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ARROWHEADS AND DOLPHINS: PRE-COINAGE MONETARY INSTRUMENTS FROM THE WESTERN BLACK SEA (5TH CENTURY BC)

Abstract: During the last decade, archaeological research carried out at Istros and other points of interest in the western Black Sea has led to the discovery of some rare or even unique pre-coinage monetary instruments. Presented in this regard, are a primary lead sample, a commercial coin showing the representation of a sturgeon fish, and a silver Olbian dolphin. These discoveries add new information regarding the origin of pre-coinage monetary instruments and their role in the Greek colonies and, subsequently, in the autochthonous environment of the western Black Sea. Also included are the results of interdisciplinary analyses (X-Ray Fluorescence and micro-PIXE – Proton Induced X-ray Emission) done on approximately 300 specimens from the category of those instruments that were cast for commercial purposes of the laurel leaf/olive leaf/wheat grain types.

Keywords: *Monetary instruments, commercial purpose, western Black Sea, Istros, 5th century BC.*

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INTRODUCTION

Over the past two decades, the study of the pre-coinage monetary instruments of the Black Sea area has greatly increased. There are two main forms, arrowheads and dolphins, of which the first is the more common. These monetary instruments are known from the Milesian colonies of northern and western Pontus: Borysthenes-Berezani/Olbia, Istros, Tomis, and Apollonia Pontica. Indeed, most, if not all, of the Ionian colonies of the region issued them in large quantities from the end of the 6th century and throughout the 5th century.

FINDINGS AND COMMENTARY

A possible prototype for the monetary instruments substitutes, which have variously been described as arrowheads, laurels, olive leaves, or wheat grains, was discovered during the archaeological excavation of the Metaxa/Constanța sector of the ancient city of Istros in 2016 (Fig. 1, no. 1).¹ It is made of lead, cast in a mold, with a length of 33 mm and a weight of 9.27 g. On one side, it has two lateral edges and a third one in the center; on the reverse, it

¹ TALMAȚCHI 2021, 312.

is entirely smooth.² Its weight is heavier than what has been recorded for these monetary instruments in the Western Pontus. It is not a piece for regular circulation but an experimental prototype before regular production commenced.

Arrowhead money can be divided into two groups: arrowhead money that was made by converting actual arrowheads from their original use in warfare or hunting into monetary instruments, and arrowhead money that was cast specifically to be used as a medium of exchange. The first group was made by cutting off the sharp tip and filling the central shaft with lead. These arrowheads may have had a religious function.³ They are thought to be votive objects related to the cult of Apollo the Healer.⁴ During the archaeological excavations carried out over the past decade in the “temple” sector of Istros, several monetary instruments were discovered, including one Olbian dolphin. Most of these were modified from functional arrowheads, converted from their original purpose for warfare and hunting. These arrowheads were found in the context of votive deposits of a comparatively early date, at the beginning of the 6th century BC. Monetary instruments cast intentionally for commercial exchange appear in this sector only in small numbers, and stratigraphy indicates that they are chronologically later, dating towards the end of the first half of the 6th century BC.⁵

Among the second group of arrowhead money—those made intentionally as a medium of commercial exchange—we can distinguish various design types. They have a central rib and an elongated shape of a willow or laurel leaf, or an olive leaf, or a wheat ear. Several of the monetary instruments bear symbols, such as the letter A on one or both sides, embossed fir or leaf veins on one or both sides, an axe, an anchor, or a four-spoked wheel. Symbols are common on the elongated pieces. Some have been attributed to specific *poleis*: the letter A and the anchor have been assigned to Apollonia Pontica,⁶ while the four-spoked wheel has been associated with Istros.⁷

More than ten examples of arrowhead money with wheel representation have been published.⁸ The wheel was stamped over the central rib after the piece had been cast, being applied after the metal had cooled. The wheel has four spokes, with its circumference in relief. When a wheel is stamped on the obverse, there are three parallel striations on the reverse below the pronounced central line. This arrowhead money with wheel stamps represents an intermediate stage between the monetary instruments without special designs and the cast coins of the wheel type that were issued by the citadel of Istros starting from the middle of the 5th century BC.⁹ Some believe that the arrowhead money and the wheel-type coins circulated side by side for at least a decade.¹⁰ Based on findspots, I believe that all arrowhead money with the wheel stamp was made at Istros. The wheel

symbolized the citadel of Istros within the Milesian community in the west and northwest of the Black Sea.¹¹

