ROUTES BETWEEN THE SEAS: BALTIC-BUG-BOH-PONT FROM THE 3RD TO THE MIDDLE OF THE 1ST MILLENNIUM BC

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BALTIC-PONTIC STUDIES

V O L U M E 14 • 2009

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Cover Design: Eugeniusz Skorwider

Linguistic consultation: Ryszard J. Reisner, Piotr T. Żebrowski

Printed in Poland

Computer typeset by PSO Sp. z o.o. w Poznaniu

Druk i oprawa: Zakłady Poligraficzne SERIGRAF w Suchym Lesie

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Editor's Foreword

As regards the identification of the early forms of Europe's long-distance routes, the area lying between the Baltic and Black seas can be said to be one of relative neglect. Specifically, little research has been devoted to the development stages of the area's socio-cultural map, i.e. to neighbourly forays, itineraries, routes (of varied continuity, range and transport technique), stable segments of roads leading to water crossings, networks of fords and the communication channels running along watersheds. The foremost issue, at present one of great difficulty with respect to a study embracing the whole region in question, is the cultural context of these innovations and the related mechanisms that saw their creation in regard to the socio-economic basis and ritual-epistemological nature of ancient peoples in these regions.

The study by Marija Gimbutas [Gimbutas 1965] of 'amber routes', joining the west and east of Europe, may be considered the first attempt to tackle the issue of the region's early communication channels and was accordingly referred to in the analyses of the distribution of stone 'fluted maces', regarded as hypothetical markers of Baltic-Pontic routes [Kośko 2001; 2002]. Generally, this conceptual leaven can be said to have provided broader intellectual stimuli for the international academic community of 'Archaeology Bimaris'. The turning point in the nascent study of ancient routes has been thus given a clear framework: an inter-university and interdisciplinary discussion (see the Poznań-Obrzycko symposium *Routes Between the Seas: Baltic-Bug-Boh (Southern Bug)-Pont* held in October 2008).

The papers included in this volume are a partial record of the discussion. The intentional selectiveness here is seen therefore in the conscious limitation of the scope of papers ('piecemeal' treatment of linguistic or ethnological and anthropological analyses). Moreover, there is a special focus on one of the inter-regional routes, namely the Baltic-Bug-Boh (Southern Bug)-Pont, or more specifically, its early evidence (generally speaking, prior to – widely known to the academia – its use in the times of Goth migrations).

Editorial comment

1. All dates in the B-PS are calibrated [BC; see: Radiocarbon vol. 28, 1986, and the next volumes]. Deviations from this rule will be point out in notes [bc].
2. The names of the archaelogical cultures and sites are standarized to the English literature on the subject (e.g. M. Gimbutas, J. P. Mallory). In the case of a new term, the author's original name has been retained.
3. The spelling of names of localities having the rank of administrative centres follows official, state, English language cartographic publications (e.g. *Ukraine, scale 1 : 2 000 000*, Kiev: Mapa LTD, edition of 1996; *Rèspublika BELARUS', REVIEW-TOPOGRAPHIC MAP*, scale 1:1 000 000, Minsk: BYELORUSSIAN CARTOGRAPHIC AN GEODETIC ENTERPISE, edition 1993).
4. As far as names of administrative units in Polish, Ukrainian, Belarusian and English are concerned, a convention has been adopted that województwo = oblast = region and powiat = raion = district.

Baltic-Pontic Studies
vol. 14: 2009, 9-18
PL ISSN 1231-0344

Aleksander Kośko, Viktor I. Klochko

TRANSIT ROUTES BETWEEN THE BALTIC AND BLACK SEAS: EARLY DEVELOPMENT STAGES – FROM THE 3RD TO THE MIDDLE OF THE 1ST MILLENNIUM BC. AN OUTLINE OF RESEARCH PROJECT

The question of (long-distance) transit routes has arisen from the discussions held among scholars contributing to *Baltic-Pontic Studies* and *Archaeologia Bimaris* and focusing on the mechanisms of cultural pattern circulation along the borderland between the East and West of Europe. We have arrived at a conclusion that it will be interesting to document in this volume of *Baltic-Pontic Studies* the current state of research into the said question and discuss desired forms of research projects dealing with transit routes that would be feasible to carry out by archaeological research centres located between the seas.

1. ROUTES OF PREHISTORIC TIMES – COGNITIVE LIMITATIONS

Prehistoric routes can be viewed from two analytical perspectives: natural-science one (studies of natural routes) and historical (studies of historical routes). Both perspectives go beyond archaeologists' field of study but they can inspire both of them or rather programme them by submitting specific research requests. This is exactly what happens in the project being contemplated here.

Traditionally, inspirations for the study of early long-distance routes came from ancient and medieval history, and palaeophysiography (chiefly palaeohydrography). It was only the combination of these two research experiences that produced hypotheses noticed and made use of by archaeologists. The methodology for the study of transit routes was developed in reference to districts mentioned early in written

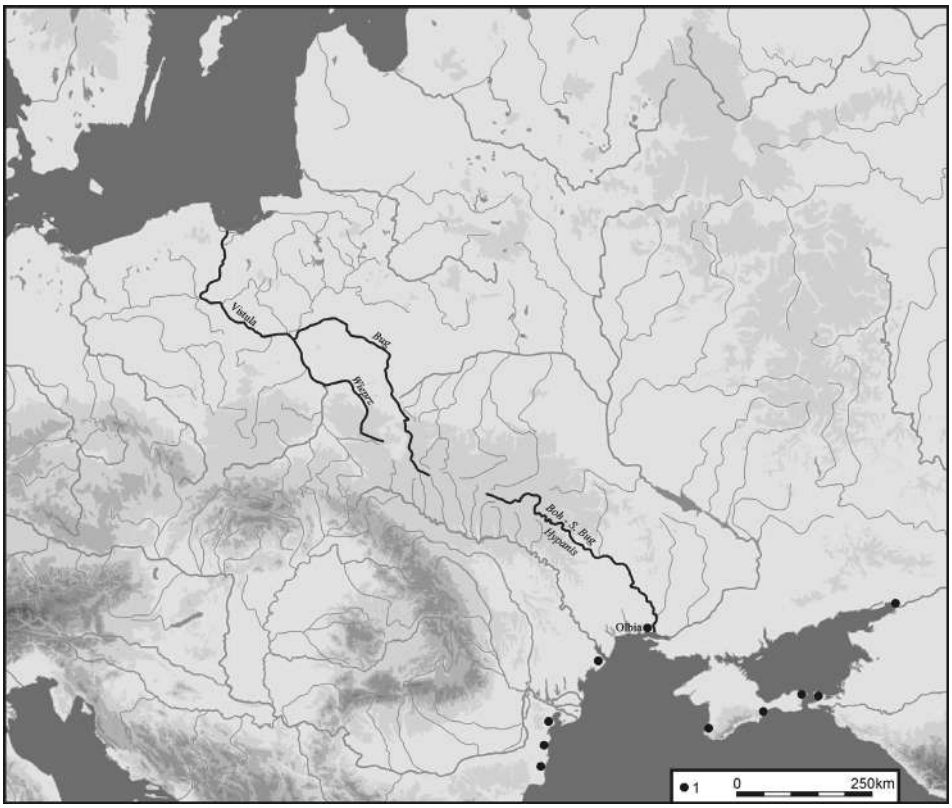


Fig. 1. Routes between the Seas: Boh/Southern Bug – Bug – Wieprz – middle/lower Vistula. Legend: 1 – Greek colonies on the northern shores of the Black Sea

records or charted on maps. In the case of Europe, this refers chiefly to its part covered by the Roman Empire.

