

BEYOND TYPOLOGY: METAL AXES AND THEIR POTENTIAL

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Motto: Cultures are not “discovered”, “types” are not “found”. The student does not „recognize” a type, he makes it and puts the objects in it. Objects do not “belong” or “fall into” types, they are placed in types by the student (J. O. Brew 1946¹).

Typology functions as a classification system. Archaeologists have come to use this method with a view to better organizing and to more efficiently controlling the studied material, as well as in the hope of finding adequate answers, answers verging on “truth”, that is – for the various research themes with their particular configurations of problems. The debate over the selection of criteria and the definition of a type according to “the reality”, the means of drawing up a typology, the verification of its efficiency – all these are issues that have long been in the north-American literature, especially as they were carried by the *American Antiquity* journal. It was Alex D. Krieger who broke a path in this direction (in 1944)². His conviction was that “an archaeological type should represent a unit of cultural practice equivalent to the *culture trait* of ethnography (...). Each type should approximate as closely as possible that combination of mechanical and aesthetic executions which formed a definite structural pattern in the minds of a number of workers, who attained this pattern with varying degrees of success and interpretation”³. According to Krieger, there are no universal criteria applicable in drawing up a typology and the “combination of features” in the definition of a type is more important than a single feature; the criteria are selected in accordance with the circumstances. It is necessary for a type to be endowed with consistency, so as to evidence clear differences between types and to make it easy for further researchers to recognize the types. The typological method should be flexible and the purpose of drawing up a typology is to answer the concrete cultural, historical problems. Krieger recommended that a type be regarded with reservations whenever it is not accompanied by a complete explanation of the method through which it has been determined. Krieger’s opinions seem to me really valuable, and their validity has extended over a sufficiently long period of time. In the decades to follow and since then, they have been supplemented by arguments, completed or criticized constantly – and have formed a solid basis for discussion for the subsequent typological attempts.

The debates around the “type” concept were continued in the early 1950s by Albert C. Spaulding⁴ and James A. Ford⁵. In the former researcher’s opinion, types exist in culture as such, and they can be discovered by the most competent scholars; they represent the ideas of people responsible for their appearance and are endowed with historical significance. Spaulding states that the artifact types may be discovered and defined by statistical methods, and he considers that the selection of attributes relevant for

¹ Quoted by R. Vossen, *Klassifikationsprobleme und Klassifikationssysteme in der Amerikanischen Archäologie*, ActaPraehArch 1, 1970, p. 36. I have not been able to get hold of Brew’s, *Archaeology of Alkali Ridge, Southeastern Utah*, Cambridge, 1946.

² A.D. Krieger, *The Typological Concept*, American Antiquity 9/3, 1944, p. 271-288.

³ *Ibidem*, p. 272, 278.

⁴ A.C. Spaulding, *Statistical Techniques for the Discovery of Artifact Types*, American Antiquity 18/4, 1953, p. 305-313.

⁵ J.A. Ford, *On The Concept of Type: The Type Concept Revised*, American Anthropologist 56/1, 1954, p. 42-54.

the particular artifacts is the most useful means for establishing the types. Ford has a different point of view; for him, the types are arbitrary constructs deriving from the researcher's mind, they are a work instrument "designed for the reconstruction of culture history in time and space"⁶. In the decades to follow, the debates circled around the methods wherein the objects could be better or more exactly classified, and they involved using the methods of statistics more and more frequently for determining the types and drawing up the typological charts⁷.

Here is a series of ideas obtained as the outcome of these discussions: 1. There is no universal, generally valid typology; 2. Typologies are constructs of the archaeologist, meant to help him in organizing the material and to answer some specific problems; 3. The archaeologist's experience and intelligence are of utmost importance in selecting the attributes involved in the grouping of artifacts, irrespective if the method adopted for drawing up a typology is the intuitive or the statistical-mathematical one; 4. A typology is established with a particular purpose and it is therefore, necessary for the criteria to match the exact purpose followed; 5. Typologies are aimed at solving "problems of temporal relationships, cultural affiliation, and tool use; to identify individual manufacturing styles; to identify community styles, trade, and technological processes; to estimate the interactions between communities or community groups; to monitor recycling and status differences; to help interpret religious structures and beliefs; to distinguish between egalitarian (symmetrical) versus hierarchical (asymmetrical) social forms of organization; or to deal with any other specific interpretational problems of interest to archaeologist"⁸; 6. The types that the archaeologist draws up may either correspond or fail to correspond to the types that the people who produced the artifacts had in mind⁹; 7. The drawing up of a typology does not represent the terminus of an archaeologist's work but its beginning.

What I believe is that archaeologists do need typologies, but the most important thing in drawing them up are the criteria resorted to in defining the types; the criteria should be selected in accordance with what we need to find out, i.e., observing the goals of the research. For instance, an archaeologist who is interested in the technique employed in making a metal axe will focus on the metal composition and on the casting modality, while another archaeologist, interested in the functionality of such parts, will give precedence in her/his research to characteristics such as the form, the weight, the wear and tear of the axe edge. The research goal, therefore, determines the selection and hierarchy of the classification criteria. Also, one cannot exclude the human error factor, which is often determined by the archeologist's (in)experience, by her or his capacity for correctly selecting the relevant criteria, or by her/his subjectivity¹⁰. This is precisely why there have generally been sought methods considered to be "more objective", methods whose origin is somewhere beyond the archaeologist's "intuition" or her/his perception of what is similar or is different. Here should be included the statistical, mathematical methods aimed at establishing "structures" or groupings sharing features that cannot be easily observable to the naked eye. But the fact is that the human factor intervenes even in such analyses; the archaeologist should select the variables which are to be introduced into the analysis, she/he should make certain decisions at a particular moment – and it is very likely that errors will appear. Statistical procedures make the archaeologist's work so much easier, but „statistics are never a substitute for thinking"¹¹. I feel bound to

⁶ *Ibidem*, p. 51-52.

⁷ I. Rouse, *The Classification of Artifacts in Archaeology*, *American Antiquity* 25/3, 1960, p. 313-323; J.C. Gifford, *The Type-Variety Method of Ceramic Classification as an Indicator of Cultural Phenomena*, *American Antiquity* 25/3, 1960, p. 341-347; D.J. Tugby, *Archaeological Objectives and Statistical Methods: a Frontier in Archaeology*, *American Antiquity* 31/1, 1965, p. 1-16; R.C. Dunnell, *Seriation Method and its Evaluation*, *American Antiquity* 35/3, 1970, p. 305-319. A critique of the excessive use of statistics in archaeology is to be found in D.H. Thomas, *The Awful Truth about Statistics in Archaeology*, *American Antiquity* 43/2, 1978, p. 231-244; what is more, this presentation is phrased in a very enjoyable language.

⁸ B. Hayden, *Are Emic Types Relevant to Archaeology?*, *Ethnohistory* 31/2, 1984, p. 82.

⁹ Regarding the relationship between the *emic* (i.e., the classification of the artifacts as made by the natives) and the *etic* (the „scientists" classification), see Hayden, *op. cit.*, p. 79-92. The two concepts are borrowed from ethnography.

¹⁰ P.R. Fish, *Consistency in Archaeological Measurement and Classification: a Pilot Study*, *American Antiquity* 43/1, 1978, p. 86-89; C. Beck, G.T. Jones, *Bias and Archaeological Classification*, *American Antiquity* 54/2, 1989, p. 244-262.

¹¹ Spaulding, *op. cit.*, p. 313.

add as a conclusion to this theoretical preamble¹², that the drawing up of a typology should not remain a goal *per se*, a last stage or final construction, but a starting point for examining what is “beyond the objects” – as far as this is something feasible.

In what follows I shall discuss two metal axe classification proposals, dwelling on the criteria used by the authors of these classifications and on the ways the results were interpreted. The occasion of my discussion is offered by an unpublished piece kept in the collection of the school of Mastacăn (Borlești, Neamț County)¹³. The piece in question is a shaft-hole axe, probably cast in copper¹⁴ (Fig. 1). It has a long, protruding shaft tube, and on the outside, at the lower part of the shaft, there can be noticed a small extension. The back edge of the blade is straight, but it curves rather strongly in the area where it meets the shaft. The axe blade widens gradually towards the slight curve of the cutting edge; the cross-section of the blade is hexagonal. The axe surface is rough, colored light brown, and the metal left over after the casting has not been thoroughly removed from the under-side. There are no traces to testify that the piece had ever been in use; on one of the sides of the blade, quite near the cutting edge, there are a number of recent scratches. The length of the piece is of 14 cm; the edge width is 5 cm; the diameter of the socket is 2.6 x 3 cm; the piece weighs 680g. The only item of positive information I have on this piece is that it was found “on the premises”¹⁵, which means that it may come from the Mastacăn village or the Borlești village, as these two places actually merge.

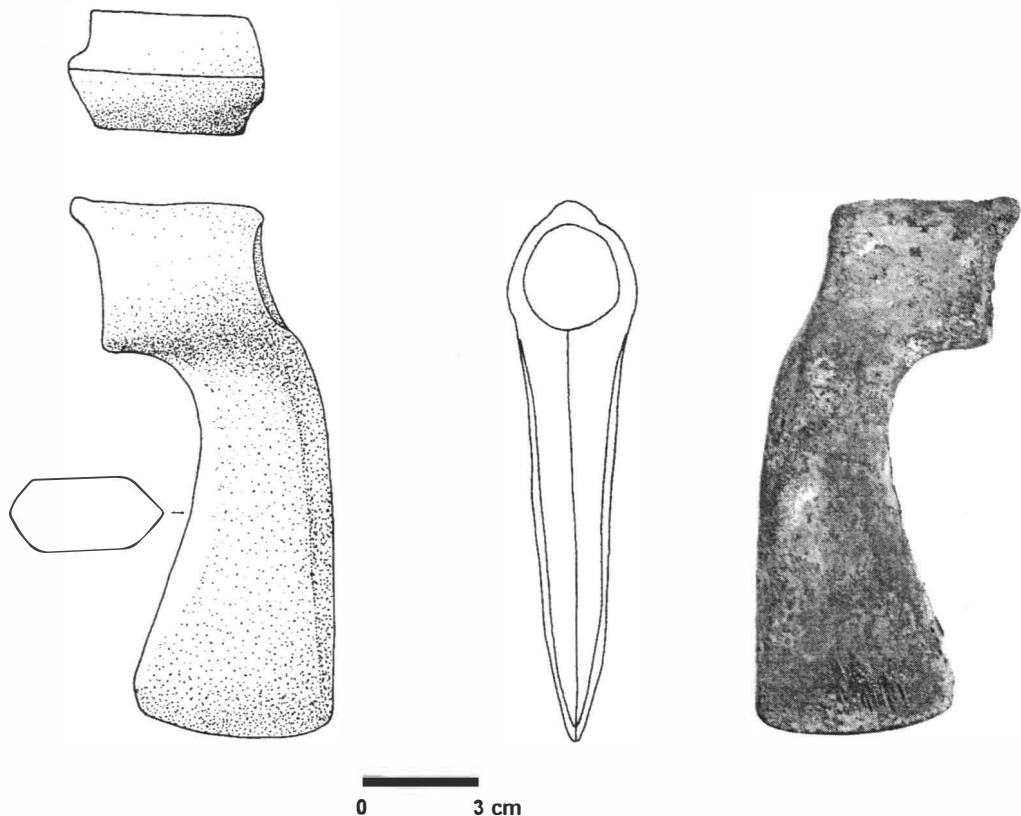


Fig. 1. The shaft-hole axe of Mastacăn (Neamț County).

¹² A recent, ample presentation in the archaeological literature of the main topics to be discussed in connection with the classifications and their impact on the Romanian literature can be consulted in N. Palincaș, *On Classification in Archaeology*, New Europe College Yearbook 2001-2002, p. 219-248.

¹³ The collection was put in place by Gheorghe Poștelea, the teacher of Romanian language and literature. But on his death, all the data respecting the place of origin and the conditions under which the parts were discovered got lost.

¹⁴ The piece was not analysed metallographically; it was only by inference from the colour and the aspect of the surfaces that it was conjectured the material is copper.

