

**METALLURGY OF THE COLCHIAN BRONZE CULTURE:
A TYPOLOGICAL CLASSIFICATION OF COPPER INGOTS
(ACCORDING TO THE MATERIALS OF THE MARTVILI MUSEUM
OF THE LOCAL LORE AND THE TSAGERI HISTORIC MUSEUM**

კოლხური ბრინჯაოს კულტურის მეტალურგია: ბრინჯაოს
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მუზეუმისა და ცაგერის ისტორიული მუზეუმის მასალების
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Abstract

The main purpose of this study is to suggest a classification of copper ingots, the main surviving product of the widespread copper smelting industry which has recently been shown to underpin the well known transitional late Bronze Age/early Iron Age culture of Colchis (western Georgia). This new study is based mainly on the many copper ingot fragments now in the collection of the Martvili Museum of the Local Lore and the Tsageri Historical Museum. This typological classification of the copper ingots from this region suggests that there were 6 differing forms and 3 main types of ingot although the variety of ingot forms seems to be similar across much of western Georgia. Characteristic types for both Lechkhumi and eastern Samegrelo are represented by both conical and rounded ingots so that some preliminary conclusions can be drawn about the shape of the crucibles in which the

ingots were cast. This typological classification and its variations may suggest that we are dealing with different metallurgical foundries possibly representing two neighboring regions. The abundance of ingots found in Lechkhumi and Martvili indicates that this was an important region for copper smelting in the late Bronze/early Iron Age transition period.

Key words: Copper, smelting, metallurgy, ingots, Colchis, prehistory, Martvili, Tsageri.

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აბსტრაქტი

ნაშრომის მიზანია კოლხური ბრინჯაოს კულტურის არეალში ლითონის ჩამოსხმის პროცესის ერთ-ერთი კომპონენტის, სპილენძის ზოდების კლასიფიკაცია მარტვილის მხარეთმცოდნეობის მუზეუმისა და ცაგერის ისტორიული მუზეუმის მასალების მიხედვით. დადგინდა, რომ მარტვილის მასალების მიხედვით 6 ძირითადი სახის ფორმა იყო, ხოლო ცაგერის მასალების მიხედვით - 3 ძირითადი სახის ფორმა; ორივე რეგიონისთვის დამახასიათებელი ტიპებია კონუსური ფორმის და გვერდებმომრგვალებული ზოდები; ზოდების ტიპოლოგიური კლასიფიკაციის მიხედვით ცხადია, რომ ორ სხვადასხვა მეტალურგიულ სახელოსნოსთან გვაქვს საქმე. ლეჩხუმში და მარტვილში აღმოჩენილი ბრინჯაოს ზოდების სიმრავლე ამ რეგიონების ბრინჯაო-რკინის ხანაში დაწინაურებულ მდგომარეობაზე მიგვითითებს მეტალურგიის თვალსაზრისით.

საკვანძო სიტყვები: სპილენძი, დნობა, მეტალურგია, ზოდები, კოლხეთი, პრეისტორია, მარტვილი, ცაგერი.

Introduction

This paper is the first stage of research the aim of which is to recover and present previously largely unknown evidence of the prehistoric copper production processes used in ancient Colchis which is now possible to reconstruct on the basis of recent archaeological findings. This is necessary to correct earlier misconceptions about late prehistoric metal production in this region and the aim of this part of the work is to show the variety of copper ingot forms and types from the Lechkumi and adjacent Samegrelo regions and what this might imply.

Methods

The research is based on the method of typological classification of artefacts tested in archaeological science. The typological classification of the final product of metallurgy, the bronze ingots, preserved in the Martvili Museum of Local Lore and the Tsageri Historical Museum, has not been specially conducted by anyone. The classification of the ingots of the Martvili Museum of Local Lore (30 samples) by the typological method gives the following picture: I. conical ingots (a, b, c, d), II. flat ingots, III. ingots with rounded sides (a, b), IV. ingots with extending edges (a, b), V. ring-based ingots, VI. discoid-shaped ingots. 16 examples of ingots from the Tsageri Historical Museum were examined resulting in the following classification: I. conical ingots (a, b, c, d), II. cylindrical ingots (a, b), III. ingots with rounded sides (a, b).