Historical transit routes are much harder to trace in the area lying between the Baltic and Black seas, deep into the Barbaricum, i.e. far away from Roman Empire limites, hence outside its civilization impact that could be observed in the early forms of the western European Middle Ages.

With respect to 'roads' associated with the Baltic-Bug-Boh/Southern Bug-Black Sea route, the oldest records appear in the 5th century BC and refer to episodes related to Greek penetration. What is specifically mentioned is the Black Sea ('steppe') segment of the Boh River (Hypanis) at the mouth of which Olbia was founded (Fig. 1) [Herodot IV; cf. Plezia 1964: 234-235]. Any maps are available only for the 17th century, giving the courses of the so-called black routes: migrations by Cossacks towards centres located in the Baltic drainage [Atlas 2005: 52] (Fig. 2). The Baltic

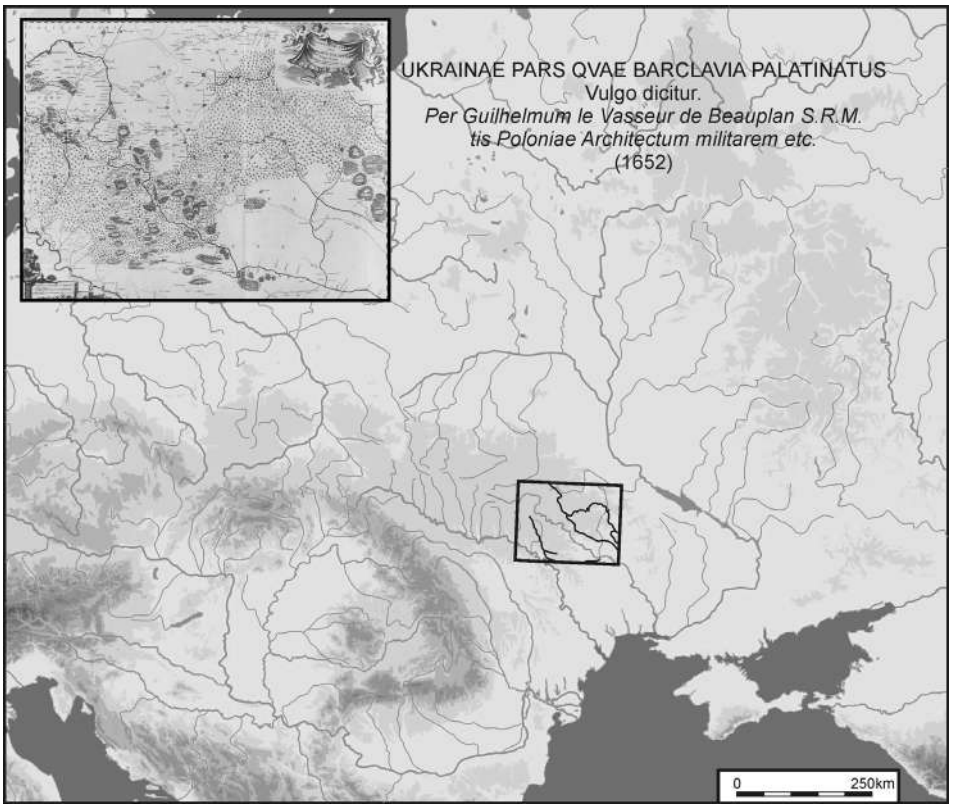


Fig. 2. 'Black routes' of Cossacks in the Boh drainage: a 17th century map [Atlas 2005]

section of the route is mentioned in records beginning only with the 11th century [cf. Rozwadowski 1948: 241-243], whereas the earliest cartographic representations of the Vistula-Bug section were charted only in the 18th century prompted by the "demand for Volhynia grain transported by waterways from the port in Uściług on the Bug River to Gdańsk." [Rąkowski 2005: 27; cf. Słownik 1880: 452 – "already in Galicia floating of rafts with barrels, staves and grain begins; for lighters and other barges navigation usually starts at Uściług (...) all barges and lighters loaded with grain sail down so that they drop anchor on the Narew River when the water is high, in May at the latest, because later they would run aground"].

It follows from this general review that studies of prehistoric routes, criss-crossing the lands between the Baltic and Black seas, did not have any clear historic inspirations. This is true for all alternative courses of the routes. Also, no specific palaeophysiographic studies of natural routes, water, land and water-land ones, have been carried out so far.

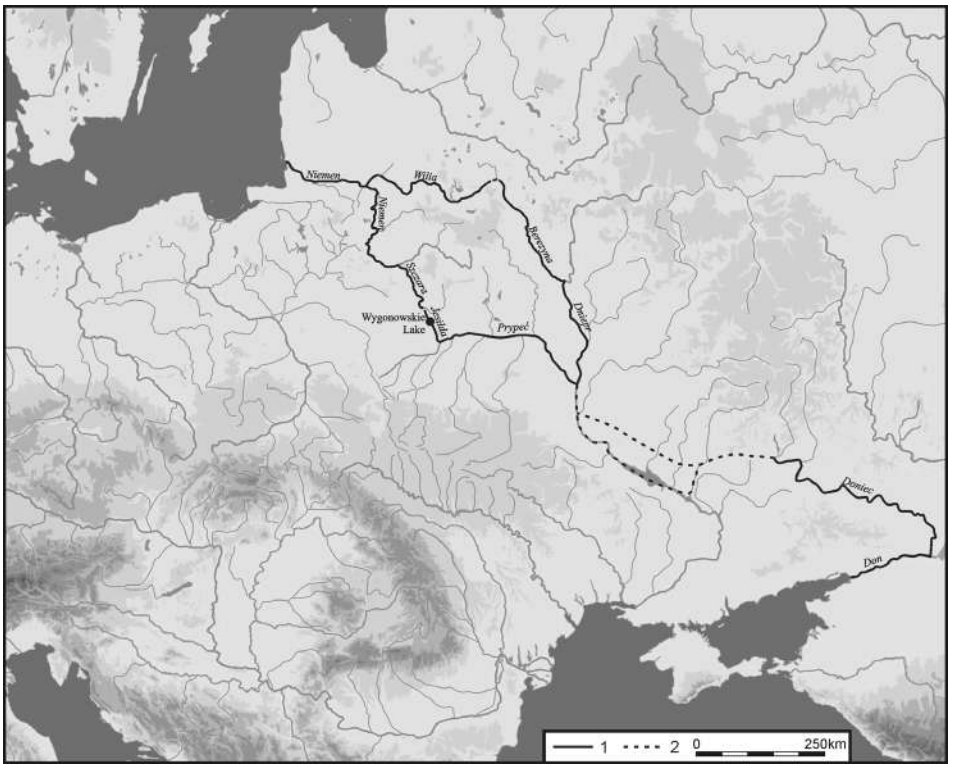


Fig. 3. 'The route of the Argonauts' journey according to S. Czarnowski [Czarnowski 1937/1956 – visualization by the present authors]