Three hundred arrowhead pieces of the laurel/grain or wheat type, originating from hoards in the Istros *chora* and from indigenous settlements in the western Pontus, have been studied by XRF (X-Ray Fluorescence) and micro-PIXE method (Proton Induced X-ray Emission).¹² The composition of the alloys proved to be quite disparate—from regular copper and bronze (copper-tin) to rarer alloys like copper-manganese and copper-antimony. Those with a copper-tin content are believed to have been made from bronze imported from the Aegean; those with zinc and manganese content are believed to have been cast in Olbia from materials obtained from the Dnieper region; those with manganese, zinc, arsenic, and antimony content are believed to contain metal from deposits in the northern area of the Anatolian coast (Trabzon, Turkey) and the Caucasus Mountains. Two additional conclusions of this study are that the purpose-made arrowhead money were produced by melting down functional arrowheads, thereby converting them from their role in warfare and hunting and, probably, also from their role as votives. Secondly, the metal used to make the purpose-made arrowhead money was subsequently re-used to cast the coins of the “wheel” type from Istros.¹³

Among the laurel leaf/olive leaf/wheat type arrowhead instruments with stamped symbols, there is one that depicts a fish, which is the second-ever recorded. Its weight is 3.82 g, and its length is 33.5 mm (Fig. 1, no. 2).¹⁴ It was discovered during the excavations of 2016 in the Metaxa/Constanța sector of Istros. The other known piece, having 4.08 g and 38 mm, was found on the Bulgarian coast north of the ancient colony of Mesembria (modern Nessebar). The first-known piece has been attributed to the colony of Apollonia Pontica and dated to the 5th century BC.¹⁵ On the specimen discovered at Istros, the fish faces right and has an elongated and slender body. The head ends in a long mouth that is slightly elevated towards the end. The body ends in the caudal fin. One can identify two dorsal fins and three abdominal fins—pectoral, ventral, and anal. Sturgeon species in the Black Sea are many and varied.¹⁶ Sturgeons flourish in the Danube and the Black Sea because of low salinity, a high concentration of nutrients, and an optimal oxygen percentage.¹⁷ Sturgeons enjoy a long life and steady growth and undergo a double anadromous migration.¹⁸ The fish depicted on our monetary instrument may possibly be identified as the starry sturgeon (*Acipenser stellatus*) or, less likely, the

² Inventory number 84.276 (Museum of National History and Archaeology Constanța).

³ CALLATAÏ 2019, 269.

⁴ ALEXANDRESCU 1990, 60.

⁵ TALMAȚCHI 2017, 49–57.

⁶ KARAYOTOV 1995, 397–398.

⁷ PREDA 2003, 21; TALMAȚCHI 2015, 34.

⁸ TALMAȚCHI 2021, 312–313.

⁹ PREDA 1998, 63.

¹⁰ OCHEȘEANU/DICU 1983, 450.

¹¹ This wheel symbol was considered, in an article of about forty years ago, as a symbol specific to the autochthonous population in non-Hellenic environments: MITREA 1982, 89–97.

¹² The nondestructive analyses were performed at Legnaro National Laboratories (LNL, Italian National Institute for Nuclear Physics) and Horia Hulubei Institute of Nuclear Physics and Engineering (IFIN-HH). The research that led to these results received funding from EC FP7 grant agreement EU-EN-SAR-INFN program and from ANCS Romanian National Scientific Research Agency, grant PN II-ID-PCE-2011-3-0078.

¹³ CRISTEA *et alii* 2016, 455; CONSTANTINESCU *et alii* 2017, 334.

¹⁴ Inventory number 68.884 (Museum of National History and Archaeology Constanța).

¹⁵ TOPALOV 2007, 155–156, no. 40, 578–579, no. 29, 578 and 737.

¹⁶ OȚEL 2007, 101, 106, 110, 115, 119 and 122.

¹⁷ PANNIN/DINU/JIPA 2009, 11–45.

¹⁸ BEMIS/KYNARD 2002, 175–177.

starlet (*Acipenser ruthenus*) or the beluga (*Huso huso*).¹⁹ In my opinion, the fish is probably the Russian sturgeon (*Acipenser gueldenstaedtii*) or maybe the beluga (*Huso huso*).