¹⁵ I must give thanks here and now to Mr. Vasile Pârnu, the history teacher at the Mastacăn school, who offered me the piece for publication.

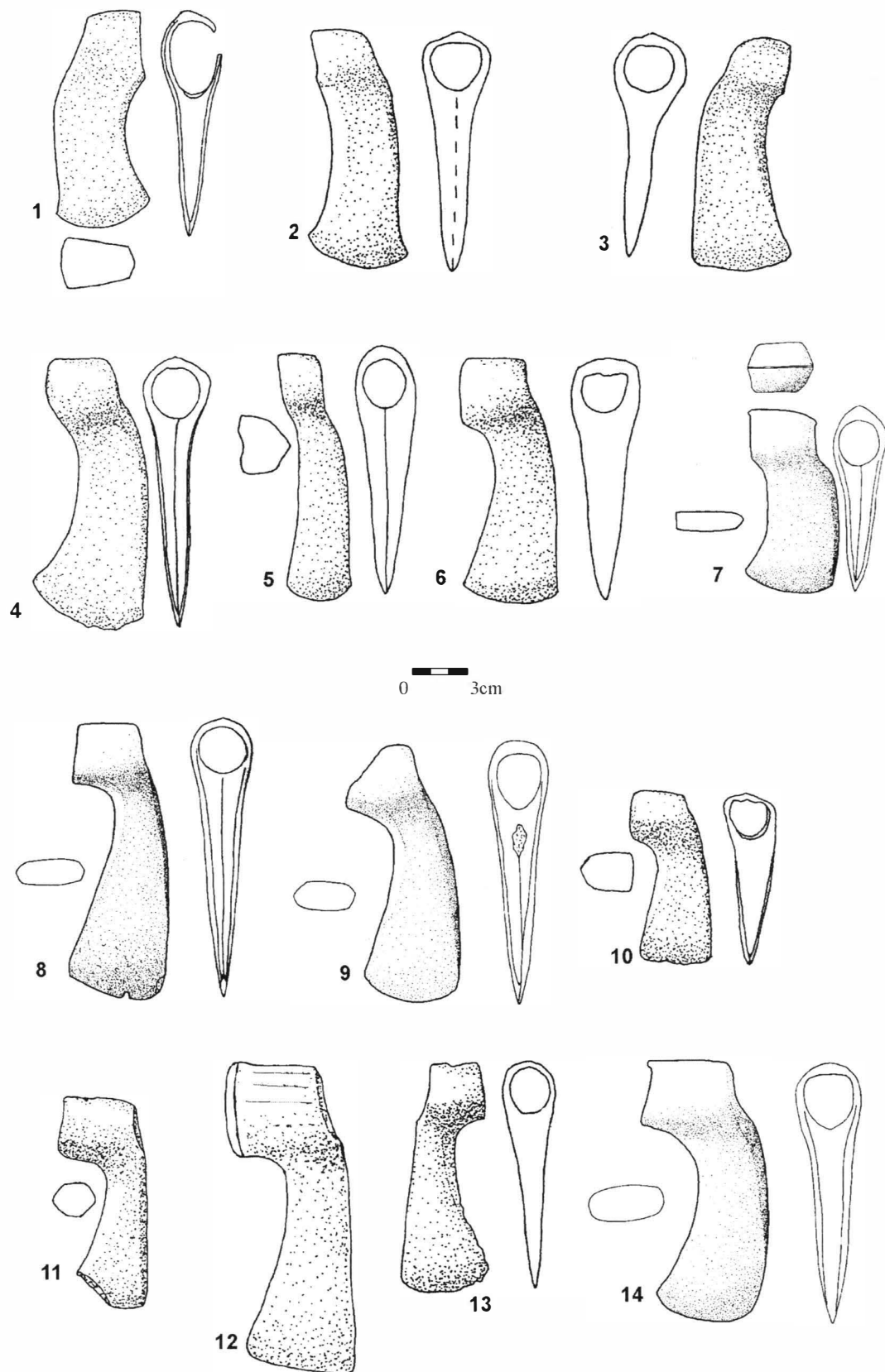


Fig. 2. Metal axes: 1 Bârlălești/Murgeni; 2 Osoi; 3 Poduri; 4 Petricani; 5 Goești; 6 Mirosllovești; 7 Corbasca; 8 Găiceana; 9 Mărăști; 10 Oroftiana de Sus; 11 Darabani; 12 Stubło; 13 Lespezi; 14 Izvorul Berheciului (1, 3-4, 6, 8-12 initially attributed to the Darabani type). 1, 4, 11 after Vulpe 1970; 2, 6, 13 after Chirica, Tanasachi 1984; 5, 10 after Burtănescu 2002; 12 after Antoniewicz 1929.

In the absence of data regarding the archaeological context of the axe, it is possible to obtain more information as to its chronological positioning or the cultural environment it derives from by searching for pieces similar in form primarily, and also for pieces whose contexts are better specified. Taking the form as the main classification criterion, the Mastacăn axe finds its nearest neighbors in the axes belonging to the Darabani pattern, though it is far from being entirely similar to any of these (Fig. 2). The Darabani type of axes was defined by Alexandru Vulpe circa 36 years ago¹⁶. In the monographical work dedicated to the axes of the Bronze Age in Romania, published in the *Prähistorische Bronzefunde* collection, Vulpe defines the general criteria employed in his proposal for a typological and chronological ordering of this category of pieces¹⁷. The purpose of his study was to observe the possible relations among the axe types, their production centers and the material cultures they would have pertained to¹⁸. One of the first criteria used was the morphological one, as the form of the pieces ranked first in establishing the types; in this respect, the aspect of the shaft tube was taken into consideration, together with its position in respect to the axe blade, i.e., the aspect of the blade and the cutting edge. The technological process used in making the pieces also represented an important criterion. According to Vulpe, the pieces with a pentagonal cross-section forged by open mould casting should be dated earlier than the ones with a hexagonal cross-section, forged in closed casting moulds. Consequently, the aspect of the blade cross-section is taken into consideration for establishing the types and for dating them, while also considering the archaeological context in which the pieces appear. The third relevant criterion was for Vulpe the geographical one, as he connected to the material culture the similar pieces grouped in the same area (Fig. 3). In his opinion, the similar forms appearing in different cultures situated at great distances from each other cannot possibly pertain to the same type, but appear as mere coincidences, especially if they are not to be found in the intermediate areas as well; and these coincidences usually appear in the cases of the simple pieces probably developing from common prototypes. According to Vulpe, the Darabani type consists of axes with a curving back blade line, wide in surface, with an almost always curvilinear cutting edge and a hexagonal cross-section – which are spread in Moldavia and the Western Ukraine. Within the type, he grouped the axes into variants: the first variant, comprising the pieces with a strongly curving back side (Mărăști, Găiceana, Petricani, Bârlălești, Veseloe), the second one consisting of pieces with a crooked aspect but with the back edge straight (Stublo, Bielousova); the Darabani axe was considered an intermediate variant within the group. Vulpe specified that the respective classification represents only one stage in the research, anticipating a clearer definition of the variants and even their potential transformation into separate types once the number of archaeological discoveries increased. Chronologically and culturally, the Darabani type axes were assigned to the beginning period of the Middle Bronze Age, and they were related to the Costișa-Biały Potok-Komarov pottery.

Vulpe noticed the resemblances between some of the Darabani pieces and the Kozarac axes in the western parts of the Balkan Peninsula or the resemblances between the Darabani pieces and the axes in the northern Pontic area and northern Caucasia. But as already mentioned, according to Vulpe, these resemblances are rather random ones, since the Darabani axes are situated too far in space from the area where the Kozarac axes or the eastern pieces are concentrated. There is consistent material proof as to the fact that the objects and the ideas had a wide circulation in the Bronze Age and this is true even over big expanses of land¹⁹. An eloquent

¹⁶ A. Vulpe, E. Tudor, *Cu privire la topoarele de metal cu gaură de înmănușare transversală*, SCIV 21, 1970, 3, p. 423, 426; A. Vulpe, *Die Äxte und Beile in Rumänien I*, PBF IX/2, München, 1970 (quoted in what follows as Vulpe, *Äxte* 1970), p. 41-42, pl. 8/111-115.

¹⁷ Vulpe, *Äxte* 1970, p. 9-10, see also fig. 1.

¹⁸ This approach was also expressed in the article published in the SCIVA: „Tipul definit formal trebuie urmărit în repartiția lui geografică și căutate legăturile cu culturile materiale în aria cărora se răspândește”, see Vulpe, Tudor, *op. cit.*, p. 418.

¹⁹ Of the numerous items in the literature on this topic I will only quote: R. Bradley, *Exchange and Social Distance- the Structure of Bronze Age Artefact Distributions*, *Man* 20/4, 1985, p. 692-704; J. Maran, *The Spreading of Objects and Ideas in the Late Bronze Age Eastern Mediterranean: Two Case Examples from the Argolid of the 13th and 12th Centuries B.C.*, *BASOR* 336, 2004, p. 11-30; C.F.E. Pare (ed.), *Metals Make The World Go Round. The Supply and Circulation of Metals in Bronze Age Europe*, Oxford, 2000; C. Renfrew, *Trade and Culture Process in European Prehistory*, *Current Anthropology* 10, 2/3, 1969, p. 151-169. An interesting discussion regarding the access to what may be termed as „exotic” matters can be read in J. Taffinder, *The Allure of the Exotic. The Social Use of Non-Local Raw Materials during the Stone Age in Sweden*, Uppsala, 1998. The author also presents some examples from ethnography; some of them regarding the importance of the knowledge derived from the distant contacts. Thus, in the communities of the Havasupai Indians of North America, the prestige of the chiefs was not manifested through the possession of particular „goods”, but by the knowledge about the outer world that the chiefs had acquired. A similar situation could be observed in the case of an Eskimo group whose leader was judged by the number of trips that he had made.

example of this sort would seem to me to be the shaft-hole axe with the blade widening and rounded towards the inside part which was found alongside an axe considered to be of the Darabani type in the deposit of Stublo (today, Steblivka, in the Ukraine). Similar pieces were found at Faskau (in the Caucasus Mountains); the distance between the two points being in the range of hundreds of kilometers²⁰. There could be provided yet other examples on this topic. The circulation of the objects can offer chronological information but could also serve at the same time as an indicator of relations among the various communities or the elites of those times; it would be a good thing to follow the duration and consistency of such contacts. On the other hand, it is quite possible for there to be absolutely no connection between two groups of pieces resembling in form but situated very far from each other in space. It appears to me, however, that both possibilities are worth considering, and there does not seem to be a need for making generally applicable affirmations in a single direction; what is actually needed is a rigorous examination of the information for each individual case. As regards the definition of the Darabani type of axes given by Vulpe, the geographical criterion seems to have been given precedence over the morphological one. Consequently, some axes that shared morphological traits with the Kozarac or eastern pieces have not been put in direct relation with these owing to their remoteness in space. This interpretation mode resulted in placing within the Darabani type some axes that were very different in form, some of which had analogical pieces in the Western Balkan Peninsula, others having analogical pieces in the cultures of the northern Pontic areas²¹; and these analogies were in fact recorded by Vulpe himself. One should not overlook, however, the fact that Vulpe did not have at his disposal at the time too much information on the shaft-hole axes from eastern Europe, or from the North-Pontic area, or from Caucasia. Vulpe's monograph was the first ample work to examine the metal axes of the Bronze Age in Central and Eastern Europe.