2. ROUTES BETWEEN THE SEAS – MYTHOLOGICAL INSPIRATIONS?

The only source of information from antiquity concerning early transit routes or trails crossing the lands between the Baltic and Black seas can be found in the myth of the Argonauts [Graves 1974: 52ff.]. In the dominating, simplified interpretation, the myth concerns: "the journey of the Argonauts who sailed up the Tanais River (Don), then carried their ship over land to the river flowing into the Northern Ocean and after sailing around the northern and western shores of Europe, they reached the Mediterranean" [Kolendo 1987: 195; cf. Cieszewska ..., in this volume]. It is interesting that an attempt to trace accurately the route, using archaeological techniques and materials (i.e. taking into account a rich set of sources dating back to different times and originating in the area in question) was made by S. Czarnowski in 1937. S. Czarnowski, a historian of culture and sociologist, claimed

that, viewing the Argonauts' journey from an interdisciplinary perspective (Fig. 3), another route could be traced as well: "It followed the lower Don, moved to its right-bank tributary, the Donets, to proceed up this river until it reached a point closest to the Dnieper, which could be reached – without encountering any natural obstacles – via a short and easy land route across steppes (...).

The route reached the Dnieper close to today's Kiev to follow the river upstream. The route could be continued along the Pripet River only to switch to the Neman River taking advantage of – we presume – the Yasiolda River and Lake Wygonowskie. It is here that (...) one should look for Herodotus' information on the lake from which the Borysthenes (Dnieper) was supposed to flow. Alternatively, instead of switching to the Pripet, goods could continue to move along the Dnieper as far as the Berezina River to reach the Neman or its tributary, the Neris" [Czarnowski 1956: 257; originally written in 1937]. The author stresses the fact that in "all versions of the return journey, the Argonauts, fleeing ships pursuing them, always choose routes paved by trade" [Czarnowski 1956: 250].

From this perspective, as a piece of evidence, arguing in favour of identifying the Boh River as an important route into the interior of the Black Sea steppe-forest-steppe, can be taken the foundation of Olbia in the river's estuary in the middle of the 7th century BC by Greeks from Anatolia's Miletus (Fig. 1). Dating back to the 5th century BC, Herodotus' description [Herodot 1959] ranks the city among the most important Greek colonies on the Black Sea. Olbia is often termed "gates to the steppes of the North", whence timber and iron (bog iron ore) were imported to the colony [King 2006: 43 ff.]. For the upper Boh drainage, north of the Black Sea, was abundant in these goods [Denisik 1998: 70, 76 – discovery of a canoe for transporting bog iron ore, which could take a load of 300-400 kg, made in the Vinnitsa district].

3. PREHISTORIOGRAPHY OF ROUTES BETWEEN THE SEAS

The historical evidence discussed above can hardly be found in the first comprehensive approach to the question of early transit routes connecting the East and west of Europe, developed by M. Gimbutas [Gimbutas 1965: Fig. 15]. Her approach ignores inspirations arising out of Greek sources (the Don, Boh), focusing directly on archaeological evidence from the 3rd/2nd – 2nd millennium BC. This includes object markers (putative 'imports') from the East European Plain [Gimbutas 1965: 47ff.; cf. earlier analyses: e.g. Tallgren 1925; Czarnowski 1956: 255ff.]. The outline of routes, making up the central European network and facilitating the exchange of amber

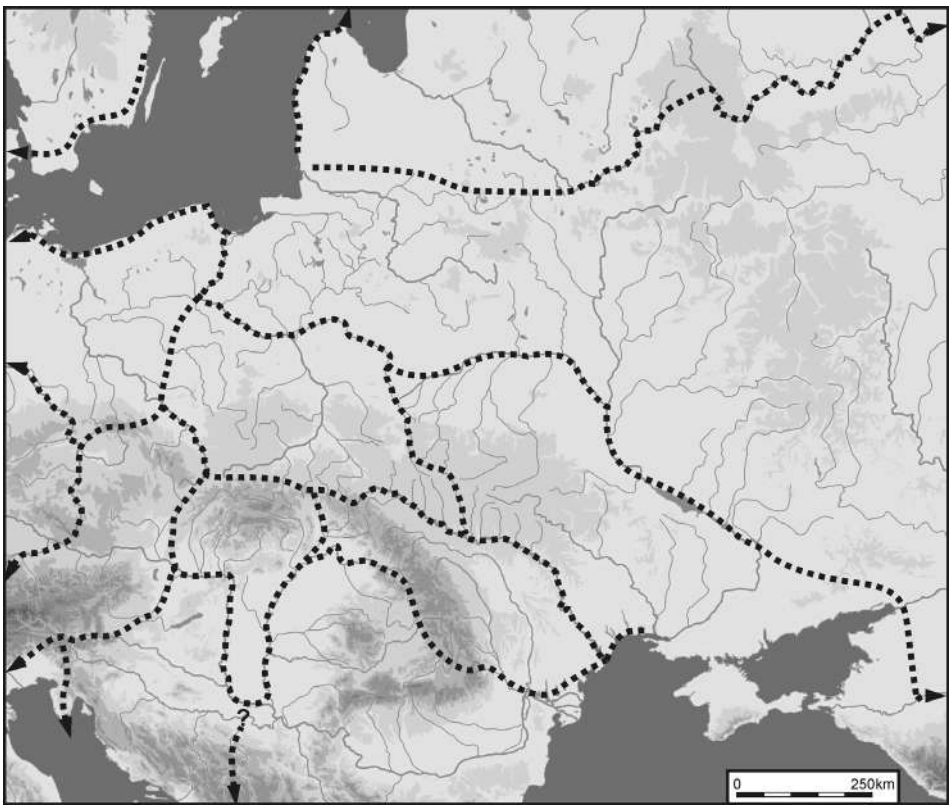


Fig. 4. 'Amber routes', according to M. Gimbutas [Gimbutas 1965]

and copper, was joined by M. Gimbutas to the eastern European centres of civilization, taken to be especially significant for the development of mining and processing of copper. They were located chiefly on the Caucasus or the southern Urals. Considerably less legitimate arguments served to stress the culture-making role of the northern shores of the Black Sea. After forty years of applying and transforming the approach (e.g. an expanding approach by W. Sarnowska [Sarnowska 1975: Fig. 11] much promoted in Polish archaeology), despite several major adjustments in the assessment of source evidence [see, for instance, new explorations of significant centres of copper procurement in the drainages of the Horyn and Dniester rivers, on the middle Dnieper and especially on the Donets River: Klochko *et al.* 2000; Brovender 2006], it has kept power to inspire, which the present authors wish to acknowledge.

