ARAM GEVORGYAN, ARSEN BOBOKHYAN
Dr. Hist, Institute of Archaeology and Ethnography,
National Academy of Sciences of Republic Armenia,
argev@mail.ru arsenbobokhyan@yahoo.com

METALLURGY OF ANCIENT ARMENIA IN CULTURAL AND HISTORICAL CONTEXT

Introduction

The territory of contemporary Republic of Armenia is divided into eleven provinces (marz). Six among these provinces are metalliferous (Lori, Tavush, Kotayk, Vayots Dsor, Syumk, Gegharkumk) and five - non-metalliferous (Erevan, Ararat, Armavir, Aragatsotn, Shirak). However, all of the mentioned eleven provinces (supplemented by the data from the Republic of Mountainous Karabagh) attest very active prehistoric and early historic metallurgical activities reflected both in ancient mine exploitations (within metalliferous provinces) and in secondary metal production (both within metalliferous and non-metalliferous provinces).

The main purpose of our project is to clarify the peculiarities of metal miming and production in the Bronze and Iron Age Armenia reconstructing ancient metallurgy as a part of the social system of the local cultures, trying to recover the ways of miming and distribution of metal products, the routes of their spreading, as well as the concrete and abstract values of the society. The final result of the work could be clarification of the mentioned questions in the context of archaeology of ancient Armenia (first stage), Caucasia and Anatolia (second stage), as well as the Near East and the Aegean (third stage).

With this purpose our team during 2009 and 2010 visited metal mines and archaeological sites in Armenia, trying to define some questions which should lie on the ground of a project to be expanded in the future years. As a result of those works archaeological excavations have been undertaken at the site Margahovit since 2011. In this report preliminary results of the survey works are described.[1]

[1] The project was initially a collaboration between the Institutes of Archaeology (Aram Gevorgyan) and Geology (Khachatur Meliksetyan) with Idahoo University (David Peterson). In this article only archaeological and historical aspects of the problem are considered.
Chronology of mentioned in the text periods is as follows: Chalcolithic (5200–3500 BC), Early Bronze (3500–2400 BC), Middle Bronze (2400–1500 BC), Late Bronze (1500–1200 BC), Ealy Iron (1200–900 BC), Middle Iron (900–700 BC).

Before going to the results of our main survey, it should be mentioned about the earlier works towards the topic. The question of ancient metallurgy in world archaeology became actual only since the middle and especially the end of the 19th century. Likewise, the first, however, rudimentary reflections towards ancient metal and miming in Armenia belong to this very period. Particularly, among the first 'investigators' of ancient mining in Armenia was the German geologist H. Abich, in whose geological descriptions there are some essential information on possible ancient workings in the region.[2] Other reflections towards ancient miming, workshops and metal values belong to the French engineer J. de Morgan. While working in the mines of Alaverdi district exploited by the French, he made wide excavations here and considered the corresponding data from archaeometallurgical point of view.[3] Among the Armenian specialists, the ethnologist E. Lalayan was among the firsts who mentions the metal mines of Lori in archaeometallurgical context stressing that some of the mines could be used also in ancient times, attested by the traces of old wells and foundries.[4] First chemical investigation of Armenian and Caucasian metal belongs to the Russian specialist V. Skinder at the beginning of the 20th century.[5] However, it was the Russian/German archaeologist A. Iessen, who in 1930-s presented ancient miming and metallurgy of Armenia very scientifically in the context of Caucasian and later the Near Eastern archaeology.[6] During the second half of the 20th century archaeometallurgical investigations in Armenia are connected with the names of E. Chernykh[7] and A. Gevorgyan[8], who did a lot in surveying of ancient mines and their archaeological contexts. The questions on ancient miming in geological context are reflected also in the works of I. Maghakyan,[9] E. Madatyan,[10] S. Aivazyan,[11] S. Goginyan[12] and Kh. Meliksetyan.[13]

From this point of view our main purpose is to compare new investigations with that of made in the last century, both calibrating our new analyses with old ones and making up new background in using of these data in archaeological terms.

[2] Cf. **Iessen**, 1935, 8–22; **Gevorgyan**, 1980, 9; **Devejyan**, 1981, 6. For the common history of investigation of archaeometallurgy of Armenia cf. **Gevorgyan**, 1980, 8–20, as well as **Melkumyan**, 1972, 5–18.
[3] **De Morgan**, 1889, 65, 85.
[4] **Lalayan**, 1901, 271.
[5] Cf. **Gevorgyan**, 1980, 9.
[6] **Iessen**, 1935; 1963.
[7] **Chernykh**, 1966; 1992; **Gevorgyan**, **Chernykh**, 1971.
[8] **Gevorgyan**, 1972; 1973; 1980. From archaeological point of view important are also the works of O. Xnkikyan towards crafts of Bronze Age Armenia (cf. **Xnkikyan**, 1977).
[9] **Maghakyan**, 1941.
[10] **Madatyan**, 1965; 1987.
[11] **Aivazyan**, 1968.
[12] **Goginyan**, 1964; 2005.
[13] **Meliksetyan et al.**, 2003; **Meliksetyan**, **Pernicka**, 2007.

Besides, it will be also very important to conduct contextual analyses of old and new finds and situations, which has not been done in Armenian archaeology thus far. One of the essential novelties of our project will be new descriptions, precise mapping and spatial analyses of ancient mines and archaeological sites at and far from these mines, using GIS system.

The perspectives of conducting such work in Armenia are evident. This region is not only very rich in metal mines and in archaeological materials towards ancient metallurgy. It is a very important area where the Near Eastern and northern Steppe cultures, it means two different worlds based on different value systems, should impact. And this impact is expected to be reflected among others also in metallurgical developments of the region.

I. Metalliferous Provinces

I.1. Lori

1. Lori is the northern province of Armenia, bordering to Georgia from the north. Archaeologically stands Lori near to Tavush and Shirak regions, as well as to southern Georgia.

2. Lori is the richest in metal mines region of Armenia. These mines are distributed within some sub-regions among which are Alaverdi mining district (Alaverdi, Shamlugh, Akhtala, Armutli), Martsiget river basin mining district (Zhangari, Sari Aghbyur, Hakhmidsor, Acharkut by the village Lorut), Ledzhan mining district (Privol'noe, Alvard/Rudnichnaya Balka or Madani Mat, Mets Dsor, Aghvi, Spasakar and Kachachkut by Lalvar, as well as Belaya Tserkov'), Hankadsor-Sisimadan mining district (Sisimadan, Antonovo, Hankadsor), Margahovit mining district (Margahovit, Fioletovo, Tandsut, Frolova Balka). These all appearances are characterized through accumulations of ancient slags, as well as workings.[14]

Some of the mentioned mines are disposed by archaeological sites or are connected with them. Among such sites worth mentioning are Shamlugh (Kura-Araxes Culture ceramics), Lorut (settlement of Kura-Araxes Culture with potter's workshop, a Kura-Araxes shaft hole axe, tomb of the Middle Bronze Age), Alaverdi town (a copper pick axe of the 3rd millennium BC with Anatolian-Mesopotamian-East European parallels),[15] Ledzhan (Kura-Araxes burials), Fioletovo and Margahovit (Kura-Araxes settlements on the mines), Akhtala (Late Bronze Age hoard of seven flat and seven massive axes deposited in a copper cauldron and to be found just in the territory of metal enrichment fabric, Late Bronze-Early Iron Age metal workshop, J. de Morgan's excavations of the Iron

[14] **Goginyan**, 2005, 50–68; cf. **Devejyan**, 1981, 5–6. For Armenian medieval sources on mining in these districts cf. **Goginyan**, 2005, 52, 56; **Devejyan**, 1981, 5.

[15] Such axes could be used also during metal–working process (cf. **Xnkikyan**, 1977, 16).

Age tombs, among which also tombs of metalworkers), Lalvar (Early Iron Age cemetery).[16]

3. The archaeology of Lori is only partly investigated.

Chalcolithic sites are not known.

Early Bronze Age is very good represented in Lori through settlements and less tombs (Tagavoranist, Dimats, Kosi Choter, Lorut).

Middle Bronze Age is known only through tomb excavations (Vanadsor, Lori Berd, Kamakatar, cf., however, the settlement of Lori Berd).

Late Bronze Age (Cheshmanis, Dimats, Lori Berd) and Early Iron Age (Kobayr, Vornak, Sanahin) are also represented through cemetery excavations.

Middle Iron Age is known by investigations of big cemeteries (Vornak, Musieri, Akhtala, Uch Kilise). Urartian materials are present only at Lori Berd demonstrating the impact of the local and the Urartian cultures. Lori, perhaps Lusha of Urartian cuneiform sources, was clearly under the influence of the Urartian state.[17]

Margahovit

1. The name of the hill, on which the archaeological site is disposed, is Sari Sop (Fig. 1, 2). The site is situated within the village Margahovit, 17 km far from Vanadsor town, Lori province, just in the central part of the highway Vanadsor-Dilijan, on a crooked plain. Margahovit is well known by its gold and copper ores.

2. First mentioning of Sari Sop belongs to E. Khanzadyan. While speaking about the sites of Kura-Araxes Culture in historical province Tashir-Dsoraget (one part of which was Lori), she makes a superficial note: 'An Early Bronze Age settlement has been also discovered in the village Margahovit of Kirovakan region, at the sources of the river Aghstev, on the hill called Sari Sop'.[18] According to other data, within the gold mines of Margahovit archaeological finds have been discovered, which speak for the mine to be exploited since early times and this

[16] **Devejyan**, 1981, 8; 2001, 9–21; **Martirosyan**, 1964, 141; cf. also **Martirosyan**, 1964, 115–117 and **Xnkikyan**, 1971 (for Akhtala), **De Morgan**, 1889 (for Lalvar). The old settlements of Lorut and Ledzhan/Alvard/Rudnichnaya Balka are mentioned also by geologist S. **Goginyan** (2005, 56–57, 60). For excavations of E. Takayshvili in Privol'noe cf. **Devejyan**, 1981, 7. The comparison of chemical compositions of the metal from Alaverdi, Akhtala and Shamlugh mines with those of archaeological artifacts, demonstrates that they could be used during the Late Bronze-Early Iron Ages (**Gevorgyan**, 1980, 23–24).

[17] **Devejyan**, 1981; 2001. For Lusha cf. **Arutiunyan**, 1985, 131.

[18] **Khanzadyan**, 1967, 20. For another short reflection towards Margahovit cf. **Devejyan**, 2001, 21. The Geologist S. **Goginyan** (2005, 74, cf. also 106, 126 – no. 28, 29, 140) writes towards Margahovit gold mine as follows: 'In the place of geological tunnel N 10 there are traces of an old settlement. They are represented by rectangular deepenings with fallen stone walls. Some stone channels /now to be kept on the depot of Margahovit consignment/ were found just here, which were used, possibly, during the washing of the gold'. I think the author means here the Early Bronze Age site Margahovit under consideration.

metal processing should be connected with the archaeological site under consideration.[19] In 2000-s the site was visited by A. Gevorgyan and A. Palmieri, who were excavating in the nearby mining settlement Fioletovo, as well as by R. Badalyan, who is preparing a catalogue of Kura-Araxes sites of Armenia. No excavations or surveys have been conducted in the site.

3. During our visit of the site in 2010 we collected diagnostic surface materials which demonstrate that we deal with a big settlement (of area of about 7-10 ha or more?), which is fortunately not disturbed by later activities (only some recent graves of the 19-20th centuries and a new shrine-khachkar are visible on the surface). It is disposed on a natural hill and seems to be formed by the thick levels of cultural deposit (modern hill is ca. 10 m high from the valley level). The site is defended by walls of middle-size stones from all the sides, which are visible only in some places. Accumulations of regular stones within the site attest the existence of some kind of rooms. The site should have also a lower town and a cemetery the territory of which is currently under agricultural works by the villagers. Some other smaller settlements are situated around Margahovit.

Shreads of classic Kura-Araxes ceramics, discovered both on the central part of the hill and on the slopes, show that the settlement was densely populated during the Early Bronze Age - surely the main period of habitation of the site. The question is, if the rests of fortification structures, visible in different parts of the hill, belong to the Early Bronze Age settlement? In any case, the shreds of the Late Bronze-Early Iron Ages, as well as Hellenistic and medieval ceramics prove that the life on Sari Sop continued also during later periods (on the whole 25 shreds have been gathered, the main part of which belonged to the Bronze and Iron Ages).[20]

The importance of Margahovit is that it is the biggest and the most central site in the settlement system of the Margahovit valley, situated just by the metal mines. Around Sari Sop are situated such sites as Karhunk-Tala, Gzraver, Jaghatsner-Aibasan, Achajur Handamas, Gruzinskaya Gorochka, Burtsevo, Shavrukh. The site is disposed from the one hand on the road connecting Kirovakan region with that of Dilijan, from the other hand the distance between Margahovit plain and Meghradsor, the other mining district in Kotayk region of Armenia, is only 8,5 km

[19] **Margahovit**, 1981, 300; **Hakobyan et al.**, 1988–2001, v. 3, 724–725. For ancient workings in Margahovit gold mines and corresponding gold washings cf. **Madatyan**, 1965; 1987, 90; **Esayan**, 1976, 190–192; **Goginyan**, 2005, 73–75; Gevorgyan A., Zalibekyan M., in: **Kalantaryan**, 2007, 22.

[20] Materials concerning different periods of prehistory of the village are kept in the local museum of Margahovit. (for the hint we thank Dr. Ruben Badalyan, Institute of Archaeology and Ethnography, Armenian Academy of Sciences). Among the materials are objects belonging to the Early Bronze (vessels, a metal adze with high nickel composition and a spiral) and Late Bronze-Early Iron Ages (vessels, a kernos, bronze bracelet found with a flask, an iron dagger) to be illegally excavated mainly at the place called Achajur Handamas. Medieval pottery and a finger-ring is reported to come from a place called Gzraver.

in direct line, and it is very possible that these two regions acted within the same system of metal production and distribution in ancient Southern Caucasia (it is also worth mentioning that the site is not far from the Georgian border).

Fioletovo

1. The archaeological site (called by the local people 'castle') is situated on the east edge of the village Fioletovo, Lori province, 22 km to the south-east of Vanadsor town. It is populated by the Russian community of molokans migrated here at the beginning of the 19th century from Tambov province of Russia.

2. In 1960-s excavations were conducted in Fioletovo by A. Mnatsakanyan. In the eastern part of the citadel he made a small ditch, however, there is no excavation report published. In one of his articles about Lchashen the author mentions only an obsidian arrowhead from the site.[21] E. Khanzadyan reckons Fioletovo among the Early Bronze Age sites.[22] S. Devejyan brings an Early Bronze Age chance find of a small bull sculpture from Fioletovo.[23] In 1999 A. Gevorgyan and A. Palmieri undertook here test excavations.

3. The site is disposed on a natural hill, on the right bank of the river Aghstev and is 55 m high from the river level. On the whole upper part of the hill traces of fallen fortification walls of cyclopean masonry and in western edge - the outline of a buttress are clearly visible. All of the walls of the citadel consist of big fragments of the local granite-diorite.

During recent excavations it turned out that the hill was inhabited since the Early Bronze Age II (28-26th centuries BC). The Middle Bronze Age materials fail. During the Late Bronze Age some activation of life is visible in the site to be attested by small quantity of corresponding ceramics. The life in the settlement wholly revives in the Early Iron Age.

As a result of the mentioned investigations it was managed to clarify that the inhabitants of ancient Fioletovo were specialized in gaining and enrichment of copper ores from the very beginning of its foundation. The ore was brought to the site from the neighboring hill, where copper ore mines are situated. This is attested above all through the big quantity of stone tools discovered both during the excavations and surveys on the territory of the hill and its slopes.[24]

Sisimadan

1. Other name - Lori. The Sisimadan mine is located by the village and resort house Lori, in the gorge Sisi Jur, 2,5 km south-east from the village and railway-

[21] **Mnatsakanyan**, 1965, 98.
[22] **Khanzadyan**, 1967, 20.
[23] **Devejyan**, 2001, 20.
[24] **Gevorgyan, Palmieri**, 2001.

station Vahagni (Shahali), which is situated in its turn 12 km north-east of Vanadsor, Lori province on the lower flow of the river Vahagni.

2. Although the questions on ancient mining in Sisimadan mine have been discussed many times, however, archaeologically still remains the district to be not investigated. Among the first investigators of Sisimadan mines in the mid-19th century was the well known German geologist H. Abich. On the ground of his descriptions of old workings, A. Iessen discussed the problem of possible ancient miming here.[25]

3. In the neighborhood of Sisimadan are situated the ruins of Hani, Verin Vahagni, Chamanlu and other deserted old settlements, churches and cemeteries, which should belong to the medieval period.[26]

The only archaeological find from the district is a splendid sword with crescent-shaped hilt and swastika images to be found accidentally from the village Vahagni and kept in the local museum at the secondary school. The hilt of this perhaps cultic sword is of bronze and the blade of iron. Similar finds are known only from north-eastern Armenia (Zarkhech, Astghi Blur, Noyemberyan), similar ones - also from other regions of Armenia (Shirakavan, Spandaryan, Lori Berd), as well as from Luristan, Iran and are dated as a rule into the 8-6th centuries BC.[27]

The concentrations of old looking slags, as well as many irregular pits around the miming district, do not except the possibility of their exploitation also in ancient times.[28] Some observations towards Sisimadan mines bring to supposition that it could be used since the Bronze Age. Particularly, the comparison of chemical compositions of the metal ore from Sisimadan mine with those of corresponding archaeological artifacts, demonstrates that they could be used since the Late Bronze Age.[29]

Hankadsor

1. The former village Hankadsor is situated on the right bank of the river Alareks. At the beginning of 1960-s the village was resettled because of small quantity of population. On the Hankadsor plateau, along the Sisiget river, 16 km to the south-east from the village and railway station Vahagni/Shahali, copper and poly-metallic ores are present.[30]

2. Hankadsor is archaeologically unknown (the only find from the district is the mentioned sword with crescent-shaped hilt to be discovered at Vahagni, see

[25] **Iessen**, 1935, 50.
[26] **Hakobyan et al.**, 1988–2001, v. 4, 735.
[27] **Devejyan**, 2001, 132–133, fig. XII/2; cf. also **Esayan**, **Hovhannisyan**, 1969, 37, tab. XXXVII/6; **Esayan**, 1976, tab. 140/2.
[28] **Melkumyan**, 1972, 103–104; **Goginyan**, 2005, 64.
[29] **Gevorgyan**, 1980, 27; cf. also **Devejyan**, 1981, 6.
[30] **Hakobyan et al.**, 1988–2001, v. 3, 350; cf. **Devejyan**, 1981, 6.