Results

The presented work is the first stage of the work, which aims to document the specific archaeological material of the metal casting process in the area of the Colchian bronze culture, in this case copper bars, and to correct the existing data.

The results of the first phase of our research are as follows: 1. A typological classification of artefacts (ingots) was made according to the material of the two museums, which in fact formed the basis for the classification of other similar materials; 2. It was concluded that all bars (even of the same type) were cast in different shapes; According to Tsageri materials, there were 3 main types of forms, and according to Martvili materials - 6 main types of forms; 3. Typical types for both regions are cone-shaped and side-rounded bars; 4. As a result of the classification of bars, although the process of casting bars belongs to the field of metallurgy, it is possible to make a preliminary conclusion about the structure of the stove in which this or that type of bar was cast; 5. According to the typological classification, I think we can conclude that even in these two nearby regions we are dealing with two different workshops, which will probably be confirmed by proper analysis.

Discussion and Conclusions

THE STUDY OF COLCHIAN COPPER INGOTS. Copper-ingots are a characteristic and important component of the late Bronze Age metal culture of Colchis which differs from other contemporary archaeological cultures of the Caucasus with its abundance of ingots (Sulava, et al. 2014). Almost all have mainly been





























TSAGERI		MARTVILI	
Typological Classification	INGOTS	Typological Classification	INGOTS
I	a 	I	a 
	b 		b 
	c 		c 
	d 		d 
II	a 	II	a 
	b 		b 
III	a 	III	a 
	b 		b 
IV	a 	IV	a 
	b 		b 
V	a 	V	a 
	b 		b 
VI	a 	VI	a 
	b 		b 

Fig.1 Tsageri, Martvili. A typological classification of Copper Ingots

found as chance discoveries or occasionally in archaeological contexts (mainly hoards or on their own) and many if not all of these findings are likely to be votive in origin, in other words buried intentionally in specific of special places as offerings.

We believe that a detailed study of prehistoric copper ingots, will eventually help us to answer a number of problematical questions concerning the (copper-bronze) metallurgical basis of Colchian culture.

If we sum up some existing discoveries relating to copper based metallurgy in the South Caucasus before the beginning of the 2nd millennium BC new can see that many copper-based artifacts – from the period between about the late 6th millennium and the early 3rd millennium have been found mainly in eastern Georgia (This region contains some of the oldest known copper or copper alloy objects known from the south Caucasus region and many of these have been analysed (Abesadze, 2011). By the late Bronze Age (mid to late 2nd millennium BC) the emphasis has

shifted and western Georgia (Colchis) has a higher proportion of decorative and characteristic copper alloy metalwork.

However no dated Bronze Age copper mines have yet been identified in the modern state of Georgia. For the early to middle Bronze Age these may be extremely difficult if not impossible to find. Recent research and survey work has show that by the late Bronze Age many copper smelting sites existed scattered across the western Georgian region (now Ajara, Guria, Samegrelo, Abkhazia, Svaneti, Ratcha and Lechkhumi) known as Colchis by the first millennium BC.

Even though earlier mining and smelting sites must exist given the many late Bronze Age smelting sites that have been found across western Georgia. Recent research suggests that this copper production was at its height between about the 13th and 8th centuries BC (Sulava, et al. 2020). This industry is known from the many (stony waste) slag tips which not only mark the location of the copper smelting activity but also show that the smelting was based on the exploitation of unweathered chalcopyrite. This in turn implies the existence of local – deeper, hard rock – mines than existed before although these are hard to find and even then are likely to be relatively small in extent (Inanishvili et al. 2010).

This scope of this widespread industry is known mainly through the discovery of up to about 400 smelting sites in a 25 year period after about 1960 (Khakhutaishvili, 2009) although until more recent work these were thought to belong to an early iron smelting industry. These were found scattered across the hilly zone near the Black Sea coast (of Colchis) between the main and lesser Caucasus mountain ranges. These prehistoric copper smelting sites were found in Ajara, Guria and Samegrelo (Gzelishvili, 1964; Khakhutaishvili, 1987; Erb-Satullo, et al. 2014; Sulava, et al. 2013; Rezesidze, et al. 2018).