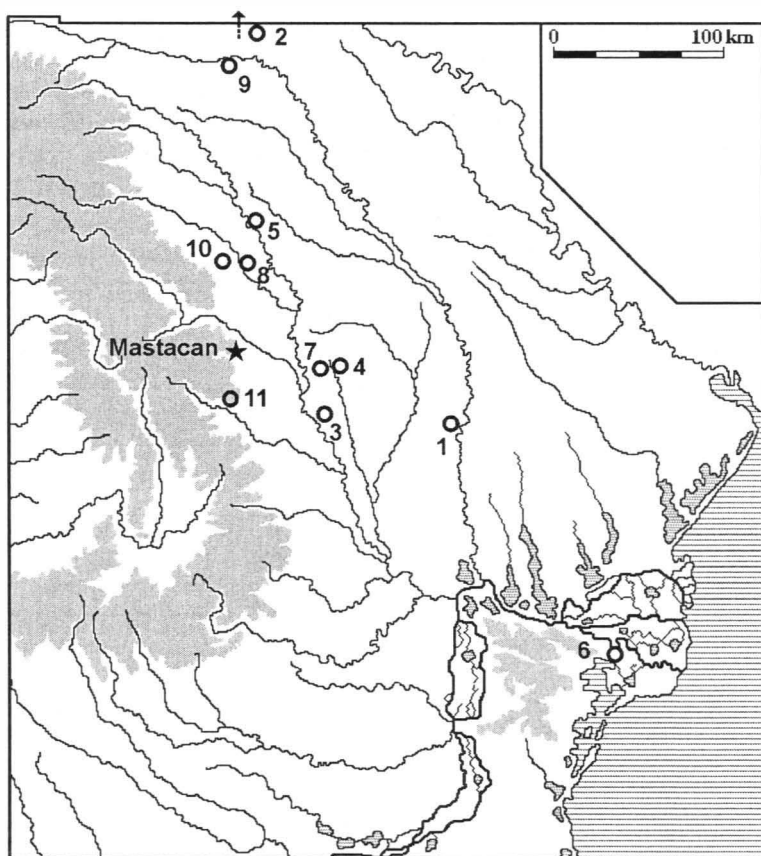


Fig. 3. The spreading area of the metal axes attributed to the Darabani type (apud Vulpe 1970, with some additions): 1 Bârlăleşti/Murgeni; 2 Darabani; 3 Găiceana; 4 Izvorul Berheciului; 5 Lespezi; 6 Mahmudia; 7 Mărăşti; 8 Mirosloveşti; 9 Oroftiana de Sus; 10 Petricani; 11 Poduri.

²⁰ V. Antoniewicz, *Der in Stublo in Wolhynien aufgefundene Bronzeschatz*, ESA 4, 1929, p. 135-148; S.N. Korenevskij, *Vtulčatye topory- oružie bližnego boja epochi srednej bronzy severnogo Kavkaza*, in *Kavkaz i srednjaja Azija v drevnosti i srednevekovje (istorija i kultura)*, Moskva, 1981, p. 28-30, pl. 7/10-21.

²¹ Compare, for example, the Bârlăleşti axe with the one at Găiceana; see Vulpe, *Ăxte* 1970, pl. 8/114, 115.

In the years to follow Vulpe's monograph, the number of studies on the shaft-hole axes and on the Bronze Age metallurgy in general increased considerably²². There was also an increase in the number of metal pieces quoted in Moldavia, and another six pieces were added to the five axes included in Vulpe's Darabani type: the axes of Izvorul Berheciului²³ and Poduri²⁴ (Bacău County), of Lespezi²⁵, Miroslovești²⁶ (Iași County), of Oroftiana de Sus²⁷ (Botoșani County) and of Mahmudia²⁸ (Tulcea County). There were dedicated brief study sheets to these new finds and they were attributed to the Darabani type established by Vulpe, taking into account certain characteristics of the form as well as their geographical distribution. The fact that the new pieces found were included in this type increased the heterogeneous character of the type itself, therefore, an attempt was made by Florentin Burtănescu²⁹ to reorder the Moldavian axes, including those of Darabani. The title of Burtănescu's article specifies the goal pursued there, the author being bent on attaining "a typochronological and cultural ordering" of the shaft-hole axes from the East-Carpathian area. For the author of this study, the important criterion in establishing the types is the morphological one, and the relevant attribute for the form, i.e., the one that differentiates the pieces, is the aspect of the blade. The relevant detail is the rectilinear or curvilinear aspect of the back edge and the manner in which the blade is secured in the shaft hole. In Burtănescu's opinion, and taking into account the shape of the blade, the axes that were deemed to be of the Darabani type can be grouped into two different classes: 1. Darabani, comprising axes with a slender blade, with a rectilinear back edge and a tiny „crooked” part where the blade fits into the shaft hole; the cutting edge has a widening shape, the shaft tube is clearly visible, in some cases even becoming oblong (in the Darabani, Lespezi, Stublo, Komarów pieces); 2. Mărăști, comprising axes with the blade's back edge always curvilinear, a cutting edge widening in shape and a protruding shaft tube (within this group, the Oroftiana variant is considered more archaic from a typological point of view, and it comprises the pieces from Oroftiana de Sus and Miroslovești, while the „classical” variant comprises the axes of Mărăști and Găiceana). Burtănescu considered that some of the Darabani axes could be related to the late corded ware cultures dated back to the second half of the 3rd millennium BC. For the axes included in the „classical” variant of the Mărăști type, there have been mentioned typological similarities with some of the Kozarac pieces (especially, similarities with the axes of the Kozarac and Griča hoards); it is in view of these analogies that the pieces of the Mărăști type have been dated to the early Bronze Age, considering that they could be connected to the type of the Aldești or Târpești units. The other axes included in the Darabani type by Vulpe or published after Vulpe's monograph and attributed to the Darabani type by their authors are separately discussed by Burtănescu, who also presents the analogies that he considers the most applicable here.

Burtănescu observes the resemblance between a number of Moldavian axes and some axes found in the northern Pontic area or in the Middle Danube area, but he beware of regarding the Moldavian axes as potential imports from the latter areas; Burtănescu generally seems to me to incline towards considering that the influences were just instances of „grafts” on the local pieces – as the text does not

²² I am only quoting a few examples: S.N. Korenevskij, *O metalličeskich toporach severnogo Pričernomorja, srednego i nižnego Povolžja epochi srednej bronzy*, SovArch 4, 1976, p. 16-31; E.F. Mayer, *Die Äxte und Beile in Österreich*, PBF IX/9, München, 1977; A. Durman, *Metalurgija vučedolskog kulturnog kompleksa*, OpArch 8, 1983; E.N. Chernych, *Ancient metallurgy in the URSS*, Cambridge, 1992; Z. Žeravica, *Äxte und Beile aus Dalmatien und anderen Teilen Kroatiens, Montenegro, Bosnien und Herzegowina*, PBF IX, 18, Stuttgart, 1993; I. Montzenbäcker, *Sammlung Kosnierska. Der Digorische Formenkreise der Kaukasischen Bronzezeit*, Staatliche Museen zu Berlin, 1996; K. Picchelaury, *Waffen der Bronzezeit aus Ost-Georgien*, Archäologie in Eurasien 4, 1997; V. Dergačev, *Die äneolithischen und bronzezeitlichen Metallfunde aus Moldavien*, PBF XX/9, Stuttgart, 2002; J. Bătora, *Kupferne Schaflochäxte in Mittel-, Ost- und Südosteuropa (Zu Kulturkontakten und Datierung – Äneolithikum/Frühbronzezeit)*, SlovArch 51/1, 2003, p. 1-36.

²³ S. Antonescu-Iovița, *Carpica* 13, 1981, p. 5-10.

²⁴ S. Antonescu, *StComVrancea* 3, 1980, p. 53-55.

²⁵ V. Chirica, M. Tanasachi, *Repertoriul arheologic al județului Iași*, I, Iași, 1984, p. 213, pl. 9/7; M. Ignat, *Metalurgia în epoca bronzului și prima epocă a fierului din Podișul Sucevei*, Suceava, 2000, p. 30, 40.

²⁶ Chirica, Tanasachi, *op. cit.*, p. 243, pl. 9/9; Ignat, *op. cit.*, p. 31, 40.

²⁷ P. Șadurschi, *Hierasus* 4, 1981, p. 7-11.

²⁸ E. Lăzurcă, *Pontica* 10, 1977, p. 302, pl. I/2. It was at Mahmudia also that an axe with ribs on the shaft was found; see, Vulpe, *Äxte* 1970, p. 60-61.

²⁹ F. Burtănescu, *Epoca timpurie a Bronzului între Carpați și Prut*, *BiblThracologica* 37, 2002, p. 210-211; idem, *Topoare cu tub transversal pentru fixarea cozii și tăiș vertical din Moldova (perioada bronzului timpuriu și mijlociu). Încercări de ordonare tipocronologică și culturală (I)*, *Thraco-Dacica* 23, 2002, 1-2, p. 171-207.

contain any clearly expressed opinions regarding their origin. The author takes advantage of the analogies and „influences” to date the Moldavian axes and once they have been dated, they are subsequently placed in relation with the cultures in whose areas they were found. But I tend to think that Burtănescu’s „typo-chronological” ordering starts from a false premise, as the author considers that an axe which has a coarser, more rudimentary aspect is of necessity more archaic than an axe with a slender main body, i.e., more carefully wrought. There is one argument that runs counter to his assumption even in the body of his text: the slender, carefully wrought axes with a clearly observable shaft tube, grouped in the Kozarac type, are dated to the first half of the 3rd millenium BC, while the coarser looking pieces, with a wide blade and a short, less clearly observable shaft hole, which have been grouped into the Kolontaevka type, are dated to the second half of the same millenium!

The axes considered to be of the Darabani type are isolated finds or they pertain to some hoards, and we have no sure frames for dating them. In connection with them, the fact that the similarities with the axes of other spaces, or with better specified contexts were stressed has the role to offer a more exact chronological positioning of the parts in our part of the world seems obvious. Under these circumstances, the form of the pieces represents an important criterion; and what is required is to examine some attributes as: the aspect of the shaft, the blade or the cutting edge or the way the components of the axe are joined.

To set order in the multitude of axes included in the Darabani type, I have chosen as a first relevant attribute, the aspect of the shaft. Depending on the way the shaft protrudes, or it becomes prolonged, these axes could in a first stage be divided into two main groups. One would consist of the axes with a short shaft, whose length would be approximately equal to the width of the blade under the shaft; this includes the axes found at Bârlălești/Murgeni, Goești³⁰, Mahmudia, Miroslovești, Osoi³¹, Petricani, Poduri. The other group would comprise the pieces with a clearly observable, prolonged shaft: Darabani, Găiceana, Izvorul Berheciului, Lespezi, Mărăști, Oroftiana de Sus.

Apart from the short shaft, the axes in the first group present a number of characteristics such as the curving back edge of the blade in the area around the joint with the shaft, the wide blade, the tapering cutting edge, which causes them to resemble the axes of the northern Pontic area making up the Kolontaevka series³². The pieces of the first group resemble each other in close detail as little as do the pieces in the Kolontaevka series which is equally non-homogeneous; therefore, a reordering into or by variants of the pieces considered Kolontaevka would be really useful³³. But the general aspect and the combination of features permits including them into the same type (Fig. 4). The Kolontaevka axes were found in tombs pertaining to the Katakombnaja and Mnegovalikovaja cultures, within some hoards or as individual finds and they were assigned to the second half of the third millenium, as well as to the beginning period of the 2nd millenium BC. It is possible for the pieces from the extra-Carpathian area to be “imports” from the North-Pontic area. They can be assimilated also to the axes of Osebiți (Bacău County)³⁴ and Cernătești (Buzău County)³⁵ already considered a long time ago to be pieces of eastern origin; these pieces were found in the vicinity of Monteoru settlements (pottery of the Ic3 style)³⁶. In my opinion, the axe found in the hoard of Corbasca (Bacău County)³⁷ may be included as well among the pieces of eastern origin, and there can be found very good analogies with it among the axes pertaining to the second group of the Korenevskij (Kolontaevka) type³⁸. A casting mould for making a similar axe was discovered in the inventory of grave 16 in barrow 3 at Lugansk³⁹, a locality of the middle Donets basin; in this area have been recorded and published the oldest catacomb graves – in the barrows of Svatovo,

³⁰ F. Burtănescu, *Thraco-Dacica* 23, 2002, 1-2, p. 183, pl. 2/2.

³¹ Chirica, Tanasachi, *op. cit.*, p. 90, fig. 9/5; Dergačev, *op. cit.*, p. 202, pl. 68/A409.

³² Korenevskij, *op. cit.*, p. 19-23, fig. 6-7. Korenevskij uses the phrase „the Kolontaevka type” for the axes which he grouped in his second class.