The question of transit routes joining the Baltic and Black seas was given another chance to show its research appeal, owing to projects launched jointly by the archaeological centres of Belarus, Poland and Ukraine after the disintegration of

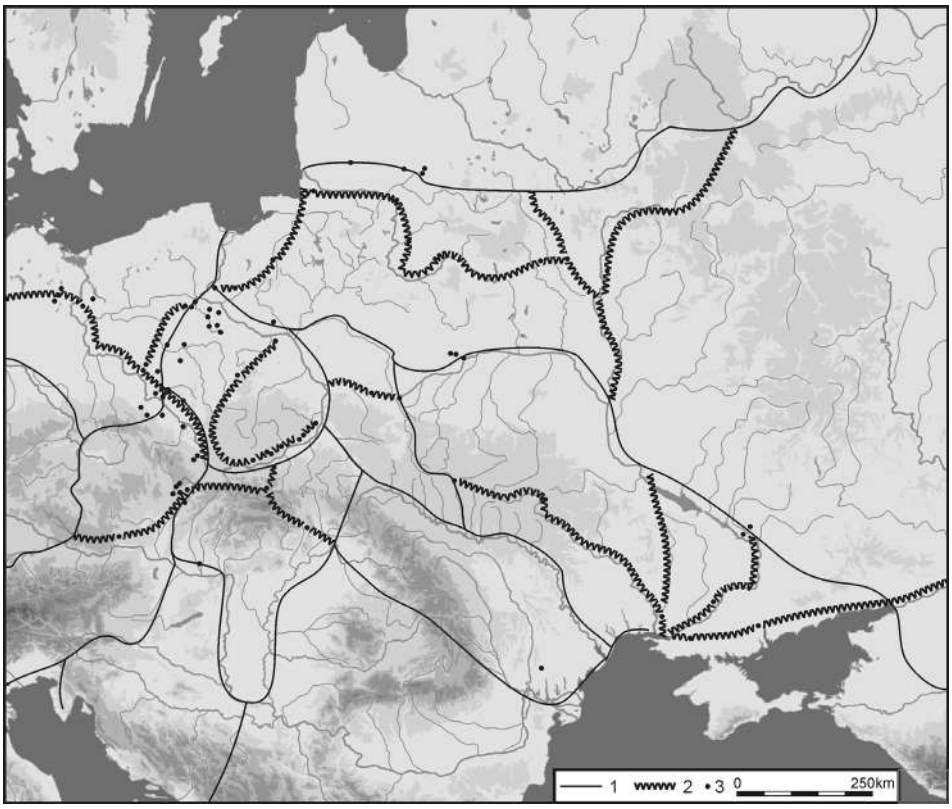


Fig. 5. Long-distance routes of the 2nd millennium BC according to A. Kośko [Kośko 2002]. Legend: 1 – M. Gimbutas's approach (see Fig. 4); 2 – amendments by the author; 3 – locations of fluted maces finds

the Soviet Union. A major research objective was to study the cultural borderland between the East and West of Europe. This objective has led to the emergence of a specialist area of study known as Archaeology Between the Seas [cf. a series of papers in Archaeologia Bimaris: Kośko, Czebreszuk 1998; Czebreszuk *et al.* 2001; Kośko, Szmyt 2004a; Krywalcewicz 2007]. Scholars working in this area began to register markers of the cultural contact, covering also many informal collections of artefacts (see, for instance, the Polish-Ukrainian search of museums and para-museums performed in the Boh drainage – chiefly middle and lower – in 2003).

The first paper written in the academic climate favouring Archaeology Between the Seas, initiating the subject of insignia markers of Pontic-Baltic transit routes, was a study of the forms of fluted maces [Kośko 2002] (Fig. 5). An analysis of distribution of the maces (type B) justified distinguishing five potential alternative routes

that hypothetically ran along water courses identified as communication arteries in historical times or in connection with their basins – watersheds:

a. Boh – Bug – Wieprz – Vistula (possibly continued along Vistula – Neman);

b. Boh – Bug –Vistula (Vistula – Neman);

c. Dnieper (or Ingul – Dnieper) – Pripet – Bug – Vistula (Vistula – Neman);

d. Dnieper (Ingul–Dnieper) – Berezina – Neman;

e. Dnieper (Ingul–Dnieper) – Berezina – Neris – Neman.

Upon correlating the alternative routes suggested above with the environmental- cultural background, it is possible to group them into two variants (and putative development stages at the same time):

• 'Boh route' – expeditions across treeless or strongly deforested areas (variants a-b; representing an earlier development stage), and

• 'Dnieper route' – expeditions crossing in part the taiga (variants c-e; representing a later development stage) [Kośko 2002: 71].

The cited approach lacked the sixth of the possible route variants – which was present in M. Gimbutas's proposal – i.e. Dniester – San – Vistula. The reason was the then absence of fluted mace evidence.

4. HOW SHOULD WE STUDY THE ROUTES BETWEEN THE SEAS NOW?

A tentative answer to this question should be found at this symposium. Strictly speaking, it is devoted to reviewing experience and outlining a new strategy or necessary research initiatives.

The most glaring omissions concern interdisciplinary studies of 'natural routes' and the application of historico-geographical or historico-linguistic findings to the recording and constructing of specific routes or inland roads in both lands lying between the Seas and in adjacent Civilizations, i.e. the Near East or the Aegean. The prehistoric transit routes, as they are now 'objectively' documented, should be corroborated by other types of evidence drawn from natural sciences, history, linguistics and anthropology.

An assertion must be accepted claiming that the early forms of prehistoric routes emerged by adapting to a specific biocultural landscape and their 'foundation charters' formed a permanent part of its mythological image. Hence, it should not be surprising that we find similarities in ford locations or road courses between the 3rd millennium BC and the medieval/modern times [cf. investigations in the Noteć River valley: Machajewski, Rola 2006 and in the Dzierzgoń River valley: Sadowska-Topór 1999]. There are, thus, different potential mechanisms of unco-

