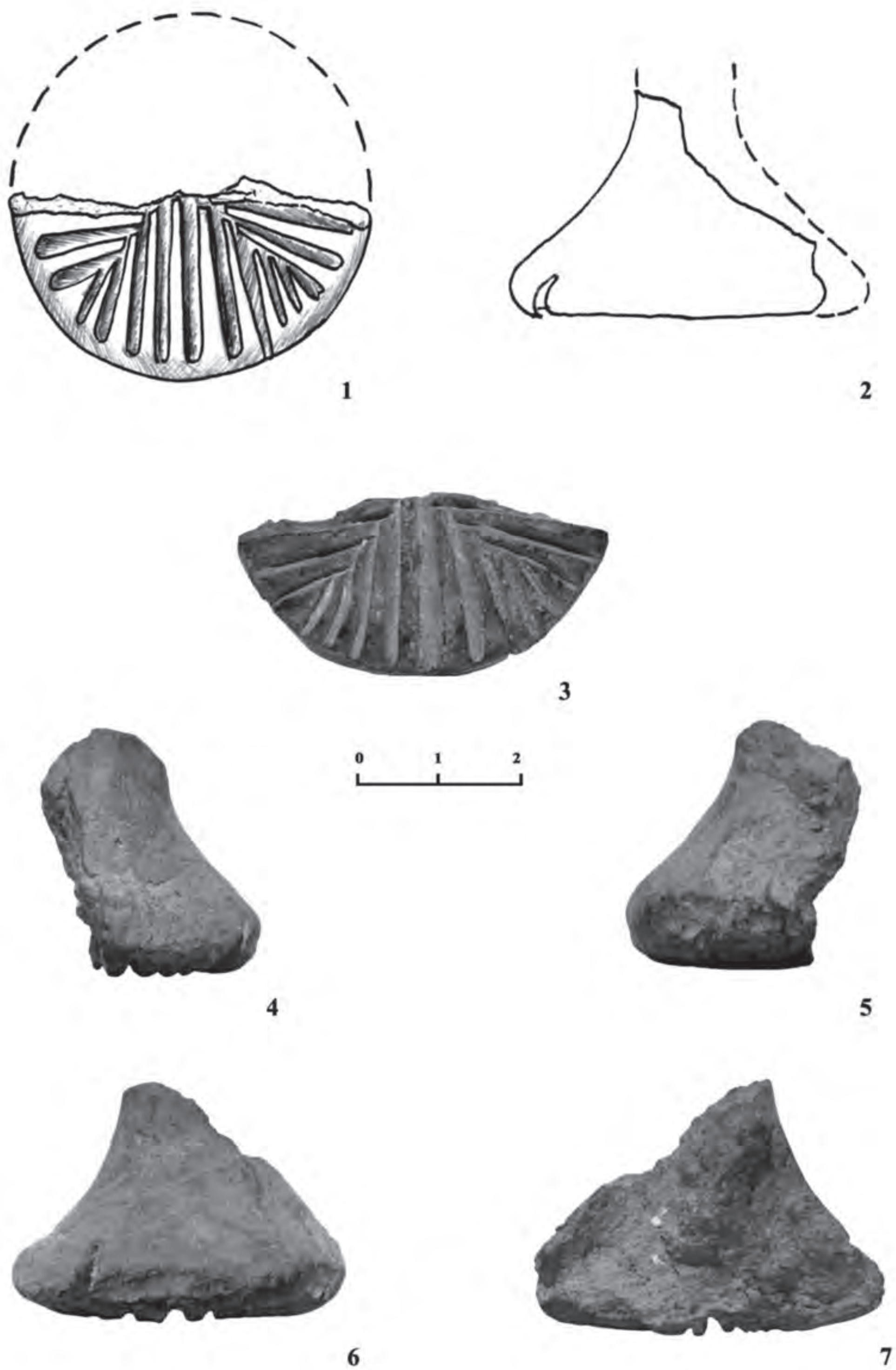
X



EARLY BRONZE AGE METALLURGY IN AMASYA PROVINCE, NORTH - CENTRAL ANATOLIA

Şevket Dönmez[1*]

The area considered as a plateau which arises from the mountainous parts in the east of Central Anatolia and exists in the extend bend of Kızılırmak (Halys) pouring out to the Black Sea in the vicinity of Bafra, is quite rich on account of mines such as copper and silver.Amasya (**see Map**), situated in the North of the subject region, has a concentric location with the vicinities of Merzifon, Gümüşhacıköy and Göynücek which have considerably intensive mineral deposits.

The Early Bronze Age is divided into 3 periods as EBA I, EBA II and EBA III in Central Anatolia chronology. The EBA I, dated to roughly 3500 - 2800/2700 BC in Central Anatolia, is a period in which the Late Chalcolithic Period is still being continued to live and arsenic alloyed copper has not become widespread yet. It is observed that copper alloy with arsenic is widely used according to the progressions in the techniques of mining process and the examples of bronze containing tin are also seen in the EBA II dated to approximately 2800/2700-2500 BC. In the EBA III, dated to roughly 2500-2000 BC, mining have reached to the highest level depending upon the advancement of mining labour and the increase of the mine usage considering the EBA I and EBA II.

The systematic archaeological excavations in Amasya developed in last years, have started to significantly contribute us to understand the mining activities of the region. After all, in the past researches, especially the discoveredassemblage in the village of Mahmatlar still saves its importance (**Pls. 2/1-4; 3/1**). The mineral findings, found in near of Mahmatlar Village located in the 24kilometres southwest of Amasya (**see Map**) on the road of Amasya- Tokat, have come out during the agricultural activities. After the works had reached to the museum, H.Z. Koşay and M. Akok carried out a short-lasting excavation in Mahmatlar, 1949. During the excavations, the EBA potsherds were detected[2].

In the vicinity, another centre in which important metal works are found is Horoztepe (**Pls. 7/1-5; 8/1-3; 9/1-2**). Horoztepe, situated in the east border of Amasya province, is in the south of the Erbaa town of Tokat (**see Map**). The first systematic excavation here on the works which was started to come out in the result of using Horoztepe as a modern cemetery in 1954, was carried out by T.Özgüç.In the results of excavations, it was understood that Horoztepe was a settlement dated to EBA III and comprised of cemetery[3]. In the nearest settlement of the cemetery, through the archaeological researches were carried out enough, it is understood that Chalcolithic and EBA settlements existed there. The cemetery findings have indicated that Horoztepe could be dated to 2100’s BC.

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Thedrawings of the plates of this paper were adaptedrelated publications appearing in bibliography.

2. Koşay/Akok 1950: 481-485.
3. Özgüç 1966: 19-25; Özgüç/Akok 1958.

Various metal pots (**Pl. 3/2-4**) and jewelleries were found in “A Treasure” which has captured in Eskiyapar situated in the 6 kilometers west of Alaca town of Çorum province (**see Map**). T.Özgüç and R.Temizer dated the subject assemblage to 2200 – 2000 BC[4].

The researches which have done in the result of the metal works (**Pl. 9/3**), found in the illegal excavations in Oymaağaç Village, located in the near of Merzifon (**see Map**), in 1964-1965, which dispersed to various museums and private collections, has showed that these belongs to EBA III. T. Özgüç dated theOymaağaç origin metal works with Merzifon – Göller Cemetery to 2300 – 2100 BC[5].

Merzifon – Göller Village situated in the 35 kilometers northeast of Çorum (**see Map**), also witnessed illegal excavations such as Oymaağaç and captured works were dispersed to the museums and private collections again. T. Özgüç dated the Göller Cemetery works to the last quarter of 3rd millennium BC by comparing Alaca Höyük, HoroztepeveMahmatlarfindings[6].

Besides these, Oluz Höyük and Devret Höyük systematic archaeological excavations developed in the last years, are outstanding for the current findings. Oluz Höyük[7](**see Map**) systematic archaeological excavations which started in 2007 finished after seven year in 2013. In the light of these seven season was studied a Middle Bronze Age, Late Bronze Age, Early Iron Age (Dark Age), Middle Iron Age (Early Phrygian Culture), Late Iron Age (Late Phrygian and Persian/ Achaemenid Cultures) and Hellenistic Period architectural layers, consisting total of 10 meters, are found over an Early Bronze Age architectural layer. On the other hand the plastered floor fragments that were recovered from the 9th Architectural Layer, which was the last layer of the Trench B and was excavated with the step-trench technique to understand the stratification of Oluz Höyük; stone casting mould with some missing parts (**Pl. 10**); baked clay stamp seal and marble idol found in 2012 in 2B Architectural Layer in Trench A strongly point to an important Early Bronze Age settlement at Oluz Höyük. In the molting side of the casting mould, which has some parts missing, there are two casting mounts engraved for two short handled, circular shouldered daggers. The stone casting mould, which until today a find encountered only in small excavation areas and the edges of settlements, points to the metal crafting at Oluz Höyük. That the subject stone casting mould was blasted captured in the hillside of the mound, indicates that it was threw after it had not been able to use anymore.

The bronze axes found in the near of Suluovatown, Kanatpınar- DevretHöyük (**see Map**) excavations which were excavated only one season by Amasya Museum Directorship in 2013, have close similarities with the Mahmatlar findings. The existence of axes not published yet in such a small settlement, is very significant for indicating the metal work trade of the region.

A group of Amasya province, town of Gümüşhacıköy (**see Map**) origin metal work which comprises an important group of Haluk Perk Museum’s collection in Istanbul, has been recently

4. Özgüç/Temizer 1993: 613-628.
5. Özgüç 1978: 31; Özgüç 1980: 465.
6. Özgüç 1978: 36; Özgüç 1980: 460.
7. Dönmez/Naza-Dönmez 2007: 49-74; Dönmez/Naza-Dönmez İstanbul 2009: 125-170; Dönmez 2010a; Dönmez 2010b: 275-306; Dönmez 2011: 103-128; Dönmez 2012: 151-178; Dönmez/ Yurtsever Beyazıt 2013: 165 - 192.

published[8].Besides human-shaped idols[9](**Pl. 1/1-2**) in which the existence of copper alloy has been declared, this important assemblage including silver and copper alloyed pots[10] (**Pls. 4/1-4; 5/1-3**), ladle[11] (**Pl. 6**), castanets[12], pins[13] and various tools[14], consists of 120 works. Ö.Bilgidates the subject collective finding to the ends of 3rd millennium BC[15]. The works observed as Amasya region products of which exact find spot is not known, indicates one more time that North – Central Anatolia is very rich for mining.

Dated to EBA III, 2500 – 2100/2000 BC, from cemeteries and settlements such as AlacaHöyük[16] (Çorum), Eskiyapar (Çorum), Kalınkaya[17] (Çorum), Çadırhüyük[18] (Çorum), Resuloğlu[19] (Çorum), Bekaroğlu[20] (Çorum),Balıbağı[21] (Çankırı),Mahmatlar (Amasya), DevretHöyük (Amasya), Oymaağaç (Amasya), Göller (Amasya), Horoztepe (Tokat) ve Kayapınar (Tokat), gold, silver, electron, bronze, copper with arsenic and many lead works have been found. The producing of mine, the usage of mineral work and its trade, intensed in the north of the Kızılırmak (Halys) Bend inside, are able to be explained with the wealth of the underground resources in the region and the advancement on mining.

İkiztepe, located in the coastline of the Central Black Sea Region (**see Map**) and the north of the above mentioned settlements, is a very significant protohistorical settlement which includes very essential periods that had an essential role on shaping the Black Sea Region culture and has very important periods such as Chalcolithic, Bronze and Iron Age. That the cemetery of İkiztepe which has a strong mining technology and mining culture in EBA, was also discovered, has brought this settlement to the most known and understood condition of Anatolia for its Early Bronze Age mining findings[22].

Anatolia was governed by local seigniors in the second half of 3rd millennium BC. It might be thought a cultural region characterized on mining and that its west border was observed as Alaca Höyük and the east one was Horoztepe in this period indicates a local seigniory. It is seen that Amasya province is geographically and culturally in the borders of this seigniory. In Alaca Höyük and Horoztepe, that the similars of the works found in cemeteries dated to EBA III, were captured in the Maykop kurgans, indicates to the relationships between North- Central Anatolia and Caucasia.

8. Perk 2014.
9. Perk 2014: 18-19.
10.Perk 2014: 21-33.
11.Perk 2014: 35.
12.Perk 2014: 38-48.
13.Perk 2014: 52-113.
14.Perk 2014: 115, 117.
15. Bilgi 2014: 15.
16. Arık 1937; Koşay 1944; Koşay 1951; Koşay/Akok 1966; Koşay/Akok 1973.
17.Mellink 1972: 169-170; 1974: 109; Zimmermann 2006: 271-311; 2007: 35-42
18. Dönmez 2008: 405-412.
19.Yıldırım 2011: 11-29; Yıldırım 2012: 33-45; Yıldırım – Ediz 2005: 193-202; Yıldırım/Ediz 2006: 57-64; Yıldırım/Ediz 2007: 211-222
20. İpek – Zimmermann 2007: 49-58
21.Süel 1989: 145-163; Süel 1991: 205-214; Süel 1992: 129-146
22. Alkım 1986: 119-131; Bilgi 1984: 31-96; Bilgi 1990: 119-219; Bilgi 1999: 41-50; Bilgi 2004a: 383-402; Bilgi 2004b: 25-50; Bilgi 2007: 15-113.

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KARADENİZ
Sinop
İkiztepe
Kastamonu
Samsun
Gümüşhacıköy
Devret Höyük
Merzifon
Merzifon-Göller
Amasya
Oymaağaç
Mahmatlar
Horoztepe
Yeşilırmak
Iris
Çankırı
Balıbağı
Resuloğlu
Çorum
Oluz Höyük
Tokat
Çadırhöyük
Bekaroğlu
Alaca Höyük
Kalınkaya
Kayapınar Höyüğü
Kızılırmak
Halys
Eskiyapar
Maşat Höyük
Boğazköy
Çekerek
Skylaks
Kırıkkale
Yozgat
Sivas
Delice
Kappadoks
Kırşehir
Tuz Gölü
Kayseri
Nevşehir
Aksaray

Map

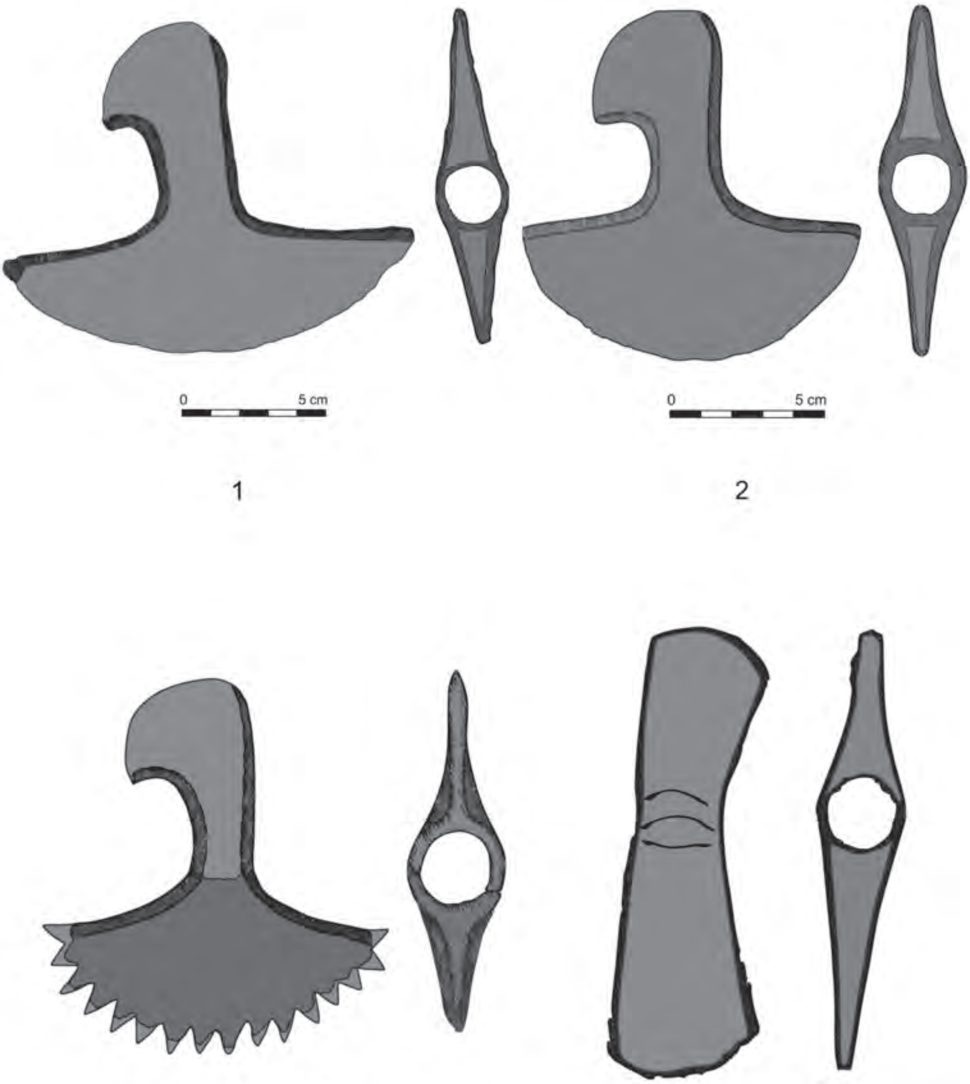
Plate 1

1

2

Gümüşhacıköy (Bronze)

Plate 2



Mahmatlar (Bronze)

Plate 3

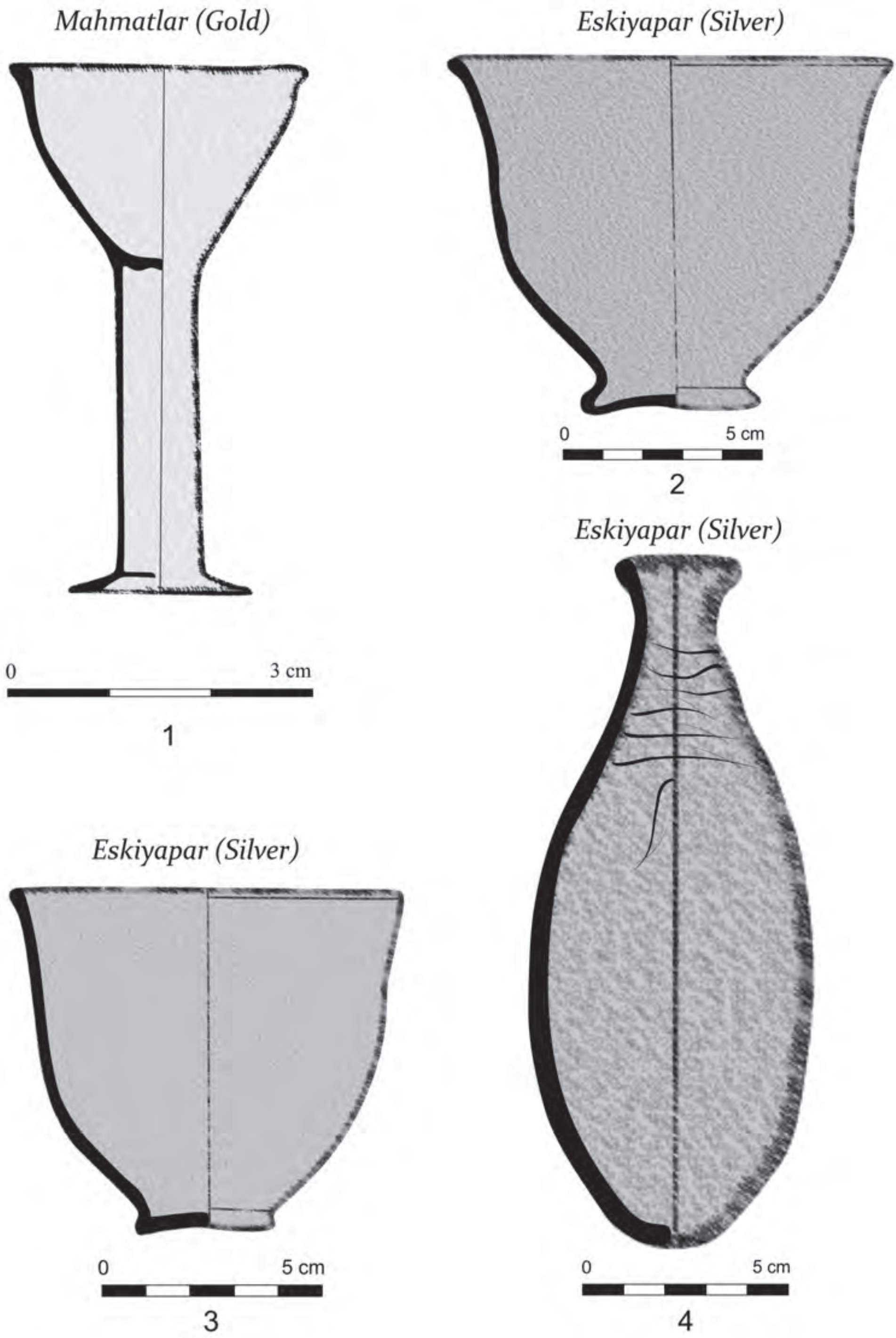
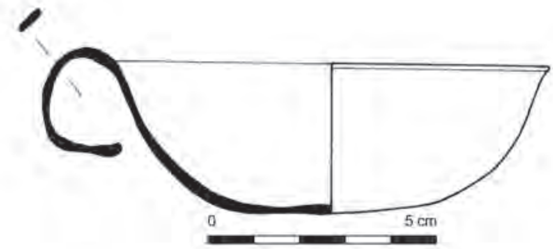

Mahmatlar (Gold)
0
3 cm
1
Eskiyapar (Silver)
0
5 cm
2
Eskiyapar (Silver)
0
5 cm
4
Eskiyapar (Silver)
0
5 cm
3

Plate 4



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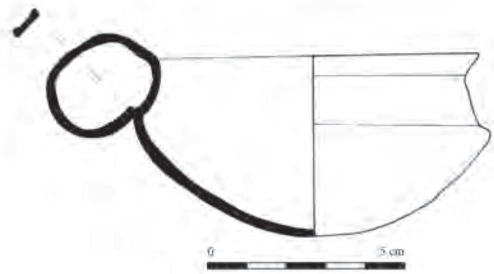

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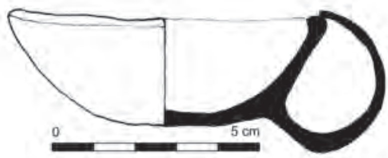

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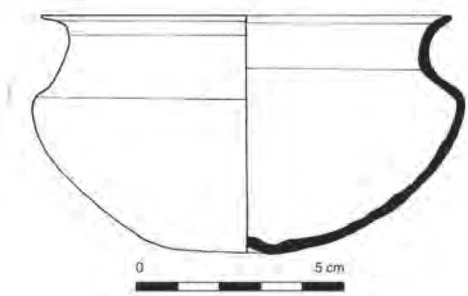
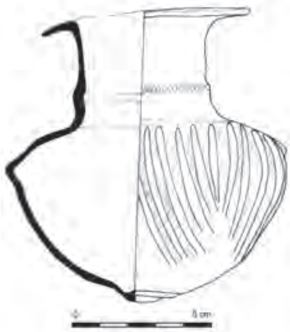


4

Gümüşhacıköy (Silver)

Plate 5

1



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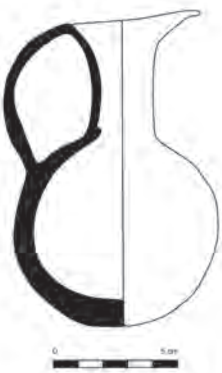
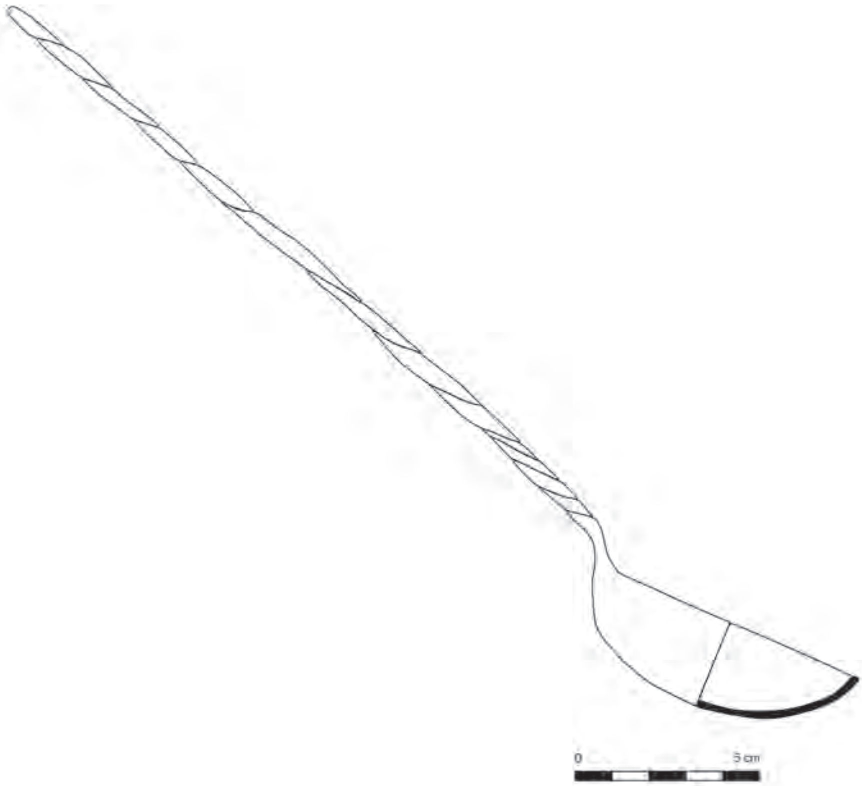


3

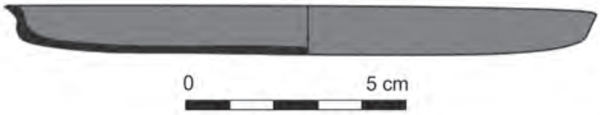
Gümüşhacıköy (Silver)

Plate 6



Gümüşhacıköy (Bronze)

Plate 7



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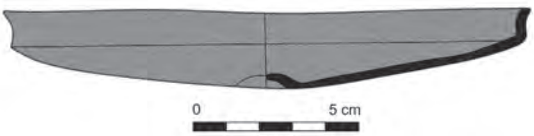

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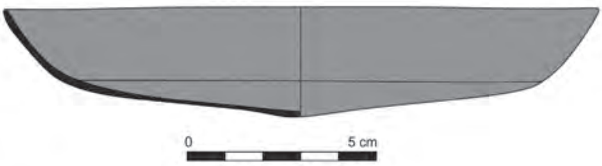

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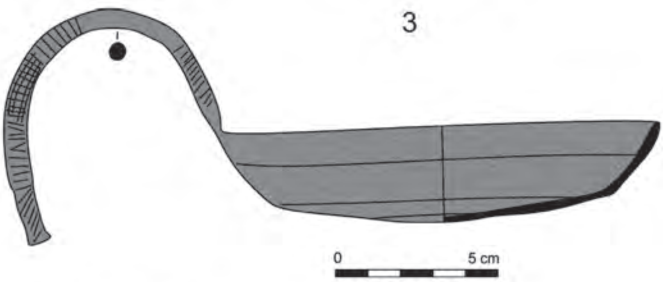
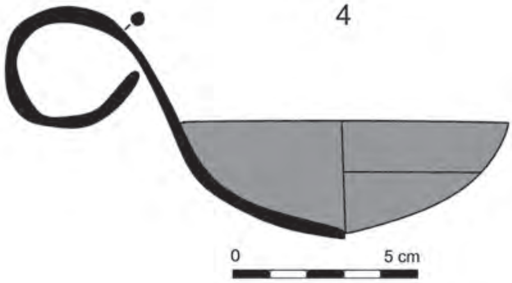


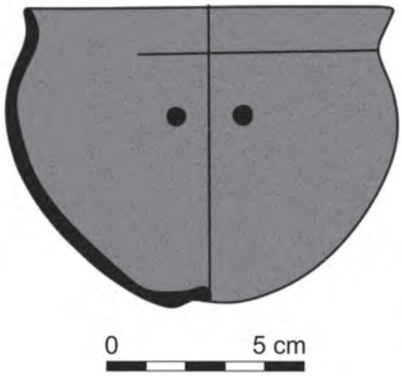
4



5

Horoztepe (Bronze)

Plate 8



1

2

3

Horoztepe (Bronze)

Plate 9

Horoztepe (Bronze)

1

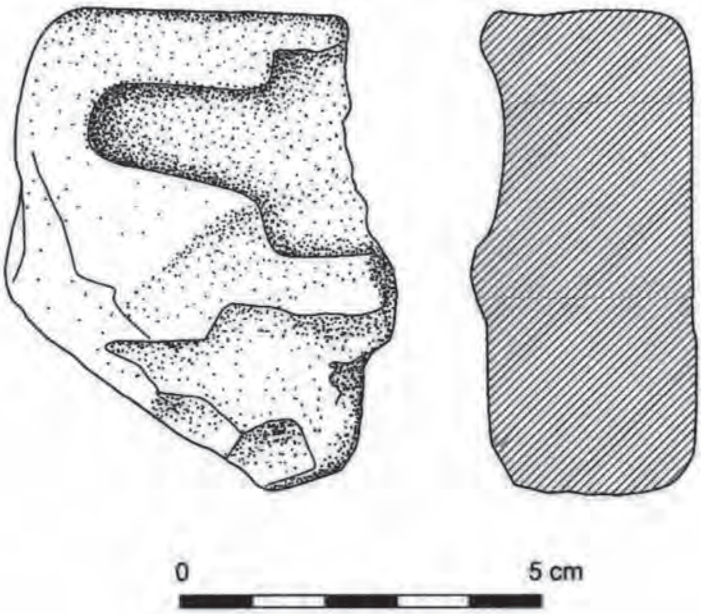
Horoztepe (Bronze)

2

Oymaağaç (Lead)

3

Plate 10



Oluz Höyük (Stone)

METAL PRODUCTION IN EASTERN ANATOLIA AND SOUTHERN CAUCASUS DURING THE EARLY BRONZE AGE

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Sapienza University of Rome

The first half of the Third Millennium does not show relevant technological changes compared to the previous period. Already in Late Calcholithic of Eastern Anatolia extractive metallurgy and metal manufacturing had reached a high technological level. The group of weapons from Arslantepe VI-A, and the funerary gifts of the Korucutepe tombs indicate the confidence in experimentation of copper alloys with arsenic, lead and nickel. Even the very beginning of the III Millennium is a moment of experimentation and production as confirmed by the finding in the Eastern and South Eastern Anatolia. Those that have the best stratigraphic and chronological sequence do not offer an exhaustive picture of the EBA I metal production: Arslantepe VI B1 did not yield ores or tools related to metal production, and Norşuntepe lacked an EBA Ia phase. A good proof of the exploitation of metal ores comes from the EBA I layers of Nevalı Çorı VII (Becker 2007: 43) much more known for its Prepottery Neolithic phases. In a multi room structure with limestone foundations, pits were found filled with 10 kg of slag and about one hundred crucible fragments (Hauptmann et al. 1993: 541). The slag fragments are red and round shaped, weighting from 150 and 250 grams, and the crucible fragments, classified as type C by Müller-Karpe (Müller-Karpe 1994: 121), are in line with the Eastern and South Eastern Anatolian tradition of the first quarter of the III Millennium. Many fragments show burned surfaces inside and outside so it is possible that the crucible was heated inside and outside. Radiocarbon dates assign the Nevalı Çorı VII phase contemporary to the end of Arsalntepe VI B1 and the beginning of the VI B2. The typological comparison of Nevalı Çorı metal artefacts finds strong parallels with Arslantepe VI B2 pins and with Norşuntepe XXVI, Hassek Höyük 2 and with those from the funerary gifts of Birecik and Karkemiş. Extraordinary is the coincidence of the coiled ring type between Arslantepe and Nevalı Çorı. Even if in the VI B2 of Arslantepe there are no evident traces of metalworking, we cannot ignore the findings of the so called “royal tomb”, that chronologically can be set between VI B1 and VI B2 (Frangipane et al. 2001: 120). The funerary gifts highlight strong cultural and social relations that involved the Eastern Anatolian communities with the Caucasus on one hand and the Middle Euphrates region on the other.