Sisimadan). Archaeometallurgy and miming of Hankadsor were discussed by A. Gevorgyan and S. Goginyan.

3. At the border of the 19-20th centuries AD a French metal enrichment plant and workers' village was erected here. In 1918 the fabric was left and dismantled.[31] Today the ruins of the fabric look like an archaeological site, which is similar to a medieval desolated fortress.

In any case the presence of old looking slags around the miming district do not except the possibility of its exploitation also in ancient times.[32] The Hankadsor mines are characterized by richness of oxidation zones, as well as by many traces of workings, part of which, according to their characteristic traits, could belong to ancient times. Moreover, the comparison of chemical compositions of metal from Hankadsor (as well as from the nearby Antonovo) mine with those of corresponding archaeological artifacts, demonstrates that they could be exploited since the Early Bronze Ages.[33]

Teghut

1. The village Teghut is situated 16 km east of the town Alaverdi, Lori province, on the right bank of the river Shnogh, tributary of Debed, in a landscape rich in forests. The village is known with its turquoise ores. In recent times Teghut region turned to be an important miming region with rich copper resources which are currently being exploited with merciless deforestation of the landscape.

2. Earlier the region was scarcely known archaeologically first of all because of its landscape rich in forests (not mentioming the medieval monuments known in the village since the 10th century AD). Only since 2009 rescue archaeological surveys and excavations have been conducted in and around the village Teghut (as well as partly in the nearby village Shnogh), where the mining activities are currently concentrated. These investigations are guided by S. Hobosyan, Institute of Archaeology and Ethnography, Armenian Academy of sciences.

3. Within the mining district surveys and excavations have been conducted which attest that the main periods of habitation and metallurgical activities in the territory of Teghut mining district are Middle Iron Age and medieval times, however, also data towards possible habitation and metallurgical activities during the 3rd millennium BC are attested.[34]

[31] **Goginyan**, 2005, 65–68; cf. **Melkumyan**, 1972, 114–119.
[32] **Goginyan**, 2005, 67.
[33] **Gevorgyan**, **Chernykh**, 1971, 401; **Gevorgyan**, 1973, 36–37; 1980, 24–25; cf. also **Devejyan**, 1981, 6.
[34] **Hobosyan**, 2011. In the local museum of Shnogh (situated at the secondary school) Kura-Araxes vessels are kept found in the village, attesting the existence of Early Bronze Age in the district (cf. **Devejyan**, 1981, 8; 2001, 10). Also a Middle Bronze Age tomb is known from Shnogh (**Devejyan**, 2001, 5). For early stages of history of Shnogh cf. also **Karageoyzan**, 1998, 109–110.

The main importance of the Teghut archaeological sites is that they are immediately situated on the copper rich mines and should have been connected with metallurgical industry in ancient times.[35] However, another trait makes Teghut very important and not only in regional context - the presence of turquoise. Teghut, known with its turquoise ore since 1974, is considered to be the only ore of this precious stone in Caucasian region. This light-blue stone of Teghut with its appearance is similar to that of from Iranian ore Nishapur,[36] however, it is a question if the Teghut deposit was used in ancient times. In special literature is commonly accepted that the Near Eastern lands received turquoise from Khorasan, Eastern Turkestan, Badakhshan and China.[37] Such provenance was supposed also for the turquoise objects found from prehistoric sites in Caucasian region such as Kultepe of Nakhichevan (Copper Age), Maikop (Early Bronze Age) and Trialeti (Middle Bronze Age).[38] The case of Teghut turquoise can add our knowledge in interpretation of problems concerning the origin and distribution of this precious stone in early societies of the Near East and Caucasia.

Mghart

1. Other name Magharat.[39] The village Mghart is situated 22 km south-west of Alaverdi, on the southern slope of the mountain Shekaghbyur, surrounded by forests. Mghart is well known through its medieval monuments.

2. No archaeological investigations - surveys or excavations have been conducted in or around Mghart yet.

3. The only information on archaeological finds from Mghart is restricted by a tomb dated to the 9-7th centuries BC, from which an iron sword with flanged hilt, as well as bronze bracelets with heads in snake forms were found. Among the finds was also another sword with 'fan-formed' bronze hilt (blade of iron) typical for Luristan and known also in Talish and southern Caucasia (Koghb, Karaklis, Ani, Aligrikh, etc.).[40]

Armanis

1. Other name - Ermanes. The village of Armanis is situated 4 km to the west of the town Stepanavan, Lori province, on the right bank of the river Dsoraget. It is

[35] Written sources mention that metal mines of Teghut and Shnogh were exploited in medieval times, which makes difficult the finding of earlier exploitation traces, the presence of which is beyond doubt (**Martirosyan**, 1954, 104).
[36] **Seiranyan**, 1987, 54.
[37] Cf. **Stöllner et al.**, 2004, 67.
[38] **Kuftin**, 1941, 92; **Munchaev**, 1975, 221; 1994, 194, 213; **Dzhafarov**, 1984, 4; cf. also **Mellaart**, 1966, 155, 163.
[39] For a possibly Urartian etymology of this name cf. **Karageozyan**, 1998, 172.
[40] **Kuftin**, 1941, 64, fig. 62; **Martirosyan**, 1964, 223; **Pogrebova**, 1977, 53.

well known by its metal mines.[41]

2. Surroundings of Armanis are rich in archaeological sites to be investigated since 1969 by S. Devejyan.

3. The most important among archaeological sites in the surroundings of Armanis is Lori Berd, situated within the village by the same name, 2 km north-west of the town Stepanavan. From both sides it is surrounded by deep gorges formed by the rivers Miskhana and Dsoraget. On the high plateau of the left bank of the river Miskhana the settlement is situated. The cemetery is spread in and around the village. The preliminary survey and small excavations within the settlement of Lori Berd demonstrate that this site, with its non-canonic rectangular rooms and cyclopean masonry, was mainly inhabited during the end-phase of the Middle Bronze Age (ca. 17th century BC). The life in the settlement should continue until the Middle Iron Age (7-6th centuries BC), as well as in medieval times.

However, the most important results come from the excavations of Lori Berd cemetery which proved the presence of tombs from the Middle and Late Bronze, Early Iron, Middle Iron and Achaemenide periods (end of the 3rd – mid-1st millennia BC). Although the main tombs have been plundered, however, the materials obtained both from the Royal or Priestly tombs (cromlech barrows with horse sacrifices and rests of wagons, metallic standards and models), as well as common ones show the extraordinary importance of the site in regional and interregional context. A lot of metal finds of bronze, iron and precious metals make Lori Berd the richest site of Armenia in metal finds. These objects show different relations with the Near East, Anatolia, the Aegean and Russian Steppes. Lori Berd is also a typical site where local and intrusive cultural elements meet (cf. the impact of the local cultures with that of Urartian, Skythian or Achaemenide). These all traits of Lori Berd are not accidental because the site is situated in the neighbourhood of important mines (such as Armanis, Shamlugh, Mets Dsor, etc.) and on that very route which connected Southern Caucasia with the Near East.[42]

Another excavated site is Cheshmanis, in south-western edge of the town Stepanavan, on the road leading to Armanis. On the Cheshmanis hill the ruins of a cyclopean fortress are visible and on its slopes the big cemetery stretches, which is partly destroyed because of erection of new buildings. Occasional investigations in Cheshmanis took place since the end of the 19th century. However, canonic excavations of the cemetery began in 1980-s. The tombs uncovered date to the last stage of the Late Bronze and transition to the Early Iron Ages (13-12th centuries BC) and contain ordinary materials (among them also of bronze, antimony and tin),

[41] Another name of Armanis is Voskesar - arm. 'golden mountain', which concerns its gold mines.

[42] **Devejyan**, 1981; 2006. For Armanis gold mines and traces of ancient mining (different pits), as well as for three jewelry molds from the tombs 12 and 21 of Lori Berd cemetery (13–12th centuries BC), cf. Devejyan, 1981, 6; Gevorgyan, A., Zalibekyan M., in: **Kalantaryan**, 2007, 22, 38–39.

if we compare them with that of nearby Lori Berd. Presumably we deal here with the cemetery of a community that fell under sphere of socio-cultural influence of Lori Berd. Also materials concerning Early Bronze Age have been found on the territory of the site Cheshmamis.[43]

Mets Dsor

1. Mets Dsor is the name of the mine situated in 6 km far from the village Agarak (5 km to the east of Stepanavan town, Lori province), on the upper flow of the river Hovhanadsor, left tributary of Dsoraget.

2. Surroundings of Agarak village and that of Mets Dsor are archaeologically unknown. In Agarak medieval monuments since the 10th century AD are present. However, some sources mention also 'ruins of old settlements' around Agarak in the places called by the local people Darmanatagh, Achkahank, Kar Hogher, without specifying the time belonging of these settlements.[44]

As to the mine of Mets Dsor, according to S. Goginyan, it is known since ancient times, which is attested through the presence of old workings covered with turf, as well as of their funnels.[45] Mets Dsor can be important especially through its arsenic compositions, so important for Armenian bronzes since the Early Bronze Age.

I.2. Tavush

1. Tavush is the north-eastern province of Armenia bordering with Azerbaijan from the east and with Georgia from the north. Archaeologically stays Tavush near to Lori province, however, close connections are visible also with central regions of Armenia, as well as with southern Georgia and eastern Azerbaijan.

2. Metal mines of Tavush region can be divided into two sub-districts - northern around Noyemberyan and southern around Ijevan.

The northern mines are concentrated around the village Koghb where ancient slags and working traces are reported from the mines Miskhana, Boveri Gash, Shlorkut, Kartsagh. Especially noteworthy is Boveri Gash 3,5 km to the south-west of Koghb, where in the place named Boveri Gomategh an accumulation of slags was discovered and by which ruins of an ancient settlement and cemetery are present. Also Miskhana is very important where in the place named Miskhana Gomategh slags in connection with an ancient settlement were fixed: the presence of a burial within the slags covered by drift seems to be very interesting. In Shlorkut, in the place called Gilatsakarer, accumulations of iron slags, fragments of clay crucibles and hematite ore are visible: besides, a burial was discovered in the same place (not far from it is a settlement and a cemetery).

[43] **Devejyan**, 2001, 83–147.
[44] **Hakobyan et al.**, 1988–2001, v. 1, 19.
[45] **Goginyan**, 2005, 61; cf. also **Melkumyan**, 1972, 127–130; **Devejyan**, 1981, 6.

Southern mines of Tavush region are situated mainly in upper flows of the rivers Hakhum, Tavush and Mehrab. Among them are Hanki Dsor, Khanum Yurt, Karaghan Dsor, Soghyuti, Tanduran, Archi Kogher, Jught Jraghats, Kosha-Dogherman, Navur (copper), Movses (lead-zinc), Erkatatsaker (iron). Only in some points old slag accumulations and traces of ancient workings (Erkatatsaker) are known. In the place Kushdzhaghats fragments of clay nozzles, damp blow furnace and an accumulation of iron slags have been found. Interesting are also the mines along the Agstev river (Haghartsin, Dilijan) with a lot of accumulations of slags, part of which are around archaeological sites such as Golovino and Khrtanots.[46]

3. The archaeology of Tavush District is more or less known.

Chalcolithic sites are not known yet.

Early Bronze Age Kura-Araxes Culture is represented mainly in cyclopean fortress-settlements and by chance finds (Jaghatsategh, Shaghlama, Jujevan).

Middle Bronze Age is known from cemetery excavations and chance finds (Joghaz, Kirghi, Navur, Ijevan, Enokavan).

Late Bronze Age materials derive mainly from cemeteries (Kirghi, Aygedsor, Dzharkhech).

Early Iron Age settlements and cemeteries are well known in all districts of Tavush province (Poploz Gash, Khortambots, Bardsraberd).

Middle Iron Age is the richest period of habitation known from excavations and surveys of many sites (Astghi Blur, Norashen). Typical Urartian materials fail from the region.[47]

Both the existence of metal mines and archaeological finds/contexts make Tavush very important in ancient metallurgical developments of Southern Caucasia. Such finds as the Middle Bronze Age axes of Tepe Gawra type from Navur or the anchor axe from Ijevan, with typical Mesopotamian, Syrian and Iranian parallels, demonstrate that the region was involved in the system of Near Eastern trade relations. In the Late Bronze and Iron Ages the sites of Tavush demonstrate typical repertoire of Lchashen-Metsamor Culture with some unique metal finds such as scoops, warrior statuettes, belts, etc. Especially noteworthy is the discovery of metal working contexts in Early Bronze Age settlements Jaghatsategh (a big hemispherical furnace, clay nozzles in form of a tube, big stones for pulverizing the ore), Shaghlama II and Schaglama III (clay crucibles with round bottoms and rounded sides, for secondary smelting processes; cf. also the find of an Early Bronze Age lop-eared axe from Shaghlama II). Metallurgical activities have been uncovered also in Iron Age fortresses of Tavush, among which traces of ovens connected with metallurgy (Ordzhonikidze, Kal Kar, Sev-Sev Kareri Blur), crucibles and spoons for metal smelting (Astghi Blur, Enokavan,

[46] Cf. **Goginyan**, 2005, 26.

[47] **Martirosyan**, 1964; **Esayan**, 1976; cf. also **Kalantaryan**, **Sargsyan**, 2009.

Berdategh, Achadzhur, Tmbadir, Koghb), as well as a stone mold for smelting of jewelry objects (Aygedsor).[48]

Koghb

1. Other names Kulbi, Kulp. Big village in Tavush province, on the left bank of the river with the same name, 4 km west of Noyemberyan town, situated within dense forests. One can differentiate between New Koghb, founded in the first half of the 19th century AD, and Old Koghb, the ruins of which are situated 2 km south-west from New Koghb. The Old Koghb is mentioned in Armenian sources since the 5th century AD and is well known with its medieval monuments and churches.

2. Koghb and its surroundings were partially surveyed and described archaeologically by S. Esayan in 1970-s. Besides, in the local museum of Koghb are collected materials to be accidentally found in and around the village, which help us by preliminary defimtion of habitation stages of the district. During our 2010 visit we met also archaeological materials by the villagers to have been found in their yards (mainly belonging to the Middle Iron and Old Armenian/Achaemenide periods). No excavations have been undertaken here thus fur.

3. Koghb and its surroundings are rich in cyclopean fortresses. They are not big constructions in rude masonry, and belong mainly to the Late Bronze, Early and Middle Iron Ages, as well as to the Old Armenian/Achaemenide period. As a rule, they possess corresponding settlements and are well adapted to local landscapes - dominating over the surroundings and in many cases overlooking on the main Koghb-Noyemberyan-Ijevan route and representing an organized-rational fortification system. Among such fortresses are worth mentioning as follows: 1,5 km south-east of the village is situated a fortress called by the villagers Berdatagh (area 1,5 ha), 300 m east of which ruins of a big settlement named Arsonts Gol are visible. 2-3 km to the east from Arsonts Gol, in the place Arsakar, the cemetery of the fortress is located. The fortress Zikatar is situated 5 km west of Koghb (area 0,25 ha). The fortress Kozmani is 10 km far to the west of Koghb (area 2 ha). Another fortress with its settlement by the name Patashar is disposed 15 km south-west of Koghb (area 0,5 ha). Fortresses are present also in the territory between Koghb and Noyemberyan.[49]

Different chance finds of the Bronze and Iron Ages are known from Koghb. Among them is a complex of weaving objects of antlers.[50] For us is especially interesting a collection of three crucibles of red and dark clay in form of small pots (5-7 cm high, 5-8 cm in diameter), with round or direct bodies, big or directly

[48] **Esayan**, 1976, 176–190. For Aygedsor mold and its parallels cf. also Gevorgyan A., Zalibekyan M., in: **Kalantaryan**, 2007, 37.
[49] **Esayan**, 1976, 213–214, 249–251; cf. **Hakobyan et al.**, 1988–2001, v. 3, 196–197.
[50] **Esayan**, 1976, 210.

narrowing bottoms. Also a pot and a jug with round handle have been found in the same context. It is worth mentioning, that there were pictographic signs on the crucible with round bottom, consisting of lines and angles, which remind flying birds, goats, etc. The complex is dated by S. Esayan into the 6-5th centuries BC.[51]

The last find can not be accidental because Koghb is situated within metal mines, hence finds attesting old metallurgy should be common here. The question is if there are traces of early metallurgical activities in the village. Old Armenian sources mention that metal mines of Koghb and its surroundings were exploited in medieval times, which makes difficult the finding of earlier exploitation rests, the presence of which is, however, beyond doubt.[52] However, as we mentioned above, we have many attestations on ancient metallurgy in the district.

During our visit of Koghb village in 2010 traces of old works were found (Kh. Meliksetyan) around which a great quantity of iron and, what seems to be very important for us, three copper smelting slags, two bones and a stone object looking like an eye, were dispersed together with ceramics which belong mainly to the Medieval times, however, also black-grey-brown shreds were present which could belong to the periods of the Middle and Late Bronze, Early and Middle Iron Ages (we managed to gather ca. 50 shreds around these workings: most of them seem to derive from the nearby settlement).[53] That the Koghb district was inhabited during the Early and Middle Bronze Ages attest also the materials which are kept in the local museum,[54] as well as small barrows with some rows of cromlechs which could be especially typical for transitional period between the Early to Middle Bronze Ages.