The discovery of hoards of arrowhead money well into the hinterland indicates that the use of these monetary instruments became widespread among the indigenous peoples. More than twelve such hoards have been found at a distance of more than 100 km from Istros. In these hoards, the overwhelming number are arrowhead pieces in the shape of leaves or cereal grains, intentionally cast to be used as money instruments, with those converted from functional arrowheads being a small minority.

The other main monetary instrument, the Olbian dolphin, also had a double function, first as votive pieces for the cult of Apollo Delphinos²⁰ and subsequently as a means of exchange. A few decades ago, the discoveries of Olbian dolphins in the Dobrudja area or outside the Olbian *chora* were rare, with the few reports of such finds being considered unreliable. Since then, some single finds have been recorded and they have appeared in more than fifteen hoards, ranging from a few specimens to dozens or hundreds (Fig. 2, nos. 1–2).²¹ The find spots correspond with the western and south-western areas of the north-eastern end of Thrace, near settlements and necropoleis occupied only in the 6th–5th centuries BC. The majority were found at the edge of lakes (former lagoons) in the southwest part of the extreme northeast of Thrace or on the south bank of the Danube. Most of these former lagoons are now at a distance of about 3–4 km from the Danube, but in ancient times, they were connected directly with the river, hosting mooring points or small emporia. In the pre-Roman period, the Danube was the communication channel for the extreme north-east of Thrace, serving both the indigenous peoples and the Greek colonies alike. The inclusion of Olbian dolphins in hoards probably occurred towards the end of the 6th century and, especially, during the 5th century BC. Some of the hoards include dolphins with the names of Olbian magistrates. These hoards seem to be later, dating from the end of the first half of the 5th century and/or in the second half of the 5th century BC. These hoards would have been the result of the active commerce between the Milesian colonies of Borysthene-Berezani/Olbia and Istros, with the latter serving as an intermediary for the trade of Olbian goods, so that Olbian goods could travel as much as 400 kilometers from their point of origin.²² Evidence for commercial relations between western Pontic colonies, on the one hand, and Olbia, on the other, during the archaic and classical periods, is ample.²³

One particularly notable piece was found in the eastern part of the region Istros.²⁴ It is an Olbian dolphin cast in silver (1.84 g; 19 mm; fig. 2, no. 2); it is, so far, the only silver example known.²⁵ According to nondestructive analyses, its composition is: 94.2% silver, 1.4% gold, 0.6% copper, 0.9% lead, 0.1% iron, and 2.8% tin. Thus, at a very early period,

the Olbian dolphins were used as part of a bimetallic (silver/copper) system.

In certain respects, arrowhead and dolphin money were ideally suited to be a circulating medium of exchange: they were made of a durable and long-lasting material; they were made from a metal alloy that was not easy to find or smelt in the western Pontic area and were, thus, relatively valuable; they were small in size and weight; their weight was relatively consistent; their appearance and significance were widely understood throughout the western Pontic area and they bore a *de facto* guarantee from the local *poleis* that issued them. Furthermore, tens, hundreds, or even thousands of these arrowheads and dolphins could be accumulated and then stored in a relatively small space, allowing their holder to store a reserve of great wealth in a compact and secret location. As a circulating medium of exchange produced in the periphery of the Greek world, these monetary instruments never fulfilled all the purposes that a proper coinage could, but they were certainly a vast improvement over other pre-coinage objects, not to mention barter. Their spread was assisted by the fact that the Milesian colonies in the Black Sea were themselves overwhelmingly commercial emporia.

Fifty years ago, a funerary deposit was discovered near archaic Tomis that contained five of these purpose-made monetary instruments and one wheel-type from Istros.²⁶ Since the monetary instruments were included in the funerary deposit to pay the fee to Charon, the transporter of the soul to the afterlife, they must have been intended to be used as a medium of exchange. Moreover, none of the monetary instruments included were functional arrowheads that had been adapted by cutting off the sharp tip. This tomb is the earliest known so far from the Tomis area, and provides clear evidence that in the late 6th century and at the beginning of the 5th century BC, these monetary instruments were accepted as an exchange medium. The use of pre-coinage monetary substitutes in funerary deposits is known from elsewhere in the archaic period, indicating that for this “small fee” a monetary instrument could replace an actual coin or circulate side-by-side with it.²⁷

As the number of recorded findspots of single finds and hoards increases, it becomes evident that these monetary instruments of the western Pontus circulated over a more and more extensive area. For approximately two decades, we have learned that the findspots are no longer concentrated in the *chora* and other areas of direct economic influence of the West Pontic Milesian colonies. Rather, findspots indicate that the monetary instruments penetrated deep into the hinterland, where they circulated among the indigenous peoples of the western and northern Black Sea region.