The strong connection between the items and the buried material suggest a central role that the man and his community could assume even in the management of raw materials such as polimetallic ores, very widespread in North-Eastern Anatolia and Caucasus. A control could be even extended to the production of objects and to their circulation. Perhaps is not a coincidence if in VI B2, period considered just after the death of the “king” in Arslantepe there is no trace of polymetallic ores but only chalcopyrite has been found. It is possible that his death created a dialectical emptiness or the loss of a regional focus inside that thick network of heterogeneous contacts shown by objects ascribed to different cultural traditions.

Differences between VI B1 and VI B2 are even in the settlement pattern: in the former we have postholes than cut the previous VI A levels, possibly huts, linked to a north-eastern pastoral tradition. Archaeozoological data for this phase shows an increase in sheep and goat exploitation (Palumbi 2008), while in the latter, VI B2, there is newly an architectural feature affected by the south with mudbrick buildings. During this period, lack of Cu-As and Cu-As-Ni ores and obsidian, which in the previous periods came from the Van region, could indirectly show the provenance of polimetallic ores. The sites that are strictly linked to Arslantepe in the second half of EBA I, Nevalı Çorı VII e Norşuntepe XXV-XXX, had only chalcopirites that according to the analyses come from the Morgul deposits (Hauptmann 1993: 552). In this case it could be hypothesised a fall-back option in the exploitation of ore deposits.

The Early Bronze Age II layers do not show change in the objects linked to the metal production: still crucibles and slag and Arslantepe and Norşuntepe newly exploit arsenical polimetallic ores. The latter site offers an interesting view over the development of metal production in Eastern Anatolia. Until the EBA IIa the site returned findings comparable with other contemporary sites in Central and Eastern Anatolia. At the end of the EBA IIa in a structure of level XXI a circular hearth was found with crucibles and slag close to it (Hauptmann 1982: 50; Müller-Karpe 1994: 29; Schmidt 2002: 125). This hearth finds a good comparison with the reconstruction of that from the site of Baba Dervish in Azerbaijan (Kavtaradze 1999: 74). In the level XIX, related to EBA IIb a metal workshop was found (Müller-Karpe 1994: fig.13; Schmidt 2002: 125-127, fig. 49).

Inside this structure, in addition to stone hammers and anvils, clay cilinders, slag and prills (Hauptman 1976a: 11), moulds for casting were also found, possibly the first in Eastern Anatolia in the EBA. In addition, there are two hearths in the workshop, one horseshoe shaped and the other trilobed in a cultural syncretism, Anatolian and Caucasian, that has to be highlighted (fig. 1; Müller-Karpe 1994: fig. 13; Schmidt 2002: 125, fig. 49).

The Transcaucasian metal production, according to the data, seems to be earlier; taking into consideration the sites along the course of Araks it is evident how the production chain is already represented during the Kura Araks I-II. At Amiranis Gora a room contains hearths for melting (Kushnareva 1997: 56-57, fig.20,20), and at Karnut trilobed hearths are used for smelting. An easy and programmatic metal production is shown at Shengavit, where besides two structures that host a metal workshop there have been found large vessels interpreted as ore bins. Associated to them stone pestles, possibly used to crash ores, and moulds have been found. Slag, crucible fragments with metal traces prove metal practice at Garni and also at Mokhra Blur is registered the presence of a metal workshop. The presence of tuyere show even the need to reach high temperatures (Schachner 2002: 123). The presence in Transcaucasia of mould for ingots, in the earlier phases of Kura Araks culture, suggest an additional step in metal production: Kültepe I has one (Schachner 2002: 122), the sites of the Aragats region some intact or in fragments (Badalyan-Avetisyan 2007: 27).

Therefor, the production phases at the beginning of the III Millennium are comparable with the Anatolian ones even if the latter lack of an important finding until the end of the EBA II. In fact, Transcaucasian sites show a further step of the metal production chain, melting into moulds since the end of the KA I. Stone or ceramic moulds are not present in Anatolian sites until their first appearance in the Norşuntepe metal workshop. Several are those in the KA I-II period found along the course of the rivers Akhouryan and Araks and at Amiranis Gora (Courcier 2007: 222), Shengavit (Kushnareva 1997: 58, fig. 21,16), Garni (Courcier 2007: 222) and Kültepe (Schachner 2002: 122). It must be mentioned the finding of half of a double valve mould from EBA II levels at Tepecik. Besides some stratigraphic problems that could let hypothesise an infiltration of EBA III materials in earlier levels, the site present an incongruity between the ores found and the composition metal objects: while the ores are polimetallic with high quantity of arsenic, the few objects are copper with iron and lead suggesting an exploitation of chalcopyrite (Esin 1982b: 71-93).

The old matter of absence of evidence is a dangerous field but this fact should not be ignored. As Eastern Anatolia gave a huge number of objects produced with moulds and so the question about where are the Anatolian EBA I-II moulds should be addressed. Is even conceivable that these objects were produced using moulds made from perishable materials, or by lost wax technique which had been used since the IV Millennium in the Near East. Contacts not uniquely based but strictly linked to metallurgy between Eastern Anatolia and Transcaucasia during the EBA I are undeniable. These contacts have been often attributed to nomadic Transcaucasian communities which moved seasonally, leaving at their passage evident traces of their culture (Rothman 2005: 55). There are several comparisons between Anatolian and Caucasian artefacts and a lot of literature has been published about them. New interesting coincidences are between the Arslantepe gouges and one kept in the Margahovit Local Museum or double spiral pins form Norşuntepe EBA I levels and a double spiral pin kept in the Museum of Local Lore of Lori Pambak (fig. 2). It is possible that during the first half of the III Millennium these nomadic communities came in Eastern Anatolia, possibly with knowledge of previous contacts, bringing with them knowledge about metal working and likely on this basis links were born. It can be hypothesized that these groups worked metal smelted by costumers or that they ask for raw metal as payment in exchange for a finished product previously produced. Perhaps for a mobile group it was not easy to dedicate time to the extractive activity and therefore they integrated their raw metal supply with relations of this kind. This fact could also explain why in many cases the isotopic analyses on items and ores do not match: the mixing of metal obtained from ores mined from deposits with different isotopic characteristics. The ethnographical comparisons confirm this hypothesis; the Mongolian silversmith goes from village to village and he stops in a place for the time necessary to satisfy all the demands (Rowlands 1971: 214). Boyer affirms that the metalworkers are often of a different ethnical provenience with respect to the context in which they practice their craft and tend to level the typological differences between communities, even on wide areas (Boyer 1952: 165). In the Basakata tribe in Congo, the smith works iron, copper or brass that is always provided by the costumer, who, in turn, obtained it by a prospector and smelter. A part of this metal is taken as payment and the rest is given back in form of finished product (Rowlands 1971: 211). In Northern Europe this practice is witnessed by a Celtic myth: "Now it happened that there were on the mainland three brothers, namely, Kian, Sawan, and Goban the Smith. Kian had a magical cow. Its milk was so abundant that everyone longed to possess her, and he had to keep her strictly under protection. Balor determined to get the cow for himself. One day Kian and Sawan had come to the forge of Goban to have some weapons made for them, and brought fine steel for that purpose" (Rolleston 1996: 86-87). The unusual copper-silver alloy of some objects found in the Arslantepe royal tomb could be linked to this practice: a part of silver could be taken as payment and replaced with copper. Moreover this alloy needed a peculiar knowledge. In fact to obtain the shiny silver aspect it mix together the elements isn't enough. After the cast the object undergoes a surface enrichment of silver by selective oxidation and removal of copper (Hauptmann et al. 2000: 78).

A widespread diffusion and pronounced typological levelling over such an extended geographical area imply that the relations had to be frequent and involved more than a single community. These relations have possibly involved mostly metallurgy, as other aspects of material culture have evident differences.

In Transcaucasia, on the contrary, the metal production chain, since the earlier phase of the EBA, is all represented. It is possible that also the Kura Arak settlements were in contact with the nomadic communities if these were the levelling factor for metal types, however in this case this presence is not so easy to identify. In any case, the Kura Arak's choices seem to be different from the Anatolian ones.

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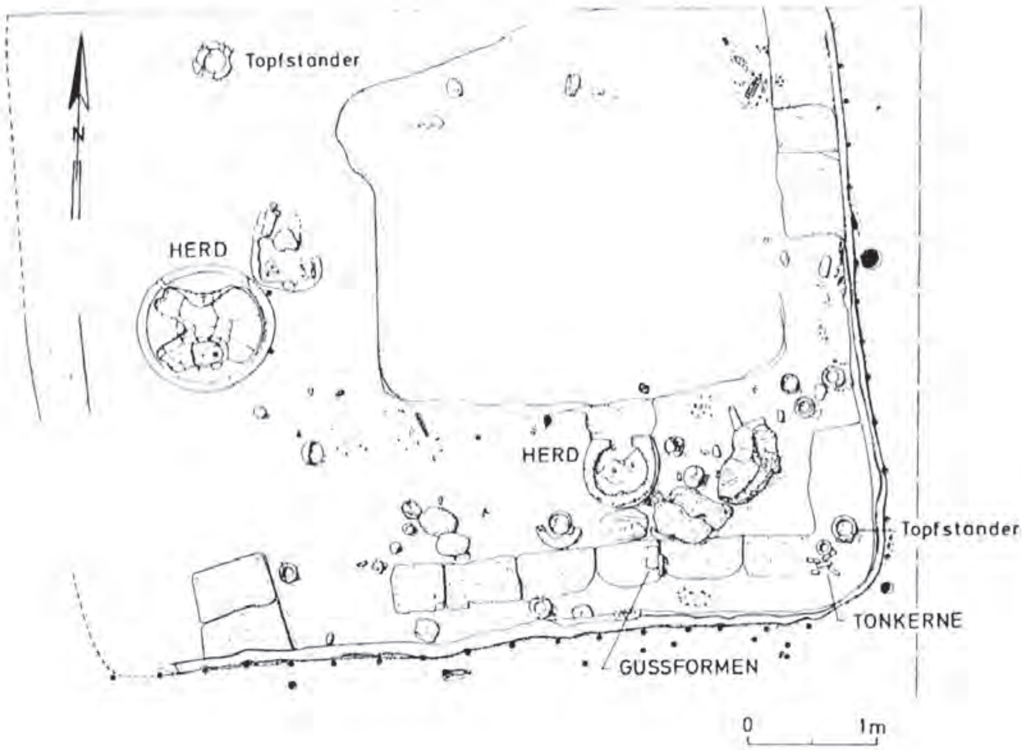
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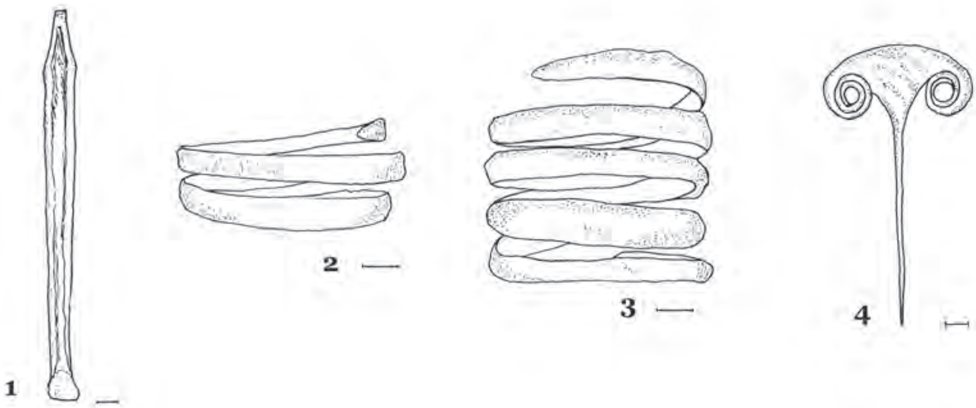
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fig. 2.

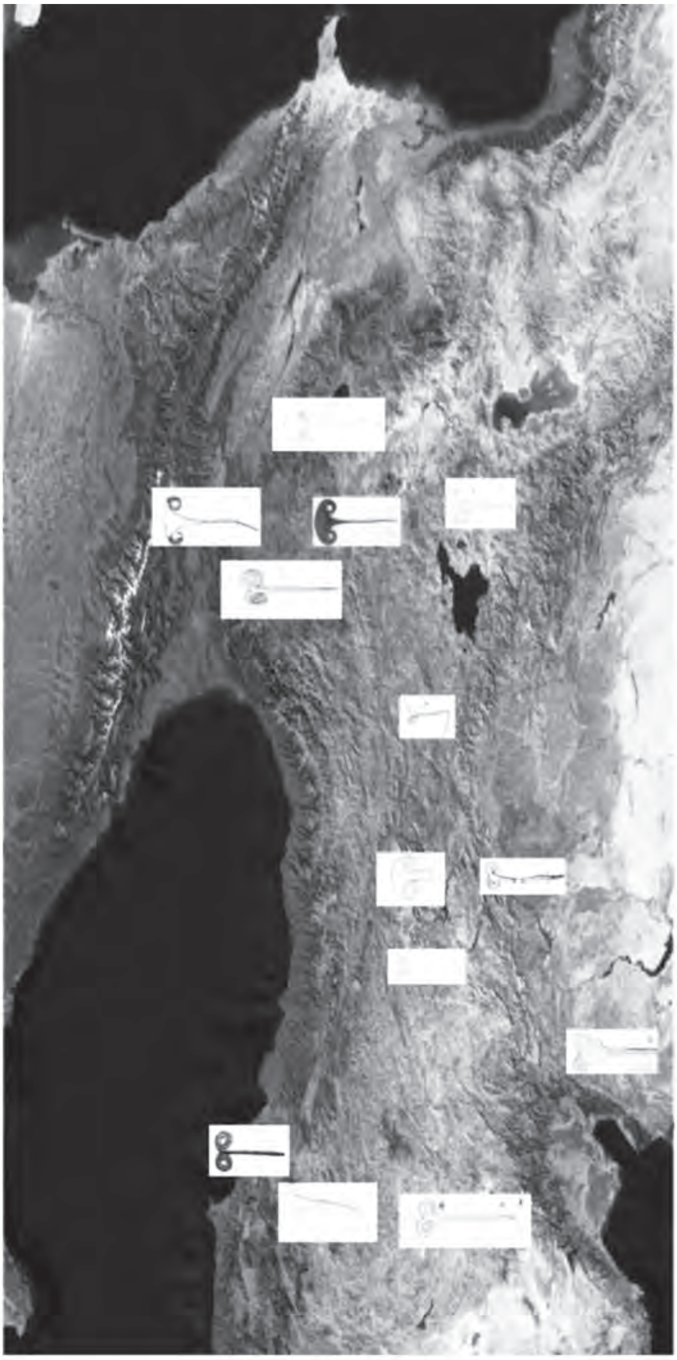

fig. 3: map of diffusion of double spiral pins in central-eastern Anatolia and south-western Caucasus. The double spiral pin can be divided in two varieties, an Anatolian one with a notch on the top and one Caucasian with a convex profile. An overlap between the two varieties could draw a cultural border, possibly around the Van Lake and could suggest contamination of Anatolian and Kura-Araks cultures.

НЕКОТОРЫЕ МОМЕНТЫ ВЗАИМООТНОШЕНИИ КУРО-АРАКССКОЙ И БЕДЕНСКОЙ КУЛЬТУР НА ЮЖНОМ КАВКАЗЕ

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Угасание расспространённой на огромной территории Кавказа и Ближнего Востока Куро-Араксской культуры в разных регионах происходила по разным причинам. По своему протекал этот процесс на территории Восточной Грузии. Большинство исследователей считает, что причина угасания Куро-Араксской культуры в Восточной Грузии, наряду с другими факторами, была обусловлена появлением и расспространением в 3 тыс. до н.э. новой культуры на территории Южного Кавказа - т.н. «культуры ранних курганов». С появлением этой культуры, которая особенно широко распространяется в Восточной Грузии, связан целый ряд инноваций. На этой же территории чётко прослеживается её две различные группы – Марткопская и Беденская. В первой, Марткопской группе, хорошо заметны признаки предыдущей культуры, по причине чего памятники этой группы рассматриваются в пределах Куро-Араксской культуры. Памятники Беденской культуры совершенно отличаются от Марткопской группы и указывают на появления новой культуры [Махарадзе, Орджоникидзе 2007: 83-84]. Характерная для Беденской культуры керамика значительно отличается от посуды предыдущей эпохи. Она изготовлена особенно тщательно. Меняется форма и орнамент – новая керамика в основном орнаментирована тонким процарапанным геометрическим узором, точками, выемками, ямочками и шишечками. Подобный орнамент украшает керамику из погребений, а на поселениях в основном распространена грубая, кухонная керамика, которая орнаментирована рельефными линиями, гребенчатым узором, рядом ногтевых отпечатков и др.

Что касается взаимосвязи этих двух групп т.н. ранних курганов, всё больше укрепляется мнение об их синхронности, тем более, что на некоторых памятниках беденская керамика появляется вместе с типично куро-араксской керамикой. Таким образом, есть основание предполагать синхронность Беденских памятников не только с Марткопской группой, но и гораздо ранними, Куро-Араксскими памятниками. По нашему мнению, об этом свидетельствует стратиграфия кургана из Ховле, где над Беденским погребением №2 было размещено позднекуро-араксское погребение №1 [Джапаридзе 1998: 148], а также целый ряд памятников из Южного Кавказа. Например, Беденская и Марткопо-Куро-Араксская керамика совместно была найдена в Дманисском кургане №1, где вместе с характерной Беденской посудой находился кувшин грушевидного типа (таб. I-1). Аналогичная керамика известна из Триалетского кургана XI (таб. I-2), а в Триалетском кургане XLVI вместе с Беденской посудой были найдены глиняная крышка и фрагмент керамики со спиральным орнаментом (таб. II), которые характерны для Куро-Араксской культуры. В Ананаурском кургане также найдена керамика обоих групп [Пицхелаури 2013: 31]. В кургане, раскопанном у Тетрицкаро также засвидетельствовано сосуществование керамики этих культур [Джапаридзе 1960: 5]. Аналогичную картину мы видим в курганах № 5 и № 9 Марнеульской долины, где вместе с Беденской посудой представлена керамика Куро-Араксского типа [Джапаридзе 2003: рис. 109-3; Джапаридзе 1998: рис. 52]. Инвентарь кургана № 2 из Ткемлара [Shatberashvili З., Shatberashvili B., Nikolaishvili 2010: таб. I-6] также содержит большой сосуд беденского типа, который орнаментирован выемчатыми треугольниками (таб. III). Этот сосуд имеет параллели в курганах № 2 и № 4 из Марткопи [Джапаридзе 1998: рис. 5-17; 6-19], а также в кургане № 5 Марнеули [Джапаридзе 2003: рис. 109-8] и в Куро-Араксском поселении Шенгавит [Sagona 1984: Form 178]. В Шенгавите вместе с типичной Куро-Араксской керамикой был найден большой сосуд Беденского типа, орнаментированный также треугольниками и шишечками [Сардарян 1967: рис. 20]. Сосуществование керамики Беденской и Куро-Араксской культур прослеживается и в Беркаберском кургане [Гаспарян 1987: 232].

Ещё более рельефно выявилась синхронность этих культур на поселениях Восточной Грузии. В некоторых Куро-Араксских комплексах Грмахевистави часть сосудов проявляет беденские признаки - три вертикальные линии на корпусе и выдавленные изнутри шишечки [Абрамишвили, Гигуашвили, Кахиани 1980: рис. 3, 7]. Поселение Цихиагора также содержит большое количество куро-араксской и беденской керамики (таб. IV). На поселении Орчосани засвидетельствовано сосуществование керамики этих культур (таб. V). В нижнем слое поселения Илто вместе с Куро-Араксской посудой был найден сосуд Беденского типа с выступом на ручке [Дедабришвили 1969: рис. 13-4]. Аналоги подобной керамики известны из Сачхерского кургана [Джапаридзе 1961: рис. 29] и поселения Хашурской Нацаргоры [Рамишвили 2013: таб. XXXIV]. На поселении Нацаргора (Хашури) процесс сосуществования культур прослеживается на протяжении нескольких строительных горизонтов. Из-за этого поселение Нацаргора (Хашури) попало в ряд особых памятников. Поэтому оно заслуживает особого внимания.

Раннебронзовый слой на поселении Нацаргора (Хашури) сильно повреждён поздними строениями и ямами, вследствии чего судить об архитектуре возможно лишь по сохранившимся фрагментам и отдельным деталям полов [Рамишвили 1991: 25; Рамишвили 2013: 28]. Повидимому, как и на других поселениях Шида Картли, здесь также были распространены прямоугольные дома каркасного типа. В центре помещения находились круглые очаги с несколькими выступами [Рамишвили 1991: 25].

Раскопки, произведённые в секторе NW, на крае вершины горы, в соответствии с уровнями полов, расположенными ступеньчато, из нескольких строительных горизонтов выделен древнейший слой, содержащий лишь Куро-Араксскую керамику. Этот древнейший слой лежал непосредственно на материковой почве [Рамишвили 1991: 25; Орджоникидзе 1992: 6]. В этом горизонте представлены сосуды колоколообразной формы, без орнамента, которые характерны для Шида Картли, вследствии чего начало освоения горы было связано именно с племенами, носителями этого варианта Куро-Араксской культуры [Орджоникидзе 1992: 6]. Видимо сосуществование этих культур на поселении Нацаргора продолжалось до конца раннебронзовой эпохи [Орджоникидзе 2004: 188].

Впоследствии, исследования, произведённые на разных участках вершины горы, увеличили число нижних, Куро-Араксских горизонтов без примеси Беденской керамики и укрепили часть первоначальных предположений [Рамишвили 1991: 25]. Но в тоже время другая их часть, по моему мнению, была интерпретирована неправильно. Например, думаю, что жизнь на поселении угасла не в эпоху Беденской культуры [Рамишвили 1991: 24], а в период сосуществования Беденской и Куро-Араксской культур, доказательством чего, наряду с другими данными [Орджоникидзе 2011: 226], служит наличие в очаге самого верхнего горизонта раннебронзовой эпохи как куро-араксской, так и беденской керамики [Орджоникидзе 1992:3].

В опубликованном в последнее время обобщающем труде, посвящённому поселению Нацаргора, отмеченные вопросы представлены уже совершенно по-другому. В нём опровергаются существования на памятнике как чисто беденских, так и горизонтов содержащих лишь Куро-Аракcские материалы. В реннебронзовых горизонтах, везде, подчёркивается сосуществование этих культур [Рамишвили 2013: 29, 32], что также не должно соответствовать действительности. Из-за объективной причины – сильного повреждения памятника, видимо, невозможно было связать друг с другом горизонты, выявленные на разных участках поселения, что сделало бы возможным восстановления картины развития раннебронзовой культуры.

В основном, во всей керамической коллекции, сгруппированной из условно выделенных горизонтов, фигурирует две группы – ранний и поздний материал. В обоих группах посуда, характерная для Куро-аракcской культуры Кавказа, и особенно Шида Картли, относится к концу этой культуры и началу нового этапа [Рамишвили 2013: 32-33]. Основное отличие состоит лишь в том, что вместе с поздней группой встречается изящно изготовленная беденская посуда, а с ранней сосуществует грубая, простая, или посуда с бессистемно расположенными желобками на поверхности, которая не чужда и для поздней группы, также, как и изящная беденская керамика на отдельных участках нижних горизонтов поселения [Рамишвили 2013: 33, таб. XXIV-12, 13].

Во всей коллекции со смешанной керамикой из поселения [Рамишвили 2013: 61-76, таб. XXI-XXXVI; 119-166, таб. I-XLVIII] можно заметить доминирование куро-аракcской керамики [Rova, Puturidze 2010: 14]. Это в основном посуда шидакартлийского типа. Керамика этого варианта начиная с развитого этапа Куро-Аракcской культуры, твёрдо обосновывается в регионе и редко изменяет форму на протяжении долгого времени [Киквидзе 1972: 73]. Ей должна соответствовать ранний материал поселения Нацаргора [Орджоникидзе 1992; Rova, Puturidze 2010: 15]. А в верхних горизонтах, как и на ряде памятников Шида Картли, на керамике появляется орнамент – выемчатые косые линии и ромбовидные узоры вокруг верхней части корпуса [Джапаридзе 1976: 105].

На памятниках Шида Картли распространяется сложный выемчато-резной спиральный орнамент, один из ведущих мотивов орнамента керамики араратского типа, нанесённый на трёхчастную посуду [Джапаридзе О. 1976: 124; Махарадзе 1994; 65]. Отмечено, что подобная керамика гораздо меньше распространяется во внутренних регионах Шида Картли. В Западной Грузии эта керамика встречается очень редко. Видимо, западная граница распространения подобной керамики на территории Грузии проходит по линии Карели-Ахалкалаки [Орджоникидзе 2002: 15-17]. Керамика араратского типа совершенно незнакома для многочисленной коллекции керамики поселения Нацаргора. Здесь не обнаружена посуда трёхчастного типа, а также выемчато-резной спиральный орнамент [Орджоникидзе 2004: 116]. Видимо, эта часть Шида Картли осталась за пределамы влияния араратской керамики.

В верхних горизонтах Нацаргоры встречаются характерные для позднекуро-аракcско-марткопского периода сосуды – миски с вогнутым венчиком, одноручные кувшины, резной орнамент и др. Но самым значительным здесь является появление новой керамики

Беденского типа [Рамишвили 1991: 23; Орджоникидзе 1992]. Это посуда баночной и бочонкообразной формы с низким горлышком или вовсе без горла, украшенная канелюрами и заштрихованными ломанными линиями, грубая посуда с насечками на венчике, а также рельефной линией, или рядом дырочек под венчиком, бессистемно расположенными желобками на поверхности. Надо отметить изящную посуду с двойной ручкой и горшочки с коленчатым выступом на ручке [Рамишвили 2013: 31-35]. Несмотря на близость с класическими беденскими памятниками, заметно определённое различие: на Нацаргора не найдены ведущие формы этой культуры [Гобеджишвили 1980: 51, рис. 13; 62, рис. 14]. Эти горшки характерны для некоторых курганов Бедени, Кахети, Триалети и схожими с ними по этим признаком памятниками. К ведушим формам также относятся и горшки больших размеров с узким и высоким горлом, а также «жемчужный» орнамент и др.[1] Вышеперечисленными признаками керамика Нацаргора сближается с беденской керамикой из поселений и некоторых погребений Восточной Грузии.

На основе стратиграфии, установленной в NW секторе на крае вершины горы, вновь считаю, что освоение Хашурской Нацаргоры начинается не на позднем, а на развитом этапе Куро-Араксской культуры, племенами, носителями шидакартлийского варианта этой культуры. Близлежащий, синхронный могильник, который содержит лишь куро-араксскую керамику [Rova., Puturidze 2010: 15], по моему, является этому доказательством. Возможно, в период сосуществования, покойников хоронили в другом, ещё не обнаруженном месте. Куро-Араксская и Беденская культуры некоторое время сосуществовали на территории поселения и затем одновременно исчезли в конце раннебронзового периода [Орджоникидзе 2004: 188].

Даже неполный перечень памятников на территории Восточной Грузии, на которых прослеживается сосуществование керамики Куро-Араксской и Беденской культур, указывает на масштабность этого явления. Отмечено, что представленная здесь куро-араксская керамика не однообразна и относится к разным локальным вариантам этой культуры, из которых, вероятно самой ранней является шидакартлийский вариант, существующий на Хашурской Нацаргоре. Таким образом, существует основа для некоторого удревнения появления Беденской культуры в Шида Картли и Хашурскую Нацаргору представить одним из ранних поселений, среди контактных памятников этих двух культур. Менее допустимым считаю предположение о начале формирования Беденской культуры в недрах Куро-Араксской культуры, так как на всех контактных памятниках и среди них на поселении Нацаргора, беденская керамика представлена в совершенно сложившемся виде, которая водимо прошла довольно долгий путь развития. Насколько долговременными были эти отношения, пока не ясно. По существующим данным, новая культура хорошо обустроилась в среде местной Куро-Араксской культуры и отчасти стала продолжать её традиции [Миндиашвили 1993]. На тех поселениях, где засвидетельствовано сосуществование этих культур, подобно Хашурской Нацаргоре, жизнь угасает и более не возобновляется. Существование прекращают представленные здесь обе культуры. Поэтому, угасание Куро-Араксской культуры на территории Восточной Грузии вряд ли можно связать с распространением Беденской культуры.

1. На Нацаргоре не встречается «жемчужный» орнамент. Посуда, которая якобы орнаментирована «жемчужинами» [Рамишвили 2013: 33, таб. XXXV-2], вдействительности украшена мелкими ямочками [Орджоникидзе 1992: 6, таб.III].

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2. – Триалетский XI курган (по Гогадзе 1972).

Таб. II. Триалетский XLVI курган (по Гогадзе 1972).