[51] **Esayan**, 1976, 188.

[52] **Martirosyan**, 1954, 104. Cf. also **Goginyan**, 2005, 52, 56.

[53] This place seems to be the mentioned Boveri Gash – 3,5 km to the south-west of Koghb, where in the place named Boveri Gomategh an accumulation of slags was discovered nearby an ancient settlement and cemetery (**Goginyan**, 2005, 46–47).

[54] Among the materials from the local museum of Koghb is an Early Bronze Age shaft-hole stone axe typical for Russian steppe cultures (for this tip we are indebted to Dr. P. Avetisyan, Institute of Archaeology and Ethnography, Armenian Academy of Sciences) and could be well used during metal gaining process (cf. **Äyräpää**, 1933). A Middle Bronze Age II Trialeti black burnished vessel from the collection is also worth mentioning (for parallels cf. **Avetisyan**, **Bobokhyan**, 2008, 149, fig. 12/10, 12). The collection possess also different Late Bronze - Early and Middle Iron Age bronze and iron weapons, among which a sword with 'fan-formed' hilt (hilt is of bronze and blade is of iron) is especially noteworthy. Such swords are typical product of Luristan and are attested also in Talish region, as well as, with only some examples, in southern Caucasia and Armenia (Mghart, Karaklis, Ani, Aligrikh) and date mainly to the 9th century BC (**Pogrebova**, 1977, 51–58). Some of the mentioned finds from the local museum of Koghb have been published in a popular book towards the history of Koghb (**Mirzoyan**, 2007, 128, fig. 1–10).
By the church Tvaraeghds we visited a small cemetery with graves covered by big and good worked slabs which turned out to have been excavated during 1970-s (excavations by I. Karapetyan, Institute of Archaeology and Ethnography, Armenian Academy of Sciences) and belong to Late Antique-Hellenistic periods.

Dilijan

1. The town Dilijan, Tavush province, is situated 106 km to the north of Yerevan, on the bank of the river Aghstev. This is a region with dense forests, rich in water and mineral-water sources. It is supposed that the town is situated in the place of the old settlement Hovk in the region Varazhnunik of historical Armenia. Today's Dilijan is formed by means of joining of old and new parts of the town being populated by the Armenians and Russian Molokans.[55]

2. Dilijan and its surroundings are archaeologically known since the second half of the 19th century through excavations in the cemetery Redkin Lager, to be the first excavations in Armenia on the whole (W. von Weisenhof, F. Bayern, P. Uvarov, A. Bobrinskiy etc., later B. Biotrovskiy: materials are spread in the museums of Russia, Georgia, Aserbaijan and Armenia). During the 20th century cemeteries of Khrtanots, Golovino, Papanino were excavated (H. Martirosyan, H. Mnatsakanyan, L. Karapetyan, A. Shahinyan). Also chance finds known from ca. 15 places were investigated in Dilijan (e.g. Kamo street, Ghapar, Furniture Fabric etc.). All archaeological materials found in Dilijan, now in the local lore museum of the town, were gathered and published by S. Esayan.

3. Chalcolithic sites are still unknown in Dilijan. Early Bronze Age Kura-Araxes culture (Down-town, Mets Chal, Redkin Lager)[56] and Middle Bronze Age (Furniture Fabric) materials are still not investigated sufficiently. Better are known the Late Bronze Age materials (Redkin Lager, Jarkhech, Mets Chal, Papanino). However, the most of the materials from Dilijan belong to the Early Iron Age (Redkin Lager, Mets Chal, Golovino, Papanino, Shamkhyan) and especially to the Middle Iron Age (Redkin Lager, Golovino, Papanino, Khrtanots).[57] These all materials are represented by rich repertoire of ceramics and metal finds. The problem in archaeology of Dilijan is that the materials are represented mainly by cemetery excavations and chance finds. No settlement was excavated yet, although such sites should exist in the region since the Early Bronze Age if not earlier. It is also noteworthy, that no cyclopean fortresses are known in the region yet.

Dilijan and its surroundings are rich in metal mines (iron, copper, alluvial gold) the importance of which in prehistoric times was underlined first by J. de Morgan,[58] than by A. Iessen[59] and other authors.[60] Until the mid-20th century AD

[55] **Hakobyan et al.**, 1988–2001, v. 2, 110–112.
[56] A corresponding sherd was found by us in Redkin Lager during 2010 survey.
[57] **Mnatsakanyan**, 1952; 1959; **Martirosyan**, 1954; 1964; **Karapetyan**, **Shahinyan**, 1964; **Esayan**, **Hovhannisyan**, 1969; **Esayan**, 1976; **Ellaryan**, 1980; **Esayan**, **Vatinyan**, 1988. No direct archaeological traces of the Urartians are present at Dilijan and surroundings, however, according to the Urartian cuneiform inscriptions, the Urartians should pass through the valley of Aghstev river (Alishtu of Urartian sources) on the way to Sevan Lake basin (cf. **Esayan**, 1976, 215).
[58] **Morgan**, 1889, 10.
[59] **Iessen**, 1935, 32, 63.

Dilijan was known through its alluvial gold (rivers Aghstev and Shamlugh) to be exploited by the local population of Russians/Molocans. During such works also archaeological materials have been found (such as a coin of Parthian king Ordodes II, 54-39 BC) which attest the possibility of using of these alluvial gold in ancient times.[61]

I.3. Kotayk

1. The province Kotayk is situated west of Sevan Lake. Historically and archaeologically it is especially connected with the Gegharkunik province.

2. Kotayk is rich in metal mines only in the basin of Marmarik river, beginning with Hrazdan town up to the lower flow of the river Kara-Choban. Among them are iron, copper and gold mines of Hrazdan, Aghavnadsor, Meghradsor, Hankavan which all demonstrate slag accumulations and traces of ancient workings (Fig. 3). Copper-lead-zinc appearances are known also by Aghveran.[62]

3. The archaeology of Kotayk is more or less known.

No Chalcolithic sites have been discovered from the region yet. Early and Middle Bronze Age sites are concentrated mainly in the southern part and the Late Bronze and Iron Age sites - in the northern part of the province.

Early Bronze Age is well known by some settlements and cemeteries of Kura-Araxes Culture (Garni, Elar, Kaghsi, Jrarat, Bjni, Jrvezh).

Middle Bronze Age is the period of flourishing in Kotayk represented by such sites as Bjni and especially Karashamb, well known by its Royal tomb and silver vessel with rich images in Mesopotamian-Anatolian stile.

Late Bronze Age is demonstrated by cemetery excavations (Karashamb, Aghavnadsor, Meghradsor).

Early Iron Age is also known through cemeteries (Aghavnadsor, Meghradsor, Korchlu).

Middle Iron Age is the most representative period in the region and is known through fortress-settlements and cemeteries (Hankavan, Aghavnadsor, Khonarvats, Meghradsor, Takyarli). There are also typical Urartian objects found in the region, to be captured by the Urartians.[63] In Urartian cuneiform texts the Hrazdan region is known as the land Ki(e)khuni.[64] For the problem of relations of the Urartians and

[60] **Maghakyan**, 1941; **Goginyan**, 1964; 2005, 26–30, 45–49, 54–55, 69–73; **Melkumyan**, 1972, 119; **Esayan**, 1976, 6, 186, 190, 247; **Madatyan**, 1987, 91.
[61] **Madatyan**, 1987, 91.
[62] **Goginyan**, 2005, 74–84. For ancient workings in Meghradsor gold mines cf. **Madatyan**, 1965; **Esayan**, 1976, 190–192.
[63] For southern Kotayk cf. **Khanzadyan**, 1967, 18; **Oganesyan**, 1988; 1990. For northern Kotayk cf. **Biyagov**, 1982; 1983; 1985; 1986.
[64] For the land Ki(e)khuni cf. **Arutiunyan**, 1985, 108–109.

the local population, excavations of sites such as Elar Darani, Dovri and Aramus are very important.[65]

Hankavan

1. Other earlier names - Mikhailovka, Miskhana. The village of Hankavan is situated 29 km north-west of Hrazdan town, Kotayk province, upper flow of Marmarik river. It is surrounded by dense forests and is well known with its mineral waters and metal mines (copper, molibden, gold). The village itself was founded during the 18th century AD by the Greeks[66] who were engaged here in copper miming activities.

2. Hankavan, and the Marmarik river valley on the whole, was archaeologically investigated in 1980-s by L. Biyagov. Some articles and a dissertation was written by the author towards these works. These investigations cover mainly the Late Bronze and Early/Middle Iron Ages, however, data on earlier occupation of the region also exist.[67]

3. Along the Marmarik river valley, which was also a route leading from Alapars plateau to Lori and than to Trialeti, as well as through the gorge of Aghstev river to south-eastern Armenia and Shirak, five cyclopean fortress-settlements controlling this route are situated. They all are united in a rational fortification system and can be divided into two types: central fortress-settlements such as Hankavan (area 5 ha) and Aghavnadsor (area 6 ha) and secondary fort-posts such as Khonarvats Ekeghetsu Tumb (at the entrance of the Marmarik river valley), Meghradsor and Takyarli (between Megradsor and Hankavan, area 0,12 ha). Test excavations in all of these fortresses demonstrate that, except the Middle Ages (11-13th centuries AD), they were inhabited mainly during the 8-6th centuries BC.

Also big cemeteries are present in the region concerning the Late Bronze Age (Aghavnadsor, Meghradsor), Early and Midle Iron Ages (Aghavnadsor, Meghradsor, Korchlu) with plenty metal finds demonstrating Near Eastern and especially Luristanian connections. Among the Late Bronze Age finds a battle axe from Megradsor is especially noteworthy, the head of which represents a lion sculpture in the moment of its jumping. Among Early Iron Age finds antimony buttons are interesting. There are also typical Urartian objects (ornaments, bronze belts) and this is not an accident because the region was captured by the Urartians.[68]

---

[65] **Khanzadyan**, 1979; **Avetisyan**, 2001; **Hmayakyan**, 2005; **Avetisyan**, **Allinger-Csollich**, 2006. From Elar Darani a cuneiform inscription of Argishti I is known, where he speaks about the conquering of the fortress Darani in the land Uluani (**Arutiunyan**, 2001, 202).

[66] Berzen is the Greek name of the village.

[67] Chance finds from the region have been gathered in the local museum of the village Meghradsor, where also Middle Bronze Age vessels are present.

[68] **Biyagov**, 1982; 1983; 1985; 1986.

Archaeological importance of the Marmarik river valley was not only in the strategic route but also in the presence of metal mines especially of gold (Meghradsor) and copper (Hankavan). However, the traces of old miming are scarcely visible today because of recent works. Especially good represented are the traces of ancient workings (pits and funnels, under-earth workings) at Meghradsor.[69] During our visit of Hankavan mines in 2010 small openings in the miming district could signify traces of early activities especially if we consider the fact that four red-brown ceramic shreds (not diagnostic, possibly belonging to pre-classical and medieval periods), as well as worked obsidian objects have been found around them.

Important data in this sense derive from Meghradsor, where just in the place of gold miming activities a tomb was accidentally opened by the villagers. Two skeletons of a man and a women were surrounded by white and red incrusted black-burnished ceramics typical for early stages of the Late Bronze Age (15-14th centuries BC). Besides, two bronze bracelets were found in the tomb, one of which was massive and is rightly considered by S. Goginyan as weight measure.[70]

In any case, Hankavan region should play an important role in ancient miming. In this connection, it is also important to note that the distance between Hankavan/Meghradsor and Fioletovo/Margahovit, Lori province miming districts is only 8,5 km in direct line, and probably these two miming districts, being situated strategically on very important routes, acted within the same system of metal production and distribution.

I.4. Vayots Dsor

1. Vayots Dsor is situated between Ararat and Syunik, south of Lake Sevan. Both geologically and historically-archaeologically is Vayots Dsor a part of historical Syunik.

2. Metal mines of Vayots Dsor (Teksar, Azatek, Kaqavasar), in comparison with other regions of Armenia, are ill investigated. These mines have been scarcely treated also from the view point of archaeometallurgy.

3. The archaeology of Vayots Dsor is not well defined. However, in recent years archaeological works here were activated in connection with the excavations of Areni cave, which is well known through wonderful state of preservation of organic materials. Excavations of Areni reveal a culture of Chalcolithic to transitional Early Bronze Ages which shed light on formation and early stages of Kura-Araxes Culture in the region.

Middle Bronze Age is represented by excavations of tombs and chance finds (Moz, Shatin, Elpin).

[69] Cf. Gevorgyan A., Zalibekyan M., in: **Kalantaryan**, 2007, 17–21.

[70] **Goginyan**, 2005, 83–84. For similar bronze rings, to be considered as weight measures and means of exchange in prehistoric Armenia, cf. **Esayan**, 1964; **Lassen**, 1994.

No Late Bronze Age sites are known thus far.

Early Iron Age is represented by cemeteries (Moz, Eghegnadsor).

Middle Iron/Urartu is known from Eghegnadsor Urartian tomb (local ceramics, typical Urartian metal), Malishka (chance find of an Urartian belt) and new excavations of Getap Urartian fortress. It is clear, that the Urartians used Vayots Dsor route for their raids from Ararat valley to Syunik.

Besides, stelae called dragon stone (vishapakar) are known from the region (Aghavnadsor, Selim etc.), dating to the 2nd millennium BC.[71]

Teksar

1. Other name - Ghazma. Teksar mountain (2898 m high), with its poly-metallic ores, is the highest point on Teksar mountain range (20 km long), Vayots Dsor province (possibly is the same as Srkghunik mountain of medieval Armenian sources). Teksar is far from settlements, the nearest one is Vernashen village, situated to the north-east of the mine, 5 km north-east of Eghegnadsor town, as well as Gladsor village, 2 km north-east of Eghegnadsor town. However, some authors suppose the existence of a settlement by the same name Teksar, by the ore.[72]

2. The territory is archaeologically unknown.

3. The villages Vernashen and Gladsor were very densely populated in medieval times especially connected with activity of Gladsor University existed during the 13-14th centuries AD. Corresponding ruins of medieval settlements, fortresses and churches surround Gladsor, where we managed to gather some not diagnostic ceramic shreds. A Bronze Age cemetery is situated not far from the medieval ruins of Gladsor.[73]

During our visit of Teksar ores in 2010, we gathered some ceramic shreds, as well as worked obsidian objects, which speak about possible existence of prehistoric settlements in the district. Such settlements should be temporary habitation places used by transhumants. Perhaps just the transhumant tribes were engaged parallel in metal gaining activities here, of course, if Teksar ores were exploited in antiquity.[74]

Azatek

1. Other names - Azadak. The village Azatek is situated 7,5 km south-west of the town Vaik, Vayots Dsor province, on the left side of the river Arpa. There are

[71] **Xnkikyan**, 2002, 23–25, 38, 70–74, 94–96, 114, 121; for Malishka cf. **Esayan**, 1975. Excavations of Getap are currently guided by Dr. H. Melkonyan, Institute of Archaeology and Ethnography, Armenian Academy of Sciences.

[72] **Hakobyan et al.**, 1988–2001, v. 2, 446.

[73] According to oral communication of Dr. H. Melkonyan.

[74] For possible models cf. **Cribb**, 1991.

metal ores and mineral water sources by the village.

2. Archaeologically is not investigated.

3. Mainly medieval monuments and sites are known around Azatek among them ruins of the fortress Smbataberd, settlements Hakhlu and Dashatli, as well as churches.[75]

Kaqavasar

1. A mountain in Zangezur range, known with its metal sources. The nearest villages are Saravan and Gndevaz 14 and15 km north-east of the town Vaik.

2. Archaeologically is not investigated.

3. Saravan and especially Gndevank villages are known by ruins of medieval settlements, churches and a canal.[76] No prehistoric finds have been reported here thus far.

I.5. Syunik

1. Syunik is the southern province of Republic of Armenia situated on the border with Iran. Historically and archaeologically Syunik stays very near to Mountainous Karabagh and Nakhichevan from the one hand and to north-western Iran from the other hand.

2. Syunik is one of the richest in metal mines provinces of Armenia to be divided into Meghri-Kajaran (Kapan, Kajaran, Terterasar) and Kapan (Agarak, Bugakar, Nyuvadi) mining districts. Mines around the towns Kapan and Kajaran, villages Ltsen and Bartsravan have all possibilities to be used in early times (attested by ancient workings, rests of ancient slags, archaeological materials, cf. especially the Kura-Araxes settlement by Ltsen).[77] It is even supposed that the metal ores of Syunik could be exported to the North Caucasus, the Maikop Culture area.[78]

Ancient mines in a recently reopened gold mine were found in Terterasar with Middle Iron Age pottery around the mine and at the nearby site. More ancient mines should be expected in Shikahogh (where a bronze ceremonial axe comes from the miming site Ttujur, now in Kapan Museum), as well as from the mining site Kadjaran (where another bronze ceremonial axe derives from, now in Kapan Museum).[79] In this context, the presence of a Late Bronze-Early Iron Age metal-smith's tomb (with billhook mold) of Akhlatyan, as well as finds of molds from

[75] **Hakobyan et al.**, 1988–2001, v. 1, 41.
[76] **Hakobyan et al.**, 1988–2001, v. 1, 925; v. 4, 518.
[77] **Goginyan**, 2005, 84–96; **Xnkikyan**, 2002, 100–102.
[78] **Chernykh**, 1966, 46, 72.
[79] **Kroll**, 2006, 20–21. For archaeology around Kajaran cf. also **Martirosyan**, 1964, 150. The comparison of chemical compositions of the metal from Kajaran mine with those of corresponding archaeological artifacts, demonstrates that they could be used since the Early and Middle Bronze Ages (**Gevorgyan**, 1980, 28).

Angeghakot (small flat axe) and Kapan (dagger with framed hilt) are also worth mentioning.[80]

3. The archaeology of Syunik is more or less known. In recent times, through excavations of Godedzor, an image of local Chalcolithic culture with Iranian-Mesopotamian relations is being reconstructed. Chalcolithic sites are known also in Chakaten and Shikahogh.