³³ A proposal made by Burtănescu, also: *op. cit.*, p. 188.

³⁴ M. Florescu, V. Căpitanu, *Carpica* 1, 1968, p. 52-55, Plate. 2; Vulpe, *Ăxte* 1970, p. 60-61, no. 269.

³⁵ A. Oancea, V. Drâmbocianu, *SCIVA* 27, 1976, 4, p. 565-566.

³⁶ They differ from the other axes because they have a channel on the shaft and there can be found pieces like these in Caucasia. Another axe of eastern origin is the one with a ribbed shaft discovered at Mahmudia. See: Vulpe, *Ăxte* 1970, p. 60-61; Oancea, Drâmbocianu, *op. cit.*, p. 565-566; S.N. Korenevskij, *Vtulčatye topory- oružie bližnego boja epochi srednej bronzy severnogo Kavkaza*, in *Kavkaz i srednjaja Azija v drevnosti i srednevekovje (istorija i kultura)*, Moskva, 1981, p. 23-24, fig. 3/8.

³⁷ Florescu, Căpitanu, *op. cit.*, p. 50-55, fig. 1/2; Vulpe, *Ăxte* 1970, p. 29-30, no. 40.

³⁸ S.N. Korenevskij, *SovArch* 4, 1976, fig. 6/4-5, 12; 7/1-2, 10.

³⁹ L. Černych, *Eurasia Antiqua* 9, 2003, p. 39, fig. 5/6.

dated back to the first half of the 3rd millennium (2900–2600 BC), on the basis of radiocarbon calibrated dates⁴⁰. For the dating of the catacomb graves in the Dniepr area the series of radiocarbon dates of the barrows near Ordžonikidze is very useful; it offers a span between 2300-1900 BC⁴¹. The radiocarbon dates from the tombs of Zatoka, Myronivka and Iševo, attributed to the Mnogovaligovaja culture, are situated between 2500-1500 BC⁴². Recently, E. Sava has proposed for the Mnogovaligovaja culture a dating in the time-span 2100-1800 BC, while admitting that it could have extended for an even longer period, until 1700-1600 BC⁴³, in the area between the Prut and the Dniester.

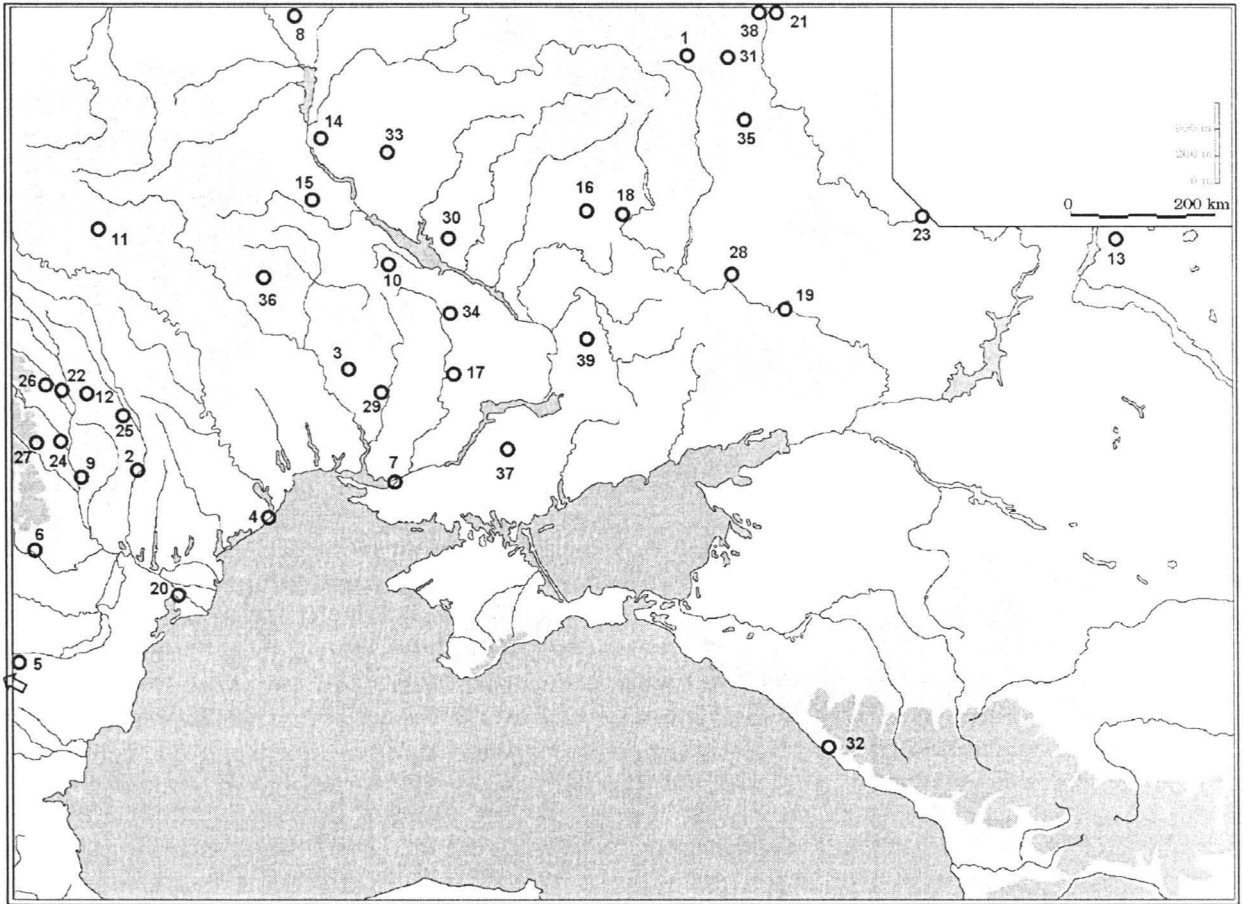


Fig. 4. Distribution of the Kolontaevka axes (after Korenevskij 1976, with some additions): 1 Aleksandrovka; 2 Bârlălești/Murgeni; 3 Bednaja Mogila; 4 Belgorod-Dnestrovsky (Cetatea Albă); 5 Brestovac; 6 Cernătești; 7 Cherson; 8 Chodosoviči; 9 Corbasca; 10 Čigirin district; 11 Derevjannoe; 12 Goești; 13 Kalinovka; 14 Kiev district; 15 Ključniki; 16 Kolontaevka; 17 Krivoj Rog; 18 Kurjažsk; 19 Lugansk; 20 Mahmudia; 21 Matyra river; 22 Miroslovești; 23 Nikolaevskaja; 24 Osebiți; 25 Osoi; 26 Petricani; 27 Poduri; 28 Privol'e; 29 Privol'noe; 30 Pustovoitovo; 31 Skakun; 32 Soči; 33 Stop'jači; 34 Tarasovka; 35 Ternoviščenka; 36 Uman'; 37 Veseloe; 38 Vorgol'skoe; 39 Zaporož'e district.

⁴⁰ E. Kaiser, *Radiocarbon Dates from Catacomb Graves*, in A. Koško (ed.), *The Foundations of Radiocarbon Chronology of Cultures between the Vistula and Dniepr: 3150-1850 BC*, Baltic-Pontic Studies 7, 1999, p. 141; idem, *Neue Radiokarbondatierungen für Gräber der Gruben- und Katakombengrabkultur im Steppengebiet der Ukraine*, in J. Czebreszuk, J. Müller (eds), *Die absolute Chronologie in Mitteleuropa 3000-2000 v.Chr.*, Poznań/Bamberg/Rahden, 2001, p. 86-87, 102, fig. 11.

⁴¹ According to Kaiser, with the two studies quoted in the previous footnote.

⁴² M. Szmyt, I. Cernyakov, *Radiocarbon Chronology of "Akkiembetskiy Kurgan". A Preliminary report*, in Koško (ed.), *op. cit.*, p. 196-202; V.I. Klochko, *Radiocarbon Chronology of the Early and Middle Bronze Age in the Middle Dnieper Region. The Myronivka Barrows*, in Koško (ed.), *op. cit.*, p. 165-195; S.S. Berezanskaja, *Usovo Ozero. Poselenie srubnoj kul'tury na Severskom Donce*, Kiev, 1990, p. 104; I. Motzoi-Chicideanu, *Câteva observații asupra culturii Monteoru*, Mousaios 8, 2003, p. 47.

⁴³ E. Sava, *Die Bestattungen der Noua-Kultur. Ein Beitrag zur Erforschung spätbronzezeitlicher Bestattungsriten zwischen Dnestr und Westkarpaten*, PAS 19, Kiel, 2002, p. 220.

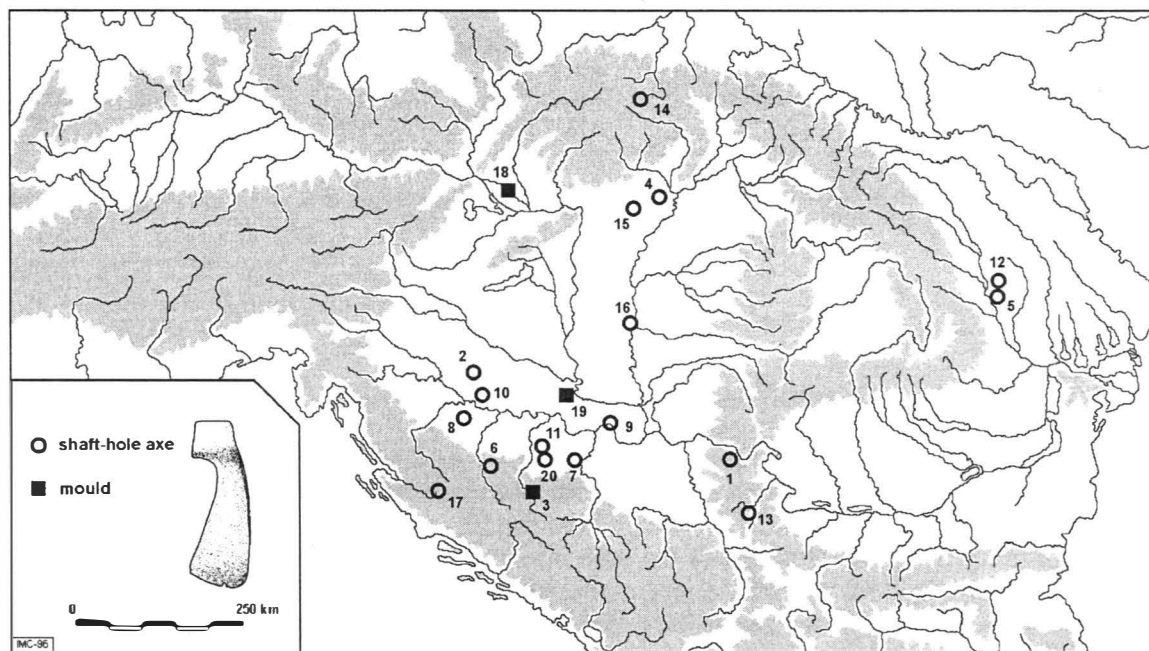


Fig. 5. The spreading area of the curved blade axes of the Kozarac type: 1 Boljetin; 2 Brekinjka; 3 Debelo brdo; 4 Emöd-Nagyhalom; 5 Găiceana; 6 Griča; 7 Kosovača; 8 Kozarac; 9 Leget; 10 Lippik; 11 Lohinja; 12 Mărăști; 13 Osnić; 14 “Poprad”; 15 Tápé; 17 Topolje; 18 Vel’ký Meder; 19 Vinkovci; 20 Vranovići.

Of all the oblong shaft hole axes, the ones at Găiceana and Mărăști stand apart owing to their slender body, the thin blade under the shaft, their widening considerably towards the oblique cutting edge, and the curving back edge of their blade. As Vulpe and Burtănescu have already noted, these are characteristics that cause them to resemble some axes grouped in the Kozarac type. The mapping of the points where there were found axes similar to the ones at Găiceana and Mărăști indicates a concentration of such pieces especially in the areas along the tributaries from the right of the Sava river (in Bosnia and Herzegovina). Among the casting moulds for such pieces, some come from settlements belonging to the classical or late stages of the Vučedol culture (Vinkovci, Debelo Brdo)⁴⁴ and from an archaeological feature attributed to the Kosihy-Čaka-Makó culture (Vel’ký Meder)⁴⁵, dated to the first half of the 3rd millennium BC. The two pieces from Moldavia may come from the Vučedol culture environment, which hypothesis is also supported by the chemical composition of the Găiceana axe, resembling quite a lot to the Kozarac pieces of this area⁴⁶.