Таб. III. Ткемларский курган №2 (по Shatberashvili et all 2010:)

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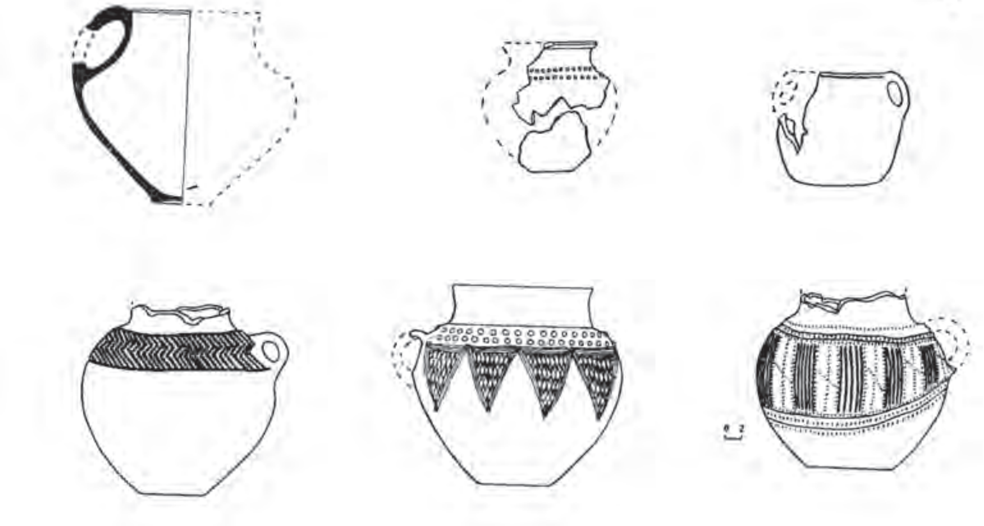
Таб. V. Поселение Орчосани (по Орджоникидзе и Джибладзе 2005)

1



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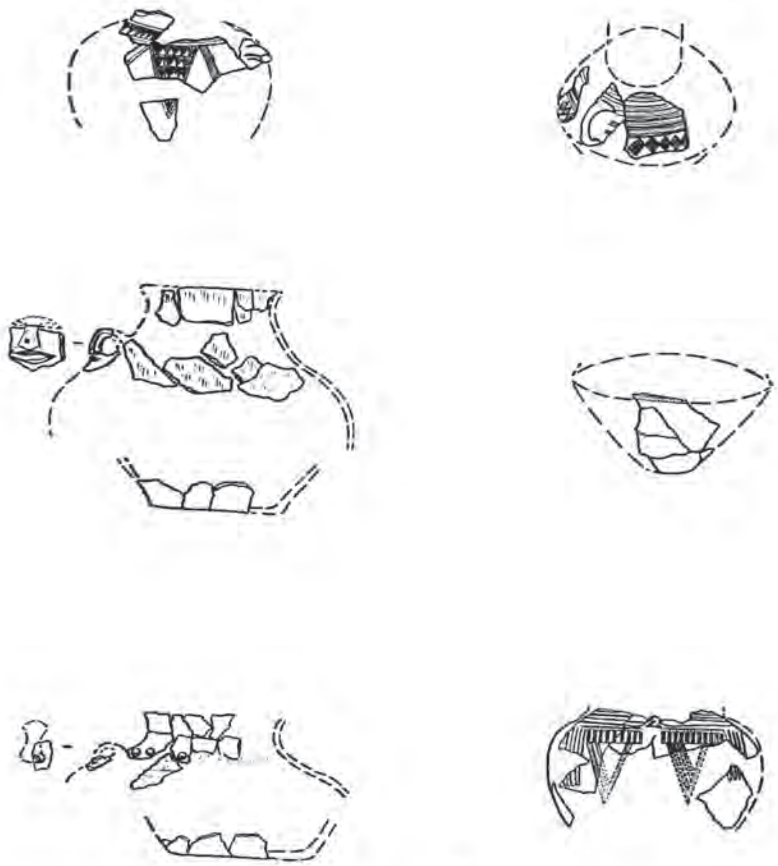

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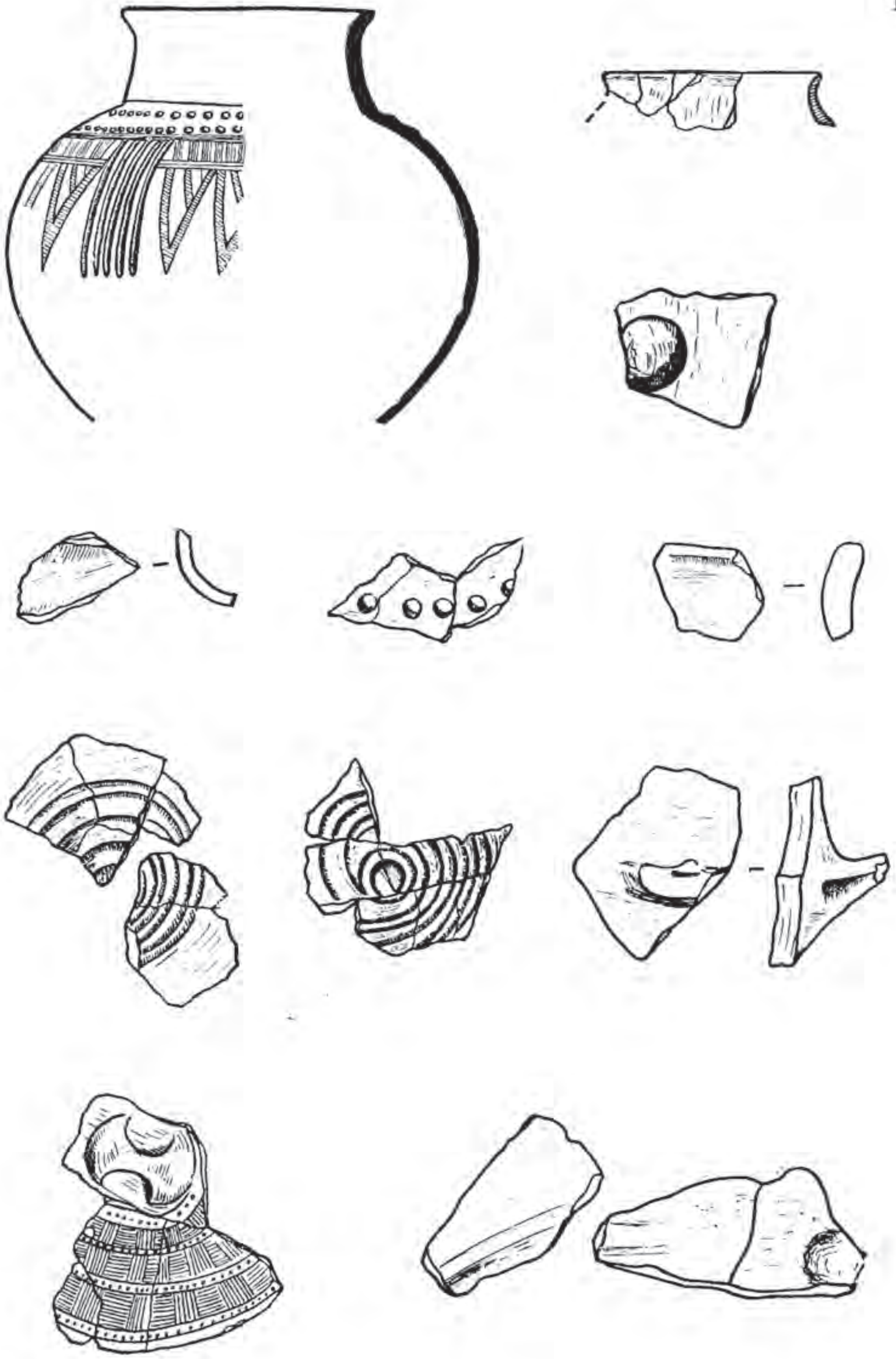

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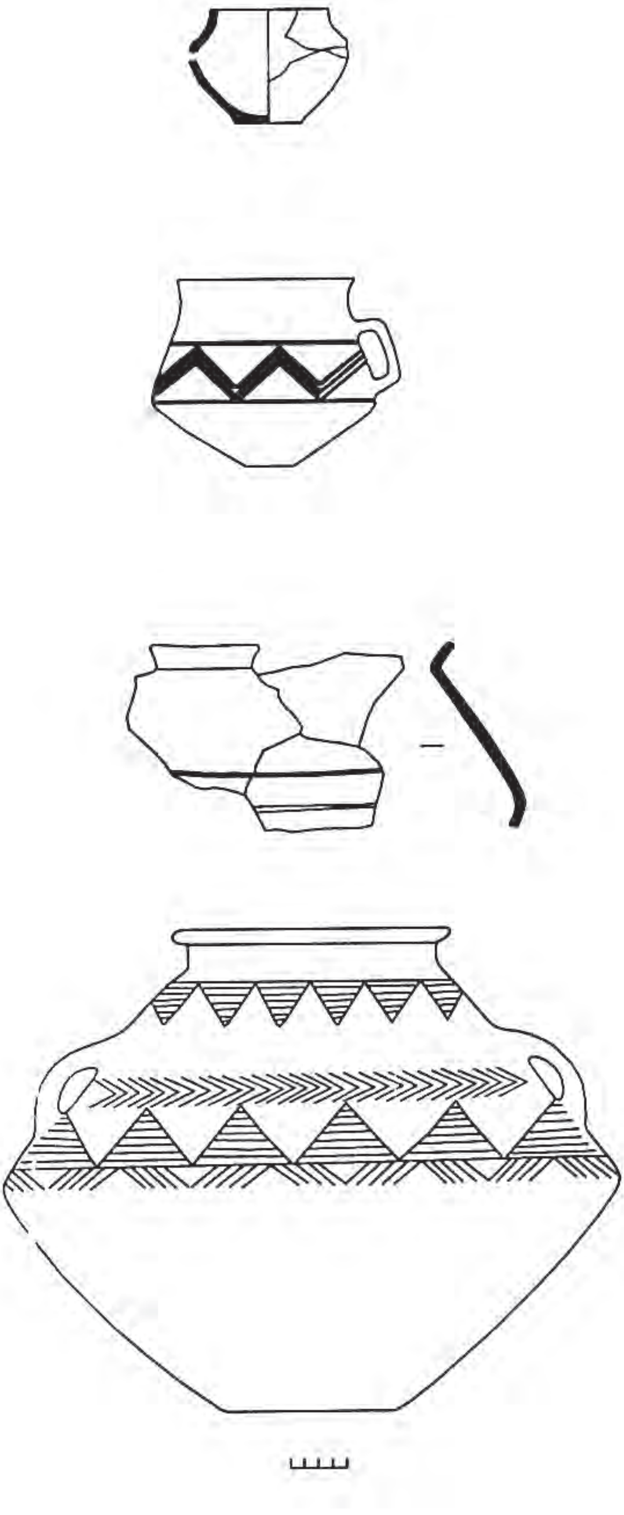

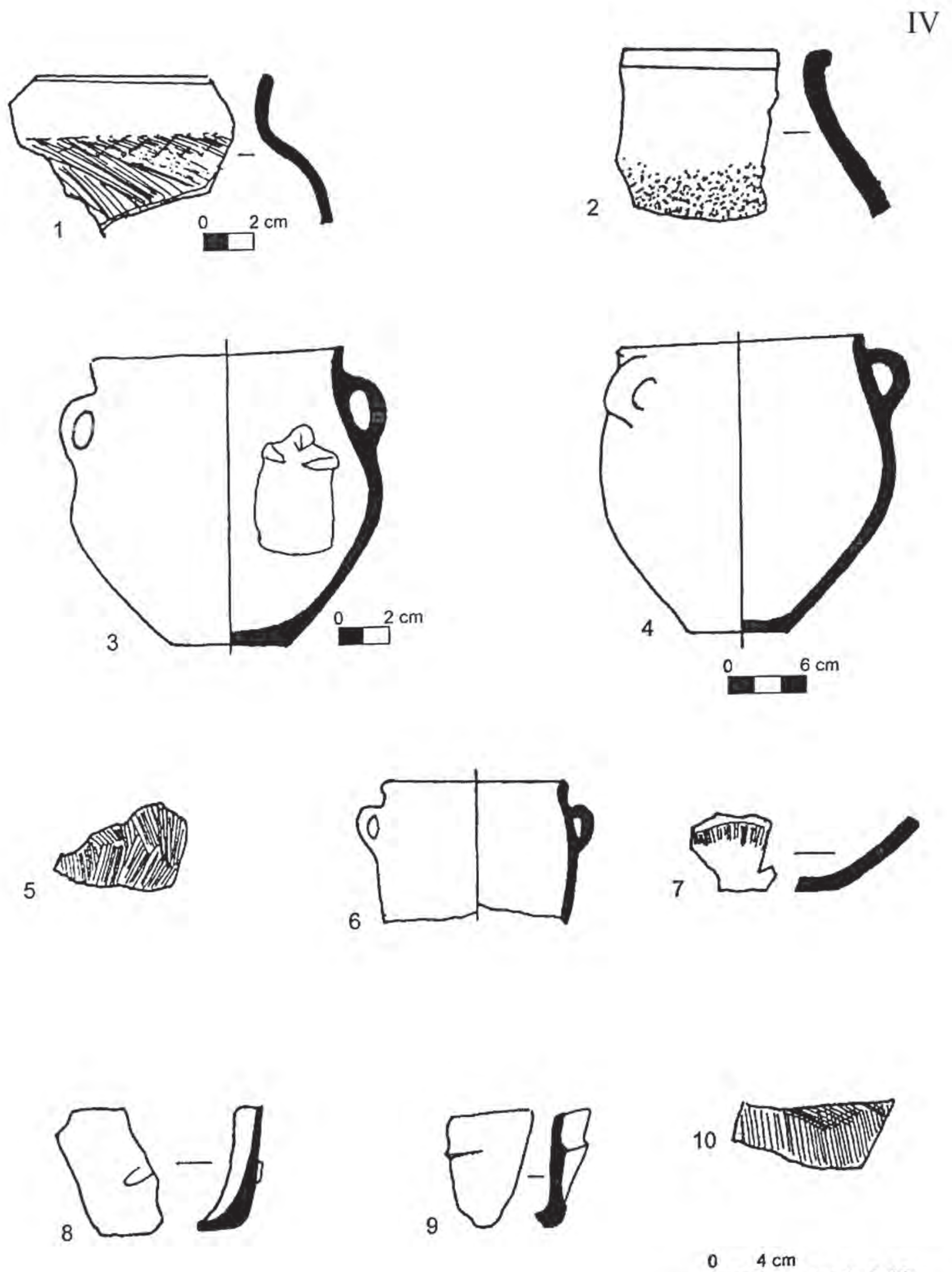
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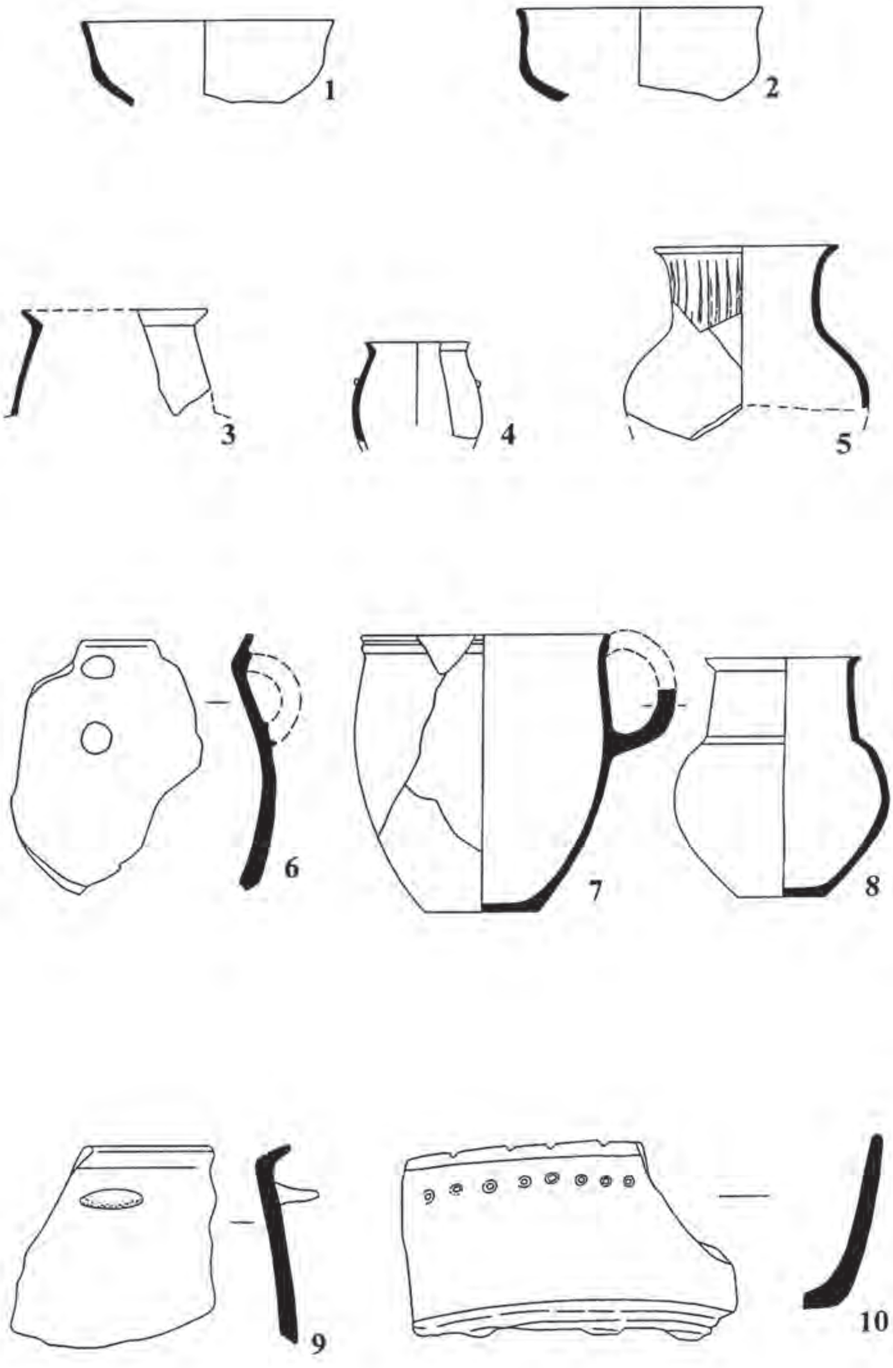
V



BEDENI CULTURE AND BERIKDEEBI SETTLEMENT

Dr. Mindia Jalabadze
Georgian National Museum

The paper deals with one of the most interesting problems of the Early Bronze Age in Transcaucasia and, particularly, in Georgia, namely, the Culture of Early Barrows, touching related problems, as well. This culture became especially interesting after Berikldeebi a well-stratified settlement, was revealed and thoroughly excavated.

In the 4th and 3rd millennia BC a quite similar archaeological culture - the Kura-Araxeses culture - was spread all over Southern Caucasia. The material characteristic of this culture (black-red burnished pottery) is found on a large territory - N-E Caucasia, Near East, N-E Anatolia, Syria-Palestine (here this culture was known as the Khirbet-Kerak Culture).

In the second half of the 3rd millennium BC certain changes are registered in Transcaucasia. New elements appear in the Kura-Araxeses culture, among which we must point out funerary rites.

Individual burial mounds start to appear. Burial goods have changed. New pottery shapes and ornamentation appear, bronze tools and weapons also changed. Silver and gold items appear among burial inventories. Often a deceased was placed on a wooden cart or a couch.

Several explanations of these changes are offered in the special literature. Some scholars suppose that they were caused by changes in economics (cattle-breeding developed, while the role of agriculture diminished). An idea was voiced that the funerary rites in burial mounds might have been brought from South Russian steppes by the cattle-breeders. According to an opposite idea, the invasion of Hurrian tribes from the S-E caused these changes.

Early Burial Mounds are found mostly in East Transcaucasia. No burial mounds are revealed in west Georgia, but some fragments of characteristic black pottery came to light at the Black Sea coastal settlements (EB age levels).

Prof. O. Japaridze points out two stages in EBM culture: I - the Martkopi stage, II - the Bedeni stage. The first stage is earlier, the second one - later.

The earliest burial mounds must be related to the stage I. This type of kurgans is known in S-E Georgia. It is interesting, that on this stage burial mounds consist of less implements and in pottery some elements of previous age (i.e. the KA culture) could be found. These elements are: pottery shapes, decoration, though some changes in pottery are definable. Stage I of EBM culture is distinguished by its huge dimensions of burials. For instance, the diameter of burial mound № 4 in Martkopi reaches 100 meters, its height is 15 meters. New types of bronze weapons and tools were found in the same burial, precious metals (gold, silver) start to appear, and etc.

On the second stage burial mounds are more developed. By the time this culture seems to be spread all over the eastern part of Georgia. Burial mounds are again huge, though some of them are smaller. At first the barrows have been excavated in S-E Georgia, on the Bedeni Plateau.

Hence the name of the culture - the Bedeni Culture. Pottery is quite peculiar. Vessels are black - pollished, very often shining like metal. Bronze tools and jewelry became more refined. The well-known golden sculpture of the lion from Kakheti belongs to this period. Obsidian industry and wood-working reaches the highest level (filigreed retouch of arrowhead).

Up to 1979 the Bedeni Culture was known only by the burials. In 1979 the archaeological expedition of the State Museum of Georgia led by Prof. A. Javakhishvili began the excavations of a multi-layered site on the left bank of the Kura River. The site was called Berikldeebi according to the place of the excavation (100 km N-W from Tbilisi, Kareli district).

Five different cultural layers were revealed on the site: I- Late Bronze-Early Iron Age; II - Middle Bronze Age graves; III - Bedeni; IV - Early Kura-Araxeses; V - the lowermost, Late Chalcolithic.

From finds of the level V of interest are a large rectangular mud brick building and a mud brick citadel. In the building a circular hearth was evidenced with a small hole in the centre. Similar hearths are found in the next level (IV), but the architecture is quite different. In the first case the rectangular building is changed into a circular wattle-and-daub one with a circular hearth in the centre. In the layer dated to the Early Kura-Araxeses culture the remains of two circular buildings are excavated. Circular architecture seems to be traditional in early sites of South Caucasia.

The mud brick (rectangular) building of the previous layer is unique. Of special interest is pottery, which contains, on the one hand, clay wares of high quality with organic (straw tempered) inclusions and, on the other hand, ceramics of relatively lower quality (with inorganic admixtures).

Layer II contained 5 burials dated to the Middle Bronze Age. Finds from the graves are typical for Central Caucasia. The graves are dated back to the 17th and 16th cent. BC.

The uppermost layer - layer I - is considered to be of the Late Bronze-Early Iron Age. This layer is very badly damaged by erosion. Only some fragments of this layer are preserved. Thus, it is difficult to say something definite about it. The material could be dated back to the 9th-7th cent. BC.

As for the Bedeni Culture layer (Layer III), it is composed of 2 main levels: 1. Level with buildings (fig. 1); 2. Level with pits. The former is well stratified, while the latter is damaged (the character of pits is not much clear; it is difficult to define their function - ritual, storage, for garbage). Pits were found on the different absolute levels of the whole settlement. This makes their interpretation difficult.

The level I of the Bedeni Layer contains 6 building horizons (from bottom to top):
1. Building № 9 and remains of Buildings №№ 12-14
2. Buildings №№ 10, 11
3. Complex of buildings №№ 2-5
4. Building № 6
5. Buildings №№ 7, 8
6. Building № 1
6. Constructions with altars (sacrificial platforms)

Architecture is almost similar. Buildings are square, with wattle-and-daub walls and a circular hearth in the centre (fig.1,2,5). There are several variants of hearth: simple circular, bordered and circular with anthropomorphic elements (fig.4). The construction of hearth sometime finds slight and distant parallels with the hearths characteristic of the late Kura-Araxeses Culture.

As for altars, they are decorated with clay horns (fig.14) and relief spiral pattern. Each altar has a small ditch for ashes on one side (fig.3). Only in two cases we managed to relate them to the definite buildings.

It is worthy to note, that the site is very damaged by the pits of different times (mostly Bedenian), fox holes. This makes the reconstruction of constructions quite difficult.

Among finds the most numerous and important is pottery. In contrast to the pottery known from the burials of the Bedeni culture, a large number of new shapes (and functions) is distinguished. Besides the black-polished pottery (fig. 6-13), a series of absolutely new type of kitchen ware is observed (rough jars - fig. 15-17,19-22,27,30). There are also large jars with polished ornament (fig. 18,29). Polished net ornament appears in Georgia in the Middle Bronze Age and is widespread in Late Bronze Age too. This ornament must be one of the most important evidences for asserting the contacts of the Bedeni stage with the cultures of the following period. There are found jars with stroked bodies (fig. 17,20). Analogous pottery is known from the sites of the stage I of EBM culture, attesting to the connection between the two stages of this culture.

In Berikldeebi quite a small amount of copper artefacts has been revealed. They are similar to the materials widespread in Caucasia in the EB Age (small daggers - (fig.23), biconical arrowheads, bracelets, pins, etc.). Everything is made of arsenical copper.

Some stone tools came to light. These are: flint sickle blades (fig. 25), several arrowheads of obsidian, cobble-stone hammers, grinding tools, mortars, etc.).

Tools made of bone are represented by awls, whorls, antler mace heads, spoon (fig. 26) etc.

Bone domino-like beads (fig. 28), as well as shell beads (rounded, with the hole), and two ornamented pendants made of alabaster (fig. 24) compose a small group of personal ornaments.

The problem, that may be settled by the study of the Bedeni layer in Berikldeebi is, first of all, the complete study of the stage II of EBM culture. The burials and the stratified layer (together) could solve the problem of the genesis, chronology, and cultural relations of this culture.

Description of the figures

1. Bedeni buildings 3, 4, 5
2. Aerial photo of Bedeni buildings
3. Platform 10
4. Hearth with human face protrusions from building 8
5. Bedeni building 7

6-13. Fine,black-polished pottery

14. Clay horn-shape projections of platforms

15-17, 19-22. Rough kitchenware

17,20. Kitchenware with stroked body

18. Large, ornamented jar

23. Copper dagger

24. Alabaster pendant

25. Flint sickle blades

26. Bone spoon

27. Mug (Rhyton)

28. Bone domino-like beads

29. Large, ornamented jar

30. Churn

fig. 1

fig. 2

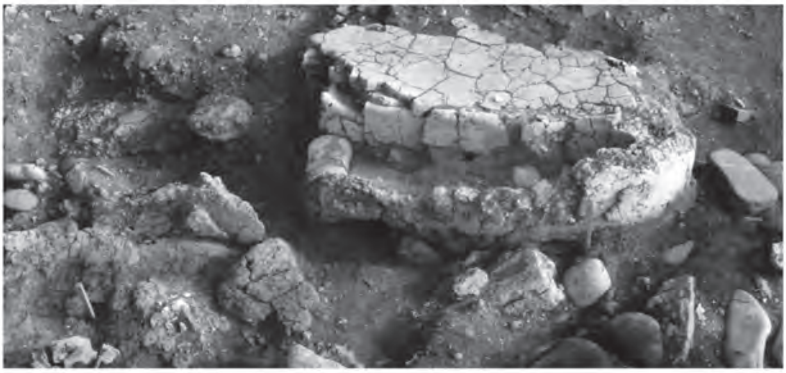


fig. 3

fig. 4

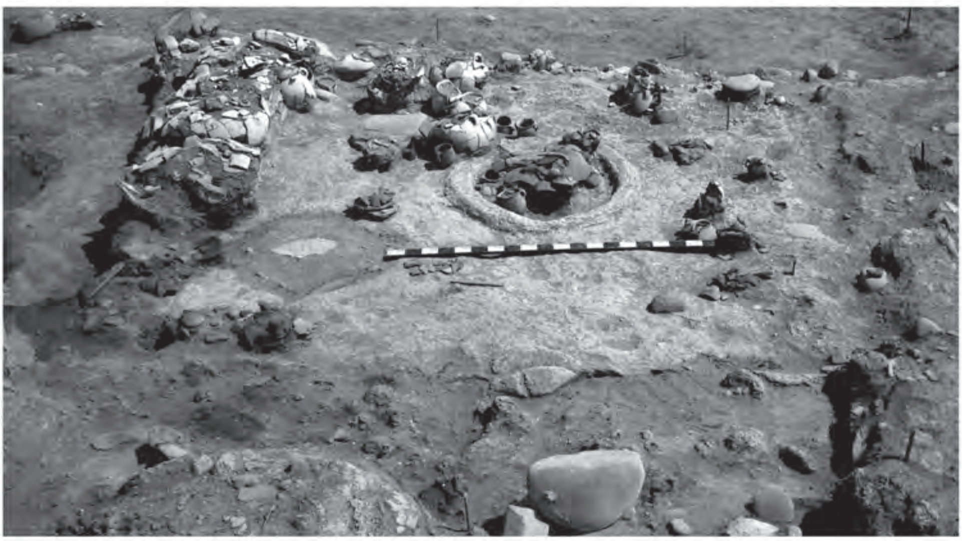


fig. 5

fig. 6

fig. 7

fig. 8

fig. 9

fig. 10

fig. 11

fig. 12

fig. 13

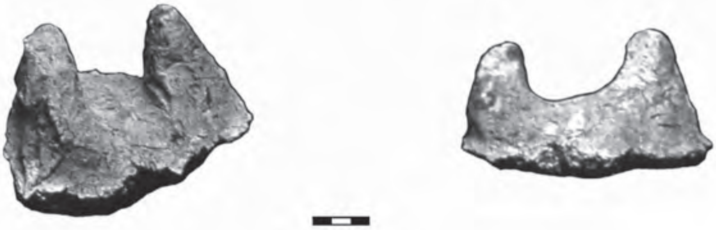


fig. 14


fig. 15


fig. 16


fig. 17


fig. 18


fig. 19


fig. 20


fig. 21


fig. 22

fig. 23

fig. 24

fig. 25

fig. 26

fig. 27

fig. 28

fig. 29

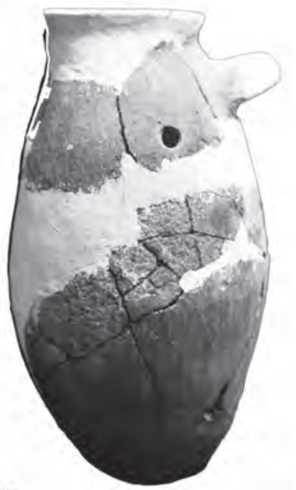


fig. 30

THE END OF THE EARLY BRONZE AGE IN GEORGIA

Dr. Zurab Makharadze
Head of the Ot. Lordkipanidze Centre of Archaeology
Georgian National Museum

Early Bronze Age on the territory of Georgia is dated from the second part of IV millennium and III millennium BC. This period is very important for Southern Caucasus. The region is rich with cooper, gold and other metal recourses, which made possible to starting the development of metallurgy.

This period is identified as Kura-Araxes or old Transcaucasian archaeological culture, which is spread from Southern Caucasus to Eastern Anatolia, North-Western Iran, Eastern part of Northern Caucasus and Syria-Palestine, known as Khirbet-Kerak culture. Also we can see the connections with Aegean region.

It is specified by black and red burnished ceramic, circular hearths with projections and fire stands. Also arsenic bronze artifacts, which are distinctive to Early Caucasian metallurgy.

In the III millennium BC, it is seen some influence of Northern nomads in Southern Agricultural societies. This process with different intensity is appearing in Middle Asia, South Caucasus and The Balkans.

Introduction of new elements in Southern Caucasus caused important transformation of local culture, however there are not seen big migrations, because main components of material culture was not changed.

From the middle of the III millennium BC, on the territory of Georgia appears significant innovations – graves for chiefs, big size kurgans (barrow). We can separate Martkopi step, where in the kurgans are materials, which are mainly of native production, but their construction and some types of weapons and jewelry show that there were groups of people coming from Northern Black Sea region valleys. They who came, because of their mobility and probably military advantage achieved powered position, however they adopted local culture, or it was stimulated transformation of the society.

From the II half of III millennium BC exist Bedeni archaeological culture. Specified also with big, rich kurgans for chiefs. We find burial on the chariot wagon. Black burnished ceramics are handmade. They are kind of patterns of metal vessels and polished to the point where they look like metal. Besides we find rough ceramic. In Bedeni culture appears tin bronze weapons, wonderful golden and silver objects.

The genesis of Bedeni culture is unknown. We know that on the territory of Georgia at the end of Early Bronze Age, II part of III millennium BC, co-exist late Kura-Araxes, Martkopi and Bedeni cultures. Approval for this argument is studying stratigraphy of several settlements in Georgia: Tsikhiagora, Berikldeebi, and Natsargora. This period which is transitional from Early Bronze to Middle Bronze is one of the most interesting and problematic period in Georgian archaeology.

The period of Early Bronze Age Kurgans is not studied well, because it was investigated in sixties eighties of 20th century and the publications are not enough. That is why every new site is important which include new information and is excavated with modern methods.

Ananauri #3 Big Kurgan.

In 2012 the archaeological expedition of the Georgian National Museum studied a burial mound located in the eastern Georgia on the territory of Lagodekhi Municipality, at the left bank of the Alazani River (the head of the expedition –Dr. Zurab Makharadze).

The diameter of the burial mound is 100 m and it is 12 m high.

The kurgan was expected to have a stone mound but the investigative trenching became clear that the mound was of yellow clay soil that had 0.5-1 m large armour of cobblestones with obsidian flakes in it.