Early Bronze Age Kura-Araxes Culture seems to be well represented in Syunik both by settlements and burials (Shaghat, Uyts, Ltsen, Tandsaver).

Middle Bronze Age settlements and burials are also present (Zoratskarer, Sisian, Uyts). Syunik is distinguished especially through existence of settlements which during the Middle Bronze Age are rare in other regions of Armenia.

Late Bronze Age settlements and burials are also known (Nerkin Getashen, Shaghat, David Bek and Tandsaver).

Early Iron Age is the richest in archaeological sites. Syunik seems to be very densely populated in this period (Angeghakot, Zoratskarer, Uyts and Shikahogh).

During the Middle Iron Age Syunik was captured, or better to say, was under the influence of Urartian state (among the sites of this period are Sznak - typical Urartian finds, Sisian, Uyts, Harzhis, Shikahogh - local culture of the Urartian period).[81] An Urartian inscription of Argishti II was found by Sisian, where the ancient name of the district is mentioned as Suluku. This district was a part of the land Etiuni, the name of the territory of modern Armenia according to Urartian inscriptions.[82]

Terterasar

1. The nearest villages to the miming district of Terterasar are Tashtun (20 km north-west of Meghri town) and Lichk (19 km north-west of Megri town), which are well known by the medieval monuments and ruins of ancient settlements.

2. The territory of Terterasar was surveyed by the Armenian-German expedition (S. Kroll, P. Avetisyan) in 1999. Second time it was visited by the Armenian-American expedition in 2010.

3. In Terterasar was able to spot ancient mines in a recently reopened mine in search of gold. The pottery found in connection with these mines belongs to the Middle Iron Age (local Urartian pottery). There is also a settlement at Terterasar where Middle Iron Age pottery was likewise found.[83]

---

[80] Xnkikyan, 2002, 67, 100. During the construction of Kapan-Kajaran road, not far from Vahanavank, a mold fragment for making Near Eastern daggers (second half of the 2nd millennium BC) was found in a room which is considered to be a destructed workshop (**Karakhanyan**, **Azizbekyan**, 1981).

[81] **Hasratyan**, 1985; **Xnkikyan**, 2002; **Avetisyan et al.**, 2006; **Kroll**, 2006; **Cherry et al.**, 2007.

[82] **Arutiunyan**, 1985, 236; 2001, 324–329.

[83] **Kroll**, 2006, 20.

The Terterasar settlement of ca. 5-6 ha area is situated in the territory of the mine. It was surveyed by our expedition in 2010. The settlement is constructed mainly by middle-size and unworked stones. Preserved walls are up to 2,5 m high and 1-2 m wide. Traces of rooms are visible on the surface. Three red-brown, however, not very diagnostic pottery shreds were found within the settlement, which could belong to the Early and Middle Iron Ages. Among the finds was also a worked flint object. Perhaps the settlement was inhabited since this period till the Middle Ages.

I.6. Gegharkunik

1. The province Gegharkunik stretches around Sevan Lake. Historically and archaeologically the region is connected especially with Kotayk and Syunik provinces.

2. Only eastern part of Gegharkunik is known by metal mine appearances. Among them are copper and iron mines of Zuyg Dzhraghats and Salakh by Chambarak. However, the most important is the gold mine of Sotk which is well known by traces of ancient workings.[84]

3. The archaeology of Gegharkunik (except its eastern regions) on the whole is well known.

No Chalcolithic sites have been discovered from the province yet.

Early Bronze Age is represented by different settlements and less tombs of Kura-Araxes Culture (Lchashen, Kamo, Akunk).

Middle Bronze Age is known mainly through burial excavations (Lchashen, Gavar, Karmir, Ayrivan).

Late Bronze Age is represented by both settlements and cemeteries (Lchashen, Kanagegh, Tsovazard).

Early and Middle Iron Ages are the most thoroughly investigated periods. The symbiosis of local and Urartian cultures is especially good demonstrated on the southern shores of Sevan, where the archaeological data are supplemented through Urartian inscriptions found there. Investigations show, that the building of 28 fortified settlements of that region began in pre-Urartian period and was finished in the time of Urartian expeditions during the 8th century BC. These settlements were concentrated around four units (Arkukiuni, Luerum̀i, Kamaniu, Tulihu), the central sites of which were Nagharakhan, Mtnadsor, Tsovak and Sangar fortresses. To the idea of city-state stands near especially the group Kamaniu with its central site Nagharakhan (15,5 ha), which was surrounded by five small (0,15 ha) fortresses. Urartian sources mention three types of political units in this region - city-states

[84] **Goginyan**, 2005, 75, 96–99.

(Tulihu), chiefdoms (Arkukium, Lueru, Kamaniu), federations (Uduri-Etiuni), which included settlements of those chiefdoms.[85]

Metallurgical activities are attested in some sites of Gegharkunik region. So, in the room 8 of the citadel of Lchashen fortress a metal smelting furnace dating to the early 2nd millennium BC was unearthed, constructed on the surface by small stones and clay mixtures: it had wide bottom and narrow upper part. Charcoal was found within the furnace.[86] In the room 11 of the same citadel two dump-blow furnaces with slags, ash, charcoal, as well as a fragment of finery iron were found, dating to the 14-13th centuries BC.[87] A Late Bronze Age tomb of a metal-smith, with corresponding jewelry mold, was discovered at Kanagegh.[88] An iron slag, as well as a clay crucible were excavated in the same context at the fortress Klor Dari Amrots.[89] In the fortress Mtnadsor a jewelry mold was found.[90] The last two sites can be dated into the border of the 2nd-1st millennia BC (it is worth mentioning that also an Early Bronze Age settlement is present to the north of Klor Dari Amrots) .

Sotk

1. Other name Zod.[91] Sotk is situated on the south-eastern part of Sevan mountain range, 2100-2500 m high from sea level, by the village Sotk, on the bank of river Sotk, 18 km north-east of the town Vardenis, Gegharkunik province. It is well known by its gold mines (Fig. 4). However, the importance of Sotk was not only in these mines. Sotk town, the capital of Armenian principality of Syunik, being situated on the most strategic point of Sotk mountain pass, was connecting southern and eastern Caucasia being the most important settlement on the medieval road Dvin-Partav.

2. Surroundings of Sotk have not been investigated from archaeological point of view. Some surveys have been conducted here by geologists, less by archaeologists.

3. The Sotk mine is well known through traces of ancient mining (many pits and funnels covered by grass, under-earth workings, wooden parts of working devices, stone mortars for working the mines, washing pots of stone, big and small hills of slags and pits). It is an accepted view point that the mine was exploited

[85] **Biscione et al.**, 2002.
[86] **Avetyan**, 2003, 74.
[87] **Goginyan**, 2005, 30–31, 110, fig. 4–5.
[88] **Piliposyan**, **Mkrtchyan**, 2002.
[89] **Mikaelyan**, 1968, 44.
[90] Gevorgyan A., in: **Biscione et al.**, 2002.
[91] J. Markwart and N. Adonts connect this name with the tribe Tsavde (atsvots) mentioned in ancient Armenian sources (cf. **Hakobyan et al.**, 1988–2001, v. 2, 313). Others connect the name Sotk with the toponym Suta/Shuta of the Hittite sources (cf. **Hakobyan et al.**, 1988–2001, v. 2, 313), which, however, seems to be not very logical because of its being too far from the Hittite core region (however, the presence of the Hittites was recently supposed in the Lake Sevan region, cf. **Petrosyan**, 2009).

during the 2nd millennium BC, was used with interruptions until the 14th century AD and rediscovered in the 20th century AD again.[92]

Bronze Age materials were found in the surroundings of Sotk, particularly traces of settlements, cemeteries, materials (weapons, cultic and everyday life objects, etc.). In the dump of one of the ancient workings, two meter deep from the surface, an iron fibula and shreds of hell ceramics were found together with a bone fragment and an animal tooth. On the southern slope of the mine, ruins of a big ancient settlement are visible, from where an old route covered with grass led to the mine (later in 1954 it turned into a new car way to the village of the miners). A stone wall of a big room, called by the villagers 'fabric', was visible within the settlement. The river valley is covered by huge artificial terraces of oval form at the settlement, which steep dully from the side, to be directed to the river flow. Here, and over the whole miming district, extraction of gold was produced from alluvial and delluvial deposits.[93]

West of Sotk, around Vardenis (the land Arkukium of Urartian sources) there are some cyclopean fortresses with corresponding cemeteries from the 2nd and 1st millenmia BC, among which are Kare Dur, Tsovak (with a cuneiform inscription of Sarduri II) and Klor Dari Amrots (with finds of an iron slag and a clay crucible). To the north of the last one there is a settlement of Kura-Araxes Culture. Also Akunk, a Late Bronze Age settlement and cemetery, with finds of Kura-Araxes ceramics, is worth mentioning. To the north of Sotk, around Chambarak, some cyclopean fortresses and cemeteries of the 2nd and 1st millennia BC are known among which Dashtaler, Artanish, the last one belonging very probably to the Middle Bronze Age.[94] The sites around Sotk should be considered in the system of archaeology of Sevan Lake basin, where centers like Lchashen were playing leading roles by controlling the entire regions (the land Uduri-Etiuni of Urartian sources). From this point of view it is no accident that the rich gold from Lchashen elite tombs of the Late Bronze Age, according to metallurgical analyses, derives just from the Sotk mine.[95]

[92] It is noteworthy, that also materials belonging to the Early Bronze Age have been found in the mining district of Zod (**Xnkikyan**, 1977, 14). H. **Martirosyan** (1964, 35) mentions Early Bronze Age 'complexes of settlements of the Zod pass'. It is supposed, that during the Early Bronze Age gold was gained by alluvial way and only at the end of the Middle Bronze and beginning of the Late Bronze Ages begins the exploitation of real mines (cf. Gevorgyan A., Zalibekyan M., in: **Kalantaryan**, 2007, 30). However, earlier works of such kind can not be excluded.

[93] **Goginyan**, 2005, 34–35, 75, 96–99; cf. **Madatyan**, 1965; **Aivazyan**, 1968, 17–20; **Esayan**, 1976, 190–192; **Xnkikyan**, 1977, 14–18; **Hakobyan et al.**, 1988–2001, v. 2, 313; Gevorgyan A., Zalibekyan M., in: **Kalantaryan**, 2007, 16–17.

[94] **Mikaelyan**, 1968, 41–46. For Akunk cf. **Avetyan**, 2003, 73, 124. For the land Arkukiuni cf. **Arutiunyan**, 1985, 37.

[95] **Xnkikyan**, 1977, 18.

I.7. Mountainous Karabagh

1. Mountainous Karabagh Republic (Armenian Artsakh) is situated between Republic of Armenia and Azerbaijan. Historically and archaeologically it is connected with Syunik (especially the mountainous Karabagh) and demonstrates also cultural ties to southern, north-eastern Caucasia and south Russian steppe regions (especially the steppe Karabagh). Also data on Iranian and Near Eastern connections are present.

2. Karabagh is not very rich in metal mines. Only in Mardakert region are known some poly-metallic mines to be situated around the villages Mehmana and Drmbon. Iron ores are known in Hadrut region, by the village Tsor. Around Mehmana, Drmbon and Tsor different accumulations of kurgans are present. Archaeometallurgy of the region is ill investigated. However, hundreds of finds of bronze, iron and gold artifacts (weapons, tools, ornaments) from different Bronze and Iron Age sites, as well as metal workshops (Uzerliktepe, Middle Bronze Age) attest high level of development of ancient metallurgy in ancient Karabagh.[96]

3. The archaeology of Karabagh is on the whole well known. Excavations here have been taking place since the end of the 19th century by German, Russian, Azeri and Armenian archaeologists.

Chalcolithic settlements are present in Karabagh (Ilanlitepe, Hantepe, Leylatepe).

During the Early Bronze Age Karabagh is within the area of Kura-Araxes Culture and is represented both by settlements and cemeteries (Stepanakert, Khachenaget, Gyoytepe).

Middle Bronze Age is known through excavations of tombs and settlements (Uzerliktepe, Uchtepe, Gyuneshtepe).

Late Bronze, Early and Middle Iron Ages are the best investigated periods to be represented by excavations of thousands of tombs and chance finds (Hojali, Arjadsor, Dolanlar). Typical Urartian cultural elements fail at Karabagh, however, it was under the influence of Urartian state, which is attested also by the fact of mentioning of the region in Urartian texts as the land Urtekhini. Interesting are finds of Mitannian seals (Arjadsor) and of a bead with cuneiform inscription (Khojali) mentioning the name of Assyrian king Adadnirari I (13th century BC).[97]

Drmbon

1. Drmbon village is situated in Mardakert province of Mauntainous Karabagh Republic, 30 km north-east from the town Mardakert, on the right side of the upper

[96] Cf. **Asryan**, 1999, 68–75. For kurgans around Mehmana, Drmbon and Tsor cf. **Asryan**, 1999, 13–15. For Uzerliktepe cf. **Kushnareva**, 1965.

[97] **Kushnareva**, 1951; **Asryan**, 1999; **Safaryan**, 2009. For Urtekhini cf. **Arutiunyan**, 1985, 211–212.

flow of the river Tartar. Drmbon together with Mehmana village are disposed in the mining district of poly-metallic ores, just by the Sarsang water reservoir.

2. From archaeological point of view Drmbon and its surroundings have not been investigated yet deeply. However, Mardakert seems to be the richest region in archaeological sites in whole Karabagh.

3. Different accumulations of kurgans belonging mainly to the Late Bronze and Early/Middle Iron Ages are reported along the rivers Tartar and Khachen in Mardakert region, particularly by the villages Archadsor (well known by old excavations with very essential results), Tsmakahogh, Bahmanlu, as well as by the Hakob Metsarants monastery and by the antique site Tigranakert. Especially many big kurgans are situated along the river Tartar, from the village Haterk to the Sarsang water reservoir. From Tartar gorge to the village Metsshen there are a lot of kurgans, from destructions of which chance finds of metal artifacts have been discovered. Such kurgans are known by the villages Nareshtar, Magavuz, Chldran, Mataghis, Storin Oratagh and the town Mardakert.

As to the metal mining district Drmbon-Mehmana, on the bank of the river Tartar, by the village Drmbon seven kurgans are disposed, which are very big in comparison with that from other places. Ca. 30 kurgans of different sizes are situated by the village Mehmana, in location called Mehmana Hills. Also chance finds of the Late Bronze and Early Iron Ages (ceramics, metal) are known from the kurgans of Drmbon and Mehmana.[98]

In July 2009 we visited Drmbon with the aim to investigate some points which could be interesting from the perspectives of ancient metallurgy. The copper and gold mine is currently exploited by the local enrichment fabric. One of the workers of this plant has gathered archaeological materials and keeps them in an adminstrative room, where we could get acquainted with them.

This archaeological material consists of ceramics, stone tools and some metal artifacts. All objects of the collection have been gathered from the bottom of Sarsang water reservoir, which is situated just by the fabric. We could not visit these find spots because the reservoir is filled with water during summer time. Actually, the author of this collection gathers archaeological material in winter, when the water goes back.

Ceramics are divided into two chronological groups. The first group consists of bad preserved black-burnished and well preserved hell-brown ceramics of the Middle Bronze Age. The second group consists of ceramics of the Late Bronze Age (some fragments of cups and a complete grey pot with swollen body, on the upper part of which is an ornament of carelessly made lines which, crossing each other, make rhombs of different sizes and angles).

[98] **Asryan**, 1999, 13–14, 33, 41.

Metal is represented only by some bronze artifacts - a sharp tool and a hammer like object of unknown function (perhaps belonging to the Early Bronze Age?), as well as bracelets and plates (stripes with holes on edges) (belonging to the Late Bronze - Early Iron Ages).

Stone tool collection is the richest and most various. Axes and hammers are especially interesting for us. One of them finds complete analogies with lop-eared axes of Kura-Araxes Culture. A gutter for fastening of the wooden hilt goes through its central part. These axes and hammers are interesting also because traces of oxidized copper ores of green color are visible on their surface, which attests that these objects were in the copper-ore sphere for a long time and during this span traces of copper oxides were formed on their surface. It is logical to suppose that these tools are connected with ancient metal mining process, from which we can conclude that the mines of Drmbon were in use since the Early Bronze Age. The other category of stone tools is represented by different mortars made of local solid volcanic stones.[99] Very probably they were used during crushing and grinding of copper ore. Also a big quantity of black and brown obsidian tools (knife like blades, scrapers and various chip stones) have been gathered here, however, their chronology is not clear (some of them are very long, good worked and retouched and remind Chalcolithic-Early Bronze Age tools).

These all materials could derive both from the kurgans around Sarsang reservoir and as from a settlement on a natural hill, surrounded by middle-size stone walls, which was discovered by us during our 2009 visit (no diagnostic shreds have been found from the settlement to define the precise dating of the site).

II. Non-Metalliferous Provinces

II.1-3. Erevan, Ararat, Armavir

1. These central-western provinces of Armenia coincide with the territory of Ararat valley (northern part of Yerevan belongs geographically and historically to Kotayk) and border with Iran, Nakhichevan and Turkey. During the history of Armenia this region played the most essential role, where all of the administrative centers of the land were situated. This seems to be the case also in prehistoric times.

In archaeological terms this region is more or less good investigated and demonstrates contacts to all of other parts of Armenia. In comparison with other regions, Ararat valley sites are represented mainly by settlements, in particular tells or sites on lava cones.

[99] For stone hammers and mortars from the Bronze Age sites of Armenia to be used during metal gaining processes cf. **Xnkikyan**, 1977, 17; Gevorgyan A., Zalibekyan M., in: **Kalantaryan**, 2007, 29–30.

2. Neolithcic-Chalcolithic sites are well known here (Aratashen, Aknashen, Teghut).

Ararat valley seems to be the center of the Kura-Araxes Culture being represented by its most classic sites (Shengavit, Mokhrablur, Jrahovit, Metsamor, Dvin).