Monetary instruments are increasingly found in the local settlements of northeastern Thrace. In the settlements of the indigenous people, located outside the *chora* of the Greek *poleis*, an increase in the number of Greek imports is paralleled by an increase in the number of monetary instruments. In particular, the arrowhead money that was purposely cast to serve as a medium of exchange, plus the Olbian dolphins, were used, along with imported luxury items, to purchase

¹⁹ OȚEL 2007, 110–118, 122–125.

²⁰ MIHĂILESCU-BÎRLIBA 1990, 39.

²¹ Publication of these new discoveries is forthcoming in *Il Mar Nero*.

²² PREDĂ/NUBAR 1973, 49.

²³ RUSCU 2002, 185.

²⁴ TALMAȚCHI 2008, 13.

²⁵ Inventory number 68.884 (Museum of National History and Archaeology Constanța).

²⁶ TALMAȚCHI 2020a, 331–350.

²⁷ TALMAȚCHI 2020b, 223.

products of the local agriculture and fisheries. Since the end of the last century, it has also been noted that hoards of monetary instruments are very rarely found in the residences of local dynasts. Having been made of base copper, they were not regarded highly enough to be prestige goods.²⁸

Both arrowhead money cast in the form of points/laurel leaves/olive leaves/wheat grains, which were intended to be used as a medium of exchange, as well as dolphin money, are present in great numbers in the settlements of the autochthonous population in the hinterland outside the territory of the Greek *poleis* (the *chora*). At these locations, it is not possible that the arrowheads and dolphins could have been used as part of a Greek cult. The discovery of hundreds, indeed thousands, of arrowheads and dolphins far from the Greek *poleis* indicates that they did not serve a religious purpose but rather as a means of exchange with the indigenous populace.²⁹ Arrowhead money that has been converted from functional arrowheads has also been found in hoards dating from the first half of the 5th century BC in areas that were inhabited by the indigenous peoples. At these locations, the arrowheads could not have been connected with Apollo and similar symbolism but must have been used exclusively for commercial purposes. In Herodotus' discussion on the beliefs of the Thracians of the northern Balkans, the Getae, who lived south of the Danube, are described to have been very strict in their religious observances.³⁰ The Thracians and the Geto-Dacians followed a traditional conservatism in terms of their religion and their specific pantheon. Thus, when we find arrowhead and dolphin money in locations that are appreciably distant from the Black Sea coast, in a context that must be assigned to the autochthonous peoples, we cannot attribute this to a Greek religious custom whereby these pieces were used as a semi-monetary form of payment to a prominent deity of the Pontic colonies.³¹

INSTEAD OF CONCLUSIONS

Situated as they were on the periphery of the Greek world, the Milesian colonies of the northwest Black Sea were able for a time to circulate arrowhead and dolphin money. These monetary instruments could never fulfill all the roles that coins did in the Greek world, but they were useful enough to supplant a barter economy. They were acceptable enough to circulate far into the hinterland among the indigenous peoples of the Pontic areas. In the Hellenistic period, the new silver coins (drachms) issued by the colony at Istros would have a far more extensive circulation, and would be used for more diverse purposes. Their extensive circulation could, therefore, result from them being used to pay mercenaries or as *de facto* ransoms paid to barbarian leaders as part of a "barbarian protectorate," or from them being introduced as

loot from occasional raids. The arrowhead and dolphin monetary instruments served a more limited purpose and circulated in a more limited area. With time, their defects—the lack of a defined weight standard, the relatively small geographic area of their acceptance, and an increasing distrust of this exchange medium by the local population—became increasingly apparent. By the second half of the 5th century BC, these monetary instruments could no longer cope with the new commercial, military, and political requirements and had to yield to a proper coinage.