At the level of the old surface a 25X15 m large square was identified that was arranged with large (0.30-0.35 m thick) wooden logs. The square of logs was covered with chips of wood and the ground surface around it was covered with ochre.

The square arranged with logs turned out to be the roofing for the burial chamber. The roofing itself contained two rows of logs with matting layer between them.

The roofing covered a 15X10 m large pit with a wooden structure set in it. The inner dimensions of the burial chamber were 9X6.5 m, 2.75 m deep. The chamber was right-angled, oriented to the W-E line with a slight bend. The walls were double-layered. The outer row was built with round logs and the inner one was arranged with quadrangular skinned logs. In the corners the logs of the walls were tied together like the wooden hut construction.

The flooring of the burial chamber was wooden planks covered with the matting. The roofing was supported with three poles and seven logs those were laid horizontally.

The roofing was fallen down to the chamber and it was destroyed at several places. It was visible that in the north-eastern part of the roofing the logs were cut and then covered with relatively thin beams. Later it became clear that one more person was interred in the chamber besides the main deceased. In addition there were traces of entries to the burial chamber from the east side and at the western wall, in the central part of it those turned out to be the trenches made by the plunderers.

The burial was robbed twice but as it became obvious the robbery took place after the falling the roofing down that partially saved the grave goods.

Two four-wheeled wooden wagons were discovered in the burial. The wagon #1 was found in the south-western part and the wagon #2 – in the north-western part. The wagons were oriented to the east. Two ornamented yokes were at the eastern wall of the chamber. One deceased was let down and reposed in the north-eastern part of it.

The burial was plundered as it was mentioned above. All the skeletons were disturbed and incomplete. The skeletal remains of seven individuals were identified. The wagon #1 – one deceased was on the wagon and the other one was under it on the floor. The wagon #2 – two deceased persons were on the wagon (one of them teenage) and the other one was found under it on the floor. Two individuals were identified in the north-eastern part of the burial chamber. Despite the plunder various goods were discovered in the burial: two ornamented four-wheeled wooden wagons, wooden armchair and three-legged vessels, ornamented ceramics, flint and obsidian arrowheads, a chalcedonic ring, textile and leather goods, beads of cornelian, jet and amber, three metal stems with disk-shaped heads associated to the wagons, 23 items made out of gold, adornment-beads, umbones, pendants. Should be noted that the mentioned string of amber beads is ancient not only in the South Caucasus but in the whole Near East.

Great variety of palaeobotanical material was identified at the site. A large amount of nut, chestnut, acorn and together with them forest berries were found that is really a unique case.

The process of restoration/conservation of the artefacts obtained from the kurgan is in progress at the moment and during this process a row of interesting information is revealed like the fact that the bones of the dead people were kept in honey that is an indication to balsaming. The further investigation of the recovered material promises a lot of information in addition.

Based on the obtained material the Ananauri #3 big kurgan can be preliminarily dated by the middle period of the III millenium B.C., the Early Bronze Age. It can be assigned to the "Bedeni" archaeological culture. According to the C14 results the kurgan was dated to 2400 BC.

The material recovered from the Ananauri #3 big kurgan is kept in the relative depositories of the Georgian National Museum in Tbilisi.

I

1. Burial chamber after the removal of roofing

2. View to the unearthed burial chamber

II

1. Armchair

2. Wagon wheels

III

1

2

IV

Golden object

SOME ASPECTS OF NONFERROUS METALWOKING IN THE CAUCASUS – NEAR EAST (III – II millennium B.C.)

Prof. Dr. Givi Inanishvili

Georgian National Museum

One of the substantial issues among the problematic ones of relations of archaeological cultures of the Caucasus-Near East of the III-II millennium B.C. is thorough analysis of metallurgical manufacture of the region (base of raw material, area of functioning of mining-metallurgical center and type of ligature of the used alloy, technological scheme of object making etc). Correspondingly it is possible to determine the type of economic relations among cultures and dynamics of the progress of historical process.

From the second half of the IV millennium B.C. assimilation and spreading of copper based alloys doped by arsenic is observed in the form of jewelry and battle and economic designation objects made of arsenic-containing bronze (Arslantepe, Nahal Mishmar, Kura-Araxeses culture monuments and others). Copper-arsenic alloys occupy the leading place in the system of metallurgy of the Early Bronze period (second half of the IV millennium B.C. – first half of the III millennium B.C.).

As to the Caucasus region, the nonferrous metalworking artifacts of Bronze Age of the North as well as the South Caucasus are made of complex copper ores, which are distinguished by different mineral composition.

Chemical and technological analysis of objects of nonferrous metalworking of the Caucasus-Middle East of the Early Bronze period shows the impact of bronze metallurgy centers of the South Caucasus and Near East on synchronous products of the North Caucasus, which is somewhat decreased in Middle Bronze period. At the same time, for metallurgical centers of the Caucasus, specimens made of local mineral resources base are characteristic, which are presented mainly in the form of arsenic-containing copper ingots.

Origin of the material exposed here, on the grounds of available information, is associated with Anatolia region which played historical role in a matter of development of copper-bronze metallurgy. Especially it refers to its south-eastern regions, where copper ore outcrops of early Bronze Age were exposed (Palmieri et al. 1999. pp. 576).

Cultural relations between regions which surrounded the Black Sea, based on metallurgy-metalworking principles, united the vast geographical territory, and these relations lasted along the long historical time section (Early and Middle-Bronze Age), from the 3rd quarter of the IV millennium B.C. till the mid dle of the II millennium B.C. Its south cultural zone covered the territory of the Caucasus-Near East, where technique-technological peculiarities of copper-bronze working of local metallurgical centers are evidenced, together with common organizational-economic characteristics of metallurgical centers (Chernykh et al. 1991. pp. 14-16).

The above stated associations contributed to the existence of several synchronous cultures of the system in Early Bronze period. Their cultural integrity and reciprocal influence was well mirrored in the process of development of metalworking. Syria-Mesopotamia region (Tepe-Gawra VIII-VI, Amuk F-H). Asia Minor (Mersin XX-XII, Beije Sultan XX-XIII, Troja I-III) and the Caucasus (Shulaveri-Shomutepe, Damtsvari Gora, Tekhut, Maykop, Novosvobodnaya, Kura-Araxeses, Martkopi) are the local ethno-cultural elements of this period, which form integral system of metallurgical province of Eurasia. Ready product and technological scheme of object making define the level of development of metallurgical centers and create historical prospects of their relations in the system.

Among the known archaeological cultures of the Early Bronze Age in the system of bronze metallurgy and metalworking development the Kura-Araxeses culture occupies the specific place; it showed tremendous industrial potential of bronze and encompassed the North and South Caucasus, North Iran and East Anatolia, east bank of Mediterranean Sea. Kura-Araxeses culture completely assimilated dwelling and economic designation zone and copper-arsenic ore outcrops of the above mentioned geographical space which were necessary for mining industry. Progress of cultural-economic development was contributed by bronze metallurgy, which differs principally from the preceding historical period by surprising scales of manufacture and optimal quality of bronze articles. Bronze artifacts of Kura-Araxeses culture of the Caucasus region (battle and economic objects/tools, jewelry) are made by casting, forging, casting-forging combination, wax model, which refers to high level of metalworking (Inanishvili, 2003. p. 55-56).

The issue of origin and spreading of nickel-containing bronze alloy in the area of spreading of the copper-based alloys of Early Bronze Age incite specific scientific interest.

Among the metallurgical regions of bronze treatment of this period, spreading of bronze ingots alloyed by nickel or arsenic-nickel bronze ingots are atypical and non-characteristic, which is well evidenced by materials found on archaeological monuments of Near East (Nahal Mishmar, Amuq F), Mesopotamia (Hassek-Hüyük, Ur), Anatolia (Arslan-Tepe VII, VIII, Alishar 1, 2) Iran (Susa) (Avilova et al. 1999, p.56; Avilova et al.1996, p. 68-81). Likewise great number of nickel-copper objects are known of Maykop culture (Chernykh, 1966. p. 98-99, Tab.1).

In the beginning of the 20th century the well known researcher of the ancient metallurgy of the Caucasus A.Yessen noted that in the bronze inventory of Maykop, where nickel-containing bronze objects are evidenced, it is hard to refer to historical place of their origin, that we can just suppose southern import of this type objects to North Caucasus (Yessen, 1935, p. 109-110).

I.Selimkhanov stated about origin of all objects which contained nickel, including those found in the Caucasus, that they were from one common source –Oman (Selimkhanov, 1960, p.43; Japaridze, 1976, p. 214).

An opinion was also expressed that the objects of Maykop culture made of copper-containing nickel were imported as finished objects/ manufactures or were made on the spot from the metal delivered from the Caucasus, from the southern cultural centers (Mahmudov et al, 1968, p.25-26).

Later, having studied the bronze inventory of the 1st early group of Maykop culture, E.Chernykh supposed that metallurgical source of this material was to be searched in southern regions of the Caucasus (Iran, Near East, Anatolia).To prove this idea he refers to the data of chemical composition of bronze inventory found during excavations made in Syria, Amuk (F,G,I strata), which similar to Maykop culture inventory is characterized by high concentration of nickel (Chernykh, 1966, p. 45, 1978, p. 63; Avilova et al. 1999, p. 56).

O. Japaridze considers that copper-nickel metal found in Maykop culture is introduced from Near East, Ts. Gevorkyan, on the base of comparison of copper groups from Anatolia and Maykop that consist of high nickel concentration, as well as on the base of some nonconformity in their microstructure, supposes various sources of copper ore (Japaridze, 1976, p. 215; Gevorkyan, 1980).

There is also an opinion that copper ores of the Caucasus don't contain nickel and they attribute its presence to close contacts with Near East (Narimanov, Japarov, 1990, p. 5-14).

Nickel-containing copper ore is not evidenced in the Caucasus (Machabeli 1958, p. 152-154), therefore copper-nickel alloy found in Kura-Araxes cultural area of the III millennium B.C. can't be a product of local bronze working. Proceeding from the above stated the issue of origin of nickel-containing bronze is associated with the aspect of economical development of metallurgical complexes, which can be explained by geographical spreading of specific specimens of metalworking. The issue of determination of origin of nickel-containing bronze objects found in the South Caucasus and respectively determination of the center of copper-nickel containing ore deposit, can be elucidated by the comparison of the data of basic alloy of the object (as well as other data) with the data of chemical composition of metal objects from Maykop and those of other known metal objects.

In the material of early group of Maykop culture nickel composition reaches 3,4-4,5% (Chernykh 1978, p.63l Avilova et al. 1999, p.58). In nickel-containing bronze alloy from the known Amuk excavations (E stratum) nickel is presented by 10%, in inventory of Hassek-Höyük, Ur – by 2-5,9%; Objects from Kish, Tel-Asmars, Arslantepe (VIA, VII strata) Alishar (1), Byce sultan, Tarsus, Pulur (Chernykh, 1978, p.44-45; Avilova 1996, p.68-81; Avilova et al. 1999, p.56-57; Gevorkyan, 1980, p.81) are also distinguished by high concentration of nickel; bronze objects from Susa (10%), Troy (8,9%), Nahal-Mishmar (8,6%) too are characterized by high nickel concentration (Chernykh 1966, p.44-45; Semilkhanov, 1970, p.55; Tallon, 1987; Tadmor et al. 1995, pp.).

According to the chemical composition of the nickel-containing and arsenic-nickel-containing bronze objects of the III millennium B.C. found on the territory of Georgia and studied by us, and according to the concentration of alloing elements in the ligature, the artifacts are attributed to metallurgical group of nickel-arsenic-containing alloys (Table 1).

If we consider Sumer bronze material from Ur, Kish, Tel-Asmar as well as the material from Troy of the III millennium B.C. which is made of high concentration nickel-containing alloy (Aitchison, 1960. pp. 62-64; Cheng et al, 1957. pp. 352, tab. 1,2), we'll see that bronze inventory considered by us is chemically analogous and at the same time is characterized by one-type data of admixed to the material elements. Therefore, it might well be that industrial base of these alloys (copper ores) were genetically of similar origin.

Based on the results of historical-metallurgical studies that are available today about the known mining- metallurgical complexes functioning around the Black Sea, and simultaneously sharing the conception about close trade-economic connections in the geographical area of the southern region of the association (Near East, Anatolia, Caucasus, Iranian plateau, Mesopotamia), it is possible to raise a question about possible localization of bronze industrial center and directions of spreading-migration of artifacts made of the above type alloy.

Table 1

Chemical composition of nickel-containing bronze of the III millennium B.C.

N	Object	Place of exposure	Cu	Ni	Zn	Pb	As	Sb	Sn	Bi	Ag
1	arrowhead	Baraleti	98,1	0,3	<0,001	0,029	2,10	0,008	<0,001	0,011	0,041
2	arrowheadi	Kheltubani	96,8	1,9	<0,001	0,025	2,24	0,017	<0,001	0,007	0,029
3	dagger	Amiranis Gora	96,4	0,6	0,002	0,033	2,97	0,21	<0,001	<0,001	0,017
4	arrowhead	Amiranis Gora	98,5	0,4	0,001	0,02	1,70	<0,001	<0,001	<0,001	0,03
5	arrowhead	Amiranis Gora	99,1	0,4	0,001	0,018	1,46	0,009	<0,001	<0,001	0,029
6	fastener	Samshvilde	98,0	0,50	_	0,010	1,50	_	0,001	0,001	0,10
7	arrowhead	Orchosani	96,3	1,20	_	0,010	1,50	_	_	0,001	0,16
8	hoe	Orchosani	93,7	4,0	_	0,02	2,50	_	_	0,001	0,30
9	dagger	Khramebi	96,6	0,60	0,001	0,4	2,30	0,02	0,001	0,01	0,02
10	arrowhead	Abanoskhevi	96,7	1,59	0,001	0,03	1,20	0,001	0,001	_	_
11	dagger	Nacherqezevi	95,3	1,0	_	_	3,10	_	_	0,02	0,1

In the epoch of creation of ancient state formations, significant contacts are observed among definite cultures of the vast territory of Near East (ceramic forms, metal material et al), on the roads of exchange of archaeological achievements, former settlements and mining-metallurgical industrial points (typical samples of Uruk ceramic reach North Mesopotamia and central Anatolia, bronze treatment regions – Tepecik and Norshuntepe and so on). At the same time there is a demand for import, on imported material (metal objects). We can think about active process of exchange of cultural achievements and organized spreading, the scales of which are spread over the vast geographical space, along merchant roads and crossroads, since the product reaches very distant points. (Potts, 1994. pp. 45-47, 73).

The fact of spreading of metal objects on the territory of Near East is typical for the III millennium B.C., while the artifact, as such, irrespective of its origin is prestigious. In the regions poor in metal ores, such objects are made of imported material or the imported finished objects of such designation are used. In metallogenic regions, irrespective of the existence of local metallurgical manufactures the imported materials are also spread, which is explained by intensification of trade-economic relations.

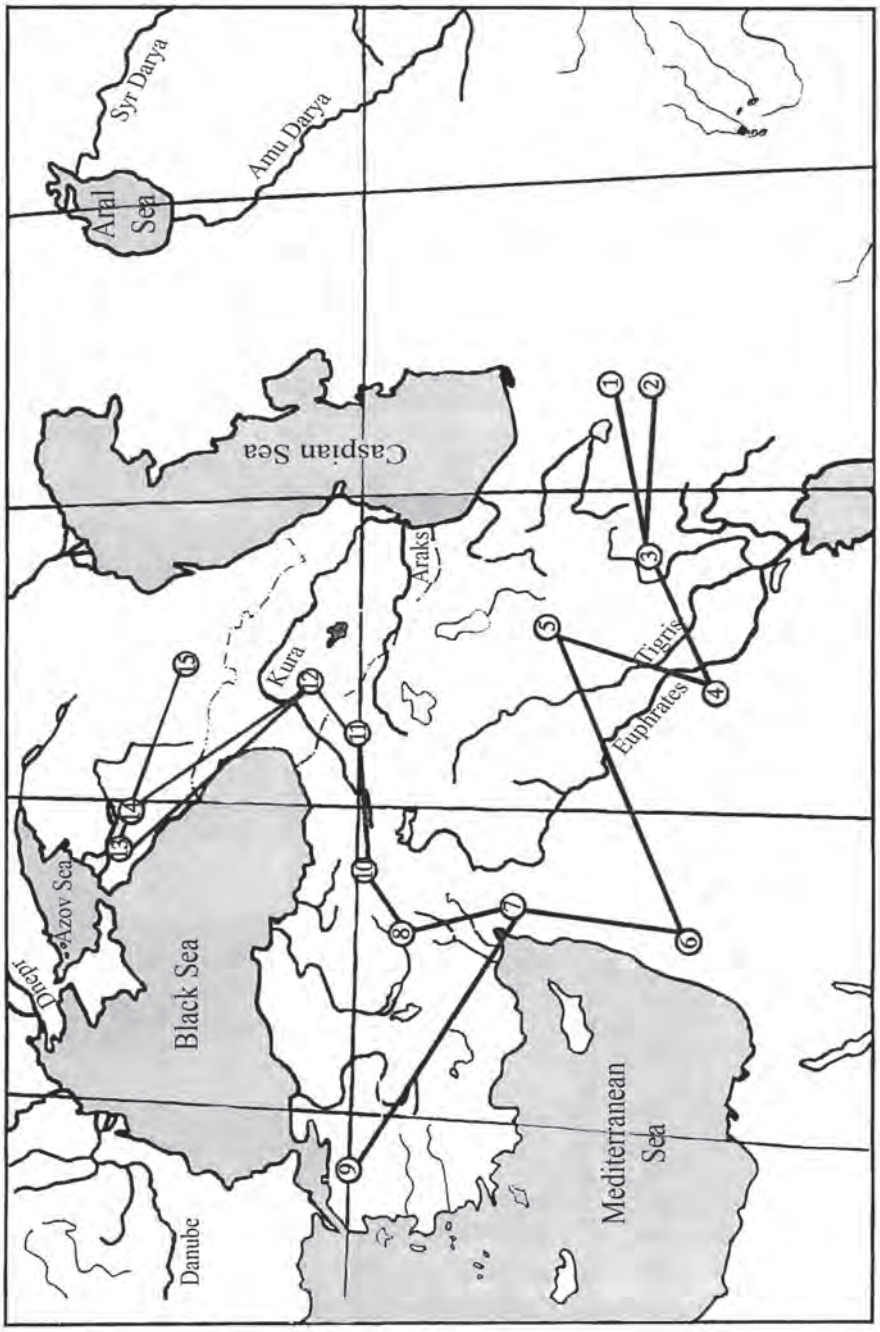


Fig.1. Schematic map of nickel- containing bronze in Fore-Asia – Caucasus region of the III millennium B.C.:
1.Muskan; 2.Tamlus; 3.Suzi; 4. Ur; 5.Tepe-Gavra; 6. Nahal Mishar; 7. Amuk; 8.Alishar; 9. Troja; 10. Arslantepe; 11.Orchosani; 12.Amiranis Gora; 13. Maikop; 14. Novosvobodnaya; 15. Nalchik.

In Near East (Mesopotamia, Syria, Egypt and others) , from the IV-III millennium B.C., in the period of formation of urban civilization forms, socio-economic changes and organization of exchange- trade makes great influence on the functioning and organization of mining-metallurgical centers and respectively demand on metal material and finished objects is increasing (Wertime, 1964). By this period the South Caucasus is not engaged in the system of town-states and early centralized states relations, but as peripheral and at the same time active metallurgical-industrial region, participates in common exchange-provision of still distant regions and cultures existing there and in the integral process of transit spreading of new innovations. Simultaneously, in the III-II millennium B.C. the South Caucasus is considered as a region of accumulation of culture impulses coming from the centers of Asia Minor and Mesopotamia, since this region was under the influence of contacts with those cultures and participated in the process of their spreading-migration towards still more distant regions (Oganesyan, 1988, p,160). We think we have the grounds to suppose spreading of intercommunicating impulses from the South Caucasus cultural zone passing through North Caucasus on the background of geographical and cultural relations, In particular, we can consider that one of the directions of migration of metal objects or alloys (nickel-containing bronze) coming from southern regions of the civilization till Maykop cultural area, including it, transected the Caucasus.

Nickel –containing bronze archaeological monuments of the South Caucasus are found in the extreme northern section of the so-called “Uruk Expansion”, which from the west sides with Anatolia and from the South Mesopotamia and Near East cultural world. Migration of a distinct flow of development of historical-metallurgical production coming from the south-west towards the north, in the area of Maykop culture, on the base of the present day data seems possible through cultural road transecting the South Caucasus (Fig.1).

Monuments of Alishar –Arslantepe – Pulur – South Caucasus Kura-Araxes and Maykop cultures area might be considered as peripheral part of northern direction of cultural-geographical space of spreading of nickel-containing bronze artifacts in Near East region in the III millennium B.C. We can also consider a direction that connected cultural relations: Tepe-Gawra – Igdyr – South Caucasus – Maykop.

The process of migration of cultural impulses of the southern civilizations through the Caucasus is well expressed by archaeological data: materials from Maykop materials from Abastumani, former Kanobili settlement, Maykop culture elements evidenced in Upper Imereti and Abkhazian caves (Pkhakadze 1978, p. 24-26; Nebieridze, 1986, p.90; Orjonikidze 2004, p.75; Pkhakadze et al. 1980, p.20-21); resamblance of ceramics of Bedeni traditions exposed in the territory of the South Caucasus with the economic designation objects of Maykop culture (Orjonikidze, Jibladze, 2007, p.6).

As it was shown by the experimental data, obtaining of an alloy consisting of arsenic and nickel could have been possible from low-sulfur copper ores rich in these elements. In the copper ore deposition system of Near East, such ore outcrops are evidenced in Talmes and Meskan deposits (West Iran plateau). An opinion was expressed that such copper ore depositions were used for making of the known and spread in the III millennium B.C. nickel-containing bronze ingots (Avilova et al, 1999, p.57). Participation of nickel-containing copper deposits located on

Oman peninsula in obtaining of nickel-containing bronze and in the process of their migration/ transporting to distant points is not excluded, but as it turns out Oman copper deposits are of lower capacity and they contain mainly copper sulfide mineral, which is proved by chemical composition of local production wastes and ore samples (Hauptmann, 1980. pp. 135-136). Thus Oman deposits can be only the subsidiary objects in a matter of provision of Near East region by the above referred material (Selimkhanov, 1970, p.55). As to the known Singbhum nickel-containing copper deposits of India, ore outcrops and metallurgical origin slag exposed here, metal samples of high nickel concentration (3,56%) belong to the zone of initial deposition of copper, functioning of which, according to our opinion in the IV-III millennium B.C. is less probable.

Thus, it can be stated that region of depositions (deposits) of nickel-containing copper of Iran Plateau (Anaraq region) should be one of the main mining-metallurgical centers of manufacture and spreading of the nickel-containing bronze ingots, well known in Near East. Results of isotopic analysis of lead (Pb) carried out in this respect gave both positive and negative results. We think further study will adjust the opinion offered by us about origin and spreading of nickel- and arsenic-nickel-containing bronze artifacts.

Proceeding from the above stated and taking into consideration territorial spreading of nickel-containing bronze objects considered by us (Iran plateau, Mesopotamia, Near East, Anatolia, Caucasus), we can define direction of roads which conducted metallurgical innovations coming from southern civilizations and their close connection with the near and very distant points. The South Caucasus, by its geographical and strategic function and location can be placed on one of the arteries of cultural impulses taking origin in the ancient civilization centers.

In the second half of the III millennium and in the period of transition to the II millennium the Kura-Araxeses culture of tremendous bronze metallurgy traditions stops its existence and culture image suffers changes in the South Caucasus. Genesis of Martkopi-Bedeni culture commences and in the first half of the II millennium B.C. it continues in the form of Trialeti culture. In the central part of the South Caucasus (Iori-Alazani basin, middle section of Kura, Trialeti plateau, northern part of Armenia) huge kurgans –burial sites with the rich inventory appear (including those with abundant metal objects).

The above stated historical period, which is the period of transformation of cultures, is distinguished by significant achievements in nonferrous metalworking. Bronze metallurgy enters the new stage and corresponding technical-technological changes become apparent. Alongside with the assimilation of mining-metallurgical ore base of the Central Caucasus the sulfide copper ore assimilation is begun and mining industry objects of the mountainous region of the Small Caucasus function synchronically (Fig.2). Alloying element not known till then, tin, is used in industry,instead of traditional copper-arsenic and innovative imported nickel-containing bronze they use tin-arsenic, antimony- and tin-containing bronze ingots (Japaridze, Inanishvili, 2011, p.106).

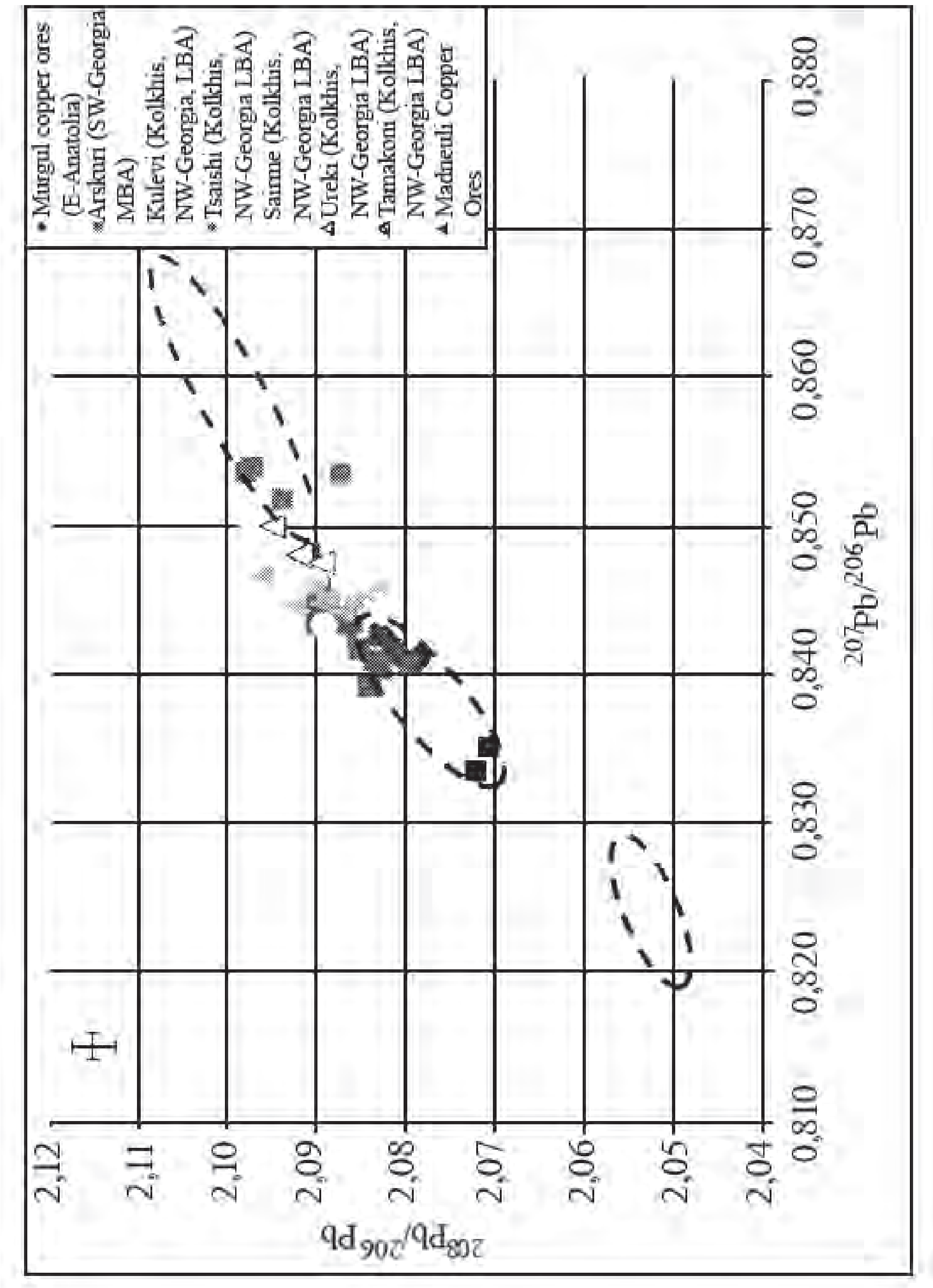


Fig. 2. Results of isotropic analysis of lead of Small Caucasus mining manufacture objects and Colchis bronze working monuments

If antimony is an element of local production, tin is imported to the Caucasus. Tin is probably imported from Asia Minor and from the Mediterranean Sea basin (Kuftin 1949, p.207, 221). The fact that tin initially appears on the monuments of South-Eastern Caucasus and then in the central and western Transcaucasia should speak of the origin of this element in Asia Minor and metallurgical centers of eastern region. Import of tin to Colchis metallurgical center of West Transcaucasia is evidenced later, when the above stated mining-metallurgical association becomes a connecting ring for Asia Minor, Mediterranean Sea Basin and North Caucasus regions. Metallic tin, bronze ingots, finished objects migrate in the form of common import (Chernykh, 1978, p.19-23; Inanishvili et al., 2010. p.121-122).

The fact of spreading of arsenic-antimony- and antimony-containing bronze metal is observed in the cultural area of the second half of the II millennium Eurasia which speaks of big industrial scales of alloy (inventory) obtained by antimony alloying/doping. Geographical location of tin-antimony deposits, the data of functioning of metallurgical manufactures, wide cultural area of using of bronze artifacts alloyed by these elements, formed the significant prerequisite for contacts of geographically close and distant ethno-cultural associations, for integration of their cultural-economic achievements (Fig.3).

Diapason of wide spreading of Bronze Age Eurasia cultural associations, typological-technological closeness of nonferrous metalworking artifacts, besides chemical-technological peculiarities of bronze material of local centers, raises many interesting problems for full-value comprehension of economic development of ancient civilized society.