Middle Bronze Age is known not only through cemeteries, as the most territory of Armenia, but also settlements (Metsamor, Mukhannattapa, Aygevan).

Late Bronze and Early Iron Age sites represent an organized system of urban settlements (Metsamor, Dvin, Karmir Blur, Armavir).

During the Middle Iron Age is Ararat valley (the land Aza of Urartian sources) the center of the Urartian culture and administration in Armenia represented by classic Urartian sites (Erebuni, Teishebaini, Karmir Blur, Argishtikhinili).

During all periods the Ararat valley seems to be a very important center of metal production. Finds of metallurgical workshops and rich inventory both within the Early Bronze (Shengavit, Jrahovit), as well as Late and Iron (Metsamor, Dvin, Karmir Blur, Urartian Argishtikhinili) Age settlements demonstrates high level of metallurgical knowledge.[100]

II.4. Aragatsotn

1. Aragatsotn province on the slopes of Aragats mountain is extremely rich in archaeological sites, which stay near from the one hand to Ararat valley (southern Aragatsotn) and from the other hand to Shirak (northern Aragatsotn) sites. The importance of the region was that the main road connecting north Armenia with Ararat valley went just through these territories.

2. Chalcolithic sites are still ill investigated (Akhtamir).

Early Bronze Age is richly represented in the province. The existence of such big settlements and cultic centers as Agarak, Gegharot, Tsaghkasar demonstrate the importance of the region in the system of Kura-Araxes Culture.

Middle Bronze Age is known through cemetery excavations (Oshakan, Verin Naver, Nerkin Naver).

Late Bronze and Early/Middle Iron Ages are known not only by cemeteries but also settlements and cyclopean fortresses (Shamiram, Voskevaz, Ujan, Gegharot, Tsaghkahovit).

For the Middle Iron Age in south-eastern parts of Aragatsotn are typical also such sites as Oshakan, where classic Urartian and local cultures impact. Perhaps the southern Aragatsotn was a part or periphery of the land Aza of Urartian inscriptions.

[100] **Khanzadyan**, 1967; 1982; 1985; 1995; **Sardaryan**, 1967; **Esayan**, 1969; 1992. For the lands Etiuni and Aza of Urartian inscriptions cf. **Arutiunyan**, 1985, 13, 262–263.

Systematic works in the region have been made in Tsaghkahovit plain, north slopes of Aragats mountain by Armenian-American expedition. These investigations demonstrate that in this region since the Late Bronze Age the habitation of the main settlements Hnaberd, Tsaghkahovit, Gegharot takes place, around which a system of satellite settlements and cemeteries appears. Some of them (Tsaghkahovit, Hnaberd) are of big scales (ca. 5000 graves with 162 groups on the territory of 32 km^2). The mentioned settlements had little fortresses (so Hnaberd is 1,56 ha), however, together with the settlement they take big areas (so Hnaberd is 33,2 ha). Among them were also handicraft and cultic centers such as Gegharot.

Excavations of the mentioned sites demonstrate extremely rich bronze and gold-silver metallurgy of the Early Bronze-Middle Bronze Age transitional period, as well as Middle Bronze and Late Bronze Ages. Such sites as Gegharot turn to be very important points of metal production especially during the Early and Late Bronze Ages, where many attestations of metallurgical procedures (workshops, molds, balance weights) have been attested.[101]

II.5. Shirak

1. Shirak is the north-western province of Armenia bordering with Turkey and Georgia. This territory is very rich in archaeological sites, however, no metal mines are known here. From archaeological point of view, Shirak stands near to Trialeti, Georgia and Erzurum, Turkey regions.

2. Chalcolithic sites are not known in Shirak.

Early Bronze Age is represented mainly by the settlements of Kura-Araxes Culture (Horom, Harich, Keti, Karnut).

Middle Bronze Age is known mainly by cemetery excavations (Harich, Keti, Parni Gegh).

Late Bronze and Early Iron Age is known through investigations of cemeteries and cyclopean fortresses (Artik, Horom, Voskehask, Sarnaghbyur).

Middle Iron Age culture of Shirak continues traditions of the previous period. Typical Urartian objects are present in Shirak but are rare (Horom, and a bronze belt of unknown origin). Shirak was clearly under the Urartian influence and is mentioned as Eriakhi in Urartian cuneiform inscriptions.

Though far from metal mines, Shirak sites demonstrate high level of metallurgy since the 3rd millennium BC. The finds of metal working objects such as molds, crucibles and spoons, as well as corresponding metal artifacts from such Early Bronze Age settlements as Harich and Karnut speak about early development of metallurgy in Shirak. Also during the Late Bronze and Early Iron Ages metal

[101] **Areshyan**, 1983; **Pons**, 2001; **Avetisyan**, 2003; **Kalantaryan et al.**, 2003; **Simonyan**, 2003; 2006; **Tumanyan**, 2005; **Badalyan**, **Avetisyan**, 2007; **Badalyan et al.**, 2008; **Smith et al.**, 2009. For the land Aza of Urartian inscriptions cf. **Arutiunyan**, 1985, 13.

working was very developed here to be attested by the metal-smith's workshop of Leminakan settlement, mould finds at Horom fortress and metal worker's tomb of Artik cemetery.[102]

II.6. Important Centers

Metsamor

1. Metsamor is situated in the south-western part of the village Taronik, Armavir province, 35 km to the west of Yerevan, in the center of the Ararat valley, within volcanic cones.

2. The site is known since 1930-s, when E. Baiburtyan gathered here black burnished and painted pottery shreds. It was surveyed in 1960s by L. Barseghyan and K. Mkrtchyan. Systematic excavations took place in the site since 1965 by E. Khanzadyan, who published a lot of articles and two books towards her investigations.

3. The area of the settlement fortified by cyclopean wall is of 30 ha. The stratigraphy of Metsamor is defined on the ground of cultural layers fixed in the stratigraphic trench (100 m^2 and 6 m deep), as well as according to other area excavations on the citadel. Investigations demonstrated that the hill was inhabited since the first half of the 4th millennium BC (there are shreds of late Chalcolothic ceramics, not published yet) and continued its existence till the 7th century BC without braking. After long period of abandoning, the life revived in the site during the 9-13th centuries AD.

Layers of Early, Middle, Late Bronze, as well as of Early and Middle Iron Ages were unearthed in the stratigraphic trench.

The Early Bronze Age layer is characterized

by many shreds of black burnished ceramics, stone tools and weapons parallels of which are known in all sites of Kura-Araxes Culture.

The second layer concerns the Middle Bronze Age, in which stone tools, brown and painted pottery has been found. For the early phase of this layer monochrome and for the later phase polychrome pottery are typical.

The Late Bronze - Early Iron Age cultural layer in stratigraphic trench of Metsamor is presented through two sub-layers. The lowest layer is characterized by burnished ceramics. In the upper horizon of this sub-layer ceramics ornamented with concentric circles, cannelures and arched ornaments have been found. The upper sub-layer is defined as a 'layer with traces of burning' and characterized

[102] **Khachatryan**, 1963; 1975; 1979; **Badalyan**, 1986; **Badalyan et al.**, 1997; **Badalyan**, **Avetisyan**, 2007. For analyses of metal artifacts from Shirak cf. **Khachatryan**, 1975, 261; **Gevorgyan**, 1980. For the land Eriakhi of Urartian sources cf. **Arutiunyan**, 1985, 258–259.

everywhere by carbonized beams, smoked walls, matt ceramics, etc. This layer is covered by clay floor of the metal workshop of the Urartian period.

A complex of industrial rooms was excavated on the small section of the north-eastern slope, in which smelting furnaces of two systems where situated: big ones constructed in brickwork (11 ovens) and cylindrical furnaces made in pisé (12 ovens) (diameter by the base up to 1,0 m and ca. 0,7 m high). These furnaces are dated by the authors of excavations to the end of the 2nd - beginning of the 1st millennia BC. However, traces of metal-production have been detected in all cultural layers of the site since the Early Bronze Age, among which also molds for smelting weapons, tools and ornaments. The most part of them were well preserved and are kept currently at the local museum of Metsamor.

The presence of such big quantity of furnaces and different attributes of metal production demonstrate that Metsamor was a central industrial settlement of the Bronze and Iron Age Armenia. Finds of objects with Babylonian cuneiform (a frog balance weight) and Egyptian hieroglyphic (a cylinder seal) inscriptions dating to the Late Bronze Age, underline the significance of Metsamor in international relations.[103]

Jrahovit

1. The site is situated 5 km to the south-east of the town Masis, Ararat province, and 15 km to the south of Yerevan, on the southern edge of the village by the same name (Fig. 5).

2. Jrahovit was excavated by E. Khanzadyan since 1966 till 1980-s. Except some common reflections, the main materials from Jrahovit still remain to be unpublished.

3. Jrahovit takes an area of 3 ha and from all sides is surrounded by swamps and waters of artesian sources. The multi-layered site was inhabited from the mid-4th millennium BC until the 17th century AD, only with some interruptions. By making of stratigraphic trench it turned out, that the lower layer concerns the Early Bronze Age and consists of 15 constructional horizons, on which the Middle and Late Bronze, as well as Early and Middle Iron/Urartian and medieval layers were laid.

By its stratigraphy the Early Bronze Age layer of Jrahovit can be considered as one of the most important among Kura-Araxes Culture sites. A well preserved street was opened here on the both parts of which round plan rooms were located. The street stretched 100 m long and was wholly paved by stones. The houses with their yards and rooms of economical significance were divided from the street by the walls constructed of adobe and coated by clay.

[103] **Khanzadyan et al.**, 1973; **Khanzadyan**, 1995. For the works before 1960–s cf. **Martirosyan**, 1964, 88, 177.

A lot of unique archaeological finds were excavated at Jrahovit. One of the round rooms next to the street was a metallurgical workshop. The preserved wall of this workshop was 1,5 m high, its floor was covered by thick layer of ash. There was a foundry of unbaked clay at the western wall, by which a leaf of fine loop-eared axe of the Early Bronze Age was unearthed. Besides, fragments of oxidized copper ore, a fragment of a crucible with traces of copper within it, some pieces of clay spoons, as well as a heated nozzle were found here.[104]

Nazrvan

1. Other names Lazrevan, Gyavur Ghala. The archaeological site, which is considered to be one of the biggest in contemporary Armenia, is situated in Ashtarak region (Aragatsotn province), 1,5 km north of the village Nazrvan, on the south-eastern slopes of the mountain Aragats and eastern (left) bank of the river Shahvert (Fig. 6, 7). From strategic point of view it is located on very high and convenient position, overlooking the surrounding areas up to the mountain Ara.

2. Small surveys in Nazrvan have been conducted by S. Ter-Hakobyan (1922), T. Toramanyan (1924), G. Areshyan (1970-s). No excavations have been done thus fur.

3. The urban settlement takes ca. 35-40 ha (G. Areshyan) or ca. 70 ha (T. Hakobyan et al.) territory, 1,5 - 2 ha of which is the citadel. The citadel stretches in the central part of the settlement, with its eastern side looking on Shahvert gorge, along which one of the town walls is going. From other three sides the citadel is defended by huge cyclopean walls, which have three rows on the southern side. The walls of the citadel are supplemented by ten huge towers, which are rectangular in plan and go forward by 4 - 5 meters from the main wall mass. Their frontal length reaches up to 17 m. Rests of monumental structures are discernable within the citadel.

The urban settlement had canonic plan. On both sides of the streets are situated living houses, the rests of which are especially good visible on the northern side of the town. The width of the largest streets is up to 6 m. In particular places living quarters and uniting squares are present.

On the whole, the town has north-south stretched configuration, was defended by walls, the rests of which are especially discernable on eastern and southern parts.

Also tombs are visible within and around the city, among which dolmen like huge constructions erected on the barrows with cromlechs are especially noteworthy (most of them seem to be plundered).

Nazrvan is dated mainly to the Late Bronze and Early Iron Ages (ca. 15-9th centuries BC). During our visit in 2010 we gathered some ceramic shreds

[104] **Khanzadyan**, 1979b; 1982; 2003.

belonging to this period. Tombs could belong to even earlier periods (Middle Bronze Age). It was also inhabited in later periods (rests of a church are visible).[105]

Discussion

The finds of thousands of metal artifacts from different sites of Bronze and Iron Age Armenia, as well as the existence of metal producing sites like Jrahovit, Shengavit, Fioletovo, Karnut, Garni and Jaghatsategh in the Early Bronze Age, Lchashen and Uzerliktepe in the Middle Bronze Age, Metsamor, Dvin, Lchashen, Karmir Blur, Haghartsin, Gyumri, Gegharot, Shirakavan, Mtnadsor and Klor Dari Amrots, together with metal smiths' tombs in Akhtala, Artik, Kanagegh and Lori Berd, in the Late Bronze and Iron Ages, demonstrates a high level of metallurgy developments in prehistoric Armenia. These all data are supplemented by the fact of using of ancient metal mines during these periods (Kajaran, Alaverdi, Akhtala, Sotk, Margahovit, Meghradsor). Meanwhile, it is clear that metallurgical activities were very advanced during the Early Bronze Age (arsenic-copper based metallurgy). The Middle Bronze Age, though represented by high quality tin-bronze and gold-silver finds of various repertoire and new technologies, however, is not well known by active metal working attestations, which coincides with the common cultural picture of this period to be charcterized by a decrease of settlement life. Metal working reached its apogee in Armenia during the Late Bronze (beginning of sulphide ore usage) and Early Iron (increase in quantity of bronze and iron artifacts) Ages. Especially rich is the evidence from the Middle Iron Age, the period of existence of Urartu and Etiuni state formations.

Excavations and surveys demonstrate that both the sites located by and far from the metal mines are important from the view point of metal production and distribution. Even more, such sites of Ararat valley as Metsamor or Jrahovit, situated so far from the mines, were centers of metal production and distribution in the common Armenian context. From other hand, other type of sites on foothill such as Nazrvan or Gegharot could be also very important points on the route of metal distribution and secondary working, not speaking about the sites which were directly disposed on or by metal mines such as Fioletovo, Margahovit or Meghradsor.

To understand the metal mining and production of ancient Armenia (Early Bronze to Middle Iron Ages) as a common system we need to consider the contexts of the sites both by and far from the metal ores. The final result of such consideration can be the defining of core and periphery regions within Armenia (e.g. Ararat valley sites like Metsamor → Aragatsotn sites like Nazrvan, valley inhabitants → mountaineers, primary state formations like Urartu → secondary

[105] **Toramanyan**, 1942–1948, 30–31; **Areshyan**, 1978, 101–103; **Hovhannisyan**, **Areshyan**, 1982, 145; **Areshyan et al.**, 1996, 70–71; **Hakobyan et al.**, 1988–2001, v. 3, 947.

state formations like Etiuni) and beyond (Armenia → Caucasus, Armenia → Near East, Anatolia, Aegean, civilization → barbaricum), hence considering archaeometallurgy in wider context of cultural relations.

To clarify these relations, except analyzing materials, mapping the sites and mines, as well as making spatial analyses, we began in 2011 excavations at the site Margahovit, which could be the most suitable for our purposes. This site is multi-layered (with Early Bronze Age as the main period of habitation), is situated just in the miming district (hence is expected to demonstrate metal-working procedures in situ) and is the biggest in the territory, to be surrounded by some satellite settlements. It has never been excavated before. It is situated on a route which can be important not only for Armenia (connecting miming districts with non-metalliferous regions) but also for the southern Caucasus on the whole. Especially important is that the site is situated within the Lori province, the richest in poly-metallic ores of Armenia. Margahovit is not far from the Georgian border and from this point of view it can be considered as some kind of borderland. Some authors have already underlined the importance of Lori miming district, metal ores of which could serve as sources not only for many Armenian but also for Georgian and North Caucasian sites since the Early and Middle Bronze Ages.[106]

From this point of view, excavations of Margahovit and surveys around the site, help us to understand and reconstruct not only the local infrastructure of the Margahovit plain, so important for early metallurgy of the region, but also its place in the common context of archaeometallurgy of Armenia and surrounding regions. However, this is a topic for another work.

Acknowledgements

For support and discussions during our works we would like to thank Dr. Pavel Avetisyan, Dr. Ruben Badalyan, Dr. Boris Gasparyan, Dr. Suren Hobosyan, Dr. Husik Melkonyan, Dr. Inesa Karapetyan, as well as Nora Engibaryan, Institute of Archaeology and Ethnography, Armenian Academy of Sciences.

[106] **Chernykh**, 1966, 45; **Abesdze**, 1974.

BIBLIOGRAPHY

Abesdze Ts.N., – K istorii medno-bronzovoy metallurgii Trialetskoy kul'tury (Towards the History of Copper-Bronze Metallurgy of Trialeti Culture), in: *Restavratsiya, konservatsiya, tekhnologiya muzeinykh eksponatov (Restoration, Conservation, Technology of Museum Exhibits)* I, Tbilisi, 1974, pp. 18–64 (in Georgian).

Aivazyan S.M., – *Razvitie geologo-mineralogicheskikh znaniy i gornometallurgicheskogo proizvodstva v drevney Armenii (Development of Geological-Mineralogical Knowledge and Metal Mining Production in Ancient Armenia)*, PhD Dissertation, Yerevan, 1968.

Alishan Gh., – *Sisakan. Teghagrutyun Syuneats ashkharhi (Sisakan: Topography of the Province Syunı)*, Venice, 1893.

Areshyan G.E., – Voprosy tipologii naselennykh punktov Armenii pozdnego bronzovogo i rannego zheleznogo vekov (Questions of Settlement Typology of Armenia of the Late Bronze and Early Iron Ages), *Gosudarstvenniy muzey iskusstva narodov Vostoka, Nauchnye soobshcheniya (State Museum of Art of the People of the Orient, Scientific Reports)* X, Moscow, 1978, pp. 91–108.

Areshyan G.E., – Raskopki bol'shikh Shamiramskikh kurganov (Excavations of Big Kurgans of Shamiram), *Arkheologicheskie Otkritiya (Archaeological Discoveries) in 1981*, Moscow, 1983, pp. 425–426.