Ingots (about 30) from the Martvili Museum of Local Lore occur in a wide variety of sizes the largest of which is a half ingot weighing 55 kg (thus about 110 kg when complete) with many smaller fragments (they are almost never found complete) and small size (secondary, remelted cakes, the weight of which ranges from 100 to 300 grams, and which are generally circular but much flatter in section (Sulava et al. 2014) (fig.1/Martvili). Similar ingots have been reported from Sokhumi (Kalandadze, 1954), Zeniti (Khakhutaishvili, 1995), Gogoleisubani (Koridze, 1965), Bezhatubani (Koridze, 1965), Kalvati (Koridze, 1965), Ochkhomuri (Apakidze, 2000) and several sites near Tsageri (the largest being the Tsagera hoard (Sulava, 2014a). The fragmentary state of most if not all ingots suggests that these may have been used as currency/exchange/trade units, like similar ingots from European hoards (Lordkipanidze, 2001).

The circumstances of the discovery of the hoards are almost always unknown and obscure although it is conventional to refer to contexts consisting of two or more ingots - and/or other artefacts – as hoards and single ingots finds as chance finds. All these findings are likely to have resulted from the intentional votive deposition of the metalwork as ritual offerings. These are common right across Europe in the Bronze Age. Hoards earlier reported in the Martvili area include those from Doshake, Tamakoni and Lebarde) (Koridze, 1965; Lordkipanidze, 2001;

Sulava, Rezesidze 2017).

The typological classification of ingots (30 examples) from the Martvili Museum of Local Lore gives us the following range of shapes : I. conical ingots (a, b, c, d), II. flat ingots, III. ingots with rounded sides (a, b), IV. ingots with extending edges (a, b), V. ring-based ingots, VI. discoid-shaped ingots (fig. I/Martvili). 16 examples of ingots from the Tsageri Historical Museum were examined resulting in the following classification: I. conical ingots (a, b, c, d), II. cylindrical ingots (a, b), III. ingots with rounded sides (a, b) (fig. I-Tsageri). The largest ingot in the collection of the Tsageri Historical Museum (from Zogishi) weighs 32 kg.

CONCLUSIONS. Thus, the results of the first stage of our typological study is based on the study of (fragments of) ingots from the collections of Martvili and Tsageri Museums and this is intended to serve as the basis for the further study of prehistoric copper ingots from a much wider area. Some tentative conclusions can be drawn from the ingots studied so far:

Conical and rounded ingot forms are characteristic for both regions. Also – especially in the case of the Tsageri material – all ingots (even of the same type) were cast in different forms and appeared to conform to 3 main types, whereas the Martvili ingots could be divided into 6 main types. We can also draw preliminary conclusions from the study of the ingots as to the shape of the crucibles in which they were cast. Our survey work so far suggests this process is likely to have taken place in a more specialized foundries – probably much fewer in number – than the smelting furnaces in which the raw copper is likely to have been recovered as small lumps or prills, gathered together for melting down into ingots (Hauptmann, 2007).

This typological classification suggests to us that we are dealing with at least two different foundries (and probably many more) in these two neighboring regions. We aim to see if there is any analytical basis for the suggested division into different foundries.

Numerous finds of ingots in Lechkhumi and eastern Samegrelo (the Martvili Municipality) can only represent a small proportion of what copper was originally produced which in turn indicates the importance of copper smelting in these regions in the transitional late Bronze/early Iron Age. We should also remember that a significant Colchian settlement was discovered in Lechkhumi, south of Tsageri, near the village Tskheta where traces of a smithing/casting workshop were indicated by the finding of a casting mould and associated (copper alloy workshop) slag remnants were found (Sulava, 2008), as well as a bronze ingot nearby. From this we can conclude that primary metal production (both mining and smelting) as well as secondary processing (artefact making and associated artisanship) were leading industries for the local population along with developed and diversified agriculture (†Sakharova, Sulava, 2014; Sulava, 2014b).

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