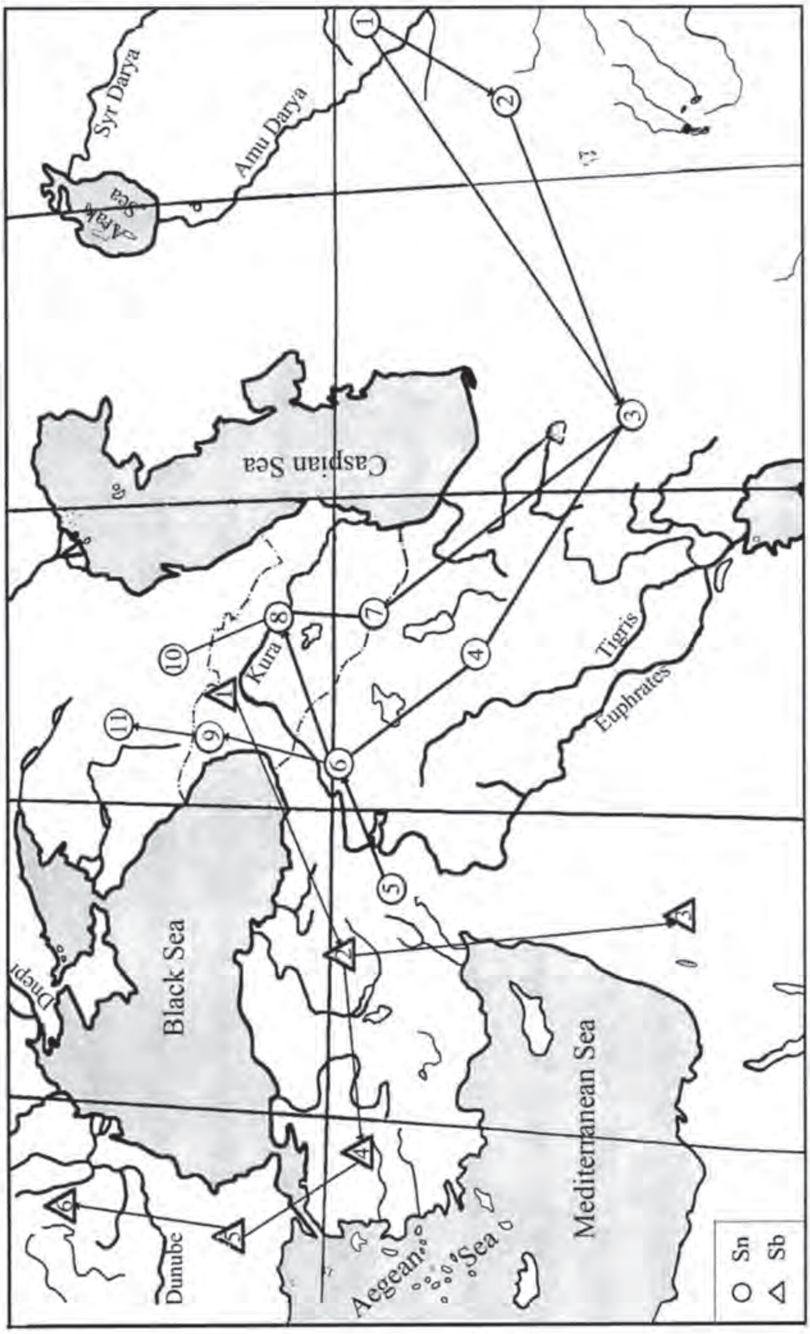


Fig.3. Schematic map of spreading of tin-antimony in the III-II millennium B.C.:
○ 1-2. Middle Asia; 3.Iran; 4. East Turkey; 5. Central Turkey; 6-9. South Caucasus; 10-11. North Caucasus.
△ 1.Racha upland; 2. Turkey; 3. Near East; 4 Eastern part of Mediterranean Sea; 5-6. East Europe.

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ENVIRONMENT AND DWELLING IN THE EARLY AND MIDDLE BRONZE AGES SOUTH CAUCASUS

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Preface

Central South Caucasus is situated south from Caucasus mountain range. Geographical environments of the area between the rivers Kura and Aras very diverse and is represented with semideserts, steppes, lowlands, foothills, mountainous plateaus and alpine zones. Natural resources of central South Caucasus and its landscape, soil, climate and intensive hydrological network used to be an important factor for human settlement there. Geographical environment of South Caucasus and its biosphere used to determine a way of human life and specifics of adoption to living area. In life of ancient human, great importance had an space, which first hypostasis was a geographical space. Knowledge of the space – surrounding territories and conditions, was forming for each people according to their character life. Farmer and nomad did perceive the space in different ways. For farmer population surrounding area generally used to be limited with their living area, where was situated his dwelling, settlement, fields and lands. Outside this area there were unknown and alien world [Моро-Дефарж 1996: 4]. On another hand, for nomads, space was unlimited, they did conquer it, destroy it and immediately head for new booty. In traditional society dwelling is perceived as a space model of the universe. So, its organization represents structure of the universe as a whole. Only two main models of universe structure are known: quadrangular and round. In archaic society any architectural building, including living buildings, are perceived from religious point. According to M. Eliade, in traditional society architectural buildings had a sacral meaning. In infinite and homogeneous space, where is no guideline, very important was to find “anchoring point” or “centre”. Finding the “centre” for human was similar of creating the universe. To live in the universe, it is important to create it. Archaic human was trying to seize a territory by means of rituals. After building of a shrine, some territories get sanctified and therefore the space becomes nonhomogenous. After sanctification appears sacral, sanctified, “stable” space and on another hand there exist amorphous space, which looks like has neither structure nor substance. For traditional society is typical to contrast the seized space, dwelling and sanctified territory, to unknown, incomprehensible space, which surrounds it. First is “our world”, cosmos, all other is “other world”, strange and chaotic space, which is settled with demons and “others”. That is why religious human tried to settle in the “centre of the universe” [Элиаде 1994: 22-23, 27-28].

Dwellings, architecture and building art.

Oldest settlements of village type appear in South Caucasus in 7th mill. B.C. Sites of so-called Shulaveri-Shumutepe culture are spread on Marneuli, Mili, Karabagh and Mughan valleys. “In this period village is built according to one plan, like one project, where dominate round wattle and daub buildings [Japaridze 2006: 265]. Round planned village, which was situated on a hill, used to be consisted of round planned living and subsidiary buildings (pl. I, 1,2; II, 1,2). Almost in all living building there was an egg form (oval) hearth in the floor [Джапаридзе 1989: 183-184].

From the 4th mill. B.C. architecture and settlement types of Kura-Araxes culture are different from the previous culture and are more diverse (pl. I, 3,4,6; pl. VI, 5-8). Topography of the settlements corresponds to the local relief [Кушнарёва, Чубинишвили 1970: 61]. In South Caucasus human is settling in lowland as well as in foothills and mountains, but the type and character of settlement depends on geographical zonality. Settlements of the Early Bronze Age appeared on previously unsettled places (Garni, Kosi-Koter, Ozni, Beshtasheni, Abelia, Tetritskaro, Didube, Kiketi, Kül-Tepe, Baba-Dervish). Architecture and building techniques in Kura-Araxes culture is distinguished by its diversity. The materials, which are used to build the dwellings, generally are depended on geoclimetic conditions. Settlements of Kura-Araxes culture in South Caucasus generally are consisted of several layers and cover vast area. For example Kvatskhelebi covers 3,5 ha and consists of three cultural layers and seven building horizons (pl. V); settlements of Amiranis Gora covers 8 ha and consists of three building horizons (pl. VII, 2-3); Beshtasheni settlement covers 12 ha (pl. IV), the Early Bronze Age layer is on 1.5 , depth and consist of three chronological periods; Ozni settlement covers 10 ha (pl. III, 1); Shengavit settlement covers 30 ha (pl. I, 3), height where of cultural layer reaches 4 m. E. Baiburtian marks out in Shengavit three building horizons. In Kura-Araxes culture for building was used stone, adobe and wattle and daub. In this period, simultaneously first appears framed buildings, which are tied with sticks and twigs (pl. VI-5-8). Appears flat, ground roofs which are based on a freestanding pillar [Джавахишвили 1973: 114,131,150,168,182,351]. In the Early Bronze Age forms a structural hierarchy of settlements. The first group are villages, which covers 1-1.5 ha, second are settlements which covers 3 – 5 ha and the third one represents settlements, which covers 10 and more ha [Массон 1997: 126]. In the Early Bronze Age South Caucasus we see three general types of architecture: 1. Log built houses with wattle and daub built walls and this wickerwork is plastered from both sides with a chuff mixed clay (pl. VI, 5-8). 2. Stone architecture is represented with stone built buildings (pl. VII, 2-3); 3. Adobe architecture. Houses of the first and third types generally are spread in lowlands and the ones of the second type in foothills and mountains. Unlike Shulaveri-Shumutepe Neolithic culture in building techniques of Kura-Araxes culture we see extensive use of wood. Relation with previous culture could be noticed in circular (pl. I, 6) planning [Kikvidze 1972: 46-47]. Houses built with adobe, like in previous period, are spread in lowlands, but are not typical for Kura-Araxes culture. Newly spread log built established log built houses are generally spread in lowlands and stone architecture could be found in foothills and mountains. Changes in planning and building techniques of houses built with adobe and wattle and daub could be clearly noticed on Khizanaant Gora settlement in Shida Kartli. Oldest type of the buildings (layer E) discovered on the site, supposed to be a wattled tholoses with small, cone-shaped or gable-roof. The second type of buildings (layer D) represents round-shaped wattled room, which walls are plastered with clay from both sides (pl. I, 6). Those buildings supposed to have a flat roof. Majority of C2 buildings are megarons and round building could be noticed only as a remnants. Houses of the layer C1 are completed type of primitive hall style buildings. Khizanaant Gora does not give any clear picture of the Early Bronze Age South Caucasian village. Kvatskhelebi, the neighbor site of Khizanaant Gora, is preserved much better. So, on the example of this site we can reconstruct the principle of village planning in this period. The planning looks like as follows – this is densely populated village, where space between rooms did not exceed 0.60 m. In C layer of Kvatskhela we can mention balanced development of the settlement. Houses are built tightly situated in two rows and are grouped around exits and small squares. Other houses are situated more freely in small groups (pl. V). Here are also several squares. Doors and exits of the houses are directed towards the squares [Kikvidze 1972: 3-5,43,47-48]. Classical examples of houses built with wattle and daub were discovered on Tsikhia-Gora (pl. VI, 5) site [Makharadze 1994: 15,44]. Houses excavated near Avranlo are also built with wattle and daub [Shanshashvili 2010: 161]. It seems that the houses discovered also in Trialeti, Beshtasheni in Kura-Araxes layer are built with wattle and daub as well [Куфтин 1948: 28; Джавахишвили 1973: 194].

Origins of stone architecture could be also noticed in Kura-Araxes culture. Rudiment of this architectural style was discovered on Ozni settlement, where the lower part of circular shaped house was built with stones. Now it is hard to say when exactly the circular planned stone architecture appears in South Caucasus and till what time did it exist there. One thing is obvious, till now the house from Ozni seems to be the oldest one. In southern Georgian mountains, around cyclopean fortresses of Shaori and Abuli (pl. III, 2) there are more than one example of circular planned houses (pl. II, 3-6) preserved till now [Narimanishvili 2009: 48-49, tab. XLI-2]. Houses are built with middle and big basalt plates, dry masonry is used. Diameter of the plates is between 1.5 and 3 meters. Roofs of those buildings are made of thin basalt plates and represents false arch (pl. II, 3,5,6). No excavations were carried out on Abuli and Shaori complexes, so it is hard to date or assign them to one or another culture. Some scientists assign them generally to the Bronze Age. One of the authors of this article believes that they do belong to the Middle Bronze Age. But, if we share the foresaid line of Neolith - Early Bronze Age architecture, we can suppose, that the earliest layer of these complexes belongs to the Early Bronze Age. Round planned buildings were also discovered on several mountain tops in Samsari mountain range [Kikodze, Koridze 1978: 25-26]. One unique complex, which includes round planned buildings, is Gogichaantghele [Насидзе 1976: 79].

Stone architecture is typical for the Early Bronze Age strong settlement on Amiranis Gora (pl. VII, 2-3). Living district is situated on the southern slope in terraced style. Houses are built only with stones, clay mortar is used. Houses are quadrangular shaped overground solid buildings, with rounded corners. Roof is based on walls or on pillars, which stood along a wall [Chubinishvili 1963: 21-25, 36; Джавахишвили 1973: 161-162].

Style and architectural planning of the Early Bronze Age houses is reflected also in clay models of houses (pl. VIII, 1-5), which were discovered on the sites of Early Bronze Age South Caucasus [Джавахишвили 1973: 122]. House models from South Caucasus are of two types: round (Khizanaant Gora) and quadrangular (Gudabetka, Kvatskhelebi, Digasheni, Ozni, Amiranis Gora) [Shanshashvili 2011: 209].

In the early phase of the Middle Bronze Age, in Bedeni culture, we see the same traditions, which used to be typical for Kura-Araxes culture during its whole existence. Architecture of this period is represented with quadrangular dwellings, built using wattle and daub and plastered with clay. Settlements, cult buildings or shrines of Bedeni culture were discovered in Berikldeebi (pl. VII, 1), Shengavit, Beshtasheni, Ilto, Zveli, Zhinvali, Khashuri Natsargora

[Глонти, Джавахишвили 1987: 81-83; Jalabadze 1998: 11; Куфтин 1941: 119-117; Дедабришвили 1969: 42-43; Чубинишвили и др. 1976: 20; Рамишвили и др. 1980: 172-173; Рамишвили и др. 1991: 24]. On these sites there practically are no round shaped stone buildings. But buildings of this type were discovered in Tsnori burial and Shengavit and Kül-Tepe settlements (pl. I, 2-3). Houses built with wattle and daub have rectangular shape with rounded angles (Tsikhia Gora) [Makharadze 1994: 15], also we meet houses built with adobe [Чубинишвили 1976: 20].

In central South Caucasus in the Middle Bronze Age Bedeni culture is replaced by Trialeti culture, which is represented generally with huge kurgans. Settlement layers were discovered in the area between rivers Iori and Alazani. Remnants of these settlements are represented with rammed clay floors. Ephemeral layer of Trialeti culture seems to be discovered on Beshtasheni settlement. On another hand, strong settlement of the Middle Bronze Age was discovered in Trialeti, near village Jinisi (pl. IX). On this site were excavated five houses, which were built with stone and had a flat roof. Roof was based on wooden pillars, which were freely standing in the middle of house [Narimanishvili, Amiranashvili 2010: 224]. It is also belived that the houses in the Early and Middle Bronze Ages maybe had a gable overlap (pl. IV, 2-4,7). Architecture of Trialeti culture shows us, that wood and stone were widely used in building. Builders often mix those two materials. High level of architecture and engineering is indicated by scales of burial halls of kurgans (150 – 180 sq.m.), stone wall building techniques and roof constructions. Great skills of architects and builders are indicated also by stone built ritual road, which are connected to the kurgans [Narimanishvili 2009: 44-45].

In central part of South Caucasus except Trialeti culture, other Middle Bronze Age cultures were spread there. Among the Middle Bronze Age cultures of South Caucasus Kamir-Berd (Tazakent) culture is studied relatively better than others. K. Kushnareva believes that cyclopean strongholds are typical for Karmir-Berd culture (Karmir-Berd, Lchashen) [Кушнарева 1993: 149-150]. Systematic excavations of Sevan-Uzerlic culture sites were carried out in Aritch cemetery and Uzerlik-Tepe settlement. Uzerlik-Tepe settlement is situated in a 10 meters high hill. Cultural layer is divided into three horizons. In each horizon were discovered remains of wooden houses plastered with clay. Houses were based on wooden pillars. Roofs were also made of wood. Higher layers of Uzerlik-Tepe should be contemporary to the multilayered settlements (Geoy-Tepe, Rasul Tepe, Nargiz-Tepe, Khan-Tepe, Uzun-Tepe) from Mili steppe. These settlements are not studied yet [Кушнарева 1993: 152-156]. Quite different is another settlement of Sevan-Uzerlik culture – Lori Berd, where was excavated vast cemetery and big settlement with monumental stone buildings. The settlement is strengthened by cyclopean walls, which thickness in some places reaches 7 m. The settlement is dated from the 2nd half of the 18th c. B.C. – 16th c. B.C. [Devedjian 2006: 413].

Kizil-Vank culture is discovered generally on the territory of Nakhchevan. Sites of this culture are almost not spread in other regions of South Caucasus. To Kizil-Vank culture belongs third layer of multilayered site Kül-tepe I, this layer is on 2-3 meter depth. Here were discovered rectangular houses with stone floors and adobe walls [Кушнарева 1993: 164-170]. To this culture also belongs Kül-Tepe II settlement. The Middle Bronze Age layer is of 4 – 4.5 meter thickness and is divided into four building horizons. The settlement is defended with strong wall, which was built on the boundary of the 2nd and 3rd mill. B.C. The citadel is a strong pentagonal stronghold with rectangular towers. Living houses are rectangular planned

[Кушнарева 1993: 164-165].

Cemeteries and burial places.

Along with seizing and distributing of living space human paid a great attention to choosing an appropriate place for deceased. On sites of Kura-Araxes culture cemeteries are generally situated away from the settlement (Samshvilde, Khashuri Natsargora, Amiranis Gora, Kvatskhelebi, Talin, Elar, Shengavit etc.), also there are some cases when graves of infants are placed under a floor (Amiranis Gora). Several graves were discovered on a territory of abandoned settlements (Amiranis Gora, Kvatskhelebi). Stone cists of children were discovered on Ozni settlement [ChubiniSvili 1963: 36; Javakhishvili, Ghlonti 1962: 24-25; Кушнарёва, Чубинишвили 1970: 66, 70-72]. In the Middle Bronze Age were situated on a bigger space. In this epoch were built big kurgans, which were not connected only to a living space, but they indicate that a group of people seized vaster existential space. By building huge burials, society a concrete community limits its existential space.

Agriculture.

Permanency of the Early and Middle Bronze Age settlements and discovery there of agricultural tools and remnants of several cereal crops, indicates an agricultural character of the society. Agricultural space of is represented with two main fields - cattle-breeding and farming. Development of cattle-breeding is indicated by osteological materials discovered in graves. On settlements bones of cattle (cow, ox) and small cattle (sheep, goat) are discovered almost equally.

It seems that stockyards were situated on the territory of settlements. On Amiranis Gora, along the terraces, houses had attached non-living buildings, which could be stockyards (Tetritskaro, Shengavit) [Кушнарёва, Чубинишвили 1970: 64-70]. According to osteological materials discovered on several sites (Khizanaant Gora and Kvatskhelebi) cattle-breeding seems quite developed there. But stockyard had not been discovered. Settling of cattle in living rooms is impossible. Rooms are so small and so arranged, that there is no space for cattle. T. Chubinishvili could be right when mentions, that the type of settlement and houses rules out bringing a cattle into the settlement. Area between buildings is so small and buildings are so unstable, that any irritation of herd could result in a catastrophe [Chubinishvili 1965: 71;Kikvidze 1972: 52].

Stockyards are also not discovered on the unearthed territory of the Middle Bronze Age sites of Jinisi, Uzerlik, Lori Berd and others. So, it is hard to find a place of this segment in tha space seized by human. We can only suppose that like some settlements of the Early Bronze Age in the Middle Bronze Age livestock was settled outside village and was milked there as well. But, future study if these sited can place the problem in a different way.

Development of farming is indicated by discovery of grain keeping pits, remnants of cereal crops, flint inserts for a sickle, bronze sickles, tuff mortars, cobble-stone floats, basalt scrapers and many handmills on the Early Bronze Age settlements (Amiranis Gora, Khizanaant Gora, Kvatskhelebi, Shengavit, Garni etc.) as well as on the Middle Bronze Age settlements (Uzerlik-Tepe, Lori Berd, Jinisi, Kül-Tepe etc.) [Chubinishvili 1963: 23, 85; Кушнарёва, Чубинишвили 1970: 72].

It seems that grain as a rule was kept in pits, which were dug in an earth. There is a opinion, grain was also kept in an overground buildings. In respect of this opinion, there must be mentioned architectural model discovered in Armenia on Teghutdzor site (pl. VIII, 6). Photo and drawing of this model was given to us by doctor of historical sciences R. Badalyan for what we would like to express our gratitude to him. The model represents three round shaped building with cone-shaped, false arch roofs. These buildings are situated very close to each other. R. Badalyan remarks, that this model has close similarity with a big granary discovered in Israel, on Beit Yerah site of the Early Brone Age III period [Mazar 2001: 449-452]. R. Amiran noticed similarity between granary from Beit Yerah and Kura-Araxian round shaped buidings in Yanik-Tepe (pl. I, 5), Shengavit (pl. I, 3), etc.) [Amiran 1965: 165-167]. For grain keeping was also used big clay jars and maybe wattled baskets.

Fortifications and military art.

In the Early and Middle Bronze Ages living and existence spaces were properties. Society got rights, which need defense. Appears control systems, where important role played war and defense buildings.

M. Eliade believes that defense buildings of the settlements were originated from magical defense means. These means – canals, embankments, and labyrinths were created for holding demons and souls of deceased. In northern India in times of epidemics around a village circle used to be drawn for keeping out demons of disease. In the Middle Age Europe walls of settlements used to be ritually sanctified against diseases and death [Элиаде 1994: 38).

In South Caucasus on the big settlements of the Early Bronze Age appear fortifications. Cyclopean fortification walls of Elar have buttresses. Fortification walls with towers surround Shengavit [Кушнарёва, Чубинишвили 1970: 70; Массон 1997:126] Defense walls have Lori Berd and Uzerlik Middle Bronze Age settlements [Кушнарева 1993: 158]. But, it is unclear yet, are these fortifications contemporary to the settlements or no. Some information could be received from the arms and weapons discovered in burials. Some settlements of the Early Bronze Age have defense moats, which were depth was 3 – 5 meters (Beshtasheni). Despite this, our knowledge of military organization is incomplete.

Shrines and cult places.

Archaeological materials indicate that people in the Early and Middle Bronze Age South Caucasus were organizing living space (existence environment) according to their imagination of universe model. Settlements, cemeteries, household buildings and remnants of manufacture indicate, that the societies who belong to archaeological cultures of these periods, perceived a space as a part of cosmos. Archaeological data from South Caucasus indicate, that Kura-Araxesian society was executing cult rites in shrines inside living houses, on the territory of settlements and outside them. Family cult rites were executed inside the living houses at hearth. In some cases, in the hearth or near it were discovered small statues or zoomorphic or anthropomorphic andirons. Important parts of family idols were clay anthropomorphic andirons [Кушнарёва, Чубинишвили 1970: 164]. Clay models oh houses, which were discovered on Kura-Araxes culture sites, supposed to be connected to the family patron gods or to idolized ancestors. House models discovered in South Caucasus as well as the ones from

Middle East, supposed to be used for rites, which serve family cult [Shanshashvili 2011:214]. Along with sacral space of settlements and private shrines in family houses, appear social places of community importance for cult ceremonies [Areshian 2005: 79-80]. On Kura-Araxes sites shrines are situated on the territory of the settlements (Gudabertka, Artik), as well as outside them (Baba Dervish II, Amiranis Gora) [Кушнарёва, Чубинишвили 1970: 165].

Shrine inside the settlement.

Along with sacral space of settlements and private shrines in family houses, in the Early Bronze Age appear social centers of community importance for cult ceremonies. These centers are situated inside the settlements. One important center of this kind is Mokhrablur, which is situated in Ararat valley near Echmiadzin. In the middle of the site is situated cyclopean platform or tower (4 – 6 m. high, 8 m. length), on which was erected 4 meter height “obelisk”. It seems, that this ritual building was not limited only people of one settlement, but was a ritual center for neighbor communities as well [Areshian 2005: 79-80].

Supposedly #1 building from Kvatskhelebi C1 layer was also a shrine. This building was burned during religious rite [Javakhishvili, Ghlonti 1962: 52]. Remnants of a shrine were excavated on Gudabertka settlement, which is situated 7 km far from Gori. Shrine is complex built with wattle and daub. Walls of the complex were decorated with polychromic drawings [Nadimashvili 1963: 148-152]. In Trialeti, on Ozni settlement were discovered sacrifice places/squares for sacrifice. These places were connected to living houses. B. Kuftin believes that, there were used to be executed family rites [Куфтин 1948: 42].

Kura-Araxes culture shrines, which are situated outside the settlements, were discovered in more than one place in South Caucasus (Amiranis Gora, Talin, Mets Sepasar, Baba Dervish). The Early Bronze Age shrine of Amiranis Gora is situated on the top of the mountain [ChubiniSvili 1963: 43,45 tab. I-3, IX]. This shrine was functioning during all existence of the settlement [Кушнарёва, Чубинишвили 1970: 62].

In the north-western part of Armenia, on Ashotska plateau, which is surrounded by mountains, on the top of mountain Mets Sepasar (2081 m. high) was discovered shrine dated back to 28th – 26th cc. B.C. On the site were discovered two hearths, at one hearth there were excavated seven skeletons of wolfs [Еганян 2012: 272].

Cult square of the Early Bronze Age, situated outside the settlement.

Near Town Talin, in the south-eastern part of Kura-Araxes cemetery, under a man-made hill of 1.5 meter height and 23 meter diameter, was discovered a square. The square is represented with two parallel stone walled quadrangular platforms [Badalyan, Avetisyan 2007: 243; Avetisyan, Muradyan, Sargsyan 2010: 161-163].

On Kura-Araxes settlements or near them, in some cases were discovered pits, where materials of cult importance were preserved. It is possible, that in these pits temple treasure was hidden. One pit of this kind was discovered near Baba Dervish II settlement. There was discovered sculpture of an ox and a fragment of stone stele decorated with double spiral [Кушнарёва, Чубинишвили 1970: 165].

T. Chubinishvili believes that this stele was “a piece of an ancient veshap style menhir” [Чубинишвили 1971: 105]. On Kvemo Aranisi (Akhali Zhinvali) settlement was discovered pit of cult meaning, where were found forty nine big and small ware (small pots, bowls, vases etc.). Among them there were nineteen small ware, most of them were filled with Hordeum distichtum. In one pot was placed red paint [Ghlonti 1985: 22]. Here also were discovered clay andiron and stamp seal.

Concusion.

For societies belonging to South Caucasian archaeological cultures of the Early and Middle Bronze Ages (Kura-Araxes, Trialeti, Sevan-Uzerlik, Kizil-Vank, Karmir-Berd) existence space was a big part of South Caucasus, Anatolian upland and banks of Urmia and Van lakes. In the Early Bronze Age it reached Palestine. But the main area was a space between rivers Kura and Aras.

In this space people live and work in all three climate zones – lowlands, foothills and mountains. They work (cattle-breeding, mine works) also in high mountains and alpine zone. Settlements are always situated near water – on the banks of rivers, lakes or streams. Mountain settlements are placed on terraces.

In South Caucasus settlements were consisted of living and household building complexes. In some cases living buildings are attached to each other, but in other cases there is a space between the buildings. Household buildings as a rule were workshops and storages. It seems that cattle stalls were situated outside the settlements.

Inside the houses there were cult-ritual and sleeping spaces as well as the storages. Separately situated cult building or rite places were also placed inside the settlements. These ones were shrines for the population of the specific settlement. Shrines situated outside the settlements were community shrines and represented territorial shrines.

Cemeteries also represented a ritual space. It seems that there used to be executed rites connected to ancestors’ cult. Deceased were buried outside settlements as a rule. Rarely, burials were places in abandoned settlements. Also there were discovered cases of child burials under the floor.

So, we can say, that in the Early and Middle Bronze Age South Caucasus human was mastering the environment on the basis of practical demands. Also it must be mentioned, that all actions of communities or individuals were determined by a Weltanschauung, which was based on mytho-religious beliefs of this period. Early examples of space mastering indicates high quality of social organization and also points to a certain social hierarchy.

Villages and all settlements of the Early and Middle Bronze Age South Caucasus were built according to determined, regular plan. At this time engineering is established and settlements have architectural shape.

On today’s phase of research we can say, that in the Early Bronze Age in the country between rivers Kura and Aras was established village form, which is preserved in Caucasus till our days.

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Description of the plates:

Pl. I. 1. Imiris Gora. Genplan [after Джавахишвили 1973: pl. 7-b]; 2. Imiris Gora. Detail of the settlment [after Джавахишвили 1973: pl. 8-a]; 3. Shengavit.Genplan [after Джавахишвили 1973: pl. 16-a]; 4. Kül-Tepe. Detail of the settlment [after Джавахишвили 1973: pl. 16-b]; 5. Yanik Tepe. Plan of the settlment [after Кушнарёва, Чубинишвили 1970: fig. 36]; 6. Khizanaant Gora, house of the D layer [after Japaridze 2003: fig. 79].

Pl. II. 1. Imiris Gora, house #8 [after Джавахишвили 1973: pl. 9-b; Japaridze 2003:fig. 39]; 2. Imiris Gora, house #9-10 [after Джавахишвили 1973: pl. 9-c; Japaridze 2003:fig. 39]; 3,4. Abuli. Circular planned house. Drawing and plan; 5,6. Abuli. Complex of the circular planned houses. Drawing and plan.

Pl. III. Ozni. Overal view of the settlement; 2. Overal view of the Shaori mountain.

Pl. IV. 1. Beshtasheni. Overal view of the settlement; 2. Beshtasheni. Topographical carte; 3. Beshtasheni. Google. 4. Beshtasheni. “Ciclopean” settlement. Plan.

Pl. V. 1-3. Kvatskhelebi.Reconstruction [after Japaridze 2003: fig. 76].

Pl. VI. 1. Jinisi. Plan of the house #1 [after Narimanishvili, Amiranashvili 2010: pl. III-1]; 2-4. Jinisi.Reconstruction options of the house #1; 5.Tsikhiagora. House #2 of the layer B [after Makharadze 1994: pl. XX]; 6.Kvatskhelebi, layer C1. House #4 [after Джавахишвили 1973: pl. 12]. 7. Cutaway view of a Wattle and daub dwelling at Kvatskhelebi [after Sagona 1993: fig. 5-b]; 8. Cutaway view of a Wattle and daub dwelling at Kvatskhelebi, layer C1. House #4 [after Джавахишвили 1973: pl. 13].

Pl. VII. 1. Berikldeebi settlement [after Japaridze 2003: fig. 115]; 2. Amiranis Gora [after Chubinishvili 1963: pl. XIII]; 3. Amiranis Gora [after Кушнарёва, Чубинишвили 1970: pl. III-3].

Pl. VIII. Early bronze age house models from the South Caucasus: 1.Digasheni [after Shanshashvili 2011: pl. I-2]; 2. Khizanaant Gora [after Shanshashvili 2011: pl. I-1]; 3. Kvatskhelebi [after Shanshashvili 2011: pl. I-6]; 4. Ozni [after Shanshashvili 2011: pl. I-3]; 5. Amiranis Gora [after Shanshashvili 2011: pl. I-4]; 6. Teghutdzor [Photo and drawing of this model was given to us by doctor of historical sciences R. Badlyan for what we would like to express our gratitude to him].

Pl. IX.1.Jinisi settlement. Plan [after Narimanishvili, Amiranashvili 2010: pl. II-2]; 2.Jinisi settlement.Topographical plan [after Narimanishvili, Amiranashvili 2010: pl. II-1]; 3.Jinisi settlement. Reconstruction.