Areshyan G.E., – Ghafadaryan K.K., Hovhannisyan K.L., Sahinyan A.A., *Haykakan chartarapetutyan patmutyun (History of Armenian Architekture)* I, Yerevan, 1996.

Arutiunyan A., Badalyan R., – Poselenie Geghakar: noviy pamyatnik srednego bronzovogo veka v basseyne ozera Sevan (The Settlement Geghakar: A New Site of the Middle Bronze Age in the Sevan Lake Basin), *Hin Hayastani mshakuity (The Culture of Ancient Armenia)* XIV, Avetisyan P.S., Kalantaryan A.A., Badalyan R.S. (ed.), Yerevan, 2008, pp. 103–112.

Arutiunyan N.V., – *Toponimika Urartu (Toponymik of Urartu)*, Yerevan, 1985.

Arutiunyan N.V., – *Korpus urartskikh klinoobraznykh nadpisey (Corpus of Urartian Cuneiform Inscriptions)*, Yerevan, 2001.

Asryan Y.A., – *Nagorny Karabagh v epokhu bronzy i rannego zheleza: II–I tys. do n.e. (Mountainous Karabagh in the Late and Early Iron Ages: 2nd-1st Millennia BC)*, Stepanakert, 1999.

Avagyan H.S., – *Hajastani hankahumkayin resursnery (Mining resources of Armenia)*, Yerevan, 2004.

Avetisyan H., – *Aragats*, Yerevan, 2001 (in Armenian).

Avetisyan H., Allinger-Csollich W., – The Fortress of Aramus: Preliminary Report of Excavations in 2004 and 2005, *Armenian Journal of Near Eastern Studies* I (2006), pp. 105–134.

Avetisyan P., Bobokhyan A., – The Pottery Traditions of the Armenian Middle to Late Bronze Age 'Transition' in the Context of Bronze and Iron Age Periodization, in: *Ceramics in Transitions: Chalcolithic through Iron Age in the Highlands of the Southern Caucasus and Anatolia, Conference held at New York in November 2004*, Rubinson K., Sagona T. (ed.), Leuvain-Paris-Dudley, 2008, pp. 123–183.

Avetisyan P., Chataigner Ch., Palumbi G., – The Results of the Excavations of Nerkin Godedzor (2005–2006): Preliminary Report, *Armenian Journal of Near Eastern Studies* I (2006), pp. 6–18.

Avetisyan P.S., – Predvaritel'nye rezul'taty raskopok pamyatnika Agarak (Preliminary Results of Excavations of the Settlement Agarak), in: *Archeologiya, Etnologiya i Fol'kloristika Kavkaza (Archaeology, Ethnology and Folkloristic of Caucasia, International Conference)*, Abrahamyan L. (ed.), Yerevan, 2003, pp. 52–57.

Avetyan V., *Sevani avazani mshakuity m.t.a. III-II hazaramyaknerum (The Culture of Sevan Lake Basin during the 3rd-2nd Millennia BC)*, Yerevan, 2003.

Avilova L.I., Antonova E.V., – Teneishvili T.O., Metallurgicheskoe proizvodstvo v yuzhnoi zone Zirkumpontiyskoy metallurgicheskoy provintsii v epokhu ranney bronzy (The Metallurgical Produktion in the Southern Zone of Zirkumpontic Metallurgical Provice during the Early Bronze Age), *Rossiyskaya Arkheologiya (Russian Archaeology)* 1 (1999), pp. 51–66.

Äyräpää A., – Über die Streitaxtkulturen in Russland, *Eurasia Septentrionalis Antiqua* VIII (1933), S. 1–160.

Badalyan R., Smith A.T., Lindsay I., Khachadourian L., Avetisyan P., – Village, Fortress and Town in Bronze and Iron Age Southern Caucasia: A Preliminary Report on the 2003-2006 Investigations of Project ArAGATS on the Tsaghkahovit Plain, Republic of Armenia, *Archäologische Mitteilungen aus Iran und Turan* 40 (2008), pp. 45–105.

Badalyan R.S., – *Rannebronzovaya kul'tura Shiraka (The Early Bronze Age Culture of Shirak)*, PhD Dissertation, Yerevan, 1986.

Badalyan R.S., Avetisyan P.S., – *Bronze and Early Iron Age Archaeological Sites in Armenia: I. Mt. Aragats and its Surrounding Region*, British Archaeolgical Reports International Series 1697, Oxford, 2007.

Badalyan R.S., Kohl Ph.L., Kroll S.E., – Horom 1995: Bericht über die amerikanisch-armenisch-deutsche archäologische Expedition in Armenien, *Archäologische Mitteilungen aus Iran* 29 (1997), S. 191–228.

Badalyan R., Smith A.T., Lindsay I., Khatchadourian L., Avetisyan P., Monahan B., Hovsepyan R., – Village, Fortress and Town in Bronze and Iron Age Southern Caucasia: A Preliminary Report on the 2003–2006 Investigations of Project ArAGATS on the Tsaghkahovit Plain, Republic of Armenia, *Archäologische Mitteilungen aus Iran und Turan* 40 (2008), pp. 59–73.

Barkhudaryan S.G., – Velikukhi erkiry (The Land Velikukhi), *Kulturayi patmutyan instituti ashkhatutyunnery (Works of the Institute of Culture History)* I, Yerevan, 1935, pp. 153–204.

Barkhudaryan S.G., – *Divan hay vimagrutyan IV Gegharkunik - Kamoyi, Martunu ev Vardenisi shrjanner (Corpus of Armenian Epigraphy IV: Gegharkunik - Kamo, Martuni and Vardenis Regions)*, Yerevan, 1973.

Bilgi Ö., – *Metallurgists of the Central Black Sea Region: A New Perspective on the Question of the Indo-Europeans' Original Homeland*, Istanbul, 2001 (türk., engl.).

Biscione R., Hmayakyan S., Parmegiani N., – *The North-Eastern Frontier: Urartians and Non-Urartians in the Sevan Lake Basin, I. The Southern Shores*, Documenta Asiana VII, Roma, 2002.

Bisson de la Roque F., – *La trésor de Tod*, Le Caire, 1953.

Biyagov L.N., – Novye nakhodki predmetov s izobrazheniem l'vov iz Meghradsora (New Finds of Objects with Lion Images from Meghradsor), *Vestnik obshchestvennykh nauk (Herald of Social Sciences)* 1 (1982), pp. 84–90.

Biyagov L.N., – Einige technologische Parameter altarmenischer Keramik der Eisenzeit (Anfang des 1. Jahrtausends v.u.Z.), *Altorientalische Forschungen* 10/2 (1983), S. 223–229.

Biyagov L.N., – Novye materially iz Aghavnadsora i Dsoraghbyura (New Materials from Aghavnadsor and Dsoraghbyur), *Vestnik obshchestvennykh nauk (Herald of Social Sciences)* 4 (1985), pp. 68–74.

Biyagov L.N., – *Material'naya kul'tura doliny reki Marmarik /epokhi pozdney bronzy i rannego zheleza/ (Material Culture of the Marmarik River Valley /of the Late Bronze and Early Iron Ages/)*, PhD Dissertation, Yerevan, 1986.

Bottero J., – Les inventaires de Qatna, *Revue d Assyrologie et Archéologie Orientale* XLIII/1–2 (1949), pp. 1–40.

Brayley Hodgetts E.A., – *Round about Armenia*, London, 1896.

Chernykh E.N., – *Istoriya drevneishey metallurgii Vostochnoi Evropy (History of the Ancient Metallurgy of Eastern Europe)*, Moscow, 1966.

Chernykh E.N., *Ancient Metallurgy in the USSR*, Cambridge, 1992.

Cherry J., Manning S., Alcock S., Tonikyan A., Zardaryan M., – Radiocarbon Dates for the Second and First Millennia BC from Southern Armenia: Preliminary Results from the Vorotan Project, 2005–2006, *Armenian Journal of Near Eastern Studies* II (2007), pp. 52–71.

Cribb R., – *Nomads in Archaeology*, Cambridge, 1991.

Devejyan S., – *Hnagitakan hetazotutyunner Tashir-Dsoragetum (Archaeological Investigations in Tashir-Dsoraget)*, Yerevan, 2001.

Devejyan S.H., – *Lori-Berd* I, Yerevan, 1981 (in Russian).

Devejyan S., – *Lori Berd* II, Yerevan, 2006 (in Armenian).

Diakonoff I.M. (ed.), – I*storiya drevnego mira (History of Ancient World)* 1, Moscow, 1982.

Dzhafarov G.F., – *Svyazi Azerbaijana so stranami Peredney Azii v epokhu pozdney bronzy i rannego zheleza (Connections of Azerbaijan with the Near Eastern Lands in the Late Bronze and Early Iron Ages)*, Baku, 1984.

Elevatorski E.A., – *Au: Volcanic Gold Deposits*, Minobras, 1982.

Ellaryan I.B., – *Aghstevi hovti patmutyan ev kulturayi hushardsannery (Historical and Cultural Sites of Aghstev Valley), Yerevan*, 1980.

Eremyan S.T., – H*aiastany yst "Ashkharhatsoyts"-i (Armenia according to the "Ashkharhatsoyts" /Geography of the 7th Century AD/)*, Yerevan, 1963.

Esayan S.A., – Hayastani patmutyan tangarani bronze aparanjannery (Bronze Bracelets of Historical Museum of Armenia), *Vestnik obshchestvennykh nauk (Herald of Social Sciences)* 2 (1964), pp. 83–94.

Esayan S.A., – *Erevan*, Yerevan, 1969 (in Russian).

Esayan S.A., – Urartskiy poyas iz Malishki (An Urartian Belt from Malishka), *Vestnik obshchestvennykh nauk (Herald of Social Sciences)* 1 (1975), pp. 93–97.

Esayan S.A., – *Drevnyaya kul'tura plemyon severo-vostochnoy Armenii (The Old Culture of the Tribes of North-Eastern Armenia)*, Yerevan, 1976.

Esayan S.A., – Urartakan gotiov dambaran Zodum (Tomb with Urartian Belt in Zod), *Patma-banasirakan handes (Historical-Philological Journal)* 3 (1979), pp. 277–283.

Esayan S.A., – *Hayastani hnagitutyun (Archaeology of Armenia)*, Yerevan, 1992.

Esayan S.A., Hovhannisyan H.A., – *Katalog Dilijani erkragitakan tangarani hnagitakan ireri (Catalogue of Archaeological Objects of Dilijan Local-Lore Museum)*, Yerevan, 1969.

Esayan S.A., Vatinyan K.M., – *Istoriko-arkhitekturnye pamyatniki Dilizhana (Historical-Architectural Sites of Dilizhan)*, Yerevan, 1988.

Forbes R.J., – *Metallurgy in Antiquity*, Leiden, 1950.

Gambaschidze I., Hauptmann A., Slotta R., Yalçın Ü. (Hrsg.), – *Georgien: Schätze aus dem Land des Goldenen Vlies, Katalog der Ausstellung in Bochum*, Bochum, 2001.

Gevorgyan A., Palmieri A., – Fioletovo, *Kul'tura drevney Armenii (Culture of Ancient Armenia)* 2, Kalantaryan A., Harutiunyan S. (ed.), Yerevan, 2001, pp. 11–13.

Gevorgyan A.Ts., – *Drevnyaya razrobotka medi (Ancient Copper Working), Archeologicheskie otkrytiya (Archaeological Discoveries) 1971*, Moscow, 1972, p. 493.

Gevorgyan A.Ts., – O drevneishey mednorudnoy baze Armenii (Towards the Ancient Copper-Ore Basis of Armenia), *Sovetskaya Archeologiya (Soviet Archaeology)* 4 (1973), pp. 32–39.

Gevorgyan A.Ts., – *Iz istorii drevneyschey metallurgii Armyanskogo nagor'ya (From the History of Early Metallurgy of the Armenian Highland)*, Yerevan, 1980.

Gevorgyan A.Ts., Chernykh E.N., – V poiskakh mednykh rudnikov v Armenii (In Search of Copper Mines in Armenia), *Archeologicheskie otkrytiya (Archaeological Discoveries) 1970*, Moscow, 1971, pp. 401–402.

Goginyan S., – K istorii drevney metallurgii v Armenii (Towards the History of Ancient Metallurgy in Armenia), *Istoriko-filologicheskiy zhurnal (Historical-Philological Journal)* 3 (1964), pp. 229–234.

Goginyan S.E., – *Metalloproizvodstvo v drevnej Armenii (Metal Production in Ancient Armenia)*, Yerevan, 2005.

Gummel Y.I., – Nekotorye pamjatniki rannebronzovoj epokhi Azerbaidzhana (Some Sites of Early Bronze Age of Aserbajan), *Kratkie soobshcheniya instituta archeologii (Brief Reports of the Institute of Archaeology)* XX (1948), Moscow, pp. 15–28.

Hakobyan T.Ch., – *Urvagtser Hayastani patmakan ashkharhagrutyan (Scetches of Historical Geography of Armenia)*, Yerevan, 1960.

Hakobyan T.Ch., Melik-Bakhshyan S.T., Barseghyan H.Ch., – *Hayastani ev harakits shrjanneri teghanunneri bararan (Toponymical Dictionary of Armenia and Surrounding Regions)*, v. 1–5, Yerevan, 1988–2001.

Haldar A., – *Who were the Amorites*? Leiden, 1971.

Hartmann A., – *Prähistorische Goldfunde aus Europa 2: Spektralanalytische Untersuchungen und deren Auswertung, Studien zu den Anfängen der Metallurgie* 5, Berlin, 1982.

Hasratyan M., – *Patma-hnagitakan usumnasirutyunner (Historical and Archaeological Investigations)*, Yerevan, 1985.

Hauptmann A., Bendall Ch., Brey C., Japariże I., Ġambašiże I., Klein S., Prange M., Stöllner T., – Gold in Georgien. Analytische Untersuchungen an Goldartefakten und Naturgold aus dem Kaukasus und dem Transkaukasus, in: *Von Maikop bis Trialeti: Gewinnung und Verbreitung von Metallen und Obsidian in Kaukasien im 4.–2. Jt. v. Chr., Beiträge des Internationalen Symposiums in Berlin vom 1.-3. Juni 2006*, Hansen S., Hauptmann A., Motzenbäcker I., Pernicka E., Bonn, 2010, S. 139–165.

Hmayakyan S.G., Dovrii amrotsy (The Fortress of Dovri), *Hushardsan (Monument)* 3 (2005), Yerevan, pp. 73–79.

Hobosyan S. 2011, Teghuti 2009–2010 tt. hnagitakan peghumneri nakhnakan ardiunknery (Preliminary Results of 2009–2010 Archaeological Exacavations at Teghut), *Patma-banasirakan handes (Historical-Philological Journal)* 2, pp. 199–211.

Höckmann O., Zu früherer Seefahrt in den Meerengen, *Studia Troica* 13 (2003), S. 133–160.

Hovhannisyan S., Areshyan G., – Nazrvan, *Haykakan sovetakan hanragitaran (Armenian Soviet Enyclopaedia)* 8, Yerevan, 1982, p. 145.

Iessen A.A., – K voprosu o drevneishey metallurgii medi na Kavkaze (Towards the Question of Ancient Copper Metallurgy in the Caucaus), *Izvestiya Gosudarstvennoy Akademii Istorii Material'noy Kul'tury (Bulletin of the State Academy of History of Material Culture)* 120 (1935), Moscow-Leningrad.

Iessen A.A., – Kavkaz i Drevniy Vostok v 4–3 tys. do n.e. (Caucasia and the Ancient Orient during the 4th-3rd Millennia BC), *Kratkie soobshcheniya instituta archeologii (Brief Reports of the Institute of Archaeology)* 93 (1963), pp. 3–14.

Jalaleants S., – *Chanaparhordutyun i Metsn Hayastan (Travel to the Great Armenia)* II, Tbilisi, 1858.

Kalantaryan A. (ed.), – *Hin Hayastani voskin. m.t.a. III haz. – m.t. XIV d. (The Gold of Ancient Armenia: 3rd Millennium BC -14th Century AD)*, Yerevan, 2007.

Kalantaryan A., Sargsyan H. (ed.), – *Tavush. Nyutakan ev hogevor zharangutyun (Tavush: Material and Spiritual Heritage), Yerevan*, 2009.

Kalantaryan A.A., Melkonyan U.A., Zhamkochyan A.S., Babayan F.S., Piliposyan A.S., Kanctsyan A.G., – Rezul'taty raskopok 2002 goda v Oshakane (Results of 2002 Excavations in Oschakan), in: *Archeologiya, Etnologiya i Fol'kloristika Kavkaza (Archaeology, Ethnology and Folkloristic of Caucasia, International Conference)*, Abrahamyan L. (ed.), Yerevan, 2003, pp. 112–121.

Karageozyan H., – *Haykakan lernashkharhy sepagir aghbyurnerum (Armenian Highland in Cuneiform Sources)*, v. 1/1, Yerevan, 1998.

Karakhanyan G., Azizbekyan O., – Drevnyaya liteinaya forma iz Syunika (An Ancient Mold from Syunik), *Vestnik obshchestvennykh nauk (Herald of Social Sciences)* 1 (1981), pp. 75–77.

Karapetyan I.A., – Karchaghbyuri peghumnery, 1975–1978 (Excavations in Karchaghbyur, 1975–1978), *Patma-banasirakan handes (Historical-Philological Journal)* 3 (1979), pp. 268–277.

Karapetyan L.L., Shahinyan A.N., – Hnagitakan haytnagortsutyunner Dilijanum (Archaeological Discoveries in Dilijan), *Teghekagir hasarakakan gitutyunneri (Herald of Social Sciences)* 12 (1964), pp. 68–78.

Khachatryan T.S., – *Material'naya kul'tura drevnego Artika (Material Culture of Ancient Artik)*, Yerevan, 1963.

Khachatryan T.S., – *Drevnyaya kul'tura Shiraka (The Ancient Culture of Shirak)*, Yerevan, 1975.