The axes with a protruding, prolonged shaft of Darabani and Stubło have as common characteristics the slender form, the narrow blade under the shaft, subsequently widening towards the cutting edge, the small “crooked formation” in the area where the blade joins the shaft, as well as the straight back edge of the blade. An axe with similar characteristics was found at Mežigirci (Ukraine), in association with some gold hair rings⁴⁷. The axe from Stubło seems to have a shaft with some facets and this element makes it resemble some other axes found in the intra-Carpathian area (at Jimbor, Mura Mare, Sfântu Gheorghe, Merești-Cheile Vârghișului)⁴⁸ or in the extra-Carpathian area (in the dwelling area with Monteoru Ic3-Ic2

⁴⁴ Žeravica, *op. cit.*, p. 27-32; Durman, *op. cit.*, p. 78-79, pl. 1-3, 5/7.

⁴⁵ Bătora, *op. cit.*, p. 20, 22, fig. 17.

⁴⁶ S. Jurghans, E. Sangmeister, M. Schröder, *Kupfer und Bronze in der frühen Metallzeit Europas. Katalog der Analysen Nr. 985-10040*, SAM, Berlin, 1968, p. 246-247, no. 8813; Durman, *op. cit.*, p. 48-51.

⁴⁷ Bătora, *op. cit.*, p. 25, 27, fig. 24/1. Similar pieces seem to have been unearthed also in Poland at Kwieciszewo, Radzikow, Strzelin, Ośno; see M. Gedl, *Rocznik Przemyski* 36, 2000, p. 3-10, but I could not have access to this article.

⁴⁸ Vulpe, *Ăxte* 1970, p. 31, pl. 4/52-54; I. Dénes, G.V. Szabó, *Der Frühbronzezeitliche Bronzedepotfund aus der Höhle 1200/9 in der Enge des Vargyas-Baches (Cheile-Vârghișului) in Südost-Siebenbürgen*, in H. Ciugudean, F. Gogăltan (eds), *The Early and Middle Bronze Age in the Carpathian Basin*, Bibliotheca Musei Apulensis 8, 1998, p. 89-110.

pottery excavated at Răcățâu, where an axe with faceted shaft tube was found)⁴⁹, or with the axes excavated in the Middle Danube area (at Zók-Várhegy, where the finds included casting moulds for faceted axes)⁵⁰ and finally with the axes found on the Dalmatian Coast (at Topolje, Mala Gruda)⁵¹. Taking into account also the other pieces that they associate with in the hoard, especially the base of the widening end hair rings, the Stubło axe has been put in relation with the late corded ware cultures, and it has been dated back to the end of the 3rd millennium BC⁵².

The piece from Lespezi differs from the Darabani and Stubło pieces owing to the small-sized shaft and the widening blade, which gives to the axe a less crooked aspect. The best analogy for Lespezi is the axe found by mere chance near Majs (Hungary)⁵³. There have been published pieces with similar features at Cheșereu (Bihor County)⁵⁴, Oradea (Bihor County)⁵⁵, Deta (Timiș County)⁵⁶. The last of these were included by Vulpe in the Kozarak type, but it may be more appropriate for this type to contain only the curved back edge axes, like the ones in the hoard at Kozarac (Bosnia)⁵⁷. The straight back edge pieces of Lespezi, Cheșereu, Deta, Oradea, on the other hand, seem closer in form to the axes of the early Bronze Age found in Hungary and attributed to the Kömlöd type⁵⁸. These last axes are spread in a different area from the area where the curving blade axes of the Kozarak type were found; they were excavated in great numbers on sites lying to the north of the Vučedol culture environment, and were related by researchers with the Somogyvár-Vinkovci culture⁵⁹. The axes from the Izvorul Berheciului and Mastacăn have among their common features the prolonged shaft and the blade that curves widely at its joint with the shaft - which gives the pieces what has been termed "a crooked" aspect. The axes do not resemble each other in detail, the first piece having a weighty body, with a wide, curvilinear blade. For the Izvorul Berheciului axe, I know of no piece that is entirely similar to it, but there are characteristics that it shares closely with the axes of the northern Pontic space. Although the dimensions of the pieces differ, I can notice the similarity between the aspect of the blade in the Corbasca axe and the Izvorul Berheciului axe. The Mastacăn shaft-hole axe does not have very close analogies either. The way the blade is joined to the shaft is a characteristic that it shares with the Kolontaeveka axe; but it differs from these owing to the wide, oblong shaft. Through its general form, it comes somehow near the Stubło axe, from which it nevertheless differs in its

⁴⁹ V. Căpitanu, *Carpica* 8, 1976, p. 34, fig. 2/1.

⁵⁰ I. Ecsedy, *Ásatások Zók-Várhegyen (1977-1982) (Előzetes jelentés)*, A Janus Pannonius Múzeum Évkönyve 27, 1982 (1983), p. 88-89, pl. XIII/3.

⁵¹ M. Primas, *Velika Gruda I. Hügelgräber des frühen 3. Jahrtausends v. Chr. im Adriagebiet – Velika Gruda, Mala Gruda und ihr Kontext*, UPA 32, 1996, p. 105-107. For the literature on the decorations of axes with facets, see A. Vulpe, *Considerații privind începutul și definirea perioadei timpurii a epocii bronzului în România*, in V. Nistor, D. Zaharia (eds), *Timpul istoriei I. Memorie și patrimoniu*, In honorem emeritae Ligiae Bârzu, București, 1997, p. 45; idem, *Epoca metalelor*, in M. Petrescu-Dîmbovița, A. Vulpe (eds), *Istoria românilor I. Moștenirea timpurilor îndepărtate*, București, 2001, p. 240.

⁵² Mayer, *op. cit.*, p. 22; S. Kadrow, *Osteuropäische Beziehungen des epischnerkeramischen karpatenländischen Kulturkreises in der Frühbronzezeit*, in B. Hänsel, J. Machnik (eds), *Das Karpatenbecken und die Osteuropäische Steppe*, PAS 12, 1998, p. 259.

⁵³ Ecsedy, *op. cit.*, p. 89, pl. 9/4; 14/4.

⁵⁴ Random find, see T. Bader, *Epoca bronzului în nord-vestul Transilvaniei*, București, 1978, p. 123, pl. 83/18.

⁵⁵ Vulpe, *Ăxte* 1970, p. 40, no. 110.

⁵⁶ *Ibidem*, p. 40, no. 109.

⁵⁷ Žeravica groups them in variant 1 of the Kozarak type, see Žeravica, *op. cit.*, p. 23-24, pl. 6.

⁵⁸ A. Mozsolics, *Bronzefunde des Karpatenbeckens. Depotfundhorizonte von Hajdúsámson und Kosziderpadlás*, Budapest, 1967, p. 15-17, pl. 1/1-8; I. Bóna, *Bronzeguss und Metallbearbeitung bis zum Ende der mittleren Bronzezeit*, in W. Meier-Arendt (ed.), *Bronzezeit in Ungarn. Forschungen in Tell-Siedlungen an Donau und Theiss*, Frankfurt am Main, 1992, p. 49-50; T. Kovacs, *Anknüpfungspunkte in der bronzezeitlichen Metallkunst zwischen den südlichen und nördlichen Regionen des Karpatenbeckens*, in N. Tasić (ed.), *The Yugoslav Danube Basin and the Neighbouring Regions in the 2nd Millennium B.C.*, Belgrad-Vršac, 1996, p. 116-119.

⁵⁹ I. Ecsedy, *On the early development of prehistoric metallurgy in southern Transdanubia*, *Godišnjak Knjika* 28, 1990, p. 227-228; Bóna, *op. cit.*, p. 49; Kovacs, *op. cit.*, p. 118, fig. 1.

„crooked” aspect⁶⁰. Because of their differing aspect and in the absence of any analogies with pieces whose context has been thoroughly ascertained, the axes of the Izvorul Berheciului and Mastacăn are hard to place chronologically. But taking into account some features they share with the eastern axes, it becomes acceptable to date them back to the second half of the 3rd millennium BC. If this dating is accepted and in view of the places where they were found, the Mastacăn axe could be related to the Costișa pottery group, while the Izvorul Berheciului axe could be related to the Monteoru Ic3 group.

I do not know of any similar pieces to the Oroftiana de Sus axe. There could be made an analogy of sorts with the piece from Mura Mare (Mureș County), attributed by Vulpe to the Dumbrăvioara type⁶¹, or with the pieces that could have been forged by using some of the casting moulds found in pit 36 at Zók⁶².

From what has been discussed above I think it is possible to conclude that the organisation of the objects into types is necessary and it is instrumental to their ordering in time. In the absence of exact information about the chronological position of the pieces, there cannot be examined any further aspects with possible implications on the social and religious life of the people who used them. There appear problems in connection to the attempts of grouping the pieces into types, even though the classification criteria may have been rigorously defined. Their putting into practice proves less than simple. For example the axes at Mastacăn and Izvorul Berheciului prove to have some common morphological traits, but do not resemble in every detail. And one wonders if the two axes can be included into the same type. How far should two pieces differ for authorizing the researcher to group them into different types? This is precisely the question asked by Julian Steward over 50 years ago: „How different is different?... To be typologically different must an object or a culture be 10 per cent or 90 per cent distinctive? Where shall one draw the line at classifying an area (...) in an increasing number of temporal and areal subdivisions?”⁶³. We can answer, by paraphrasing Krieger, that the differences between the object types should be sufficiently clear as to be noticed by other researchers as well⁶⁴. As already mentioned, the practice is a little more complicated. For axes that resemble each other, but not entirely, though, their grouping into the same or differing types is subjective: it is for the archaeologist to decide upon the criteria justifying her/his option. In my opinion, there is no statistic procedure and no mathematical algorithm capable to solve such a problem “more correctly”.

In the attempt at reordering the axes that initially formed the Darabani type, I have mainly used the intuitive procedures, starting from the resemblances and the differences between the pieces; this criterion was also resorted to by Vulpe or Burtănescu. Form was the determining criterion in grouping the pieces, the dating of the axes was an important aspect followed, together with the relationship of the axes with the pottery groups. What differs in the present case, however, is the way the similarity of the forms is established among some axes initially included in the Darabani type and the axes from other spaces. I do not think that the similarities of form are mere coincidences or that they are due to the grafting of certain features that axes from other places have. The slender axes with a curving blade from Găiceana and Mărăști may be included into the Kozarac type, since there are casting moulds for such pieces that were actually found in Vučedol settlements; the piece found at Oroftiana de Sus should probably be included in this relationship with the Vučedol culture. The axe with a straight back at Lespezi is in a relation of good

⁶⁰ I think this is the place to mention some of the problems that crop up in connection with all attempts at grouping the early archaeological pieces. The direct access to the pieces is not always possible and the only choice left, therefore, in examining the axes, is to restrict oneself to the data published by the authors. For example, in the case of the shaft-hole axes from Lespezi and Miroslavești, there is no information about the aspect of the blade cross-section, although this detail is relevant for ascertaining their casting method. For the Stublo axe, we have at our disposal a photo taken from an angle that fails to be the most adequate one for appreciating the exact curving gradient of the blade towards the shaft, and the axe could very well be much more crooked in reality. Last but not least, the acribiousness in drawing up the plates matters so much when it comes to including all the details; consequently, there are quite a number of cases where the same piece is represented in a differing manner by the various authors.

⁶¹ Vulpe, *Ăxte* 1970, p. 31-32, pl. 4/54.

⁶² I. Ecsedy, *Ásatások Zók-Várhegyen (1977-1982) (Előzetes jelentés)*, A Janus Pannonius Múzeum Évkönyve 27, 1982 (1983), pl. 12/1; 13/1.