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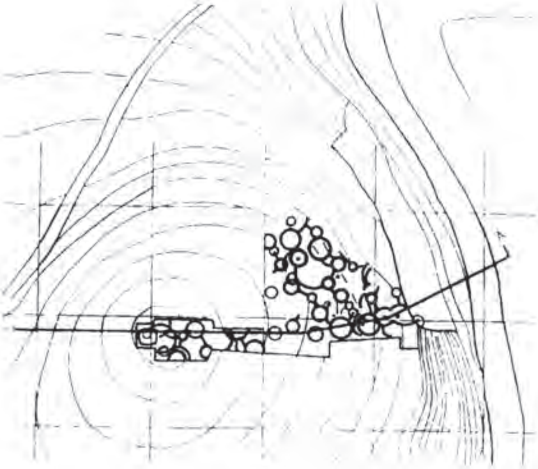

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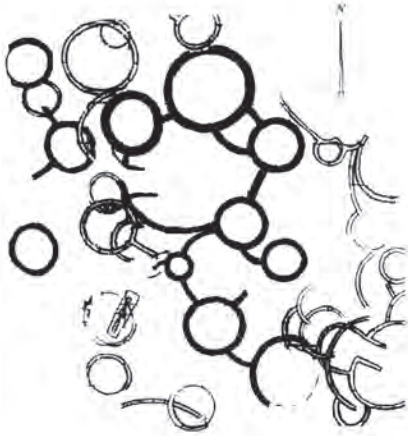

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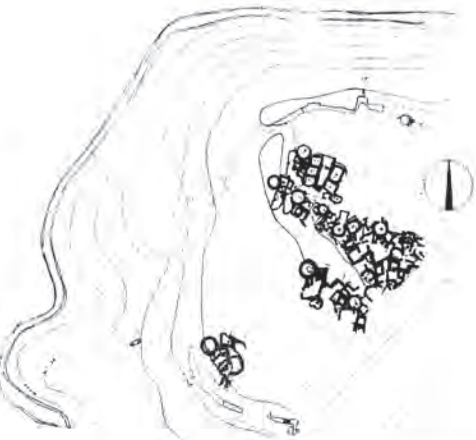

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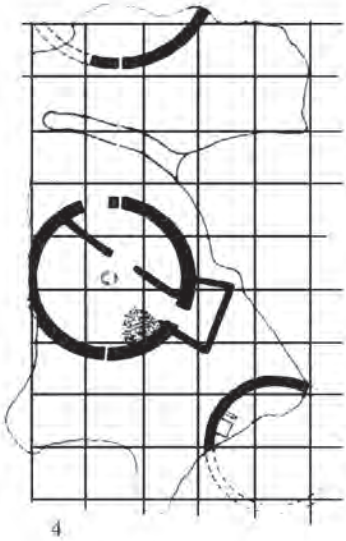

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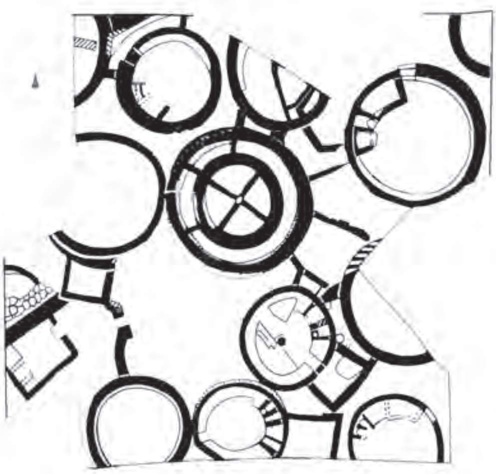

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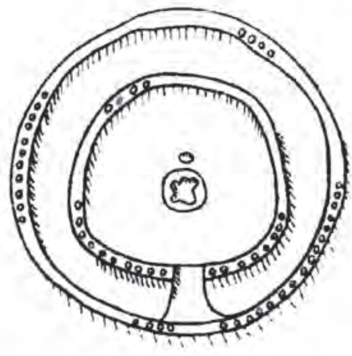

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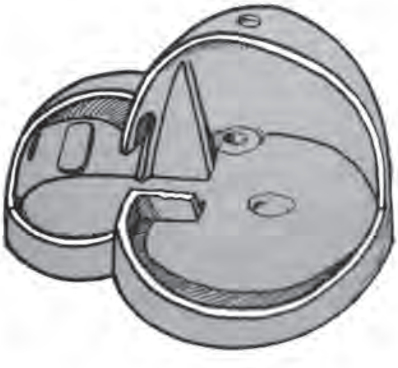

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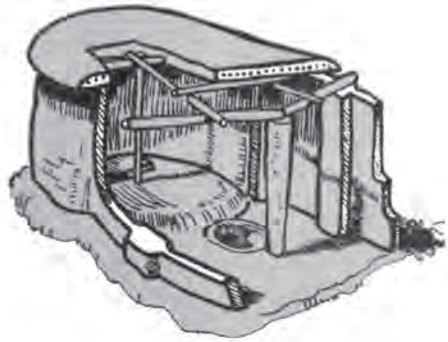

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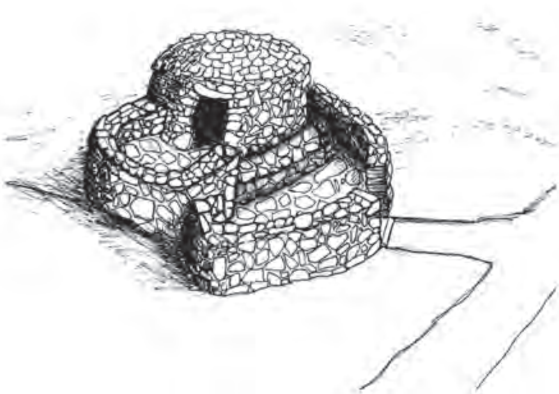

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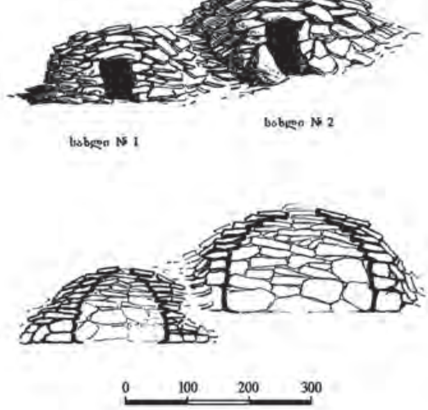
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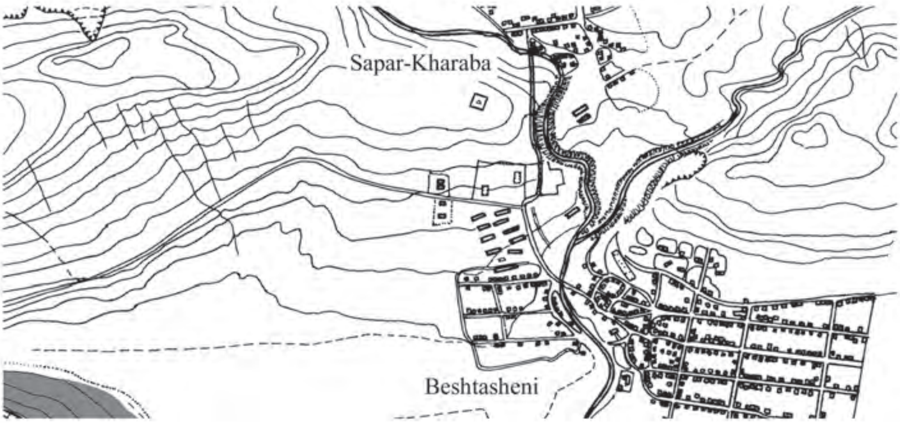
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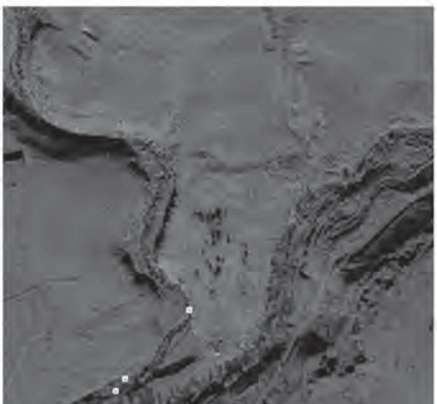
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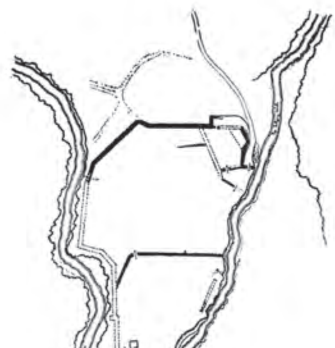

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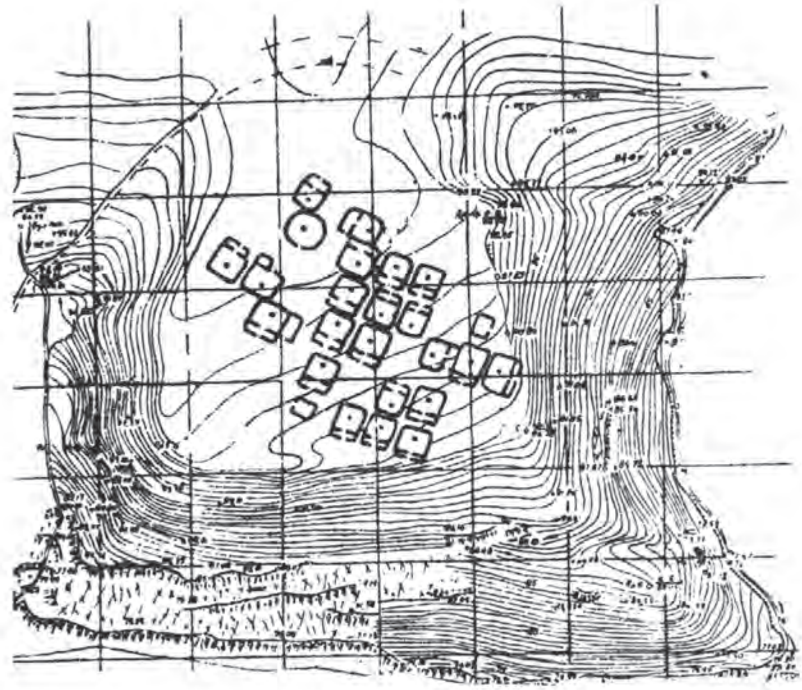

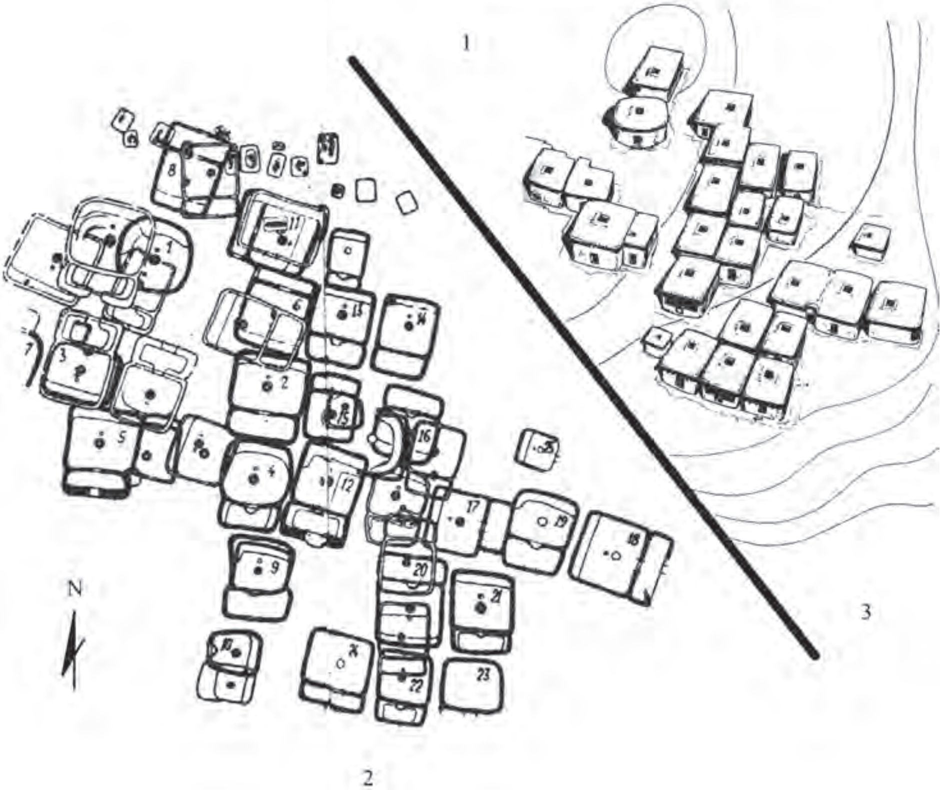

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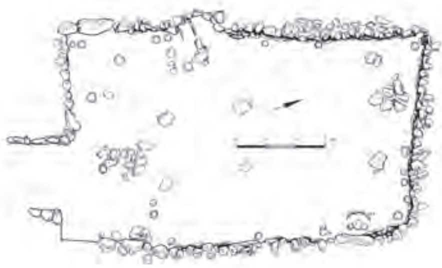

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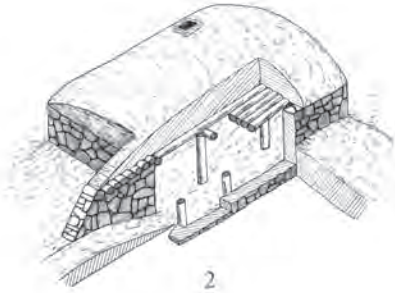

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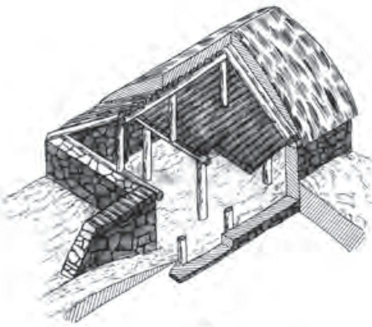

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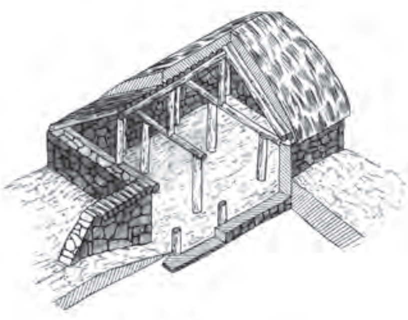

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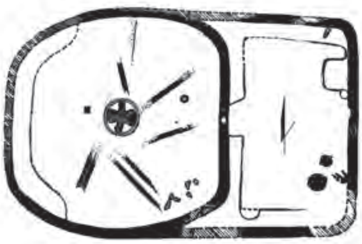

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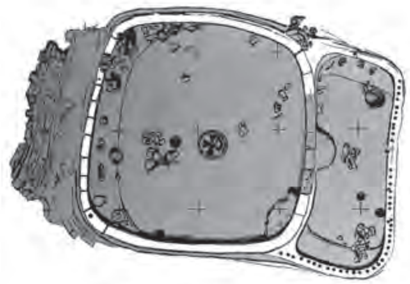

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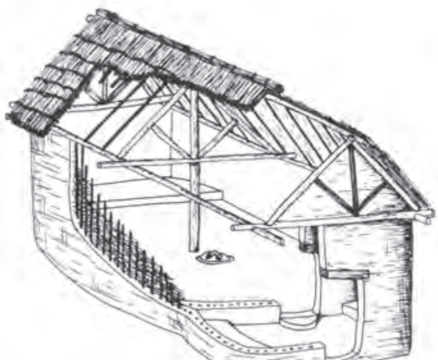

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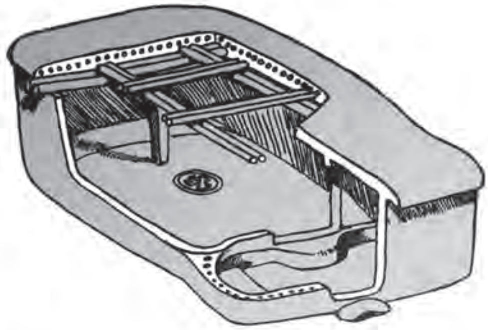

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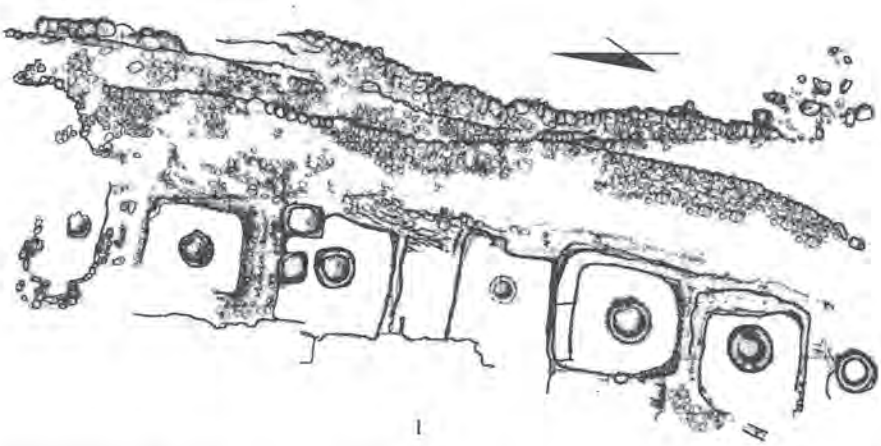

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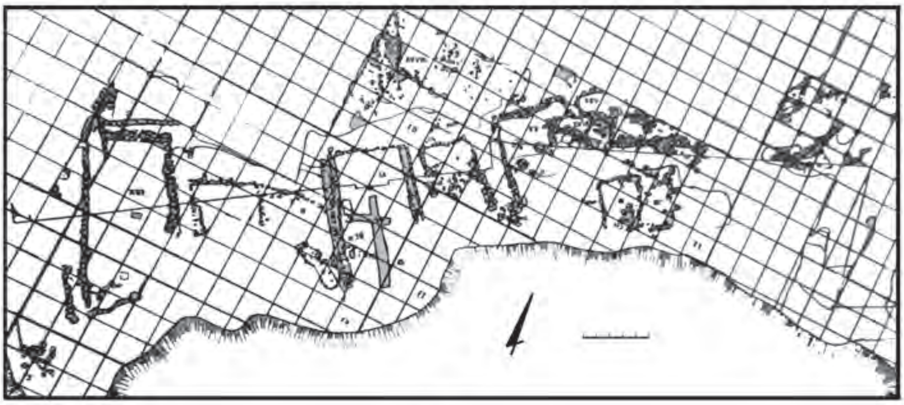

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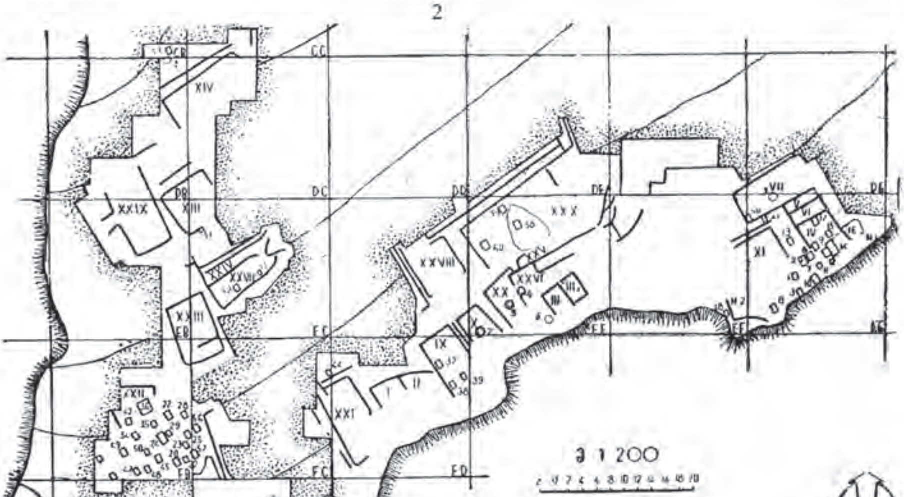

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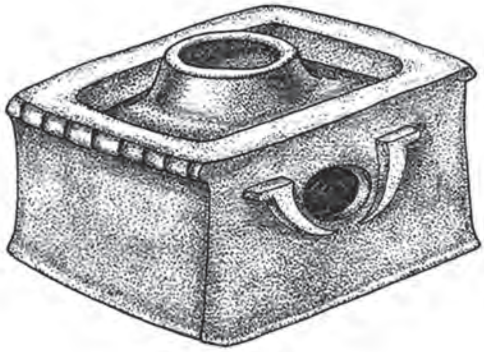

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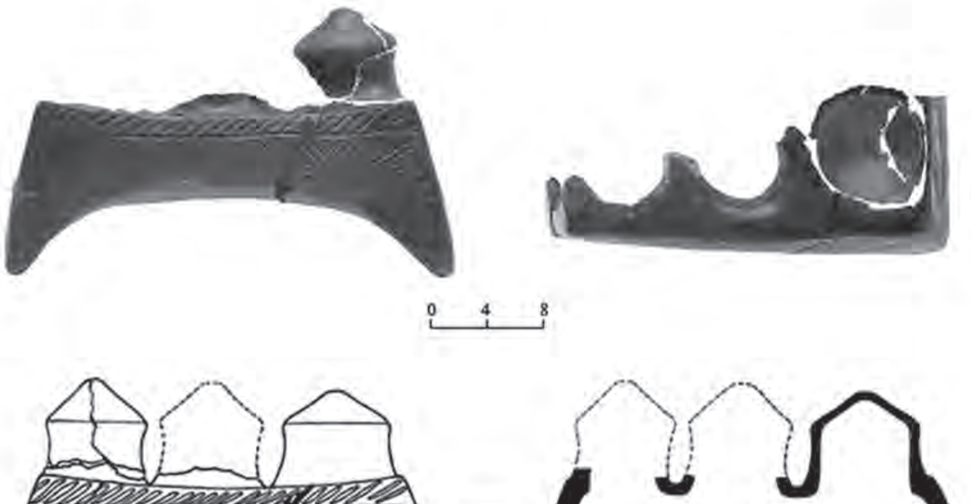

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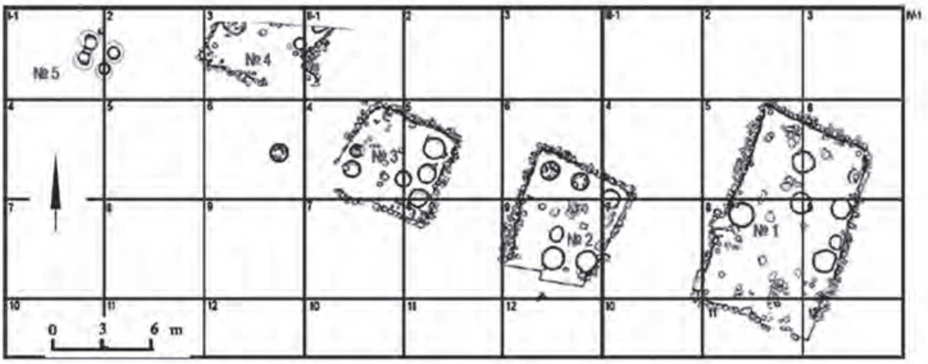
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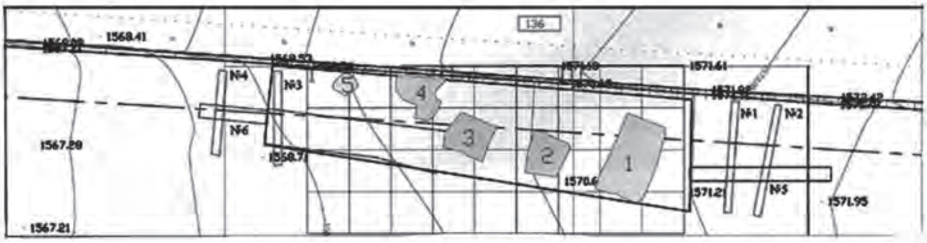
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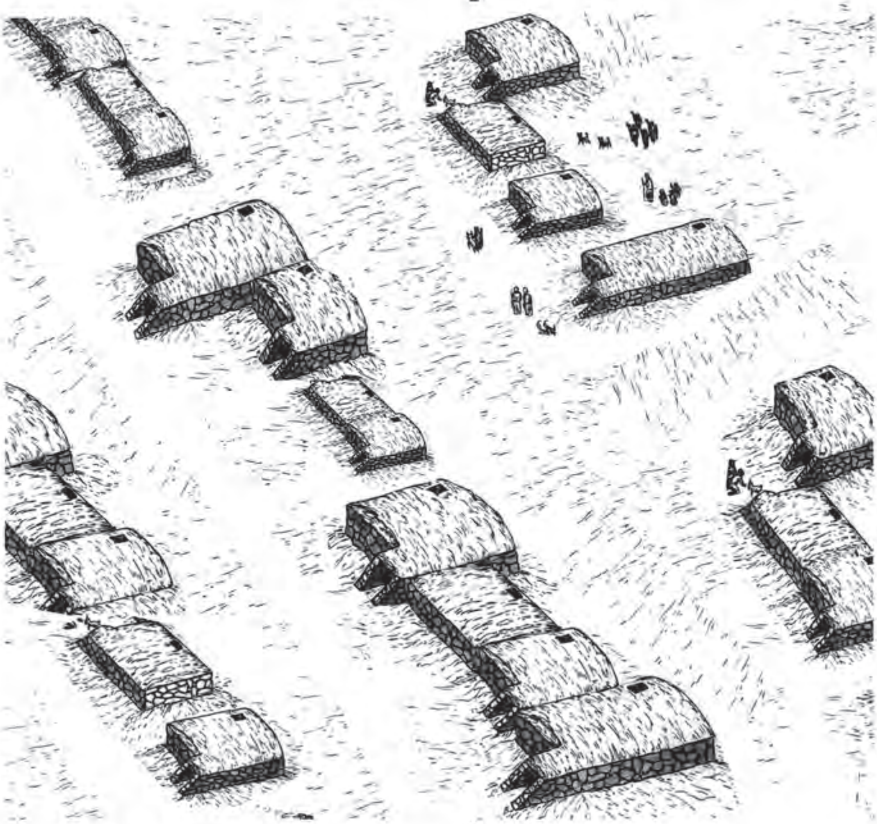

3

BRONZE AGE MUSICAL INSTRUMENTS OF THE REGION BETWEEN THE CAUCASUS AND TAURUS IN CONTEXT

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Introduction

Music was one of the important aspects of the spiritual life of Bronze and Iron Age people. Its primary function was to serve for rituals having been played at feasts, during hunting, wars, funerals, temple rites. Archaeological sources attest to the existence of music and musical instruments in the Bronze Age also for the region between the Caucasus and Taurus to be characterized by common traits of cultural developments. Particularly reliable information concerning musical instruments, mainly in form of iconographic units, come from the period of the late 3rd millennium BC and especially from the 2nd millennium BC from the North (Maykop) and South (Khanlar, Mingechaur, Trialeti, Karashamb, Lchashen, Geghama mountains, Sevan) Caucasus as well as Eastern Taurus (Arslantepe, Norshuntepe, Shamshat, Mardin). The aim of this article is to reflect the present data on musical instruments from the territories under consideration in context of corresponding cultural relations.

Present Data on Musical Instruments

Wooden remnants of a **harp** type stringed instrument were discovered in the tomb of a noble woman from Novosvobodnaya (Maykop region), dated to the mid of the 3rd millennium BC or a bit earlier (according to the new chronology – second third of the 4th millennium BC!). The parallels for this instrument are known from Ur – an aspect which is well observed in the general context of Near Eastern analogies of the Maykop culture (Rezepkin 1990) (fig. 12).

From the Early Bronze III layer (late 3rd millennium BC, Kura-Araxes culture) of the site of Arslantepe (not far from Malatya) a ceramic shard (10.5 cm) with a stylized relief image of a seated **lyre** player was discovered. His stringed instrument has general similarities to prototypes from Mesopotamia and Egypt, although it is more closely related to the triangle-shaped lyres of the contemporaneous Cycladic marble figurines (Bachmann 2000: 148-9, Abb. 5) (fig. 5).

A 7-stringed lyre is depicted on the silver goblet of Karashamb (Oganesian 1988) (fig. 1a), with parallels in the 3rd millennium BC Mesopotamian and 2nd millennium BC Anatolian feast scenes (Rashid 1984: 44-59; Spycket 1983: figs. 1, 4, 8, 9, 10) (figs. 16-17, 19-26).

The closest analogy to the Karashamb example is the image of the five-stringed lyre on a stone cylinder seal from Mardin, dated to 1800/1700 BC (Schuol 2004: 55, Taf. 2/5) (fig. 4).

Another engraved image of the lyre is known from Khanlar – on a black polished boot-shaped vessel (dated to the second quarter of the 2nd millennium BC). This instrument with an arch-shaped body has a schematically depicted single string (Piliposyan-Kamalyan 1995: 17, fig. 2) (fig. 6).

A lyre-type instrument is depicted on a petroglyph image from the Geghama mountains of the 3rd-2nd millennium BC, in the context of ritual dance. It has close analogies to petroglyphs from Negev (Kushnareva 2000: 103-4, Tab. II/2) (fig. 3).

The only object conceivably related to the lyre found in Armenia was unearthed in the Tomb no.200 of the site Lchashen (dated to the 15th-14th centuries BC). It is a 15 x 16 x 39 cm clay rectangular box with rounded edges and egg-shaped cut-outs on the lateral sides and about 20 narrow holes on the upper and lower sides. According to A. Piliposyan and H. Kamalyan this object served as a resonator and by its 14 reach-trough holes the strings were connected to the upper part, which was joined to the resonator via its egg-shaped cutouts. Such instruments were known from Mesopotamia, Levant, Iran and Egypt (Piliposyan-Kamalyan 1995: 18) (fig. 11).

In contrast to the lyre, which was imported to the region under consideration from the south, the **lute** was typical for that. The Ur III king Shulgi (first half of the 21st century BC), a musically talented person, informs in one of his inscriptions that the lute was brought to his palace from another country (Rashid 1984: 13). It is believed that the lute was imported to Mesopotamia at the end of the 3rd millennium BC, probably at the late Akkadian or Gudean (second half of the 22nd century BC) period from a northern or eastern mountainous country and reached Egypt by the 16th century BC due to demographic movements (fig. 30, cf. Lexová 2000: fig. 42). The lute was a typical instrument for mountainous people, including the Hittites, Hurrians and Kassites and it is primarily known from Hittite iconography (Eichmann 2001: 478) (figs. 17, 18). It is not accidental that one of the most ancient images of a lute player was found on a clay vessel from Shamshat and is dated to the 17th century BC (Schuol 2004: 56, Taf. 2/8) (fig. 7).

The elongated instruments in hands of squatted men on the second frieze of the Karashamb goblet are interpreted as **idiophones** (fig. 1b), an image that has its analogies in Mesopotamia, Iran and Bactria (Boehmer-Kossack 2000: 27-8). These instruments can be classified also as **pipes**, which have analogies also in Medieval Armenia (Khanzadyan 1959: 68).

Probably the wind instruments found at Mingechaur and dated to the second half of the 2nd millennium BC, made of bone and decorated with three (or four) incised geometrical ornaments also must be attributed to the same group: they were most likely Bronze Age **flutes** and have their analogies in the Central Anatolia, Mesopotamia, Iran, as well as in Western and Eastern Europe (Aslanov *et all.* 1959: 58, 63, 151, fig. 41; cf. Piliposyan-Kamalyan 1995: 18) (fig. 10).

A bronze figurine of a seated flute/pipe player from the Lake Sevan basin, now at the Louvre, conditionally was dated to the late 2nd – early 1st millennium BC (Santrot 1996: 148-9, no. 133) (fig. 9).

Often hanging decorative objects as **bells**, plungers in the form of birds or other animals are also interpreted as "musical instruments", which are found in the sites of the region under consideration especially during the late 2nd and the early 1st millennium BC and have multiple parallels in Eurasia (the earliest examples in the Syrian-Mesopotamian world are dated to the late 3rd millennium BC) (Khanzadyan 1959: 63; Devejyan 1981: tab. VI/11-12; Bobokhyan 2009) (fig. 8). Clay bells are also interpreted as musical instruments, known from such sites as the settlement of Norshuntepe (Early Bronze III, late 3rd millennium BC). They have analogies in the Anatolian and Mesopotamian world of the 3rd millennium BC (Demircihüyük, Troy, Ikiztepe, Tepe Gawra, Kish) (Bachmann 2000: 148, Abb. 4). It has been suggested that the Near Eastern and European metal bell-shaped objects can be of Caucasian origin (Möbius 1938).

There are semi-spherical pots, cone-shaped and hour glass shaped vessels which could serve as resonating instruments such as **drums**. The mediaeval drum ("naghara") evolved just from these instruments (Khanzadyan 1959: 66). Such objects are depicted on the second frieze of the Karashamb goblet (figs. 1c, 13) and the first frieze of the Trialeti goblet (figs. 2, 14) (cf. in common Areshian 2008). The interpretation of these objects as drums is possible if we take into consideration the fact that the images depicted on the mentioned goblets represent mainly military and ritual scenes and that the drum is known to be the main musical instrument used in wars and rituals.