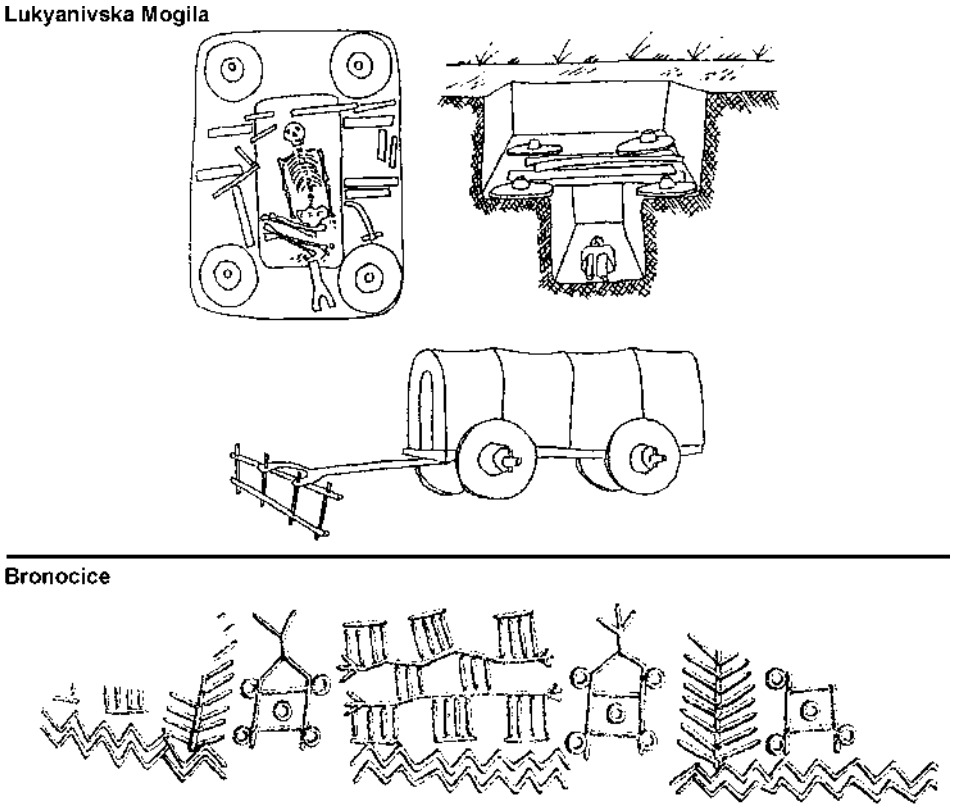


Fig. 6. Wagons of the loess lands of the upper Vistula drainage (Funnel Beaker culture – Bronocice, ca. 3650 BC) and of the steppe of the Ingul drainage (Pit-Grave culture – Lukyanivska Mogila, 3rd millennium BC) [Milisauskas, Kruk 1991; Otroshchenko 2005b]

vering prehistoric reality and verifying hypotheses built in this way. They include archaeological methods, also non-invasive ones, like aerial photography [for current experiences see Nowakowski *et al.* 2005].

5. TIME PERSPECTIVE OF THE 3RD MILLENNIUM BC

The choice of the 3rd millennium BC as the time when the network of transit routes began to stabilize and roads began to be built relies on two observations. First, bilateral transit routes emerged in the area between the Seas at that time, which

initially involved the GAC [cf. Kośko 1990; Szmyt 1999a; 2004b]. Second, wheel transport became more common, especially on old upland plains, since around 3500 BC [Shilov 1975; Milisauskas, Kruk 1991; Pustovalov 2008] (Fig. 6).

This is also a period of a rapid development – on an inter-regional and inter-cultural scale – of insignia-like objects made chiefly of stone and flint ('lithic'). Potentially, they have a high diagnostic value for identifying transit routes or population movements: one-way, reciprocal and bilateral ones. They involved circulation of human groups of varied descent specializing in the exchange of specific materials and products (nascence of trade). The lists of such markers shall be presented and submitted for discussion in successive papers.

6. CONCLUSIONS

The above findings, however, are not conclusive as to the existence in the area between the Baltic and Black seas – in the time interval focused on at this conference – of long-distance transit routes. Likewise, it is hard to assess the degree of continuity of 'route behaviour' observed now.

For the first problem that still remains unsolved is what materials or products (archaeologically identifiable or 'discreet', e.g. salt), especially what values, triggered the formation of transit routes between the Seas beginning with the 3rd millennium BC. However, one has to point out at the outset a significant restriction on the suggested research following from the shortage of specialists who could give support to the linguistic and anthropological aspects of the desired investigations. This remains an important submission for the future.

Translated by Piotr T. Żebrowski

Baltic-Pontic Studies
vol. 14: 2009, 19-71
PL ISSN 1231-0344

Mirosław Makohonienko

NATURAL ASPECTS OF PREHISTORIC AND EARLY HISTORIC TRANSIT ROUTES IN THE BALTIC-PONTIC CULTURAL AREA

1. INTRODUCTION

The present paper has been inspired by the discussion of the rise of European transit routes in the cultural borderland between the East and West of Europe in the Early Bronze Age. The discussion was started by the study of stone fluted maces [Kośko 1991a, 2001, 2002]. The distribution of this specific category of material goods in the diversified cultural environment of the area stretching between the Baltic and Black seas [see also Klochko 2002] between the 3rd and 1st millennia BC drew the attention of scholars to the potential role of the maces in the tracing of interregional routes, going beyond the limits of cultural units. Occurring in the Baltic-Pontic Area, stone fluted maces are linked, it is believed, to Mesopotamian sceptres and are interpreted as the symbols of social status of the ruling strata of warrior groups [Kośko 2002].

Undertaken in reliance on the dispersion of maces, the reconstruction of interregional contact routes draws on the studies of M. Gimbutas [Gimbutas 1965]. She relied on the distribution of amber from the deposits on the southern shores of the Baltic and western Jutland to draw a network of hypothetical routes, covering the area between the Elbe River and the Urals. The routes traced by M. Gimbutas and the dispersion of fluted maces plotted by A. Kośko coincide to a significant degree (Fig. 1). A spatial analysis of the two categories of archaeological sources made

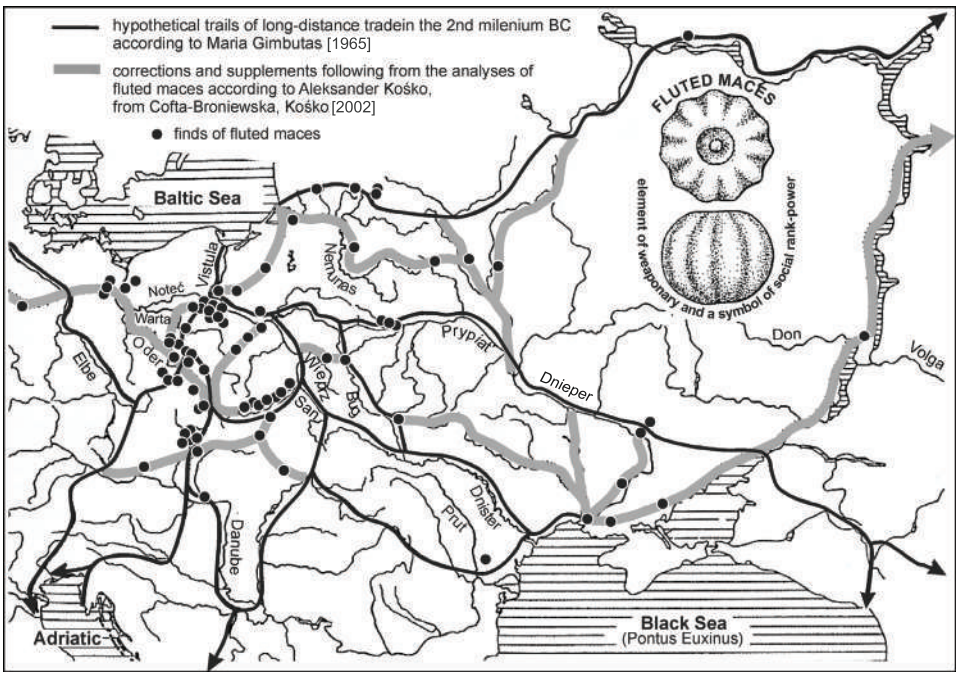


Fig. 1. Hypothetical routes of Early Bronze Age long-distance exchange reconstructed by M. Gimbutas and made more particular by A. Kośko relying on the distribution of fluted maces among intercultural societies of the bordeland between Europe's east and west [foll. Kośko 2002, see also Cofta-Broniewska, Kośko 2002], adopted as a point of departure for the analysis of Bronze Age routes in the Baltic-Pontic Area

scholars search for other route indicators among material culture products and extra-archaeological sources, including natural ones [see Kośko..., in this volume].