⁶³ J.H. Steward, *On The Concept of Type: Types of Types*, *American Anthropologist* 56/1, 1954, p. 55.

⁶⁴ „The differences between types must not be so obscure that others will encounter excessive difficulty in recognizing them”, see Krieger, *op. cit.*, p. 278.

analogy with the pieces of Kömlöd, on the Middle Danube basin, which were related basically to the Somogyvár-Vinkovci culture. The short shaft axes of Bârlălești/Murgeni, Goești, Mahmudia, Miroslovești, Osoi, Petricani, Poduri are similar to the Kolontaeвка axes of the North-Pontic area. If the axes published by Gedl in Poland and mentioned by Bátorá are similar to the ones from Stubło or Meżigirci or, as I feel bound to add, to the Darabani axe, then it is becoming increasingly possible to define a group of axes from the area to the north of the Carpathians (i.e., the north Ukraine and the south of Poland), a group that could be included in the literature under the name of the Darabani or Stubło. The axes from Izvorul Berheciului and Mastacăn cannot be attributed to any specific type and cannot amount to a separate type so far either. For a type to gain in consistence, it should, to all extents and purposes, comprise more pieces that resemble in form firstly. But as the case stands, the axes from Izvorul Berheciului and Mastacăn also evince some obvious differences.

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The most important thing about objects is their ease of movement and close association with individuals. They are received through social exchanges that forge bonds of group identity, marriage, alliances, and hierarchies of fealty.

(T. Earle, *American Anthropologist* 106/1, 2004, p. 113)

Wherever similar axes of the same area are grouped together, this could be the result of an emerging regional identity, endowed with its own customs and social hierarchies⁶⁵. Quite a number of ethnological studies show the tendency for the human groups to use certain objects capable of symbolizing their group identity – and the metal axes could very well perform such a role, given the fact that they are prestige artifacts. It has also been observed that wherever there is competition among the human groups, over such things as the control of the resources, this could result in a clear differentiation within the material culture⁶⁶. In this case, it is possible for the space occupied by each human group to have clearly delimited boundaries, with the specific object types (such as jewelry or weapon types, forms of pottery in association with a particular decorative pattern, clothes a.s.o) signifying the unity and also the identity of the respective group⁶⁷. In the first half of the 3rd millennium BC, there began to emerge along the middle and lower course of the Sava river a regional identity of this kind, clearly delimited in time and space and endowed with a rigorous social, religious and probably economic organization; and moreover, it was termed in the archaeological literature “the Vučedol culture”. We cannot tell whether it consisted of one or several human groups, pertaining to a similar ethnical formation or to different ones; it can only be noticed that, as regards the material culture, this manifestation appears as a thoroughly individualized unit. It was probably the elite community of the first half of the 3rd millennium BC of the Middle Danube zone; and the spreading of some material culture elements, in this case the metal pieces, which also have a certain symbolic charge to other cultural spaces, including the extra-Carpathian one, represents an argument in this respect. Another explanation for the presence of the Kozarac axes in Moldavia would be the mutual exchanges of goods, which would involve the possibility of social contacts. For the time being we do not have any archaeological finds to support the existence of reciprocal exchanges between the Vučedol “group” and the contemporary communities of the Middle Siret basin. If there existed any such contacts, they are not archaeologically visible.

⁶⁵ „Regional identity” should not be mistaken for „ethnic group”.

⁶⁶ „The ethnographic work suggests that the material culture differences between tribes can only be understood if material culture is seen as a language, expressing within-group cohesion in competition over scarce resources”, see I. Hodder, *Economic and Social Stress and Material Culture Patterning*, *American Antiquity* 44/3, 1979, p. 447.

⁶⁷ Hodder, *op. cit.*, p. 446-454; idem, *Symbols in Action. Ethnoarchaeological Studies of Material Cultures*, Cambridge 1982; B.J. Bowser, *From Pottery to Politics: an Ethnoarchaeological Study of Political Factionalism, Ethnicity, and Domestic Pottery Style in the Ecuatorian Amazon*, *Journal of Archaeological Method and Theory* 7, 2000, 3, p. 219-248; O.P. Gosselain, *Materializing Identities: An African Perspective*, *Journal of Archaeological Method and Theory* 7, 2000, 3, p. 187-217; M. Hegmon, *Advances in Ceramic Ethnoarchaeology*, *Journal of Archaeological Method and Theory* 7, 2000, 4, p. 129-137; M.T. Stark, R.L. Bishop, E. Miksa, *Ceramic Technology and Social Boundaries: Cultural Practices in Kalinga Clay Selection and Use*, *Journal of Archaeological Method and Theory* 7, 2000, 4, p. 295-331.

The Kolontaeвка type axes found in the sub-Carpathian region could be placed in relation with the ceramic groups Costișa and Monteoru Ic3⁶⁸. The Costișa group, characterized by some quite standard pottery, with a relatively reduced number of forms and decorative patterns, occupies a pretty restricted space that comprises mainly the middle and lower Bistrița basin and a small portion situated on the other side of the Eastern Carpathian range, including, therefore also the finds of the Ciomortan type. Another clearly individualized regional identity dating back to the beginning of the 2nd millenium BC is the Monteoru “culture”, which is spread in the sub-Carpathian hilly region, between the rivers Prahova and Bistrița and on the Bârlad Plateau. Judging by the complexity of the burial ceremonial patterns observed in the cemetery of Cândești (Vrancea County)⁶⁹ or considering the big range constructions of Costișa (Neamț County)⁷⁰ and Sărata Monteoru-Poiana Scoruşului (Buzău County)⁷¹, whose laying out process required an impressive amount of materials and a considerable human effort to enable me to present just a few number of examples, it can be supposed that there existed some local elites in the Monteoru community or communities who were able to organize and control the activity of their people, who could organize and preside over the performance of the ceremonial practices or during the exchanges with other communities, and who could organize and control the access to the resources a.s.o. The power and prestige of this elite were recognized at the moment of their death and expressed through complex ceremonies that included the laying out of some very special funereal structures, the placing in them of objects endowed with a high social value, some of these being probably brought from long distance; the ceremony might have also included the practice of human sacrifices⁷².

We cannot pass a final or certain judgment on the ways in which some pieces specific to the northern Pontic cultures – the Kolontaeвка axes, the tanged daggers, disc-shaped cheek pieces in bone – may have arrived in the cultural environments of Costișa or Monteoru⁷³. Among the possible explanations would be either that the respective products were brought by intermediaries (i.e., traders) or that they came through direct contacts among the members of the communities. In the second hypothesis, the relationships between or among the communities in the sub-Carpathian area and the communities of the northern Pontic area would have to be construed as much closer links. This last variant is also supported by the discovery within the Monteoru cemeteries of certain funereal structures characteristic for the Katakombnaja or Mnogovalikovaja cultural environments – graves with a lateral niche or dug in steps, sometimes filled with stone⁷⁴. Such a practice would be indicative of the fact that some elements of the funereal rite from the respective areas were adopted, or it could be a document indicating the presence of some “strangers” within the respective Monteoru communities who died and were consequently treated

⁶⁸ The pieces from Osebiți and Cernătești were found in the vicinity of Monteoru settlements, where there also existed ceramic decorated in the Ic3 style. The Poduri axe was found at a distance of 100-150 m from the «Dealul Ghindaru» site, where the archaeological excavations revealed a thin layer and a grave with pottery resembling the one from Costișa (Neamț County).

⁶⁹ M. Florescu, *Câteva observații referitoare la ritul și ritualurile practicate de purtătorii culturii Monteoru în lumina săpăturilor de la Cândești (jud. Vrancea)*, Carpica 10, 1978, p. 97-137; idem, *Contribuții la cunoașterea concepțiilor despre lume și viață a comunităților tribale monteorene*, Carpica 11, 1979, p. 57-134; idem, *Quelques observations concernant le rite et les rituels des communautés Monteoru à la lumière des fouilles de Cândești (dép. de Vrancea)*, Actes du II^e Congrès International de Thracologie I, București, 1980, p. 73-88.

⁷⁰ A. Vulpe, M. Zamoșteanu, *Materiale* 8, 1962, p. 309-316; A. Popescu, R. Băjenaru, *MemAntiq* 23, 2004, p. 281.

⁷¹ I. Nestor and others, *SCIV* 4, 1953, 1-2, p. 79-81; I. Nestor, E. Zaharia, *SCIV* 6, 1955, 3-4, p. 506-509; E. Zaharia, L. Bârzu, *Materiale (S.N.)*, 1, 1999, p. 41-58. An ample presentation of this unit is to be found in I. Motzoi-Chicideanu, *Observations Concerning the Bronze Age Cult-Object from Sărata Monteoru-„Poiana Scoruşului”*, in C. Kacsó (ed.), *Bronzezeitliche Kulturerscheinungen im Karpatischen Raum. Die Beziehungen zu den Benachbarten Gebieten*, Ehrensymposium für Alexandru Vulpe zum 70. Geburtstag, Baia Mare, 2003, p. 361-378.

⁷² M. Florescu, *Carpica* 10, 1978, p. 97-122.

⁷³ A detailed presentation of the pieces representing possible „imports” in the Monteoru cultural environment, as well as a presentation of the contexts and analogies of these can be consulted in I. Motzoi-Chicideanu, *Fremdgüter im Monteoru-Kulturräum*, in B. Hänsel (ed.), *Handel, Tausch und Verkehr im Bronze- und Früheisenzeitlichen Südosteuropa*, PAS 11, 1995, p. 219-242.

⁷⁴ Florescu, *op. cit.*, p. 125-127; I. Motzoi-Chicideanu, D. Sârbu, M. Constantinescu, N. Sultana, *Cimitirul din epoca bronzului de la Cârломănești-„La Arman” (Campania 2003)*, *Mousaios* 9, 2004, p. 15-38. In this context an important find is the one at Matca (Galați County), situated outside the Monteoru area; here, in a barrow, near grave 3 with catacomb, was found the lower part of a pot decorated in the Monteoru Ic3 style, see M. Brudiu, *L'Époque du bronze dans la zone de sud de l'interfluve Prut-Siret- des osmosees culturelles*, in Kacsó (ed.), *op. cit.*, p. 86, 92, fig. 4-5.

according to the rules of the group they were representatives of. As regards the object circulation, the hypothesis that some “foreign” products were imitated should not be dismissed either⁷⁵. The imitation of the metal axes does not only mean the acquisition of metallurgical knowledge and skills, but it also has a social aspect, in my opinion. In the sub-Carpathian region there are no copper ores and it would have been necessary therefore that the metal be brought from other spaces, which would be a supplementary proof as to the intensity of the contacts among the communities; and within this system of inter-communitarian relations, it is quite possible that some individuals may have had a privileged position. Irrespective of the way in which the pieces specific to the eastern cultures were transmitted to the Costișa and Monteoru environments, I think it is necessary to note the primarily “male” component of these goods. The metal axes are prestige goods, and to have owned such pieces, especially the “foreign” ones, represented a modality to express the social status that some of the members of the community had, more probably this entailing the high social status in the hierarchy held by some men. The burial of the axes, or their placing in water could represent a further form of expressing their power and the prestige⁷⁶; this renunciation to valuable objects with an exotic character was manifested probably within a ritual frame. In the series of demonstrations of prestige that the masculine elite had in the sub-Carpathian area, it is possible to include the use of spectacularly decorated horses, the disc-shaped cheek-pieces being such accessories of this very special harnessing⁷⁷.