The foregoing point of view is partially proved also with the help of contemporaneous Mesopotamian data. Particularly, investigation of the Sumerian-Babylonian iconography shows that three types of drums were spread in Mesopotamia: 1. pot-shaped ones; 2. large round ones, played by two players, and 3. "double-drummed" ones like an hour glass (Afanaseva 1979: 138). The images of the Karashamb and Trialeti goblets correspond to the last two types. In this context there arises a question whether the images of two standing men are accidental on the Karashamb goblet (fig. 13). Moreover, similarly to the Karashamb goblet, in Sumerian-Akkadian iconography some musical instruments, including the drum, are observed in the context of a specific scene. In this regard an image on the Akkadian cylinder seal at the Louvre is especially significant for depicting a scene from the epos of "Gilgamesh and the Huluppu tree". Here in front of a seated deity there is a table with two/four hoofed legs (exactly the same as the image on the Karashamb goblet). There is another object on the table, which according to S. Kramer and V. Afanaseva was interpreted as a drum (probably pot-shaped): the existence of two drumsticks in hands of the deity attests to this opinion (Afanaseva 1979: 137-8, tab. 24a) (fig. 27).

The **images of parades** accompanied by music also point to various connections. Thus, certain parallels can be observed in Mesopotamian iconography. For example, the images of musicians seated on a chair with a cross-shaped base, partially also the parade of the "Standard of Ur" (cf. Spycket 1983: figs. 4a, b, 8a; Borovskaya 1997: 12) (figs. 19-21, 26) have their direct parallels on the Karashamb goblet (fig. 1a). In this sense the Central Anatolian ties are especially evident. In particular, the data concerning the early Hittite rituals and the musical instruments used in it (compare e.g. the deer-shaped silver rhyton from the Shimmel collection, the silver fist-shaped vessel from the Boston Art Museum, ceramic vessels with relief images from Hüseyindede Tepesi – Alp 1983: Abb. 6h; Emre 2002: 230, Abb. 15; Haas 1994: Abb. 94; Sipahi 2001: 121, Abb. 1) (figs. 15-18) have parallels in iconography of Trialeti and Karashamb goblets (figs. 13-14) and testify to the existence of a certain zone of common historical-cultural relations. Accordingly, interrelations between Anatolia and the northern regions of the highland zone between the Caucasus and Taurus would have been established in the Upper Euphrates territories. It is not accidental that Hittite texts refer to the ritual music and instruments of the countries of Ishuva (Sophene=Tsopk), Samukha and Pala (in Armenia Minor) (Shuol 2004: 40, 46, 189, 208; Kapantsyan 1948: 128), which were located in the mentioned borderland.
A question arises as to the **mechanisms of exchange** of musical instruments. In the Ancient World cultural relations were realized mainly on the basis of either massive (ethnic) or individual (the forcibly relocated, merchants, travelers, craftsmen, workmen, ambassadors, captives and slaves) movements, which could be also the case for spreading of musicians and their instruments.

The same processes took place also in the highlands between the Caucasus and Taurus which is proved by some data. So far, at the Middle Babylonian or Kassite period (16th-12th centuries BC) in the Mesopotamian town of Dur Kurrigalzu (to the west of Baghdad) musicians from the country of Subartu, localized in the Eastern Taurus and beyond, were mentioned in an inscription concerning store-houses of woolen clothes (Rashid 1984: 16). This information completely corresponds to the historical-archaeological context of the mentioned epoch, according to which there was an active relationship between our region and Kassite Babylon (Khanzadyan *et all*. 1983; Khanzadyan-Piotrovskiy 1984) (figs. 28, 29). Particularly, the town of Dur Kurrigalzu was built by the Kassite King Kurrigalzu I (late 15th century BC). The name of the latter is present on a cornelian cylinder seal with an Egyptian hieroglyph inscription (fig. 28) found in the Tomb no. 11 of Metsamor.

This unique seal could appear in Metsamor through mediation of countries like Subartu. It might be also that in the Middle-Babylonian Mesopotamia "Subartu" meant abstractly the territories beyond Northern Mesopotamia up to the South Caucasus. If we make a hypothetical reconstruction of the above mentioned information, it would not be illogical to propose that these could be the musicians sent to Babylon by the Subarian royalty who on their return brought with them the royal seal (probably a gift), which somehow found its way to the Ararat Valley (?). We suggest this interpretation, which is of course possible though not certain, as one of numerous mechanisms explaining the context of cultural relations.

Discussion

Our observations demonstrate that Bronze Age musical instruments of the region between the Caucasus and Taurus have obvious peculiarities, but in general they find numerous parallels as well. In the period under investigation the following stringed, wind and percussive instruments were known in the region, with corresponding analogies: lyre (→ Mesopotamia, Anatolia, Levant), harp (→ Mesopotamia, Cyclades, Levant, Iran, Egypt), lute (→ Mesopotamia, Hittite-Hurrian and Kassite worlds), pipe-flute (→ Mesopotamia, Iran, Bactria, Anatolia, Western and Eastern Europe), drum (→ Mesopotamia, Anatolia), bell-shaped objects (→ Central Europe, Near East): cf. also the images of the parade with musical instruments (→ Mesopotamia, Anatolia). For our region as well as for neighboring zones with mountainous landscapes instruments such as the lute and bell-shaped objects were probably typical. The appearance of the harp/lyre must be connected to Near Eastern influences. Meanwhile, instruments like drums and pipes were characteristic of many societies and their similarities should be considered as a result of convergent developments.

During cultural interrelations musical instruments, raw materials for their preparation, means of treatment, traditions, ideas, as well as clothing for musicians and other cultural phenomena were exported and imported from and to the highlands. Accordingly, the highlands could be also the transmitter of Near Eastern and especially (Central) Anatolian influences to the regions beyond the Northern Caucasus.

In this sense, if the referenced analogies between Mesopotamia and the highlands can be explained by the existence of partial commercial-economic bonds and the subconscious desire to imitate the "civilized" world, the Anatolian parallels are explained by significant similarity of value systems of the mountainous population of the two regions, which is especially obvious in the details of the abovementioned parade iconography.

The Bronze Age traditions on music and musical instruments survived in Urartian, Classical and Medieval periods (Khachatryan 2001-2002; Seidl 2009) (cf. figs. 31, 32, according to Gasparyan 2005, tab. 234/1, 245/29-30) as well as in later times, when according to ethnographic data, music and corresponding instruments continued to be used during rituals of archaic contents (cf. fig. 33, according to Bdoyan 1968: 117, as well as Svanidze 1937 and Kapantsyan 1944 for ethnographic data bearing local archaic and ancient Near Eastern traits).

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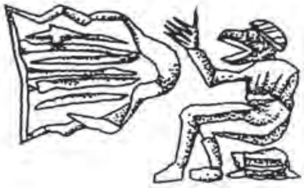
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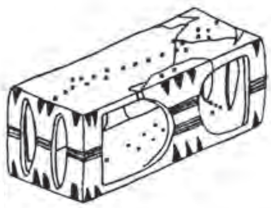
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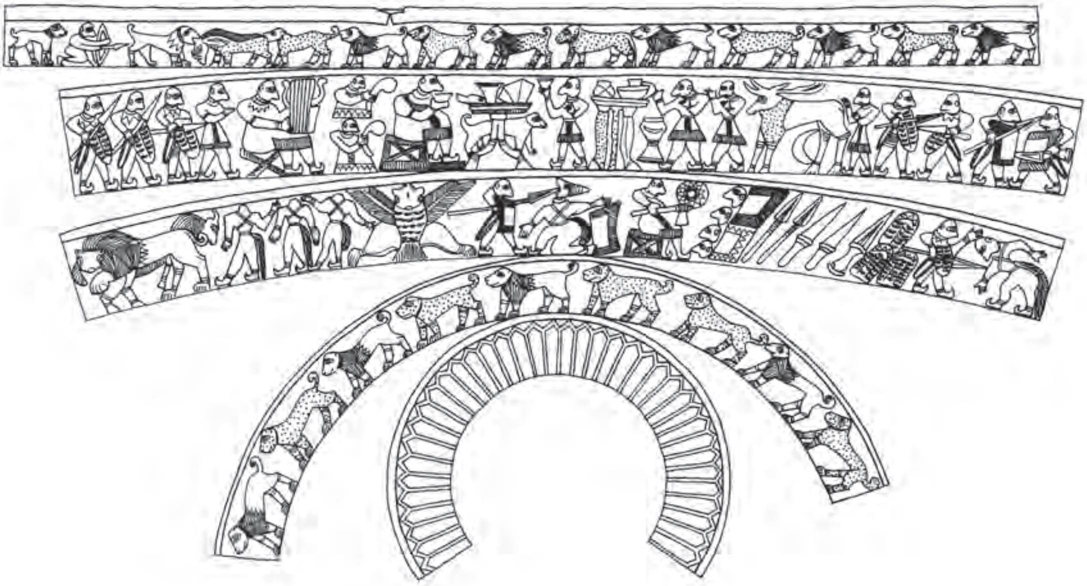

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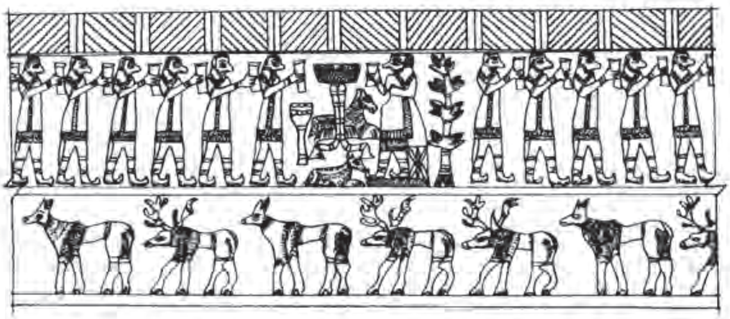

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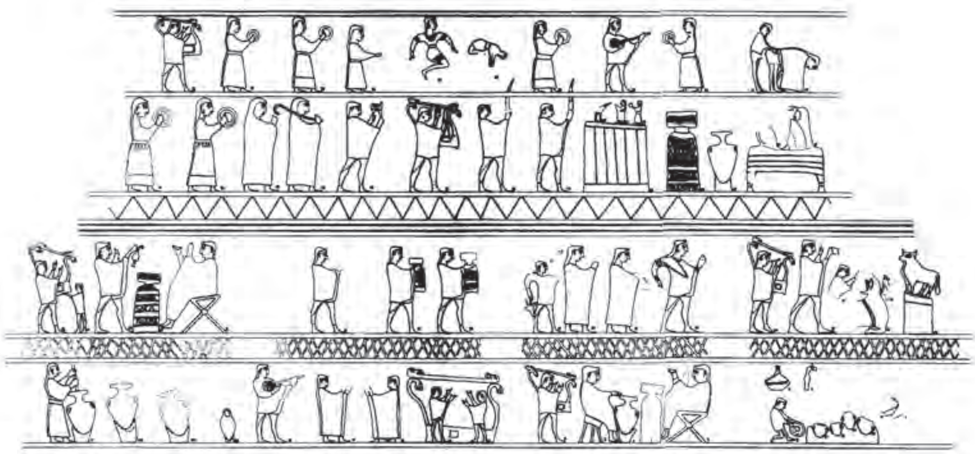

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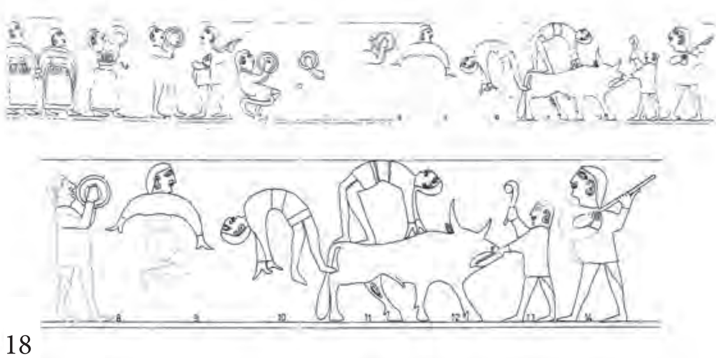

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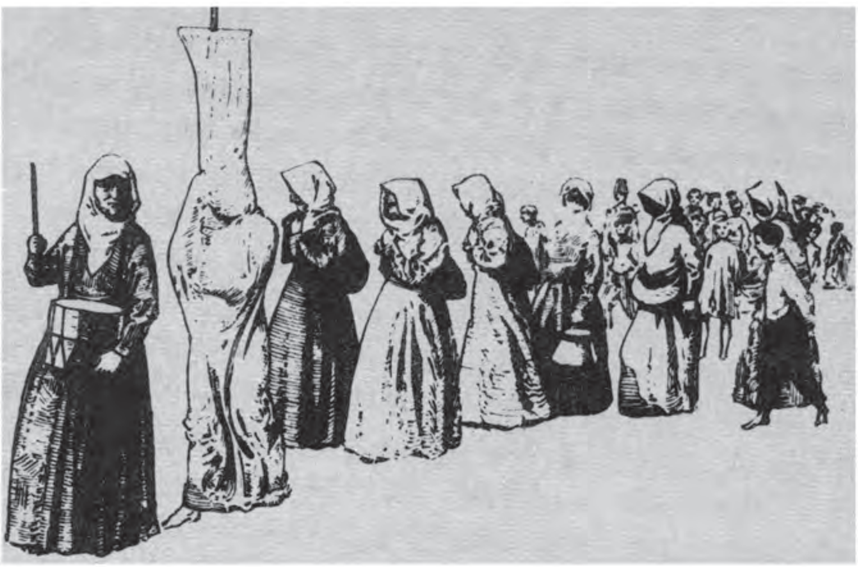
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FOR THE PROBLEM OF ASSIGN OF MIDDLE BRONZE AGE PHASES AND UPPER CHRONOLOGICAL LIMIT OF THE TRIALETI CULTURE

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Currently working chronological scheme of Bronze Age facing with some of the still unclear issues which obviously require further detail study of it. Different viewpoints were expressed, on one hand, concerning the end and transition from early to Middle Bronze Age phase and, on other hand, transition from developed (II) to late (III) phase of the Middle Bronze Age. It is necessary to mentioned that among the debatable issues remains the problem of precise assign of the upper chronological limit of famous Trialeti Culture. Definition of it arise an interest of specialists and controversial opinions were expressed mainly because of its unclear correlation with late phase/phases of Middle Bronze age. The main question is, whether the Trialeti Culture (in classical sense of it) was prolonging until the very end of Middle Bronze Age or its end started much earlier ?

Supposing that currently we are not so far to get the final answer to it, but before to prove certain point of view, it is necessary to conduct a special study and overview the datas of a big amount of Middle Bronze Age sites. This research should be conducted toward the detail comparative analyze of assemblages of the different phases of the mentioned era. Until such work doesn't done, all other judgments concerning the cultural definition of the phases would not be serious.

Present article devoted to the special consideration of late phase of the Middle Bronze Age and also revealing those main important features which clearly differing it (III, i.e. late phase) from the developed (II) phase of the Middle Bronze Age (Puturidze 2003: 111-127). The last one is known as the Trialeti Culture of Brilliant Kurgans, discovered and interpreted in prior by B. Kuftin at the mid 30s of XX century (Kuftin 1941:78-100).

It seems reasonable to present here a short history about the famous Trialeti Culture, of course, from the point of view only its chronological study and some related with it issues.

For a comprehensive study of the Middle Bronze Age Trialeti Culture of the central and eastern Transcaucasus it is considered to be most important to investigate the nature of contacts between this region and the Ancient Near East, and to reveal the measure of influence of the last one on the Transcaucasus. Since the Kuftin's discoveries scholars always were feeling its significance in terms of determining the nature of contacts of the Trialeti Culture with this part of the civilized world. What we might have to deal with here is both normal cultural or cultural-economic, and a certain political pressure. Moreover, by G. Melikishvili was assumed that a certain influence has been exerted on the formation of the Trialeti Culture by the alien ethnic element appearing here due to the migrational waves (Melikishvili 1999: 190-250). Thus, the study of contacts with contemporary to trialetians ethnicities of outer world looms large for a complete solution of the problem of genesis of this famous culture. What we might emphasize now is that, the evident facts of interconnection with certain regions of Ancient Near East cannot be traced at all exactly by the black burnished and fine decorated pottery ware (Japaridze

1969: 33-43,56-60; Gogadze 1972: pl. 24-32). Black burnished, nicely decorated hydrias of the Trialrti Culture is the local tradition of pottery producing. Most of other categories of artifacts, mainly the precious metal samples and also, monochrome painted ware of so-called "water scheme motif" (different style from that of the black burnished pottery assemblages) obviously indicate in favor of influence and relationship between neighboring to each other above mentioned regions. In general, we can state that powerful impulses of an "alien" culture can be easily traced in the Middle Bronze Age II phase trialetian materials (Puturidze 1983) which offers not only close analogies of Ancient Near Eastern artifacts, but also transformed to local manner samples as well.

This long observation of certain viewpoints about the Trialeti Culture we specially noted here in order to resume that mentioned process was familiar for this culture only at II, i.e. developed phase and it doesn't appears characteristic for later, i.e. III phase of the Middle Bronze Age. It means, that process of activated, close relationship with southern bordering areas was one of the specific and distinguishable point differing it II from other phases of the mentined era.

How long was lasted undoubtedly intensive contacts throughout the Middle Bronze Age, seems that will became clear only after the comparative analyzing of all other specifics of the above mentioned phases (i.e. middle and late) of the Middle Bronze Age. Currently, we can note that different categories of artifacts, mainly from the Trialeti burial assemblages reveal much similarity to, or find their immediate analogues with the pottery (exclusively the painted one of the certain "whate-scheme motif" style) and different types of metalwork in a number of ancient countries, in Anatolia, Summer, the Aegean World and partially Syria-Palestine. However, analogues are observed in individual objects or details, but not a complexes as a whole. So far, there has not been any record in Ancient Near East wider space of a culture including all such diverse items as Sumerian analogues of the trialetian material of high artistic craft, various details of design on precious metal vessels that was familiar for Old Hittite culture, hydrias with the so-called:" "water-scheme motif", nicely designed black burnished pottery with "combed", engraved and burnished ornaments, bronze rapiers, axes of the Kirovakan (i.e. Vanadzor) type, biconic shape vessels et. al., that is, the complexes that would approximate the Trialetian sites rather by their general content than by a single individual trait. There being no evidence of "pure" Near Eastern assemblages in the Trialeti, this is another indication of the fact that these separate artifacts, as well the whole culture, were formed on the basis of transformation and merging of an "alien" cultural tradition with local culture.

Basing on all above mentioned points, suppose that it is possible to admit that currently we are missing the series of those sites which can clearly demonstrate the process of very beginning steps of formation of the Trialeti culture. Because of the lack of such sites, surprising is not only the sudden appearance a wide range of evidences of alien style precious metal artifacts and some other ones, but also the existence of transformed variants which sometimes find no exact analogues in Ancient Near Eastern world, yet clearly indicate its influence.

Thus, we deal here with what is the result of an "alien" culture interacting with the local one, though neither the process of the formation of high artistic value patterns characteristic for the Trialeti Culture, nor the dynamic of interrelations between the local substrate culture and "alien" superstrate one can be traced in mentioned, i.e. II phase Middle Bronze Age culture's sites. Thus, if an assumption is made that the Trialeti Culture might have been formed on the basis of invasion of Near Eastern ethnic medium (according to G. Melikishvili) or the strong influence of cultural innovative wave (Puturidze 1983), then this process should have taken place little earlier, before the last century of the III – beginning of II millenniums BC, rather than at the advanced stage of full flourish of the Trialeti Culture. I suppose that the Trialeti Culture yields direct evidence of the result of this synthesis – the already formed decorative artefacts, at the peak of their development, rather than objects representing a little previous stage of their formation and development.

As concerns the problem of revealing the nature of contacts with Ancient Near Eastern world as well the measure of its influence on different areas of the distribution of the Trialeti Culture, it is the better understood problem (Puturidze 1983). From this point we can state that influence from the Near Eastern world was the strongest in most southern regions of the mentioned culture (Tsalka, Meskhet-Javakheti, Lore-Tashiri), as compared with other areas of it (Shida Kartli).

The southern regions of the Trialeti Culture suggests the certain style items, created, in most cases, by the combination of local and near eastern cultural traditions (Puturidze 1983). It will be logical to admit that if appearance of such transformed style patterns (it concerns mostly to toreutics) was the result of interrelations between the two cultural traditions, the local one and the newly arrived or influencing one, this process of contact and influence should be reflected in the certain period's artifacts as well the stratigraphy of the sites. What is possible to assume currently, is that the sites of Trialeti Culture suggests not the samples, those of indicating the process of formation of this new style, where is possible to record coexistence of local and alien cultural tendencies, but also the dynamic of this development. In Trialeti Culture we have a top level artistic craft patterns but not the samples indicating the process of its creation and first, beginning steps.

The pioneer of periodization of bronze age sites from Tsalka and also discoverer of the Trialeti Culture as the unit of Middle Bronze Age, was B. Kuftin. All other scholars afterward were based on chronological system worked out by him. Chronological scheme suggested by B. Kuftin until today does not loose importance. Nevertheless, special study of trialetian assemblages carried out at early 70s allowed to famous Georgian scientist E. Gogadze separate again 3 main chronological groups within this culture (Gogadze 1972: 95). His research fall more light to the correlation of different groups of Trialetian barrows. Relatively at the same period special study about topic of chronology of the Trialeti Culture was carried out by USA scholar K. Rubinson (Rubinson 1977). All this attempts successfully was investigated by the scholars which make clear the correspondence of trialetian barrows to the succeeding on each others groups. At that stage of existed information it was a very innovative work which doesn't loose its importance even today. Nevertheless, it should be noted that intensive accumulation of new datas that comes from the excavations that carried out after the mid 70s of last century, enable to re-consider issue about the late phase of the Middle Bronze Age. Especially important its interpretation concerning with the question of upper chronological limit of the Trialeti Culture.

In essence, chronological scheme of the MBA was considered as well studied problem until to late 70s – early 80s of XX century. Afterward, the new excavated archaeological materials, as well the special detail study of earlier discovered but, because of several reasons, still not interpreted sites, at the end XX century arise a question that Middle Bronze Age chronology definitely require certain revision. Situation, when group of Caucasian scholars understood that this becoming more and more problematic issue and needs a special deep research, continuing until now days.

This problem of separation of the Trialeti Culture from other i.e. later phases of the Middle Bronze Age still does not loose actuality.

Correspondence of the 3rd group of Trialeti barrows with late Middle Bronze Age sites discovered at the territory of Georgia allows to suggest following assumption. All of the tree groups of Trialeti Barrows might be included in the limits of developed, i.e., II phase of the Middle Bronze Age and not after it. Therefore, upper chronological limit of the Trialeti Culture of Brilliant Kurgans doesn't exceed begining of the XVII century BC which is end of the II phase.

We would like honestly note that an attempts of scholars toward the special research of this topic was always very pure (in essence, they were only noted and not more than, that such type of materials belongs to the late phase of MBA) and seems that it was a real reason why the topic of precise chronological definition of sites to inner chronological phases of the Middle Bronze Age still remains debatable.
It is clear that suggested by me problem is still waiting to be interpreted. To what I would like pay special attention is the issue of upper chronological limit of the Trialeti Culture of developed, i.e. II phase of the Middle Bronze Age and its chronological correlation with succeeding III phase of the same era. Our attempt is to reveal and interpret the differences which is obviously recorded between the II (developed) phase and III (late) phase of the Middle Bronze Age. The main question which is arising when one studying the complexes of mentioned time-intervals is: did they belongs to one and same cultural unite or to the different but closely related ones ?

Posed by me question, of course, needs the detail consideration not only the certain features, differing the materials of the mentioned II and III phases but, what is especially essential, grouping the seriouse amount of currently known all sites as the developed and late phases complexes.

Comprehensive study of the Middle Bronze Age phases and definition of their cultural belongings will allow to assume about their genetic binds.

It is clear that such kind of research requires a long-term, deep research of specialists and it is not an issue which might be presented in one article. Currently, my attempt is to pose the problem and show the reason which remined us the obligation to study this topic specially.

It is considered to be most important to define the symptomatic features both of the developed (II) and later (III) phases of the Middle Bronze Age patterns and to reveal the measure of influence of the first one on the succeeding to it phase.

Therefore, we have dwelt in detail on the signs and artifacts that yield traces, from one hand, of their (i.e. phases) direct genetic continuity and, from the other hand, various distinctive features that allowed to judge about belonging of them to the different cultural unites.

I would like point out those specific features which reveals characteristic only for the Trialeti Culture of brilliant Kurgans and as well only for the sites which might be differentiated as the cultural unit succeeding to it. What reason and as well what kind of specifics can be reordered allowing us to separate II i.e. developed and III i.e. late phases complexes as the sites of different cultures? Currently, I am considering this point of view as an admit, which should be checked afterward by the help of detail analytical and statistical study. It is a point of future research of scholars.

It seems that the leading artifacts which make possible to presume that trialetian (II) and succeeding to it (III) phases should represent different cultural unites, is the pottery ware. Supposing that this artifacts better than others demonstrate the specific difference between the "pure" trialetian and later (i.e. III) phases ceramic assemblages. It is possible to point out about the following distinctions between them:

Trialetian ceramic characterized with extreme richness of decoration and complicate design of ornamental motifs (Kuftin 1941; Japaridze 1969). In most cases they demonstrate especially nicely treated surface. Same elaborate shape and treatment of surface clearly doesn't familiar for the ware of later (III) phase of the Middle Bronze Age. The last ones offers much less fine ware from the point of decoration and shape of corpus.

Distinguishable feature of ornamentation of the trialetiatian pottery is coexistence and combination of various technological methods when creating the ornamental design (Gogadze 1972). This is one of the most essential and common sign only for the trialetian samples.

An analyses of the pottery complexes of the above mentioned phases from the region of Eastern Georgia is very significant in terms of determining the leading specifics and as well the distinctive features of pottery assemblages of each phases. Evaluation of all characteristic features can served as important argument for assuming of their cultural identification. Grouping and percentage of all similar and distinctive signs is still required necessarily to be done.

Suggested article offers not a final conclusion about different cultural belonging of II and III phases of the Middle Bronze Age but suggests some preliminary arguments for the viewpoint that Trialeti Culture of Brilliant Kurgans did not prolongs far after the beginning of XVII c. BC.

At the end we would like emphasize those point that only the evaluation of all categories of material culture from the II and III phases sites can give the final answer to debatable problem of their cultural identification.

To summarize all specifics of the Ttialeti Culture, it is necessary to point out about the following which seems especially significant. Suppose that cultural bonds and influences furnish one of the main factors that played a predominant part in the formation and development of the Trialeti Culture. Similar level of cultivation of the interconnection processes doesn't seems characteristic for late phase of the Middle Bronze Age.

For the better understanding and evaluation of complete context of all characteristic features of late phase of Middle Bronze, especially important datas that comes from Tsaghvli cemetery. Excavation carried out by A. Ramishvili (expedition of the Center for Archaeological Studies) during several years integrates several series of pottery ware which undoubtedly belongs to the Middle Bronze Age but at the same time reveals essential difference from those which is known from brilliant trialetian kurgans. Burials from Tsaghvli cemetery (Ramishvili 2004) reveals the clear features (it doesn't concerns only to the ceramic assemblages but another sort archaeological datas as well) which definitely demonstrate an obvious difference from those of the "pure", i.e. classical trialetian pottery ware.

Similar to Tsaghvli materials was recorded in earlier discovered but only after several years fully published site of Kvasatali and Nuli. Opinion which was expressed by the excavator of this site O. Japaridze is well augmented and makes clear that they are contemporary assemblages (Japaridze 2009).

All this materials doesn't arise any doubt that they should be placed in the time-interval immediately following to the 3rd group of Trialetian barrows. In other words, it means that assemblages of Tsaghvli, Nuli, Kvasatali (Japaridze 2009), Atsquri (Licheli 2002) and some other sites might be included at the late, i.e. III phase of the Middle Bronze Age.

Archaeological evidences of the mentioned period was seriously enriched by the relatively newly discovered Jinisi settlement which was excavated by G. Narimanishvili during the pipeline construction activities (Narimanishvili et.al.,2010-253: 207).

Evidances of different categories artifacts that comes from the above mentioned sites allowed to differ them and include into the III phase of the Middle Bronze Age which immediately followed after the II i.e. developed phase of this era.

Rich evidences that comes from the different sites located mainly in Eastern Georgia evidently reveals those specific features which is differing these sites from the "pure" trialetian assemblages. Therefore, currently all the datas which concentrated in the hands of scholars absolutely doesn't rejects to the idea that the start of the III i.e. late phase of the Middle Bronze Age is started after the upper chronological limit of the famous Trialeti Culture. This remarkable changeover have had place around the beginning of XVII century BC. After this date, the sites discovered in Eastern Georgia revealing the other specifics which was not common for the Trialetian assemblages.

Great attention attracts the problems how can be understood namely to which spheres touched the differences between the middle and late phases of the Middle Bronze Age and about what kind of changes might it indicate. From this point very important seems those clear distinctions which obviously recorded in following important aspects of human activity: construction of burials, pottery assemblages, increasing of bronze weapons, disappearance of goldsmith patterns and definite reduce of wealthy in burial sites of the late, i.e. III phase of the Middle Bronze Age. Exactly this drastical changes reflected by several tens of sites, discovered in Jinisi, Tsaghvli, Atsquri, Meskheti burials of Niala and Bertaqana, Kvasatali, Nuli and some ones, make obvious the changes which, supposing, that indicate about the end of the Trialeti Culture and start of the new, late phase of Middle Bronze era. All this evidences enable to proof in favor of limitation the late (III) phase of Middle Bronze Age within the XVII - mid XV centuries BC. In future it should be specially disscussed the issue how might be titled those culture, assemblages of which specialists records only from XVII century BC. It a problem which can be answered in case of precise comparative study of II and III phases sites of Middle Bronze Age.

One of the important datas to define the chronological limits of the of the late phase of this era, beside the other evidences, gives the Jinisi settlement the date of which precisely was assigned by the laboratorial methods of dating (Narimanishvili et.al. 2010: 253: 207) .

As it is clear, the posed problem of belongness of Middle Bronze Age sites of II and III phases to the different cultures, remains actual and needs to be deeply studied.
From the point of dynamic of changes of different cultures, the period between the mid III and mid II millenniums BC was full with events and one of the last changeover recorded during the Middle Bronze Age have been happened at the transition of II and III phases of it, which means

the end of the Trialeti Culture of Brilliant Kurgans and very start of the new, though the very close with it, cultural unit in South Caucasus. Actually, after the beginning of XVII century BC we record the obvious degradation of the Trialeti Culture.

Nevetheless, influence of this powerful and most flowrished culture on the succeeding cultural unit was not little. In spite of this fact, resamblance that we can record between the ceramic assemblages of II and late, i.e III group becaming less and less after the XVII century BC. Attantion of scholars necesserily should be paid to the definition of entire block of characteristic signs of the final phase of Middle Bronze Age.

Precise revealing of all features, beasing on which we can clearly differ trialetian assemblages from those of the late phase group, will allowed to point out the main specifics of each of them. The certain amount of important specifics will servs to declear about the cultural difference between the assemblages of II and III phases of Middle Bronze Age. Only such type of research and precise statistical persantage of similar and diverse features between the “classical” trialetian and later style assemblages can give the strong background to proove or refuse existance of one and same or the different cultures thoughout the total time-interval from late III millennium BC until the mid XV century BC. Before the compleating of this work, all other attempts to give an final answer to this question would not more than hypothetic.

Nevartless, until this research would de done, considered evidences allowed to admit that cultural belongness of the developed, i.e. II and late, i.e. III phases of Middle Bronze Age was different and the Trialeti Culture should be included only into the II phase.