With respect to natural sources, it is suggested that their study cover two areas. First, the search for plant and animal indicators of prehistoric routes should focus on the chorology of species related to the economic activities of humans, their migrations or trade. The species should include those related to intentional activities of humans and others accompanying man only by chance. The study may rely on both fossils and the present-day chorology of species. Second, the analysis of the environmental context should aim at determining the spatial differentiation of features and identifying these elements that may have been conducive to the spontaneous or conscious choice of migration routes between the Baltic and Black Sea (*Pontus Euxinus*) by given user groups. Following A. Kośko's suggestion, such geographic features conducive to migration have been called potential natural routes. In this context, as major environmental factors were recognized the following: (1) a river network taken to mean waterways or related land passages following river valleys

or lake chains, (2) land relief, (3) soil types and related (4) vegetation cover. In this paper, the ecology of landscape has been recognized, next to cultural factors, as a crucial element determining the geography of human migrations, together with goods and ideas, taking the form of penetration, migration, conquest or lasting trade ties. When tracing routes, it has been accepted as a possibility that specific human groups chose and consciously used communication courses making up a kind of 'ecological corridors'. For given users, these would be areas of uniform or similar ecological features formed naturally or secondarily due to anthropogenic changes. Generally speaking, these could be river valleys, mountain ranges, woodlands and open vegetation ecosystems. To identify any relationships between environmental features and human migration preferences some contact routes in the Baltic-Pontic Area have bee analyzed, using archaeological evidence and written records. In the present paper, the concept of 'route' is taken to mean a general direction of migrations and contacts, defining a certain migration zone, rather than a communication course – lasting and man-stabilized – blazed in the landscape. A route is assumed in this case to be a zone or belt of migrations.

2. THE CRUCIAL FEATURES OF THE NATURAL ENVIRONMENT OF THE BALTIC-PONTIC AREA

As a point of departure for the study of natural routes, the analysis of the environmental context of the Baltic-Pontic Cultural Area has been adopted in the present paper. It makes use chiefly of present-day environment features; however, its author is fully aware that the time range set by the subject matter reaches back to the Neolithic and Bronze Age. The period, spanning about 4,500 years, covers the Late Holocene, which in terms of interglacial succession corresponds to the telocratic stage [see Tobolski 1976]. Generally speaking, the stage is characterized by natural biocoenoses resembling present-day ones. It is planned to carry out a multi-aspect study of environment changes between the Baltic and Black seas in the Late Holocene.

2.1. GEOBOTANICAL CONDITIONS

In the Baltic-Pontic biocultural area, two major vegetation zones can be distinguished which reflect climatic and edaphic conditions. They are respectively formed

by separate plant formations or great zonal vegetation units distinguished following the physiognomic criterion, relying on plant life forms [Kornaś, Medwecka-Kornaś 2002]. These are areas (1) dominated by deciduous forests (nemoral zone) and (2) others where steppe vegetation prevails (Fig. 2). The natural range of both plant formations is determined by climate conditions. The lowland and upland areas of western and central Europe, including the drainages of the Oder, Vistula and Pripet rivers, are dominated by deciduous and mixed forests. Of the western portion of the zone, where the impact of the oceanic climate is more strongly felt, beech woods are characteristic. The north-eastern limit of the beech crosses Poland [Boratyńska, Boratyński 1990, Podbielkowski 1991]. Beech woods grow in Pomerania, Warmia, western and central Wielkopolska, on the Łódź Upland as far as the Lublin Upland, throughout the belt of southern Poland's uplands and in the Carpathians [Zając, Zając 2001]. Further east, a climax plant community is formed by oak-hornbeam forests [Matuszkiewicz 1991]. The hornbeam limit (a characteristic component of these forests) extends east as far the Pripet and middle Dnieper drainages [Boratyńska 1993].

The zone of deciduous forests tapers off at the southern Urals (Fig. 2). In the south, the occurrence of deciduous species is prevented by low precipitation while in the north by low temperatures. When one moves east, the number of deciduous tree species falls. The species that are found as far as the Russian Plain include European ash (*Fraxinus excelsior*), small-leaved linden (*Tilia cordata*), pedunculate oak (*Quercus robur*), Norway maple (*Acer platanoides*) (see Fig. 3) as well as more common species in the boreal zone such as birch or aspen (*Populus tremula*). Moving north, the share of coniferous forests grows, with dominating species being pine (*Pinus sylvestris*) and spruce (*Picea abies*), to change finally into the zone of Boreal forests known as the taiga.

South-eastern Europe, covering the vast expanses of Ukraine and southern Russia, is dominated by a formation of herbaceous xerophytic plants, known as steppes (Fig. 2). The steppe vegetation of eastern Europe has a zonal pattern. In the north, where steppes meet the forest zone, under wetter conditions, an intermediate form of forest-steppe occurs. Next come relatively wet meadow steppes dominated by perennial broad-leaved (mesomorphic) grasses and herbaceous dicots. Further south, the steppes are covered by feather grasses (so called grass steppes) dominated by narrow-leaved, xeromorphic tuft species. The next belt is made up of a dry wormwood (*Artemisia*) steppe, supporting fewer species and bordering on semideserts in the south. The changes in steppe vegetation are determined by the precipitation gradient and access to water during the vegetation period. The zone of eastern European steppes reaches now with its western arm Poland's south-eastern border and the drainages of the upper Bug and San rivers. The prevailing form here is forest-steppe, covering western Ukraine – parts of Volhynia and Podolia, as well as part of left-bank Ukraine on the Dnieper