Jewelry is generally considered an attribute of the feminine. Among the festive dress pieces found in the Costișa and Monteoru cultural environments, the following have been found: hair rings with a double wire (*Noppenringe*) discovered in the deposit with Monteoru Ic2 and Costișa pottery at Siliștea (Neamț County)⁷⁸; a copper/bronze pendant found in a grave with Monteoru Ic3 pottery at the Câmdești cemetery⁷⁹; bone spacer-plates for necklaces, discovered in deposits with Monteoru Ic4,2–Ic3 pottery at Sărata Monteoru (Buzău County), Coroteni (Vrancea County) and Vârteșcoiu (Vrancea County)⁸⁰. Similar pieces were found in great amounts in the inventory of the women’s tombs belonging to the cultural groups Periam-Pecica/Mureș, Nitra, Aunjetitz along the course of the Middle Danube (2100-1850 BC). Owing to the relatively small number of such jewelry excavated so far in the extra-Carpathian area, it is possible that these finds may have got there through exchanges in the Costișa and Monteoru environments. In the later stages of the Monteoru culture (Ia-IIb), the same preference can be noted for pieces that belonged to the feminine paraphernalia in the area along the Middle Danube: heart-shaped pendants, necklaces with rolled ends (*Ösenhalsringe*), necklaces with rolled

⁷⁵ The proofs as to the practicing of metallurgy in the Monteoru communities are few, but they could for the moment be a mere instance of lacunary archaeological information/publication. The metal analyses could be of use in determining the area of origin for the Kolontaeavka axes (i.e., whether they are „imports” or imitations), but, unfortunately, in Romania, none of the axes of this kind have benefited from such an examination. But the axe of Brestovac (Serbia), that I have included in the Kolontaeavka type has been analysed to see the composition of the metal which proves that the piece belongs the category of the arsenical bronzes (with a content of 2.5% As). The form of the piece and the composition of the metal are indications that the Brestovac axe might be an „import” from the North-Pontic zone, where the arsenic rich bronzes are very widespread. See, Jurghans, Sangmeister, Schröder, *op. cit.*, analysis no. 4320; Durman, *op. cit.*, p. 52, pl. 14/5; Chernykh, *op. cit.*, p. 130; Korenevskij, *op. cit.*, 16-31.

⁷⁶ For example, the axe of Cernătești was found among the riverbed stones of the river Slănic, see Oancea, Drâmbocianu, *op. cit.*, p. 565.

⁷⁷ A. Oancea, *Branches de mors au corps en forme de disque*, Thraco-Dacica 1, 1976, p. 59-75; H.-G. Hüttel, *Bronzezeitliche Trensen in Mittel- und Osteuropa. Grundzüge ihrer Entwicklung*, PBF XVI/2, München, 1981, p. 35-64, 173-178; N. Boroffka, *Bronze- und früheisenzeitliche Geweihtrensenknebel aus Rumänien und ihre Beziehungen*, Eurasia Antiqua 4, 1998 (1999), p. 81-135.

⁷⁸ N. Bolohan, E.R. Munteanu, in V. Cavruc, Gh. Dumitroaia (eds), *Cultura Costișa în contextul epocii bronzului din România*, Piatra Neamț, 2001, p. 44-49, pl. 40/1-3; N. Bolohan, C. Crețu, *Recent Discoveries Belonging to the Early/Middle Bronze Age in Central Moldova*, Thracians and Circumpontic World I, Proceedings of the Ninth International Congress of Thracology, Chișinău, 2004, p. 55-76, pl. 13/a-e. Pieces identical in form were found in graves of the Nitra culture, in the cemetery of Branč, see J. Vladár, *Pohrebiská zo staršej doby bronzovej v Branči*, Bratislava, 1973.

⁷⁹ M. Florescu, *Carpica* 10, 1978, p. 118, fig. 11; idem, *Quelques observations concernant le rite et les rituels des communautés Monteoru à la lumière des fouilles de Câmdești (dép. de Vrancea)*, Actes du II^e Congrès International de Thracologie I, București, 1980, p. 73-88, fig. 9; Similar pendants were found in the grave 104 of the cemetery at Mokrin, see M. Girić, *Mokrin I, nekropola ranog bronzanog doba*, Dissertationes et Monographiae, Belgrad, 1971, pl. 31.

⁸⁰ A. Popescu, *Bone Accessory of a Bronze Age Necklace*, Dacia N.S., 43-45, 1999-2001 (2003), p. 17-30, where are presented also similar pieces of the cultural environments Nitra, Mierzanowice, Aunjetitz, early Otomani, and early Wietenberg.

ends and twisted body, bracelets with longitudinal ribs, hairpins in the form of pods (*Hülsenkopfnadeln*) or with a conic end (*Kugelkopfnadeln*)⁸¹. According to Harding, the discovery of private use objects or jewelry may be connected to the circulation of the individuals from one place to another, without this necessarily involving organised or consistent contacts or exchanges⁸². Still, the previous affirmation might as well express just one side of the truth, if we consider the variant in which some long-term alliances could be made, through which women, usually those with an elevated social status, would have been offered as prestige “goods”⁸³. The product exchanges may not be necessary for the physical survival of a community but they do contribute to maintaining the inter-human relations, at the elite level mainly.

In my opinion, the situations presented above can represent arguments to maintain the existence of a rigorous control in selecting the “foreign” pieces to be made available or imitated, when it comes to establishing or maintaining the relationships between the Costișa and Monteoru communities, on the one hand, and the other middle Bronze Age communities⁸⁴. I have also signalled the possible association between the sex groups and the zones of origin for some “foreign” pieces (or pieces imitated after foreign ones), pieces found in the cultural environments Costișa or Monteoru. But we lack for the moment any archaeological proof confirming the reciprocity of the products circulated among the communities of the extra-Carpathian zone and those in the North-Pontic area or the Middle Danube basin.

Another aspect worth mentioning is related to the contexts in which appear the pieces of the extra-Carpathian zone and the similar pieces from other spaces. For example, in the north-Pontic zone, quite a lot of the Kolontaevka axes were found in funeral contexts, others were found in hoards or isolated. In the extra-Carpathian zone there have only been discovered as yet isolated deposits with such axes. These regional differentiations of the contexts for the deposits with similar pieces are not surprising and they could be explained through the fact that pieces with the same form may have a different symbolism in different regions; “Form is one method of communication, deposition another, and each society uses a different register to convey meaning”⁸⁵. A contrasting tradition regarding the structure of the deposits could be noticed even within the Monteoru culture: all the types of metal axes which were put in relation with this culture⁸⁶ represent isolated finds or are part of hoards, while in the inventory of the graves pertaining to the same culture are present axes made of stone⁸⁷. Actually, the deposition of metal axes in graves in the Bronze Age is not a common practice in the Middle and Lower Danube basin⁸⁸.

⁸¹ Motzoi-Chicideanu, *op. cit.*, p. 235.

⁸² A.F. Harding, *European Societies in the Bronze Age*, Cambridge, 2000, p. 191.

⁸³ P. Kolenda, *Woman as Tribute, Woman as Flower: Images of „Woman” in Weddings in North and South India*, *American Ethnologist* 11/1, 1984, p. 98-117, with references to earlier literature on this topic.

⁸⁴ „The thing exchanged is not arbitrary, and its associations and symbolism play an active part in the construction of social strategies”, see Hodder quoted by C. Broodbank, *Ulysses without Sails: Trade, Distance, Knowledge and Power in the Early Cyclades*, *World Archaeology* 24/3, 1993, p. 315. See also, Motzoi-Chicideanu, *op. cit.*, p. 219-242; idem, *Mormânt*, in *Enciclopedia Arheologiei și Istoriei Vechi a României*, III, M-Q, București, 2000, p. 121-123.

⁸⁵ M. Pearce, *Reconstructing Prehistoric Metallurgical Knowledge: The Northern Italian Copper And Bronze Age*, *EJA* 1/1, 1998, p. 61-62.

⁸⁶ The reference is to the Monteoru, Pădureni, Kolontaevka types.

⁸⁷ For a brief summary of the graves with stone axes in the Monteoru environment, see I. Motzoi-Chicideanu, *Observații asupra cimitirului din epoca bronzului de la Pietroasa Mică*, *Mousaios* 9, 2004, p. 69, note 79.

⁸⁸ The only certain find of this kind in Romania was the one at Fălcu (Vaslui County); in the inventory of a grave pertaining to the early bronze age there was found a copper hammer-axe in association with an axe made of solid rock, and another one made of flint; both had triangular points and silex chips. A similar axe, made of bronze, was discovered in an imposing ceremonial grave (grave 5 of the barrow 31) from Klady, in north-western Caucasia, dated back to the second half of the 4th millennium BC. It is possible in this context that the significance which the axe carried in the Caucasian space may have been adopted in the Romanian local culture, too, the two finds being probably very close in time. The initial signification from the culture of origin of this axe type seems to have been lost in time; some axes were found in different contexts along the Lower Danube course, circa one thousand years later (as there were found a bronze piece in the hoard of Tufa, a silver piece in the Perșinari hoard, and a copper piece found in isolation at Cozmești. See, E. Popușoi, *Acta Moldaviae Meridionalis* 9-11, 1987-1989, p. 15-26, fig. 2/2, 4/5a-b; A.D. Rezepkin, *Das frühbronzezeitliche Gräberfeld von Klady und die Majkop-Kultur in Nordwestkaukasien*, *Archäologie in Eurasien* 10, 2000, pl. 54/13; A. Vulpe, *Depozitul de la Tufa și topoarele cu ceafa cilindrică*, *SCIV* 10, 1959, 2, p. 265-276, fig. 1/1a-b, 2/1; A. Vulpe, *Tezaurul de la Perșinari. O nouă prezentare*, *CCDJ* 15, 1997, p. 265-301, fig. 9/1; 12.

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*He hung his sword. Studded with gold was that.
Then took his shield which finely varied was;
Bossed in twenty places with white tin;
And round about them were ten orbs of brass;
And black the circle was enclos 'd within.*
The Iliad, XI, 34.

Metal axes were objects with an outstanding social value, prestige goods, and the way they looked could not have been something random. Today we see that they will have been pieces meant to have a sure visual impact, a marked aesthetic style, and that should carry an impressive weight through the way they looked. In this context, attributes such as the form and the size, the colour and the quality of the metal, the surface treatment and decoration, maybe even the weight - played an important part. To produce such pieces endowed with uncommon qualities, what was needed was to have thorough knowledge of the metallurgical process – ranging from the capacity to detect and to recognize the sources of ores and getting as far as being in control of some minute metal working processes, through which the finished piece could have its potential imperfections corrected and through which it could have its sheen underlined.

It is something quite frequent in the archaeological literature on this subject, especially in Romanian, to present the technological changes in the evolutionist sense, as representing “improvements” or “instances of progress”, “steps forward” on the way to a superior form or a more efficient metal. For example, the use of arsenic in alloys with copper is perceived as an important stage in the process that led to the generalization of alloying copper and tin. Far from intending to deny the role played by the temporal accumulation of technological knowledge, I do not, however, believe, that the metallurgical activity of the 3rd millennium BC should be regarded as a highly experimental one, in a period in which there were made repeated attempts to obtain a more resistant metal, or that this period may have led, for that matter, at the beginning of the millennium to come, to obtaining the copper and tin alloy. The copper and tin alloy was already known at the beginning of the 3rd millennium BC, but for certain unknown reasons it was not widely used at the time.

Experimentally and by metallographic analysis of some prehistoric pieces it was noticed that the control of the arsenic levels was something deliberate and that it was most probably achieved through the smelting of the arsenic-rich copper sulphur ores⁸⁹. An illustration of the deliberate arsenic control is offered for example by the metallographic analyses performed on some pieces belonging to the Remedello culture of northern Italy; according to this, the axes had an arsenic content lower than 1%, but the daggers and halberds came to have a content of as much as 7-8% As⁹⁰. This method requires a very special skill and control of the technology employed, being a clear proof of the advanced metallurgical knowledge of the craftsmen. The properties of copper alloyed with tin, by comparison to the copper alloy with arsenic are approximately equivalent as regards the strength or malleability of the metal⁹¹. Under these circumstances it is maybe worth presupposing that it was not the functional reasons that were decisive in the replacement of arsenic with tin. The alternating use of the two alloys was a deliberate choice that came in answer to certain requirements of the respective societies, not being always connected to any economic considerations.

An important element was, in my opinion, one that was insufficiently taken into account when discussing the motivations for the changes in composition of the Bronze Age alloys: the colour that the

⁸⁹ H. McKerrell, R.F. Tylecote, *The Working of Copper-Arsenic Alloys in the Early Bronze Age and the Effect on the Determination of Provenance*, PPS 38, 1972, p. 209-218; P. Budd, B.S. Ottaway, *Eneolithic Arsenical Copper: Chance or Choice?*, in B. Jovanović (ed.), *Ancient Mining and Metallurgy in Southeast Europe*, Bor-Belgrad, 1995, p. 95-102.