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MIDDLE BRONZE AGE METAL VESSELS FROM SOUTH CAUCASUS

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Manager of the Kldekari Historical-Architectural Museum-Reserve

In the South Caucasus metal vessels appears in the Middle Bronze Age for the first time, on the sites of Trialeti culture. Various vessels of bronze, silver, electrum and gold were found in the graves of this culture. B. Kuftin noted, that toreutics of Trialeti culture is absolutely new phenomenon in the South Caucasus, although noted a certain similarity with metal ware from the Royal Tombs of Ur, Alaça Höyüc, Uruk and Tel Halaf [Куфтин 1941: 87]. E. Gogadze found analogues in Troy and Mycenae [Gogadze 1972: 75]. Nowadays in science toreutics of Trialeti culture gets a lot interest. Many scholars devoted special studies to this issue [Japaridze 1982; Rubinson 2001; Rubinson 2003; Rubinson 2009; Boehmer, Kossack 2000; Collon 1982; Puturidze 2001; Puturidze 2005; Puturidze 2006; Puturidze 2010]. In M. Puturidze's opinion, there were no prerequisites for emergence of highly artistic toreutics in the area of Trialeti culture [Puturidze 2006: 72-73].

It seems that in South Caucasus, metal vessels appear by the influences of Ancient Near Eastern art. Production of the bronze, silver and gold vessels in Mesopotamia, Iran and Anatolia chronologically anticipates the appearance of metal ware in the South Caucasus [Puturidze 2006: 72]. In the toreutics of Trialeti culture M. Puturidze distinguishes two categories: the first – bronze vessels, and the second – of precious metals [Puturidze 2006: 69].The goblets and cups of precious metals of Middle Bronze Age, in our opinion, have close parallels with Iranian and Mesopotamian examples of the 3rd – 2nd mill. BC.

Small silver cups (pl. I-6; pl. VI-1) from kourgan XV of Trialeti [Куфтин 1941: pl. CII] are similar with bronze examples from Iran (pl. VI-3) [Müller-Karpe 1995: Abb. 7-18], Hindustan (pl. VI-4) [Müller-Karpe 1995: Abb. 7-22, 23] and Mesopotamia (pl. VI-2) [Müller-Karpe 1995: Abb. 6-1, 4, 6].

Golden bowls from Kirovakan (Vanadzor) kurgan (pl. I-3) [Khanzadyan, Devejyan 2007: pl. IV] and Trialeti kurgan VII (pl. I-1) [Куфтин 1941: pl. CI] have analogues with examples from Tel Suleima [Müller-Karpe 1995: Abb. 9-6, 7, 9] and Royal Tombs (pl. I-2) of Ur [Woolley 1934: pl. 163].

A small cup with handles [Куфтин 1941: pl. CII] found in kurgan XVI (pl. VI-5) of Trialeti is typologically similar to the small bronze vessels discovered in Kale Nisar (pl. VI-6) and Tepe Guran (pl. VI-7) [Müller-Karpe 1995: Abb. 7-13, 14]. All these cups and goblets from South Caucasus, also from Mesopotamia, Iran and Hindustan are very small height: the height of silver cup from Trialeti XVI kurgan is 7.2 cm [Жоржикашвили, Гогадзе 1974: 91], bronze cup from Kale-Nisar is 6.5 cm and from Tepe Guran – 11.4 cm [Müller-Karpe 1995: 322]. The height of golden goblet from Trialeti VII kurgan is 4.5 cm [Жоржикашвили, Гогадзе 1974: 79] and examples from Tel Suleima are 4.5, 3.8 and 4.0 cm [Müller-Karpe 1995: 324]. Silver cups from Trialeti XV kurgan are also very small. Their height is 5.1 and 4.9 cm [Жоржикашвили, Гогадзе 1974: 89]. Similar examples from Assur are 7.8 cm, from Tel ad-Dera – 7.7 cm and from Telloh (pl. VI-2) – 6.2 cm [Müller-Karpe 1995: 321-322].

The metal cups found in Iran are dated back to the end of the 3rd millennium and the beginning of 2nd millennium B.C. [Muller-Karpe 1995: 322-323, Abb. 7].

Among the toreutics of Trialeti culture the pedestal goblets are distinguished. Special place among those goblets has the gold goblet from Trialeti XVII kurgan [Куфтин 1941: pl. XCI], decorated with filigree, granulation and stones. The height of this goblet is 7.0 cm. Remarkable products of jeweler's art of this type are silver cups from Trialeti V kurgan and Karashamb Kurgan, with mythological images. The small golden [Куфтин 1941: pl. XCI] and silver [Куфтин 1941: pl. XCIII] pedestal goblets excavated in kurgans of Trialeti and Karashamb kurgans [Оганесян 1988: pic. 1, 2] are typologically foreign for the South Caucasus. The similarity with these goblet have beakers from Troy (pl. V – 4, 5, 6), from so-called "Treasure of Priam" [Dörpfeld 1902: 351, Abb. 280-в; Antonova et. all. 1996: 36, 37, 97]. The similar golden and silver beakers appear from Eskiyapar and Horoztepe and its ceramical analogues is known from Thermi and Ahlatlebel [Antonova et. all 1996: 36]. Although the similar pottery of the 3rd – 2nd mill. B.C. is well-known throughout the Ancient Near East [Stein 1984: tab. X]. We meet the pedestal goblets made from stone on Jiroft cultural sites in Iran [Muscarella 2005: 190, 191, fig. 10-12**]**.

On silver goblet from kurgan V of Trialeti is depicted the cultic ceremony on which the 23 participants have the cylindrical cups [Куфтин 1941: 87]. The similar cylindrical cups were spread in Mesopotamia in Western Iran (Kale Nisar, Tepe Guran, Kamtarlan, Susa, Tepe Gyan) from Akkadian period till Old Babylonian age (XXIV-XIX centuries B.C.). The separate copies appear in Baktria and Hindustan [Muller-Karpe 1995: Abb. 7]. The vertical handles appear in the West Iranian cups. One of the similar cups [pl. VI-3] is decorated with an owner's Attahushu writing [Muller-Karpe 1995: Abb. 7-19]. The cups depicted on Trialeti cup are similar to the stone cylindrical vessels characteristic to Jiroft culture [Muscarella 2005: 186, 193, fig. 6, 15].

From Akkadian period goblets of this type were spread from Zagros Mountains till Lebanon Mountains, as well as in the countries neighboring Akkad Empire from the north. That is why on the proposal of G. Mallowan the term "Subartian Ceramics" was accepted, but later he named it "Khabur Ceramics" and "Nuzi Ceramics" [Mallowan 1947: 21-25]. This type of ceramics is believed to be a one of the distinctness of Hurrian art, despite that some scientists look skeptically to identification of one or another ethnical group with material culture [Stein, 1984: 1-5]. Typologically similar vessel (pl. V-11) several years ago was discovered in Iran on Jiroft h settlement [Muscarella 2005: 186, 193, fig. 6, 15]. Discoverer of this site, Yousef Majidzadeh identifies it with Aratta kingdom, which is mentioned in Sumerian epos [Muscarella 2005: 179].

Along with the complicated mythological scenes represented on Trialeti and Karashamb goblets, there are images of different vessels. We believe that most of those vessels are metal. This theory is supported by the fact, that metal ware on Middle Eastern archaeological sites was discovered generally in rich burials and temples. We believe that vessels made of precious metals were used in special rituals.

On Trialeti and Karashamb silver goblet are represented two types of ware: vessels, pedestal and high goblets. 22 figures, which are represented on Trialeti goblet, are carrying similar vessels [Куфтин, 1941: 87-88]. These vessels have cylindrical form with concave sides (pl. II-2,3,4,5, pl. III-7,8). According to the figures represented on the goblet, high of the vessels should be 20 – 30 sm. Clay vessels of the similar shape are discovered on archaeological sites of South Caucasus from Kura-Araxeses period in Kiketi [Kiguradze, Sagona 2003: 73, fig. 3.28] and on Khizanaant Gora, in "ritual room" of #9 house from layer C [Kikvidze 1972: 16, pl. IX-1]. Metal vessels of this type appear only in middle of the 2nd mill. B.C. in Tsitelgorebi

[Pizchelauri 2005: Taf. XLV-1] kurgan (pl. V-11), but clay ones are abundant in the Late Bronze Age from Beshtasheni [Куфтин 1941: 341, pl. LIII] and Lori Berd (pl. V-12) [Деведжян 1981: таб. X-4].

Cylinder form vessels with straight or slightly concave sides first appears South Mesopotamia in Akkadian period 24th – 23rd cc. B.C. and exists till Old Babylonian in 19th – 20th cc. B.C., then it spreads in Northern Mesopotamia and Northern Syria [Stein, 1984: 12, pl. V-14-16, 20-22, VII-1-3, 14].

Cylinder form metal vessels or ones with slightly concave sides were discovered in Mesopotamia on the sites dated from the end of the 3rd and the beginning of the 2nd mill. B.C.: 18 and 23 graves of Assur, Ur royal tombs, on cemeteries of Tell Yelhi, Tell Suleima, Tell Sifr and Larsa [Müller-Karpe 1995: 264, Abb. 6 ,7].

Since Akkadian period and till the Old Babylonian period similar vessels were spread also in Western Iran (Kale Naisar, Tepe Guran, Kamtarlan, Susa, Tepe Giyan). Several examples were also discovered in Bactria and Hindustan. On the vessels from Western Iran appears a vertical lug. On one vessel of this type is an inscription of its owner Atahushu. In this inscription is also confirmed Sumerian name of this vessel – Gunagi [Müller-Karpe 1995: 264, Abb. 6, 7]. In some cases vessels of this type are decorated with horizontal relief double circle. Prominent circle have only the metal vessels of this type in Isin-Larsa period. Similar vessels were discovered in Mesopotamia (Assur #20 grave and Tell Suleima cemetery) as well as in Western Iran (Kale Nisar, Tepe Giyan, Čigha sabz). Most vessels are made of copper, only the ones from Assur (pl. VI-12) are made of tin bronze [Müller-Karpe 1995: 264, Abb. 6,7].

Different vessels are rep resented on Karashamb goblet (pl. III-1, IV-1,2,3, 13). Figure, which is standing by table side, is holding a vessel with wide spout (pl. IV-5). The similar one is placed on the table (pl. IV-3). Similar vessels are represented on a well known standard from Ur Royal Necropolis [Woolley 1934: pl. 91]. In Ur grave dated from the Early Dynastical III period was discovered similar golden example [Wolley 1934: pl. 164; Boehmer, Kossack 2000: 30]. On the Ur-Nanshe stela, which was discovered in Telloh and is also dated from the Early Dynastical III period, God is holding the similar vessel [Frankfort 1970: 70, fig. 73].

On Karashamb goblet images, the figure, which is sitting by table side, is holding a vessel (pl. IV-6) and the similar one is placed on a second table (pl. IV-1,2) and the third similar one is represented on a pot-stand (pl. IV-9), which is placed near the second, three- legged table. Golden and electrum vessels of this type were also discovered on Ur Royal Necropolis [Woolley 1934: pl. 159-161; Boehmer, Kossack 2000: 30].

On one table, represented on Karashamb goblet is placed a vessel, a bowl and a cup (pl. IV-3,4). Similar bronze vessels were discovered in Arslantepe, in so called "Royal Tomb" (pl. IV-11,12; V-1,2,3), which is dated from 3000 – 2800 B.C. [Frangipane 2004: 194, fig. 122, 123]. On the second table there are placed three things: bowl, jug with a lug and a pot with low neck (pl. IV-1,2). Similar pots are often represented in Sumerian glyptic and sculptures. Sculpture of Gudea, king of Lagash is holding similar pot. Sculpture of Ishtar from Mari is also holding the similar one [Bahnassi 1987: 24, pic. 17] and another is represented on a wall painting in Mari [Bahnassi, 1987: 33, pic. 33]. Almost identical silver "vase" was discovered in Lagash. According to the inscription it belonged to Entemena, king of Lagash **[**Frankfort 1970: 67, fig. 70].

On Trialeti goblet image, by side of sacrifice table is placed a big bowl or an incense-burner.

Similar “cult vases” or incense-burners were widely spread in 3rd mill. B.C. Mesopotamia [Bahnassi 1987: 33] and Anatolia [Frangipane, Palumbi 2005: 237, pic. 4,5]. On Karashamb goblet image, by side of the three-legged table is placed pot-stand with a vessel on it (pl. IV-9). Similar examples are often represented on a Sumerian cylinder seals of the Early Dynastical Period [Boehmer, Kossack 2000: 30].

Supposedly, some cultic meaning had bucket-handles shape vessels or a situlas from Trialeti XVII [Жоржикашвили, Гогадзе 1974: 96, таб. 87,88] and Kirovakan [Areshian 2008: 68] kurgans, as well as a bronze vessel with hollow stem and a handle [Жоржикашвили, Гогадзе 1974: 88, таб. 77,108] from Trialeti XV kurgan. Such examples D. Collon united in one typological line named Bucket handles [Collon 1982: 96-100]. Toreutics of this type have parallels in Mesopotamia, Anatolia and Syria and a vessel with hollow stem in Mycenae [Collon 1982: 96-100; Areshian 2008: 70]. It must be mentioned that examples from Ur, Kültepe (pl. V-13) and Mycenae (pl. V-14) were discovered in burials and “buckets” from Tell Asmar and Byblos among a temple treasures [Collon 1982: 98]. Similar vessel is hold by a female figure represented on a cylinder seal of Akkadian period from Tell Asmar. Several cylinder seals with images of figurines holding similar “buckets” were discovered in Ur Royal Tombs and are dated from the Sargonid period (Woolley 1934: 333-334, pl. 214, fig. 347, 349, 351, 353). Nicely ornamented similar stone objects were discovered in Iran in Jiroft [Muscarella 2005: 187, fig. 7] and Dinka Tepe sites. These objects are dated from the 2nd half of the 3rd mill. BC. Much later, on Assyrian reliefs zoo-anthropomorphic creatures are holding similar objects. Function of this object is unclear yet, but for sure it had a ritual meaning. In Assyrian ritual-magic texts these objects are named as “banbuddu” and are used in purification rituals. According to the texts, those subjects were made of metal and were filled by a holy water [Black, Green 1992: 46; Wiggermann 1992: 66]. Executor of a ritual was personifying god Marduk, for ritual he used to “take water form a place of confluence of two rivers, strengthen it with his magic, purify it with holy pray and irritate a human, son of his god” [Wiggermann 1992: 66]. This water was liberating a human from a danger [Wiggermann 1992: 66].
Buckets, represented in Assyrian art, were often decorated with elements of vegetative décor. In some cases on its surface were represented fabulous creatures, sacral tree or a opened door. In some cases these vessels represented an imitation of wicked basket, but the ritual demanded that the vessels must be made of metal [Black, Green 1992: 46; Wiggermann 1992: 66]. Despite that these texts were written in the 1st mill. B.C. according to the images similar images on the early cylinder seals, such purification rituals supposedly were executed also in an earlier period.

It must be mentioned that the first image of an object with bow-shaped handle is dated from the 9th mill. B.C. It is carved on a stone pillar in Göbekli Tepe [Scmidt 2011:58, fig. 29], an ancient shrine in Anatolia. Much later, on Assyrian reliefs, fabulous, zoo-anthropomorphic creatures are holding a “bucket” in one hand and a cone in another are standing by side of a holy tree [Black, Green 1992: 46].

Vessels with a handle discovered in Trialeti culture kurgans, supposedly had a same function as a similar ones represented on Akkadian seals or discovered in rich burials and temples. We can suppose that believes of ancient population of Mesopotamia and Anatolia about opposition of Cosmos and Chaos as well as consecration of the Space found a reflection in cults and rituals of Trialeti culture tribes.

Silver Bucket from Trialeti XVII kurgan is decorated chaotically placed animals and plants, what, in our opinion, represents disordered, amorphous world. It must be mentioned, that similar images are represented on cylinder seals of Akkadian period [Афанасьева 1979: tab. XXI-a]. It could be, that in Sumerian and Akkadian periods function of these vessels was well known for priests, that's why there are no mentions of its use in texts, but in Assyrian period, when ancient rituals little by little became forgotten, in ritual texts appears explanations of functions of holy vessels, which are hold by zoo-anthropomorphic creatures. There could be also another explanation, in Sumero-Akkadian period function of these vessels was sacralized, that's why there is no mention of it in texts, but in Assyrian period started descralization of some ancient rituals and in texts appears function of those vessels and description of consecration rituals using the "buckets".

Supposedly, consecration rituals similar to Sumero-Akkadian ones were executed also by priests of Trialeti culture. One more example of Mesopotamian cultural influence could be the image procession of fabulous characters on Trialeti silver goblet. G. Areshian [Areshian 2008: 66] believes that this image has close parallels in Cappadocian glyptic from Kültepe II (1950-1850 B.C.). Another example could be bird Anzud/Imdugud, which used to be well known in Mesopotamian art and is represented on Karashamb goblet [Оганесян 1988: 151, fig. 3; Аветисян, Пилипосян 2007: таб.II]. It must be mentioned, the lion headed eagle in Sumero-Akkadian period was represented in full face and in later period only in half face. On Karashamb goblet there is an image of a sitting god with a solar emblem and an axe in his hand [Оганесян 1988: 152, fig. 3; Avetisyan, Piliposyan 2007: tab. I]. Supposedly this is an image of Utu/Shamash a god of justice and sun in Sumero-Akkadian pantheon. Similar emblem is represented on a cylinder seal of Akkadian period from Louvre [Афанасьева 1979: таб. XXIV-в]. We could suppose that in the end of the 3rd and in the beginning of the 2nd mill. B.C. South Caucasian tribes were under strong influence of Middle Eastern culture and it is reflected toreutics of Trialeti culture.

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Descriptions of the plates:

I

Pl. I. 1. Golden bowl, VII kurgan of Trialeti [Kuftin 1941: pl. CI]; 2. Golden bowl, Royal tomb of Ur [Woolley 1934: pl. 163] 3. Golden bowl, XVII kurgan of Trialeti [Kuftin 1941: pl. XCIII]; 4. Gold bowl, Vanadzor (Kirovakan) [Khanzadyan, Devejyan 2007: pl. IV]; 5. Bowl made of electrum, Karashamb [Avetisyan, Piliposyan 2007: pl. III]; 6. Silver bowl, XV kurgan of Trialeti [Kuftin 1941: pl. CII] 7. Bucket handle, XVII kurgan of Trialeti [Kuftin 1941: pl. LXXXVIII]; 8. Bronze bucket handle, XV kurgan of Trialeti [Kuftin 1941: pl. LXXXVII].

Pl. II. 1. Silver goblet, V kurgan of Trialeti [Kuftin 1941: pl. XCI]; 2. Silver goblet, kurgan of Karashamb [Avetisyan, Piliposyan 2007: pl. I-II].

Pl. III. 1. Silver goblet, kurgan of Karashamb. Detail. Drawing [Boehmer, Kossack 2000:18]; 2. Silver goblet, V kurgan of Trialeti. Detail. Drawing; 3. Silver goblet, V kurgan of Trialeti. Detail [Kuftin 1941: pl. XCI]; 4. Silver goblet, V kurgan of Trialeti. Detail. Drawing [Kuftin 1941: pl. XCI]; 5. Silver goblet, V kurgan of Trialeti. Detail [Kuftin 1941: pl. XCI].

Pl. IV. 1,3. Silver goblet, kurgan of Karashamb. Vessels depicting on the goblet. Drawing [after Boehmer, Kossack 2000:18, Abb. B]; 2,4. Silver goblet, kurgan of Karashamb. Vessels depicting on the goblet. Drawing [free reconstruction D. Narimanishvili]; 5-6. Silver goblet, kurgan of Karashamb. Detail. Drawing [free reconstruction D. Narimanishvili]; 7-8. Silver goblet, kurgan V of Trialeti. Detail. Drawing [free reconstruction D. Narimanishvili]; 9. Silver goblet, kurgan of Karashamb. Detail. Drawing [a. free reconstruction D. Narimanishvili; b. after Boehmer, Kossack 2000:18, Abb. B] ; 10. Silver goblet, kurgan V of Trialeti. Detail. Drawing; 11,12. Arslantepe. Bronze vessels from the "Royal tomb." Drawing [Frangipane 2004: 194, fig. 122, 123]; 13. Silver goblet, kurgan of Karashamb. Vessels depicting on the goblet. Drawing [after Areshian 2008:90, Abb. 7].

Pl. V. 1. Silver cup, Troy [Antonova et all. 1996: 37, pic. 8]; 2, 3. Arslantepe. Bronze vessels from the "Royal tomb" [Frangipane 2004: 194, fig. 122, 123]; 4.Golden beaker, Troy [Antonova et all. 1996: 36, pic. 6]; 5. Silver beaker, Troy [Antonova et all. 1996: 97, pic. 103]; 6. Golden beaker, Troy [Antonova et all. 1996: 36, pic. 7]; 7. Arslantepe [Frangipane, Palumbi 2005: 237, fig. 4, 5]; 8. Nuzi ware [Cecchini 1965:fig. 128]; 9.Nuzi ware [Cecchini 1965:fig. 245]; 10. Jiroft [Muscarella 2005: 190, 191, fig. 10-12]; 11. Jiroft [Muscarella 2005: 193, fig. 15]; 12. Lori-Berd [Деведжян 1981: таб. X-4]; 13. Kültepe II [Collon 1982: fig. 2]; 14. Mykenae [Collon 1982: fig. 2].

Pl. VI. 1. Silver bowl, XV kurgan of Trialeti [Kuftin 1941: pl. CII]; 2. Tello [Müller-Karpe 1995: 321-322]; 3. Tepe Giyan [Müller-Karpe 1995: Abb. 7-18]; 4. Chanhu Daro [Müller-Karpe 1995: Abb. 7-23]; 5. Silver mug, XVI kurgan of Trialeti [Kuftin 1941: pl. CII]; 6. Kale Nisar [Müller-Karpe 1995: Abb. 7-13]; 7. Tepe Guran [Müller-Karpe 1995: Abb. 7-14]; 8. Luristan [Müller-Karpe 1995: Abb. 7-19]; 9. Larsa [Müller-Karpe 1995: Abb. 7-8]; 10. Ur [Müller-Karpe 1995: Abb. 6-13]; 11. Tsitelgorebi kurgan [Pizchelauri 2005:Taf. XLV-1]; 12. Assur [Müller-Karpe 1995: Abb. 7-1]; 13. Kiketi [Kiguradze, Sagona 2003: 73, fig. 3.28]; 14. Nuzi ware [Stein 1984: pl. VII-1]; 15. Nuzi ware [Stein1984: pl. V-15].

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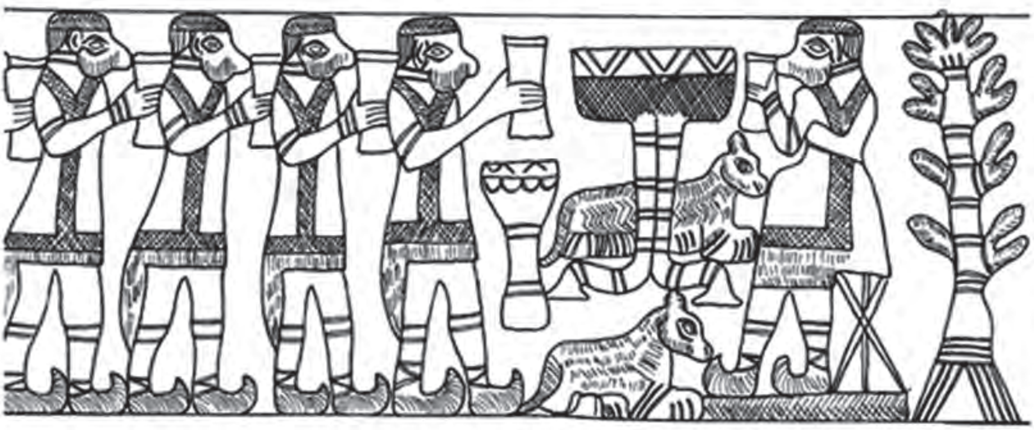

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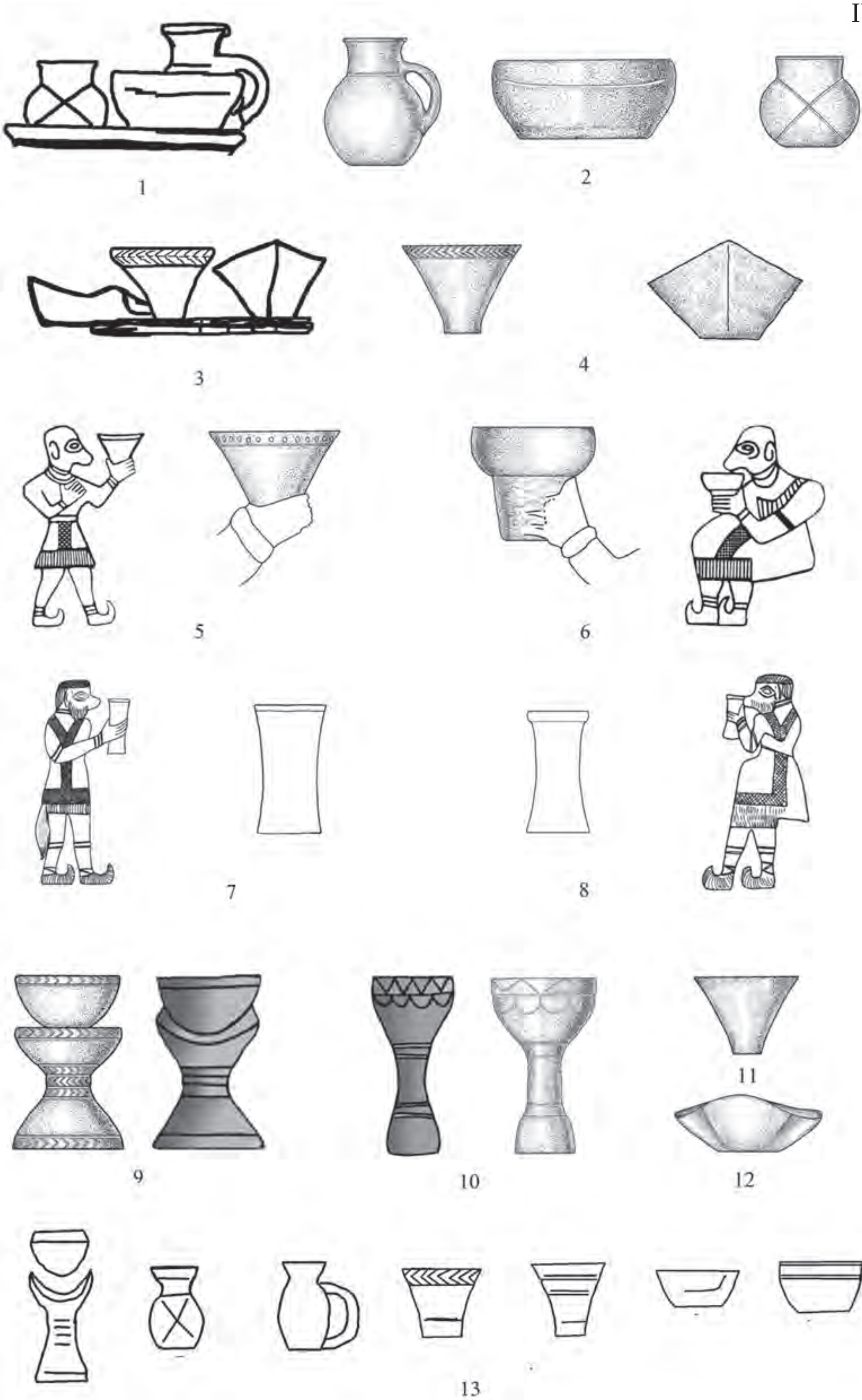

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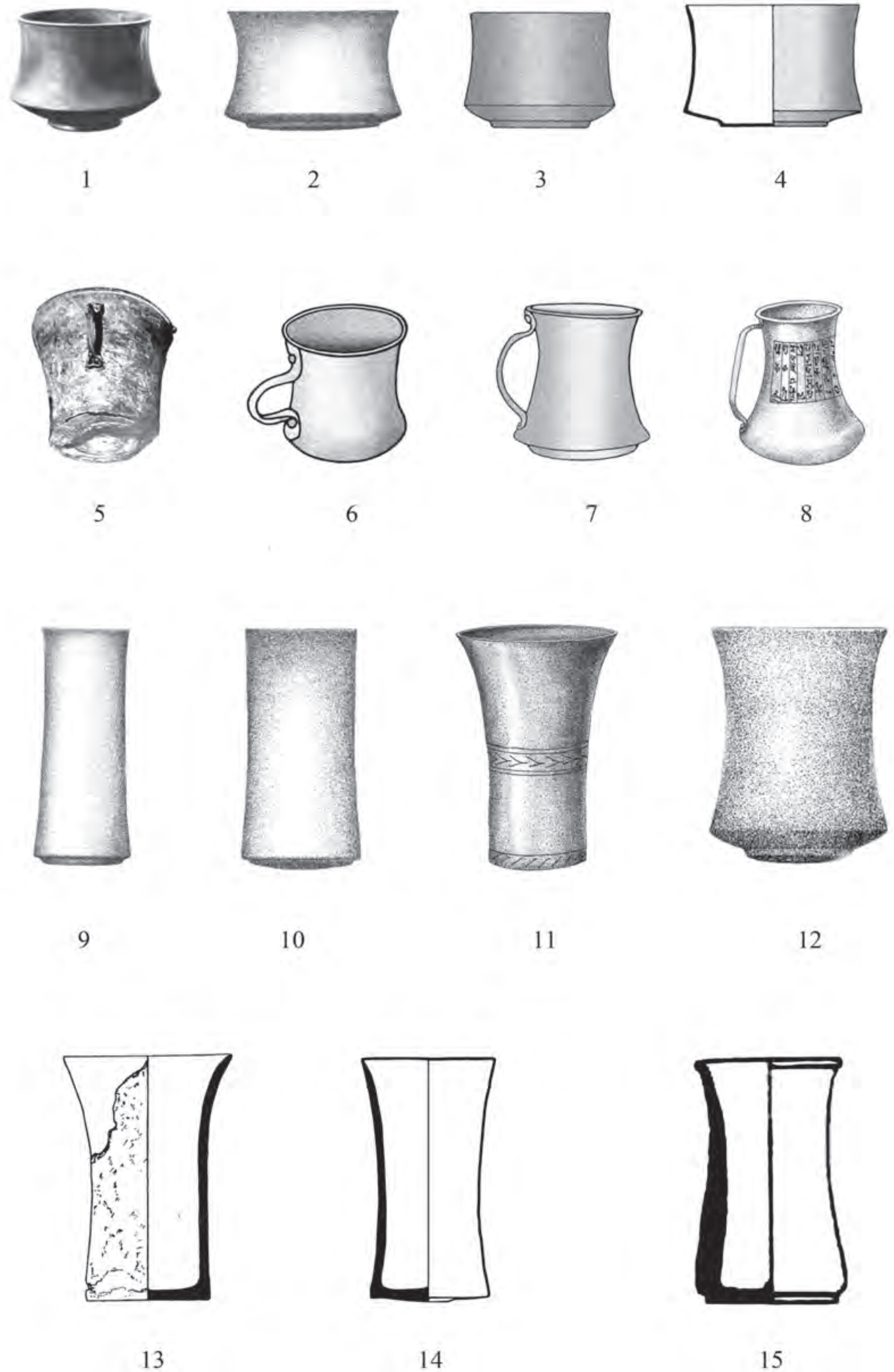

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ანანაურის ყორღანიდან
(ზ. მახარაძე)

დაიბეჭდა
შპს „მწიგნობარი“

Cover Image:

Golden Jewelry
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