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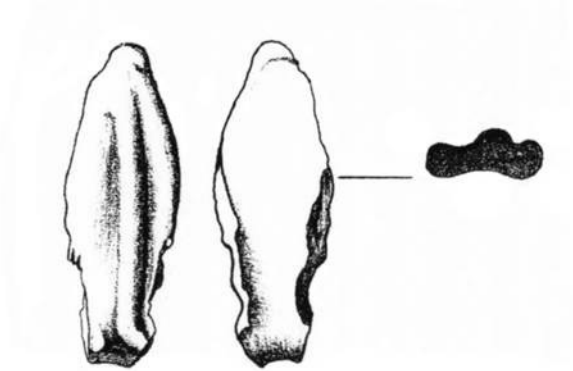
²⁸ MĂNUCU-ADAMEȘTEANU 1992, 61.

²⁹ TALMAȚCHI 2010, 72.

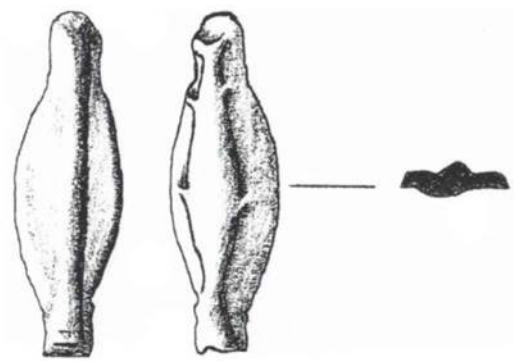
³⁰ VULPE/POENARU BORDEA 2010, 445.

³¹ According to CALLATAÏ 2019, 269: "I would like to conclude arguing that these dolphins and arrowheads are best conceived as originally created as tokens for worshippers of Apollo (i.e. as payments for the god)." In my opinion, this idea is partially negated, for the entire casting period, by the archaeological and numismatic finds regarding the purpose-made laurel/olive leaf/wheat grain type monetary instruments and some of the Olbian dolphins.

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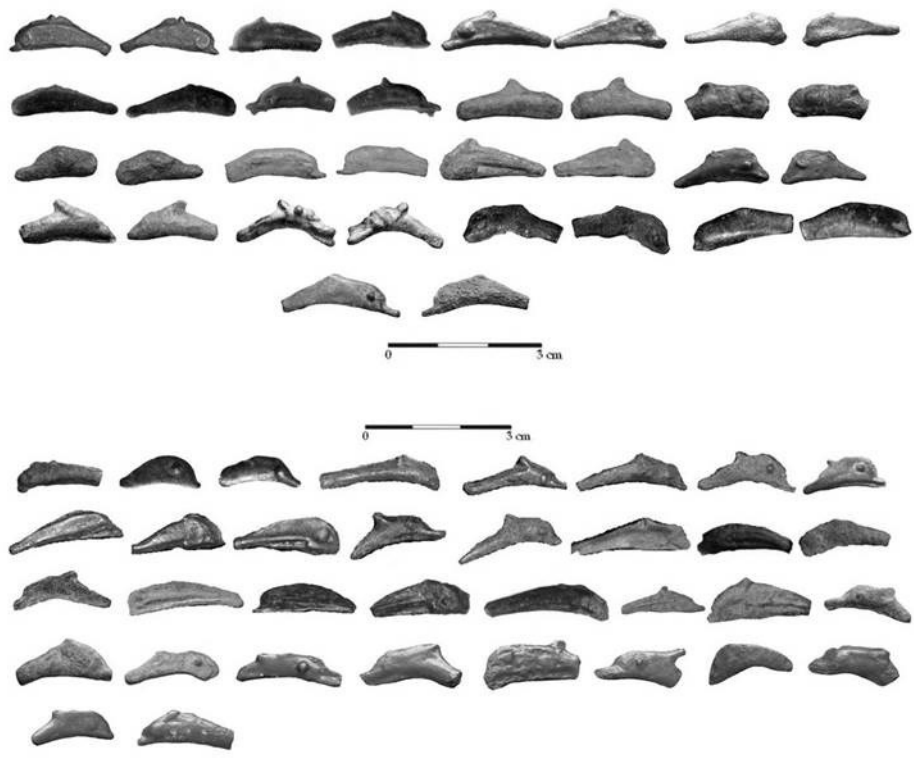


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2

Fig. 1. 1. Sample of lead found following archaeological diggings in the Metaxa-Constanța, sector of Istros; 2. Monetary instrument for exchange “printed” with the representation of a fish.



1



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Fig. 2. 1. Hoards composed of Olbian dolphins discovered in northeastern Thrace (south western of Dobrudja); 2. Silver Olbian dolphin.