⁹⁰ The daggers and halberds found in funeral contexts, while the majority of the axes are devoid of their archaeological context. See Budd, Ottaway, *op. cit.*, p. 95; Pearce, *op. cit.*, p. 54.

⁹¹ J.A. Charles, *Early Arsenical Bronzes – a Metallurgical View*, AJA 71/1, 1967, p. 21-26; H. Lechtman, *Arsenic Bronze: Dirty Copper or Chosen Alloy? A View from the Americas*, Journal of Field Archaeology 23/4, 1996, p. 477-514.

metal acquired as a result of the presence of some substances used in certain proportions in alloys with copper. Arsenic, for example, even in a low proportions, can change the colour of the metal, its surface acquiring a silvery colour⁹²; in this case „arsenical copper was not simply an alternative alloy but also a colouring technique in effect producing an artificial silver”⁹³. There can be quoted numerous examples to show that one of the main reasons why the arsenical copper was used as the metal from which several objects were made - was to imitate silver, as it acquired the silvery sheen. The ornaments pertaining to the Bedeni and Sachkhere cultures of Trans-Caucasia were made of arsenical copper, the arsenic content being as high as 15-20%⁹⁴. It has been experimentally ascertained that a high concentration of arsenic (of over 8%) makes the working of the metal difficult, as it becomes brittle⁹⁵. But the higher proportion of arsenic influences the colour and sheen of the metal and it is evident that in this case it was more important to obtain a silvery colour effect, even though in this way the metal's resistance was less; in other words, the aspect of the object had priority over its functionality. The same workable deficiencies apply in the case of the copper-tin alloy: when tin is added in proportions higher than 12 or 13%, the metal becomes brittle⁹⁶. However, in the case of some prestige objects, such as swords, daggers or axes, the tin concentration often exceeded the optimum proportion, which reduced their strength and resistance, decreased their capacity for being used as weapons, but had a specific effect upon the colour, upon the aesthetic features of the pieces⁹⁷. To support the importance of the colour in selecting the alloy type to be used for the specific pieces, I would like to mention some examples which are relevant for our discussion: a number of daggers from the Aegean space, made of arsenical copper, and with the handles fixed through silver rivets⁹⁸, the daggers made of arsenic rich copper with the silver plated surface of the Usatovo environment⁹⁹, or the swords in the hoard from Arslantepe VIA, worked in arsenic rich copper with silver inlay¹⁰⁰. In this context, the observations of Ernst Pernicka about some luxury objects of Mesopotamia dated back to the 3rd millenium are very useful, too: these contained a high concentration of tin, which probably was due to the aim of imparting them a gold-like colour¹⁰¹. I find very interesting the metal association recorded for the mounds near Kotor, Montenegro¹⁰²: the inventory of the grave of Mala Gruda contained a gold dagger and a shaft-hole axe made of silver, while the inventory of the grave at Velika Gruda contained among others a bronze dagger with the concentration of 7.62% Sn and a flat axe made of arsenical copper with 2.22% As¹⁰³. It is possible for the tin and arsenic content to have been

⁹² E.R. Caley, *On the Prehistoric Use of Arsenical Copper in the Aegean Region*, Hesperia. Supplement 8, 1949, p. 60-63; A. Giunlia-Mair, *Colouring Treatments on Ancient Copper-Alloys*, La Revue de Métallurgie 2001, p. 771; A. Giunlia-Mair, E.J. Keall, A.N. Shugar, S. Stock, *Investigation of a Copper-based Hoard from the Megalithic Site of al-Midamman, Yemen: An Interdisciplinary Approach*, Journal of Archaeological Science 29, 2002, p. 205.

⁹³ E.R. Eaton, H. McKerrell, *Near Eastern Alloying and Some Textual Evidence for the Early Use of Arsenical Copper*, World Archaeology 8/2, 1976, p. 175.

⁹⁴ In the Bedeni graves there were also found bronze objects with a high concentration of tin (8-14%). See, E.N. Chernykh, *Ancient Metallurgy in the USSR*, Cambridge, 1992, p. 106.

⁹⁵ Charles, *op. cit.*, p. 21-26; Chernykh, *op. cit.*, p. 106; Lechtman, *op. cit.*, p. 477-514.

⁹⁶ Lechtman, *op. cit.*, p. 488.

⁹⁷ Mark Pearce offers a few relevant examples in this respect. For example in the grave 75 of the Canegate cemetery (Italy, the Bronze Age) was found a dagger of small sizes (length = 13.5 cm), „a dagger non-dagger” as Pearce characterised it, and considered to be a symbolic piece, „a message-bearer”. The dagger contains 12.5% copper, which influences the metal colour, as it becomes golden, probably increasing the symbolic value of the piece. Pearce, *op. cit.*, p. 63-64.

⁹⁸ Eaton, McKerrell, *op. cit.*, p. 177.

⁹⁹ A dagger with a silver plated surface was also found at Durankulak settlement (Bulgaria). See, I. Vajsov, *Die frühesten Metalldolche Südost- und Mitteleuropas*, PZ 68, 1993, 1, p. 113, 120, 141; Chernykh, *op. cit.*, p. 95.

¹⁰⁰ A. Palmieri, *Excavations at Arslantepe (Malatya)*, Anatolian Studies 31, 1981, p. 109, fig. 3/2-3; M. Primas, *Velika Gruda I. Hügelgräber des frühen 3. Jahrtausends v.Chr. im Adriagebiet – Velika Gruda, Mala Gruda und ihr Kontext*, UPA 32, 1996, p. 156.

¹⁰¹ E. Pernicka, *Gewinnung und Verbreitung der Metalle in prähistorischer Zeit*, JahrbRGZM 37/1, 1990 (1995), p. 52-54; idem, *Die Ausbreitung der Zinnbronze im 3. Jahrtausend*, in B. Hänsel (ed.), *Mensch und Umwelt in der Bronzezeit Europas / Man and Environment in European Bronze Age*, Kiel, 1998, p. 135-147.

¹⁰² Primas, *op. cit.*, p. 75-112.

¹⁰³ In the grave at Velika Gruda there was also found a dagger, which is very ill preserved, unluckily.

meant to obtain the golden and silvery colour in the two pieces mentioned; and in this variant, their association may have had a significance somehow close to that of the pieces made of precious metals from the inventory of the Mala Gruda tomb¹⁰⁴. In my opinion, one of the main reasons for the deliberate alloying of copper presented above was to change the colour of the metal, and especially, to imitate the precious metals¹⁰⁵.

It might be of interest to study over a more extensive space to what extent there is an overlapping between the area where the silver pieces were spread in the 3rd millennium BC and the area where the arsenical copper objects were spread, as much as it might be of interest to study the association of metals in graves or hoards, basing on metallographic analysis. Also, I think it would be useful for the current research on the alloy of copper with other metals to let the current metallurgical experiments concentrate not only on the strength and resistance of the material obtained or on the procedures for obtaining the alloy, but also on the effect that the addition of metals in various concentrations may have on the colour. These are some of the motifs which have led me to believe that the use of arsenical copper is not merely an intermediate stage towards obtaining a more efficient alloy but rather that it represented a deliberate choice that answered some further requirements of the respective age, probably social or spiritual in nature.

Ethnographical studies offer numerous examples regarding the special importance of the ritual, symbolic and social aspects of the metallurgical process. Dorothy Hosler has obtained interesting results in this respect, regarding the populations that occupied the west of Mexico between the 14th and 16th AD, felicitously combining the archaeological and metallurgical data, on the one hand, and the ethnographical and historical sources, on the other hand¹⁰⁶. The metallographic analyses have shown that some objects had a high tin or arsenic content (sometimes as high as 23%, even). The primary interest of the smiths was to obtain golden and silvery objects, because, in accordance with the literary sources, gold was associated to the sun, and silver with the moon¹⁰⁷. The objects made of gold and silver and the ones that looked like them were worn by kings and nobles.

In India, pure copper was considered until the recent period as being a superior metal to any of the alloys, and the written sources showed the preference for using in ritual contexts objects made of this metal, rather than objects made of alloys¹⁰⁸. In an ancient Indian text, the *Satapatha Brahmana* (700 BC) an association is made between a razor made of copper and the caste of the Brahmins: "Brahman is fire, and fire is of reddish colour; hence a copper razor is used"¹⁰⁹. This metal processing tradition had some social implications as well, since the copper smiths who worked in pure copper considered themselves to hold a privileged position by comparison to the smiths who worked in various alloys.

In the pre-colonial West Africa, pure copper or its alloy with zinc (brass, as the copper-zinc alloy is called) was preferred to other metals, basically owing to the magic, ritual properties attributed to it, owing to the reduced number of ores in that area, but also for aesthetic reasons (copper is reddish in colour, and

¹⁰⁴ See the discussion made by Margarita Primas and Alexandru Vulpe, regarding the association in the same context, according to a specific code, of some metals with a different composition. Primas, *op. cit.*, p. 155-156; A. Vulpe, *Tezaurul de la Perşinari. O nouă prezentare*, CCDJ 15, 1997, p. 273-274.

¹⁰⁵ For example, the presence in the alloy of lead, nickel, stibium or zinc may change the metal colour to a silvery tinge. See, C.F. Cheng, C.M. Schwitter, *Nickel in Ancient Bronzes*, AJA 61/4, 1957, p. 351-365; K. Branigan, *Silver and Lead in Prepalatial Crete*, AJA 72/3, 1968, p. 219-229; A. Giumlia-Mair, *Colouring Treatments on Ancient Copper-Alloys*, La Revue de Métallurgie 2001, p. 767-776; idem, *Tin Rich Layers on Ancient Copper-Based Objects*, Surface Engineering 21/5-6, 2005, p. 359-367.

¹⁰⁶ D. Hosler, *The Metallurgy of Ancient Mexico*, in R. Maddin (ed.), *The Beginning of the Use of Metals and Alloys*, Cambridge/Massachusetts/London, 1988, p. 328-343; idem, *Ancient West Mexican Metallurgy: A Technological Chronology*, Journal of Field Archaeology 15/2, 1988, p. 191-217; idem, *Sound, Color and Meaning in the Metallurgy of Ancient West Mexico*, World Archaeology 27/1, 1995, p. 100-115.

¹⁰⁷ For more information on the association of the sun with gold and of silver with the moon, see also R.J. Forbes, *Studies in Ancient Technology*, 8, Leiden, 1964, p. 201. „The golden sun”, „golden rays of the sun” or „the silver moon” are actually very frequent figures of speech in the modern literature and vocabulary.

¹⁰⁸ N. Lahiri, *Indian Metal and Metal-Related Artefacts as Cultural Signifiers: an Ethnographic Perspective*, World Archaeology 27/1, 1995, p. 116-132. The first mention of the superiority of pure copper in respect to alloys is contained in the Vedic text.

¹⁰⁹ Lahiri, *op. cit.*, p. 120-121.

when alloyed to zinc it becomes white)¹¹⁰. Copper was used as a medium or standard of exchange, as an insignia of rank and power, to forge especially dress pieces worn by kings and nobles, to make ritual, cult objects. In African mythology, pure copper (coloured red) was associated with the sun, while the alloy copper-zinc (brass, white copper) was associated with the moon.

One of the main goals of this presentation has been to demonstrate that the value of some metal pieces should not be restricted to their being catalogued, ordered or considered to participate in establishing chronologies. Moving beyond typology, there can become visible a range of information referring to the organization and lifestyle of the pre-historical societies.

I have also tried to argue that the development of the metallurgical activities in pre-historical times, the changes in technology should not be regarded solely as continuous accumulations of experiences and knowledge destined to bring about improvement. Some choices made by the smiths are neither connected to the efficiency of the activity, nor to the functioning of the pieces, but they may have some very distinct motivations, deriving from ritual or social activity forms. One can draw inestimable advantages from the metal analyses, when examining their social and symbolic significance.

(Translated by Ioana Zirra)

¹¹⁰ E.W. Herbert, *Aspects of the Use of Copper in Pre-Colonial West Africa*, *Journal of African History* 14/2, 1973, p. 179-194.