Khachatryan T.S., – *Artikskiy mogil'nik: Katalog (Arthik-Cemetery: Catalogue)*, Yerevan, 1979.

Khachatryan Zh.D., Kalantaryan A., – Martunu ev Vardenisi shrjanneri antik ev mijnadaryan hushardsannery (Antique and Medieval Sites of Martuni and Vardenis Regions), *Lraber hasarakakan gitutyunneri (Herald of Social Sciences)* 1 (1972), pp. 58–67.

Khachatryan Zh.D., Zardaryan M.O., Manukyan A.B., – Raskopki v Akunke (Excavations at Akunk), *Arkheologicheskie otkrytiya (Archaeological Discoveries) 1978*, Moscow, 1979, p. 150.

Khanzadyan E., – *Haykakan lernashkharhi mshakuity m.t.a. III hazaramyakum (The Culture of the Armenian Highland in the 3rd Millennium BC)*, Yerevan, 1967.

Khanzadyan E., – *Metsamor 2: La Necropole 1, Civilisations du Proche-Orient*, Hors Serie 1, Neuchatel, Paris, 1995.

Khanzadyan E., – Jrahovit, *Hayastani hnaguyn mshakuity*, Kalantaryan A., Badalyan R. (ed.), Yerevan, 2003, pp. 13–19.

Khanzadyan E., Mkrtchyan K., Parsamyan E., – *Metsamor*, Yerevan, 1973 (in Armenian).

Khanzadyan E.V., – *Elar-Darani*, Yerevan, 1979 (in Armenian).

Khanzadyan E.V., – Jrahoviti peghumnery (Excavations in Jrahovit), in: *Hayastani Hanrapetutyunum dashtayin hnagitakan/azgagrakan hetazotutyunnerin nvirvats amenamya*

gitakan nstashrjanneri tezer (Annual Reports of Archaeological/Ethnographical Investigations in the Republic of Armenia), Yerevan, 1979b, pp. 9–10.

Khanzadyan E.V., – Frühbronzezeitliche Kultur des Armenischen Hochlands, *Schriften zur Geschichte und Kultur des Alten Orients* 15 (1982), Berlin, S. 27–34.

Khanzadyan E.V., – *Araratskaya dolina v kontse IV – nachale I tys. do n.e. (Ararat-Valley at the End of the 4th – Beginning of the 1st Millennia BC)*, PhD Dissertation, Yerevan, 1985.

Klemm D.D., – Goldproduktion im östlichen Mittelmeerraum um 1300 v. Chr., in: *Das Schiff von Uluburun: Welthandel vor 3000 Jahren, Katalog der Ausstellung des Deutschen Bergbau-Museums Bochum, vom 15. Juli 2005 bis 16. Juli 2006*, Yalçın Ü., Pulak C., Slotta R. (Hrsg.), Bochum, 2005, S. 527–532.

Klima J., – *Gesellschaft und Kultur des Alten Mesopotamien*, Prag, 1964.

Kroll S., – Southern Armenia Survey (Syunik) 2000–2003, *Armenian Journal of Near Eastern Studies* I (2006), pp. 19–49.

Kuftin B.A., – *Archeologicheskie raskopki v Trialeti (Archaeological Excavations in Trialeti)* I, Tbilisi, 1941.

Kushnareva K.K., – *Kul'tura Nagornogo Karabagha po arkheolgicheskim istochnikam (The Culture of Mountainous Karabagh, according to Archaeological Sources)*, PhD Dissertation, Leningrad, 1951.

Kushnareva K.K., – Novye dannye o poselenii Uzerlik-Tepe okolo Aghdama (New Data on the Settlement Uzerlik-Tepe by Aghdam), *Materialy i issledovaniya po archeologii SSSR (Materials and Investigations on Archaeology of the USSSR)* 125 (1965), pp. 74–105.

Lalayan E., – Borcahlui gavary (The Province of Borchalu), *Azgagrakan handes (Ethnographic Journal)*, Tbilisi, 1901, 271–436.

Lalayan E., – *Dambaranneri peghumnery Khorhrdayin Hayastanum (Tomb Excavations in Soviet Armenia)*, Yerevan, 1931.

Lassen H., – Zu den beiden Bronzebeinringen aus dem Gräberfeld an der Beşik-Bucht in der Troas, *Studia Troica* 4 (1994), S. 127–142.

Limet H., – *Le travail du métal au pays de Sumer au temps de la IIIe Dynastie d'Ur, Paris*, 1960.

Lux S., Althoff R. (Hrsg.), – *Kissipenny und Manilla: Geld und Handel im alten Afrika, Begleitband zur Ausstellung*, Duisburg, 1995.

Madatyan E.M., – K istorii razrabotok Zodskogo zolotorudnogo mestorozhdeniya, *Izvestiya Akademii Nauk Armianskoy SSR, Nauki o zemle (Herald of Academy of Sciences of Armenian SSR, Earth Sciences)* 3–4 (1965), pp. 127–137.

Madatyan E.M., – Haikakan SSH voskeber tsronneri shahagortsumy hnadarum (Exploitation of Alluvial Gold of Armenian SSR in Antiquity), *Bnagitutyan ev tekhnikayi patmutiuny Hayastanum (History of Natural Sciences and Technology in Armenia)* VIII (1987), Yerevan, pp. 90–102.

Maghakyan I.G., – Zheleznorudnye mestorozhdeniya severnoy Armenii (Iron-Ore Mines of North Armenia), *Izvestiya Akademii Nauk Armianskoy SSR, Estestvennye nauki*

(Herald of Academy of Sciences of Armenian SSR, Natural Sciences) 1 (1941), pp. 5–15.

Manandyan H., – *Hayastani kaghaknery IX–X dd. (Cities of Armenia during the 9-10th centuries)*, Yerevan, 1940.

Margahovit, – Article Margahovit, *Haykakan sovetakan hanragitaran (Armenian Soviev Encyclopaedia)* 7 (1981), p. 300.

Martirosyan A.A., – *Raskopki v Golovino (Excavations in Golovino)*, Archeologicheskie pamyatniki Armenii (Archaeological Sites of Armenia) 4 (1954), Yerevan.

Martirosyan A.A., – *Armeniya v epokhu bronzy i rannego zheleza (Armenia in the Bronze and Early Iron Ages)*, Yerevan, 1964.

Maxwell-Hyslop R., – *Western Asiatic Jewellery*, London, 1971.

Maxwell-Hyslop R., – Sources of Sumerian Gold, *Iraq* XXXIX/1 (1977), pp. 83–86.

Meliksetyan Kh., Pernicka E., – Les débuts de la métallurgie en Arménie, *Les Dossiers d'Archeologie* 321 (2007), pp. 36–37.

Meliksetyan Kh., Pernicka E., Badalyan R., Avetissyan P., – Geochemical Characterisation of Armenian Early Bronze Age Metal Artefacts and Their Relation to Copper Ores, in: *Archaeometallurgy in Europe, International Conference held at 24–26 September 2003*, Milan, 2003, pp. 597–606.

Melkumyan B.G., – *Hayastani pghndsardyunaberutyan patmutyun. XVIII dari erkrord kesits minchev 1920 t. (History of Copper Production of Armenia: From the Second Half of the 18th Century till 1920)*, Yerevan, 1972.

Mellaart J., – *The Chalcolithic and Early Bronze Age in the Near East and Anatolia*, Beirut, 1966.

Mikaelyan G.H., – *Sevani avazani kiklopyan amrotsnery (Cyclopean Fortresses of Sevan Basin)*, Hayastani hnagitkan hushardsannery (Archaeological Sites of Armenia) 1, Yerevan, 1968.

Miron A., Orthmann W. (Hrsg.), – *Unterwegs zum Goldenen Vlies: Archäologische Funde aus Georgien*, Saarbrücken, 1995.

Mirzoyan S., – *Koghbopor-Noyemberyan. Antsyaly, kyanqy, kentsaghy (Koghbopor-Noyemberyan: Past and Present)*, Yerevan, 2007.

Mnatsakanyan A.O., – O raskopkakh mogil'nikov u sel. Golovino (Towards the Excavations of Tombs by the Village Golovino), *Kratkie soobshcheniya instituta archeologii (Brief Reports of the Institute of Archaeology)* 16, 1952, pp. 60–70.

Mnatsakanyan A.O., – Arkheologicheskie nakhodki v selenii Basargechar Armianskoy SSR (Archaeological Finds in the Township Basargechar of Armenian SSR), *Kratkie soobshcheniya instituta arkheologii (Brief Reports of the Institute of Archaeology)* 60 (1955), Moscow, pp. 39–44.

Mnatsakanyan H.H., – Dambaranneri peghumnery Golovino gyughum (Tomb Excavations at the Village Golovino), *Ashkhatutyunner Haystani patmutyan petakan tangarani (Reports of the State Historical Museum of Armenia)*, Yerevan, 1959, pp. 5–59.

Mnatsakanyan A.O., – Lchasheni nyutakan mshakuyti zargatsman himnakan pulery (Main Stages of Development of Lchashen Material Culture), *Patma-banasirakan handes*

(Historical-Philological Journal) 2 (1965), pp. 95–114.

Moorey P.R.S., – The Eastern Land of Tukrish, in: *Beiträge zur Kulturgeschichte Vorderasiens, R.M Boehmer-Festschrift*, Finkbeiner U., Dittmann R., Hauptmann H. (Hrsg.), Mainz am Rhein, 1995, S. 439–448.

Morgan de J., – *Mission scientifique au Caucase* I, Paris, 1889.

Munchaev R.M., – *Kavkaz na zare bronzovogo veka (Caucasia on the Threshold of Bronze Age)*, Moscow, 1975.

Munchaev R.M., – Maykopskaya kul'tura (Maikop-Culture), in: *Epokha Bronzy Kavkaza i Sredney Azii, Archeologiya SSSR (Bronze Age of Caucasia and Central Asia, Archaeology of SSSR)*, Kushnareva K.Ch., Markovin V.I. (ed.), Moscow, 1994, pp. 158–225.

Oganesyan V.E., – Serebrianniy kubok iz Karashamba (A Silver Goblet from Karashamb), *Istoriko-filologicheskiy zhurnal (Historical-Philological Journal)* 4 (1988), pp. 145–161.

Oganesyan V.E., – *Kul'tura pervoy poloviny II tysyacheletiya do n.e. v srednem techenii reki Razdan (The Culture of the First Half of the 2nd Millennium BC in the Middle Flow of Hrazdan River)*, PhD Dissertation, Yerevan, 1990.

Ohanyan H.A., – Hellenistakan zhamanakashrjani dambaran Karchaghbyur gyughi Kari Dur amrotsum (A Tomb of Hellenistic Period in the Fortress Kari Dur of the Village Karchaghbyur), in: *Hayastani hanrapetutyan dashtayin hnagitakan ashkhatankneri ardyunknerin nvirvats gitakan nstashrjan, 1979–1980 (Scientific Session Dedicated to the Results of Archaeological Field-Works of the Republic Armenia, 1979–1980)*, Yerevan, 1981, pp. 31–32.

Orlin L.L., – *Assyrian Colonies in Cappadocia*, The Hague-Paris, 1970.

Otto A., – Organization of Late Bronze Age Cities in the Upper Syrian Euphrates Valley, in: *Proceedings of the 5th International Congress on the Archaeology of the Ancient Near East, Madrid, April 3–8, 2006*, Córdoba J.M., Molist M., Pérez M.C., Rubio I., Martínez S. (ed.). Madrid, 2008, pp. 715–731.

Palmieri A.M., Di Nocera G.M., – The Metal Objects from the "Royal" Tomb at Arslantepe (Malatya-Turkey) and the Metalwork Development in the Early Bronze Age, in: *Landscapes, Territories, Frontiers and Horizons in the Ancient Near East* III, Milano L., De Martino S., Fales F.M., Lanfranchi G.B. (ed.), Padova, 2000, pp. 179–190.

Petrie F.W.M., – *Ancient Weights and Measures*, London, 1926.

Petrosyan A., – The 'Eastern Hittites' in the South and East of the Armenian Highland? *Armenian Journal of Near Eastern Studies* IV/1 (2009), pp. 63–72.

Petrosyan H., Kirakosyan L., Safaryan V., – *Handaberdi vanky ev nra peghumnery (The Monastery of Handaberd and its Excavations)*, Yerevan, 2009.

Petzel F.E., *Textiles of Ancient Mesopotamia, Persia and Egypt*, Corvallis, Oregon, 1987.

Picchelauri K., – *Waffen der Bronzezeit aus Ostgeorgien*, Archäologie in Eurasien 4, Espelkamp, 1997.

Picxelauri K., Orthmann W., Qvavaze D., – Neue archäologische Funde in Kachetien, *Georgica* 17 (1994), S. 9–13.

Piliposyan A.S., – *Haykakan lernashkharhy Merdsavor Arevelki patma-mshakutayin pokharnchutyunneri volortum, m.t.a. III-I hazaramyakner (The Armenian Highland in the Sphere of Historical and Cultural Relations of the Near East, 3rd–1st Centuries BC), Doktorakan Atenakhosutyan Seghmagir (Autorreferat of PhD Dissertation)*, Yerevan, 2004.

Piliposyan A., Mkrtchyan R., – Kanageghi dambaranadashti 1999 t. peghumnery (Excavations of Kanagegh Cemetery 1999), *Hin Hayastani mshakuity (Culture of Ancient Armenia)* 2, Kalantaryan A. (ed.), Yerevan, 2002, pp. 43–49.

Pogrebova M.N., – *Iran i Zakavkaz'e v rannem zheleznom veke (Iran and Transcaucasia in the Early Iron Age)*, Moscow, 1977.

Pons N., – Les fouilles d'Akhtamir, Arménie (Fer Ancien), *Akkadica* 122 (2001), pp. 27–54.

Potts D.T., – *Mesopotamian Civilization: The Material Foundations*, London, 1997.

Raunig W., – *Bernstein, Weihrauch, Seide: Waren und Wege der antiken Welt*, Wien-München, 1971.

Safaryan V.A., – *Artsakhi hin ev mijnadaryan mshakuyti lusabanumy adrbejanakan patmagitutyan mej (Elucidation of Ancient and Medieval Culture of Artsakh in Azeri Historiography)*, PhD Dissertation, Yerevan, 2009.

Sardaryan S.H., – *Nakhnadaryan hasarakutiuny Hayastanum (The Primitive Society in Armenia)*, Yerevan, 1967.

Schmidt C., – Uberregionale Austauschsysteme und Fernhandelswaren in der Ur III-Zeit, *Baghdader Mitteilungen* 36 (2005), S. 7–155.

Seiranyan E.B., – *Armyanskie samotsvety (Armenian Semi-Precious Stones)*, Yerevan, 1987.

Shahkhatuneants Y., – *Storagrutyun katoghike Ejmiatsni ev hing gavaratsn Araratay (Description of the Central Region of Ejmiatsin and Five Provinces of Ayrarat)* II, Ejmiatsin, 1842.

Simonyan H., – Nerkin Naveri 'arkayakan' dambaranablury (The 'Royal' Tomb of Nerkin Naver), in: *Aragatsotn: hogevor ev mshakutayin zharangutyun (Aragatsotn: Spiritual and Cultural Heritage)*, Achemyan S. (ed.), Oshakan, 2003, pp. 51–53.

Simonyan H., – *Verin Naver* I, Yerevan, 2006 (in Armenian).

Simonyan H., Gnuni A., – Artsakhi azatagrvats taratskneri hnaguyn nakhakristoneakan ev mijnadaryan bnakavayreri usumnasirutiuny 1993–1995 tt. (Investigation of Ancient Pre-Christian and Medieval Settlements in the Territory of Artaskh during 1993–1995), *Hnagitakan ashkhatanknery Hayastani Hanrapetutiunum (Archaeological Works in Republic of Armenia)*, Kalantaryan A. (ed.), Yerevan, 1996, pp. 70–71.

Smbateants M., *Teghekagir Gegharkuni tsovazard gavari (Encyclopaedia of Gegharkuni Province on the Sea)*, Ejmiatsin, 1895.

Smith A.T., Badalyan R.S., Avetisyan P., – *The Archaeology and Geography of Ancient Transcaucasian Societies, v. 1: The Foundations of Research and Regional Survey in the Tsaghkahovit Plain*, Armenia, Oriental Institute Publications 134, Chicago, 2009.

Srvandstyants G., – *Erker (Works)* 2, Yerevan, 1982.

Stöllner T., – Mineralische Rohstoffe in der Bronzezeit - ein Überblick, in: *Das Schiff von Uluburun: Welthandel vor 3000 Jahren, Katalog der Ausstellung des Deutschen Bergbau-Museums Bochum, vom 15. Juli 2005 bis 16. Juli 2006*, Yalçın Ü., Pulak C., Slotta R. (Hrsg.), Bochum, 2005, 451–473.

Stöllner T., Slotta R., Vatandoust A. (Hrsg.), – Persiens antike Pracht: Bergbau-Handwerk-Archäologie, in: *Katalog der Ausstellung des Deutschen Bergbau-Museums Bochum vom 28. November 2004 bis 29. Mai 2005*, Bochum, 2004.

Stöllner T., Ġambašiże I., Hauptmann A., Mindiašvili G., Gogočuri G., Steffens G., – Goldbergbau in Südostgeorgien - Neue Forschungen zum frühbronzezeitlichen Bergbau in Georgien, in: *Von Maikop bis Trialeti: Gewinnung und Verbreitung von Metallen und Obsidian in Kaukasien im 4.–2. Jt. v. Chr., Beiträge des Internationalen Symposiums in Berlin vom 1.–3. Juni 2006*, Hansen S., Hauptmann A., Motzenbäcker I., Pernicka E., Bonn, 2010, S. 103–138.

Toramanyan T., – *Nyuter haykakan chartarapetutyan patmutyan (Materials for the History of Armenian Architecture)* 1–2, Yerevan, 1942–1948.