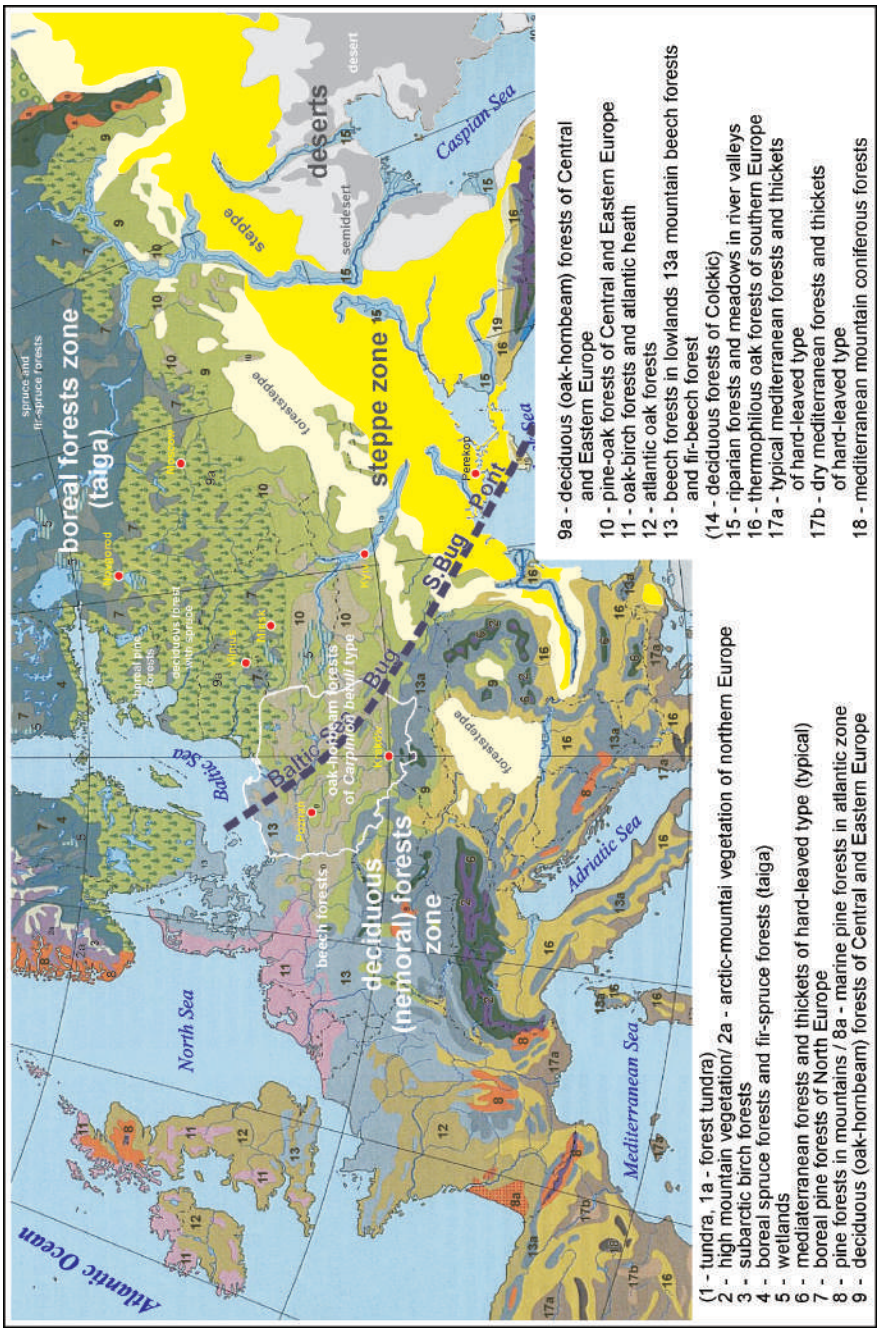
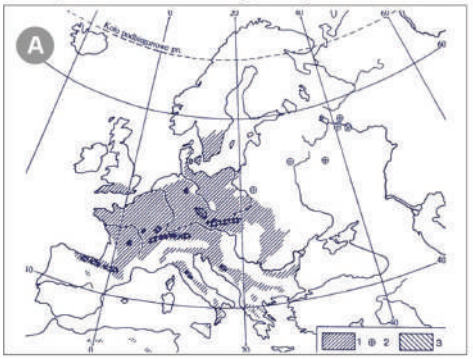
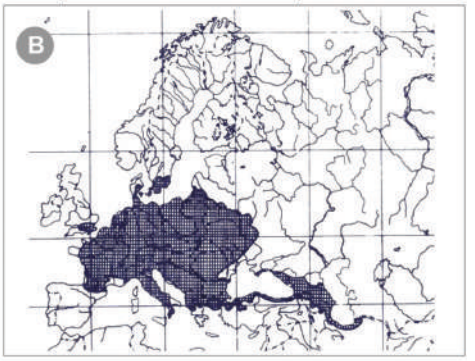


Fig. 2. Europe's natural vegetation between the Baltic and Black seas showing the distribution of steppe environments in eastern and central Europe [after Zemanek 1998, originally developed for *Atlas świata*, PWN 1962, modified]

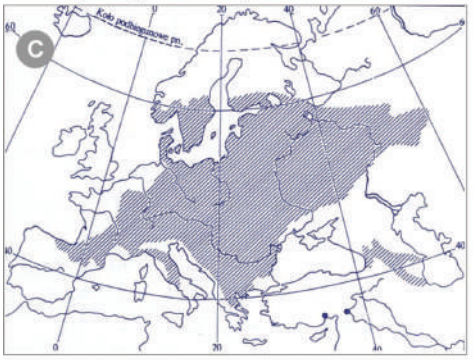
European beech - *Fagus sylvatica*



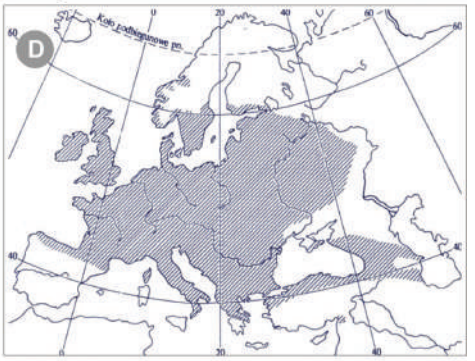
European hornbeam - *Carpinus betulus*



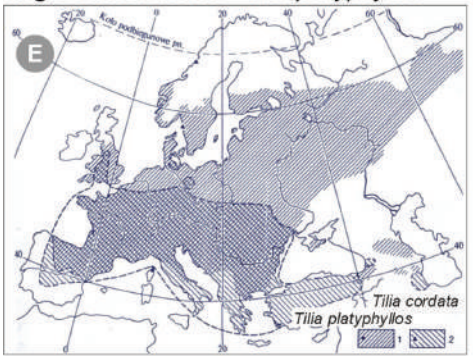
Norway maple - *Acer platanoides*



European ash - *Fraxinus excelsior*



small-leaved linden - *Tilia cordata*
large-leaved linden - *Tilia platyphyllos*



pendunculate oak - *Quercus robur*
sessile oak - *Quercus petraea*

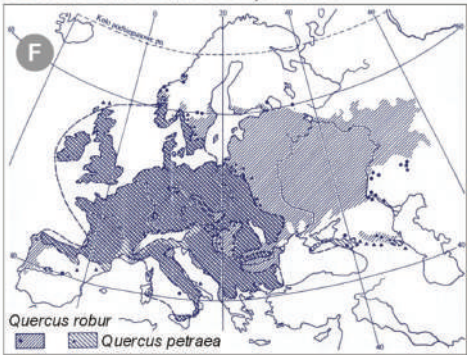


Fig. 3. Geographic limits of deciduous tree species in eastern Europe distributed in the form of a belt tapering off at the southern Urals and wedged between the boreal and steppe zones [after Podbielkowski 1991, limit of beech after Boratyńska, Boratyński 1990, limit of hornbeam after Boratyńska 1993, modified]