Trifonov V.G., Karakhanyan A.S., – *Geodinamika i istoriya tsivilizatsiy (The Geodynamics and the History of Civilizations)*, Moscow, 2004.

Tumanyan G.S., – *Ashtaraki Urutsy: Srbazan tsareri hnaguyn pashtamunki hetkery (Uruts of Ashtarak: Oldest Relicts of Cult of Sacred Trees)*, Yerevan, 2005.

Whallon R., An Archaeological Survey of the Keban Reservoir Area of East-Central Turkey, *Memoirs of the Museum of Antropology of Michigan* 11, Michigan, 1979.

Xnkikyan O.S., – Ush bronzi dari metaghagortsutyan mi kani hartseri shurj (Towards Some Questions of Late Bronze Age Metallurgy), *Patma-banasirakan handes (Historical-Philological Journal)* 3 (1971), pp. 281–288.

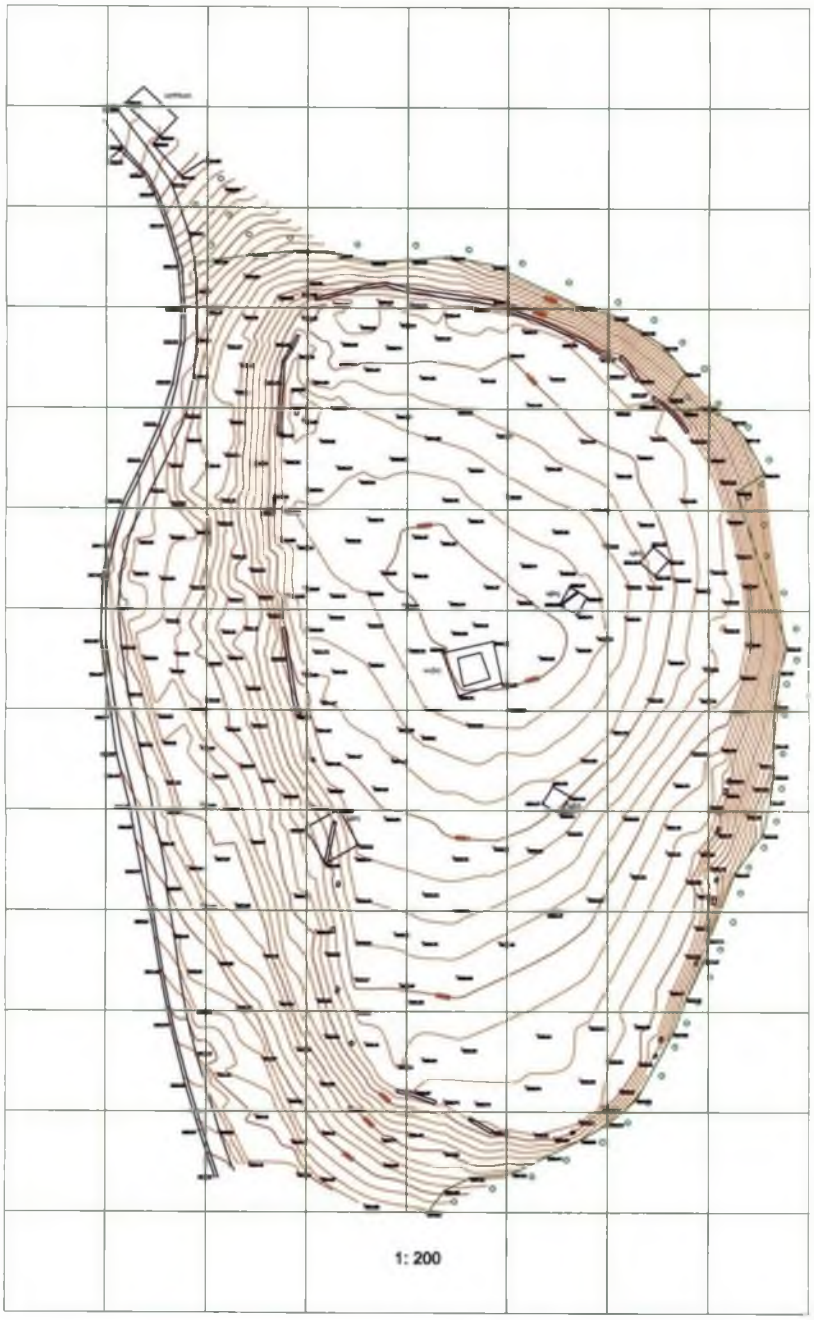
Xnkikyan O.S., – *Arhestnery bronzedaryan Hayastanum (Crafts in Bronze Age Armenia)*, Yerevan, 1977.

Xnkikyan O.S., – *Syunik during the Bronze and Iron Ages*, Barrington, 2002.

Yakar J., – Cultural Interaction between Anatolia and Southeast Europe: An Archaeological Appraisal, in: *In the Steps of James Harvey Gaul 1, J.H. Gaul in Memoriam*, Stefanovich M., Todorova H., – Hauptmann H. (ed.), Sofia, 1998, pp. 13–25.

Yengibaryan N., – An Urartian Medallion from Sotk, *Studi Micenei ed Egeo-Anatoloci* (in press).

Yerevanyan G.S., – *Patmutyun Charsanjaki Hayots (History of Armenian Charsanjhak)*, Beirut, 1956.



Topographic map of Margahovit Settlement

ԱՐԱՄ ԳԵՎՈՐԳՅԱՆ, ԱՐՍԵՆ ԲՈՔՈԽՅԱՆ
Պատմական գիտությունների թեկնածուներ,
ՀՀ ԳԱԱ հնագիտության և ազգագրության ինստիտուտ,
argev@mail.ru; arsenbobokhyan@yahoo.com

ՀՆԱԳՈՒՅՆ ՀԱՅԱՍՏԱՆԻ ՄԵՏԱՂԱԳՈՐԾՈՒԹՅՈՒՆԸ ՊԱՏՄԱՄՇԱԿՈՒԹԱՅԻՆ ՀԱՄԱՏԵՔՍՏՈՒՄ

ԱՄՓՈՓՈՒՄ

Աշխատանքի նպատակն է պարզաբանել մետաղագործության և արտադրանքի տարածման առանձնահատկությունները Հայաստանում՝ այն դիտարկելով որպես տեղական մշակույթների արժեքային համակարգի մի բաղկացուցիչ: Նման աշխատանք իրականացնելու հեռանկարներն ակնհայտ են, քանի որ տարածաշրջանը ոչ միայն հարուստ է մետաղահանքերով և հնագույն մետաղագործությանն առնչվող հնագիտական տվյալներով, այլև պատմաաշխարհագրական մի այնպիսի ոլորտ է, որտեղ մերձավորարևելյան և հյուսիսային տափաստանային մշակույթները, այսինքն՝ տարբեր արժեքային համակարգերով բնորոշվող երկու աշխարհներ, հանդիպում են միմյանց: Բնական է, որ այս շփումը պետք է արտահայտված լիներ նաև մետաղագործության բնագավառում:

Այս նպատակով 2009–2010 թթ. ընթացքում մեր արշավախումբը հետախուզական աշխատանքներ ձեռնարկեց Հայաստանի մի շարք մետաղահանքերում ու հնագիտական հուշարձաններում: Որպես այդ աշխատանքների արդյունք՝ 2011 թ. հնագիտական պեղումներ սկսվեցին Մարզահովիտ հնավայրում, որոնք շարունակվում են մինչ օրս: Սույն հրապարակման մեջ քննարկվում են հիշյալ հետախուզական աշխատանքների նախնական արդյունքները:

Հազարավոր մետաղե առարկաների առկայությունը, ինչպես նաև մետաղի արտադրության այնպիսի կենտրոնների գոյությունը, ինչպիսիք են՝ Ջրահովիտը, Արևիկը, Շենզավիթը, Ֆիոլետովոն, Կառնուտը, Գառնին, Ջաղացատեղը՝ վաղ բրոնզի դարում, Լճաշենը և Ուզերլիկթեփեն՝ միջին բրոնզի դարում, Մեծամորը, Դվինը, Լճաշենը, Կարմիր Բլուրը, Հաղարծինը, Գյումրին, Գեղարոտը, Շիրակավանը, Մթնաձորը, Կլոր Դարի ամրոցը (ինչպես նաև Ախթալայի, Արթիկի, Քանագեղի ու Լոռի Բերդի մետաղագործի դամբարանները)՝ ուշ բրոնզի ու երկաթի դարաշրջաններում, վկա-

յում են հնագույն Հայաստանի մետաղագործության բարձր մակարդակի մասին: Այս տվյալները էապես համալրվում են հիշյալ ժամանակահատվածում փաստագրված հնագույն մետաղահանքերի (Քաջարան, Ալավերդի, Ախթալա, Սոթք, Մարգահովիտ, Մեղրաձոր) շահագործման փաստերով:

Առկա նյութը ցույց է տալիս, որ մկնդեղային բրոնզի հենքի վրա առաջացած մետաղագործությունը բավականին զարգացած է եղել վաղ բրոնզի դարում: Միջին բրոնզի դարը ներկայանում է մետաղական առարկաների բազմազանությամբ, նոր տեխնոլոգիաների, անագային բրոնզի, ոսկու և արծաթի լայն կիրառմամբ: Մետաղագործությունը Հայստանում իր գագաթնակետին է հասնում ուշ բրոնզի և վաղ երկաթի դարում, երբ առաջին անգամ կիրառվում է սուլֆիդային հանքաքարը, իսկ բրոնզի ու երկաթի առարկաների քանակը կտրուկ աճում է:

Պեղումները և հետախուզական աշխատանքները ցույց են տալիս, որ թե՛ մետաղահանքերին կից, և թե՛ դրանցից հեռու տեղակայված բնակավայրերը կարևոր դեր են խաղացել մետաղի արտադրության ու տարածման ընթացքում: Ավելին, հանքավայրերից հեռու՝ Արարատյան դաշտավայրում գտնվող այնպիսի հնավայրեր, ինչպիսիք են Մեծամորը կամ Ջրահովիտը, հանդես են գալիս որպես մետաղագործական խոշոր կենտրոններ: Մյուս կողմից, նախալեռնային գոտում տեղադրված Գեղարոտի կամ Նազրվանի տիպի բնակավայրերը նույնպես կարևոր արտադրական և վերաբաշխման կետեր կարող էին հանդիսանալ: Վերջիններիս կողքին անհրաժեշտ է հիշատակել անմիջապես հանքավայրերի վրա կամ կից տեղադրված մասնագիտացված բնակավայրերը, ինչպիսիք են Ֆիոլետովոն կամ Մարգահովիտը:

Հնագույն Հայաստանի մետաղագործությունն ընդհանուր պատմամշակութային զարգացումների համատեքստում ընկալելու համար պետք է համատեղ քննարկել և՛ մետաղական հումքից հեռու, և՛ մոտ գտնվող հնավայրերի տվյալները: Նման դիտարկման արդյունքում հնարավոր կլինի սահմանել կենտրոնական ու ծայրամասային ոլորտներ բուն Հայաստանի տարածքում (օրինակ՝ Արարատյան դաշտի բնակավայրեր – Արազածոտնի բնակավայրեր, հովտաբնակներ – լեռնցիներ, առաջնային պետական կազմավորումներ – երկրորդային պետական կազմավորումներ) և նրա սահմաններից դուրս (Հայաստան – Կովկաս, Հայաստան – Մերձավոր Արևելք/Փոքր Ասիա/Էգեյան աշխարհ):

Այս հարաբերությունները պարզաբանելու համար կարևորվում են Մարգահովիտ բնակավայրի պեղումները: Այս բազմաշերտ հուշարձանը (բնակեցման հիմնական ժամանակաշրջանը վաղ բրոնզի դարն է) տեղադրված է կենտրոնական և հյուսիսային Հայաստանը կապող կարևոր ճանապարհի վրա, հանքավայրի տարածքում, ամենաարևդարձակն է տարածաշրջանում՝ շրջապատված լինելով արբանյակային բնակավայրերով:

Բնակավայրը գտնվում է Լոռու մարզի տարածքում, որը բազմամետաղային հումքով ամենահարուստն է Հայաստանում: Որոշ հեղինակներ արդեն ընդգծել են Լոռու հանքային գոտու կարևորությունը, որի մետաղական հումքը սկսած վաղ և միջին բրոնզի դարաշրջաններից կարող էր աղբյուր հանդիսանալ ոչ միայն հայկական, այլև վրացական ու հյուսիսկովկասյան բնակավայրերի համար: Այս տեսանկյունից, քննվող հուշարձանի պեղումները կօգնեն հասկանալ ոչ միայն Մարգահովիտի դաշտավայրի հասարակական ենթակառուցվածքի առանձնահատկությունները, այլև այս ենթատարածքի տեղը Հայաստանի ու հարակից շրջանների մետաղագործության ընդհանուր համատեքստում:

АРАМ ГЕВОРКЯН,
Кандидат исторических наук,
Институт археологии и этнографии НАН РА,
argev@mail.ru
АРСЕН БОБОХЯН
Кандидат исторических наук,
Институт археологии и этнографии НАН РА,
arsenbobokhyan@yahoo.com

МЕТАЛЛОПРОИЗВОДСТВО ДРЕВНЕЙШЕЙ АРМЕНИИ В ИСТОРИКО-КУЛЬТУРНОМ КОНТЕКСТЕ

РЕЗЮМЕ

В данной статье мы поставили задачу выяснить специфику использования металла и распространение готовой продукции в указанный исторический период, рассматривая металлопроизводство Армении как один из компонентов системы ценностей местной культуры. Нам представляется, что проведение таких работ просто необходимо, так как регион богат не только месторождениями и многими археологическими находками, непосредственно относящимися к металлопроизводству, но и, что очень важно, Армения является местом, где встречаются две культуры (древневосточные и северостепные), имеющие совершенно разные системы ценностей. Естественно, что эти контакты должны были отразиться и в области металлопроизводства.

Именно с этой целью наша группа в 2009 – 2010 гг. обследовала месторождения меди и железа и многие археологические памятники Армении. В результате мы решили, что необходимо предпринять археологические раскопки в зоне расположенной в непосредственной близости от месторождения. Мы выбрали поселение Маргаовит, отвечавшее этим требованиям, и в 2011 году приступили к раскопкам, которые продолжаем до сих пор. В данной статье мы рассматриваем предварительные результаты этих разведочных работ.

Наличие многих тысяч металлических артефактов, а также такие памятники как Джраовит, Аревик, Шенгавит, Гарни, Фиолетово, Карнут, Джахацатех для раннего бронзового века, Лчашен, Узерлик Тепе для среднего бронзового века, Мецамор, Двин, Лчашен, Кармир Блур, Агарцин,

Гюмри, Гехарот, Ширакаван, Мтнадзор, крепость Клор Дара (клады и погребения литейщиков: Ахтала, Артик, Канагех и Лори Берд) - для позднего бронзового и раннежелезного веков, указывают на высочайший уровень древнейшего металлопроизводства в Армении. Приведенные данные подтверждаются и остатками древних разработок в месторождениях меди (Капан, Каджаран, Сисимадан, Алаверди, Ахтала, Маргаовит/Гамзачиман) и золота (Меградзор, Сотк/Зод). В раннем бронзовом веке металлурги выплавляли мышьяковистую бронзу или же просто "чистую" медь. В среднем бронзовом веке ассортимент металлического инвентаря резко расширяется, появляется металлическая посуда, различные высокохудожественные ювелирные изделия с применением чеканки, гравировки, инкрустации. В это время начинается выплавка оловяннистых, мышьяково–оловянистых и многокомпонентных сплавов с участием свинца и сурьмы. В элитных погребениях часто встречаются золотые и серебряные предметы, что указывает на явное социальное расслоение общества.

В век поздней бронзы активность металлопроизводства резко возрастает. В это время количество металлических находок ряда памятников часто насчитывает многие сотни украшений, оружия и орудий труда. Вероятно именно тогда древние металлурги начинают использовать сульфидные руды медных месторождений, когда технология выплавки меди несколько отличается от прежней традиции. На чрезвычайно бурный расцвет цветной металлургии поздней бронзы указывают отдельные коллекции из таких замечательних памятников как Лчашен, Мецамор, Лори Берд, Артик и многие др.

Раскопки и разведочные работы показывают, что расстояние поселения от рудного источника не имело принципиального значения для производства и распространения металла. Более того, такие памятники Араратской долины как Мецамор, Джраовит, Двин, Кармир Блур, находящиеся вдали от месторождений, являлись крупными центрами металлопроизводства. Но вместе с тем поселения Гехарот или Назрван, расположенные в предгорных зонах, в свою очередь тоже могли служить местом производства и распределения металла. При этом необходимо особо выделить те специализированные памятники, которые находятся либо прямо в районе рудного месторождения (Фиолетово), либо в непосредственной близости от него (Маргаовит).

Для полного осмысления древнейшей металлургии Армении в контексте развития историко-культурных процессов, необходимо совместно рассмотреть данные памятников находящихся рядом с рудным источником, или на значительном расстоянии от него. В результате такого детального анализа мы получим возможность выделить центральные и периферийные области (например, поселения Араратской долины – поселения Арагацотна, жители

долины – горных районов, первичные или вторичных государственных образованих) как в Армении и за ее пределами (Армения – Кавказ, Армения – Ближний Восток/Малая Азия/ Эгейский мир).

Для выяснения этих отношений мы считаем крайне важными раскопки в поселении Маргаовит. Это многослойный памятник, заселённый в основном в ранний период бронзового веке, расположен на важном пути, связывающем центральную Армению с её северной территорией. Он находится в металлогенной зоне Лорийского марза, который считается самым богатым полиметаллическим рудным районом Армении. Некоторые авторы особо подчеркивают важность этой рудной зоны, сырьё которой, начиная с ранней и средней бронзы, могло служить источником также для грузинских и северокавказских поселений. С этой точки зрения раскопки данного поселения помогут понять не только инфраструктуру общества маргаовитского микрорегиона, но также его место в общем контексте древнейшего металлопроизводства Армении и сопредельных областей.