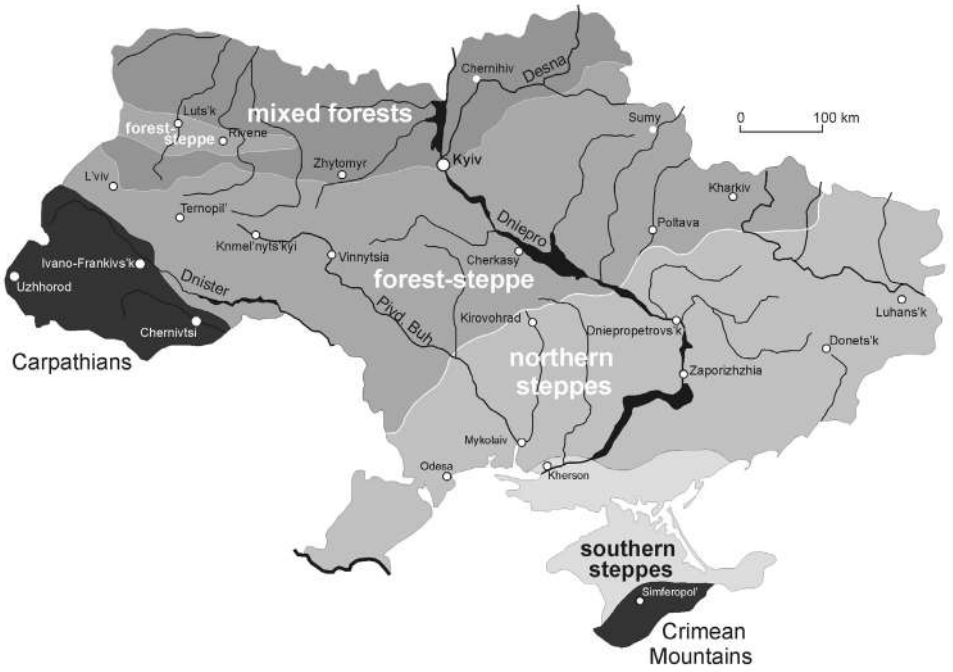


Fig. 4. Ecoregions of Ukraine showing the range of steppes (including forest-steppes) and borders with the zone of mixed forests in Polissya and mountain forests in the Carpathians [after Zastawnyj, Kusiński 2003, modified]. In the picture stand out two forest-steppe fragments reaching the current Polish eastern border (in western Volhynia and Przemyśl Gate), separated by a narrow strip of forest penetrating the Polish region of Roztocze

Lowland (Fig. 4). A stretch of European steppes extends along the lower and middle Danube to reach the Hungarian Plain, where steppe areas are called the *Puszta*.

The European steppes form only a fragment of the Eurasian Great Steppe. Its broad belt extends east as far as the Dzungarian Basin where through narrow passes it joins the eastern Asian steppe area in Mongolia, northern China and Manchuria (Fig. 5). In the western portion of the Eurasian steppe, precipitation is higher and the vegetation season is longer (approx. 190 days, and about 160-175 days in the eastern portion) [after Pobielkowski 1991]. In the European part, natural steppe vegetation has been subjected to a very strong anthropopressure, following from intensive agricultural use. Almost all the European steppe area has been either brought under cultivation or extensively transformed due to animal grazing [Wtorow, Drozdow 1988; Zastawnyj, Kusiński, 2003]. Natural forms have survived only on small stretches of land protected as nature reserves.

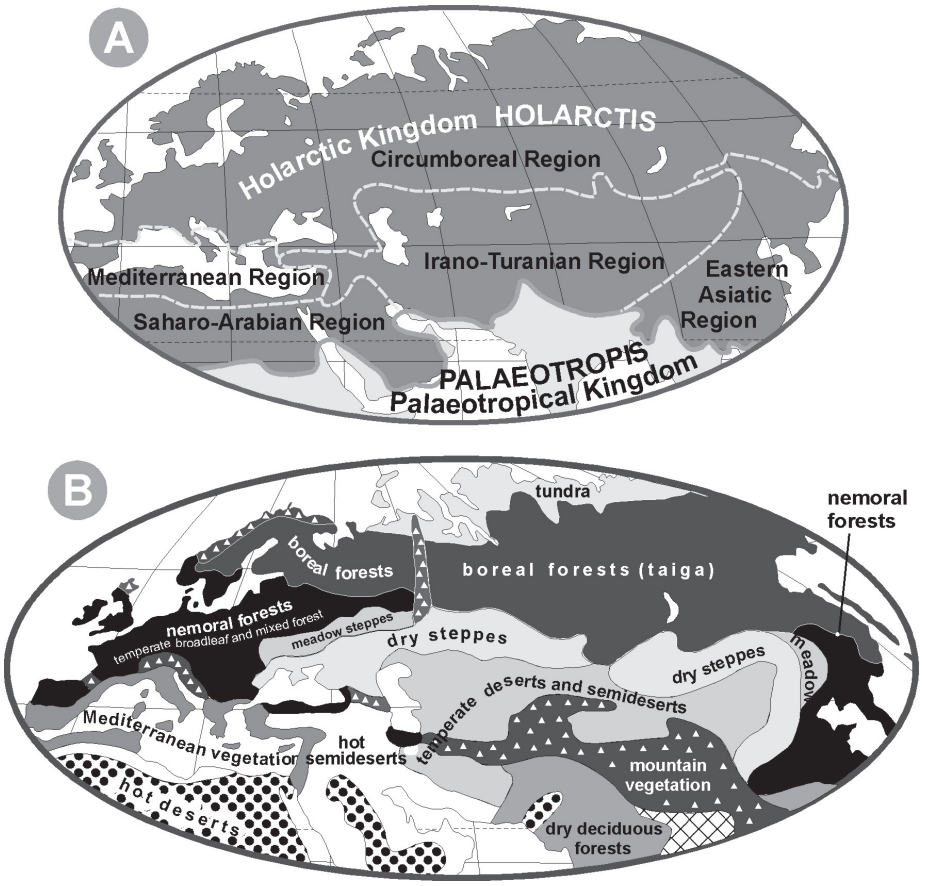


Fig. 5. Main floral and vegetation divisions in northern Eurasia: (a) floral regions [after Takhtajan 1986] and (b) vegetation formations [from Kornaś, Medwecka-Kornaś 2002]

In Europe's forest zone, human activity taking the form of forest clearing, field cultivation and animal grazing has resulted in the growth of vegetation resembling that of the steppes, which is sometimes referred to as cultural steppe. It is believed that human activity has moved the zone of Russian steppes about 200-300 km deep into the forest zone [Alechin 1951, quoted in Kostrowicki 1999]. In this way, human activity may expand the range of formations resembling steppes. The origins of the process reach back to early crop cultivation and animal breeding, i.e. the Neolithic.

In the phytogeographic division, hierarchically distinguishing territorial units using the criterion of floral affinity, almost all northern Eurasia, together with the steppe belt, belongs to the so called Circumboreal (Eurosiberian) Area, subsumed

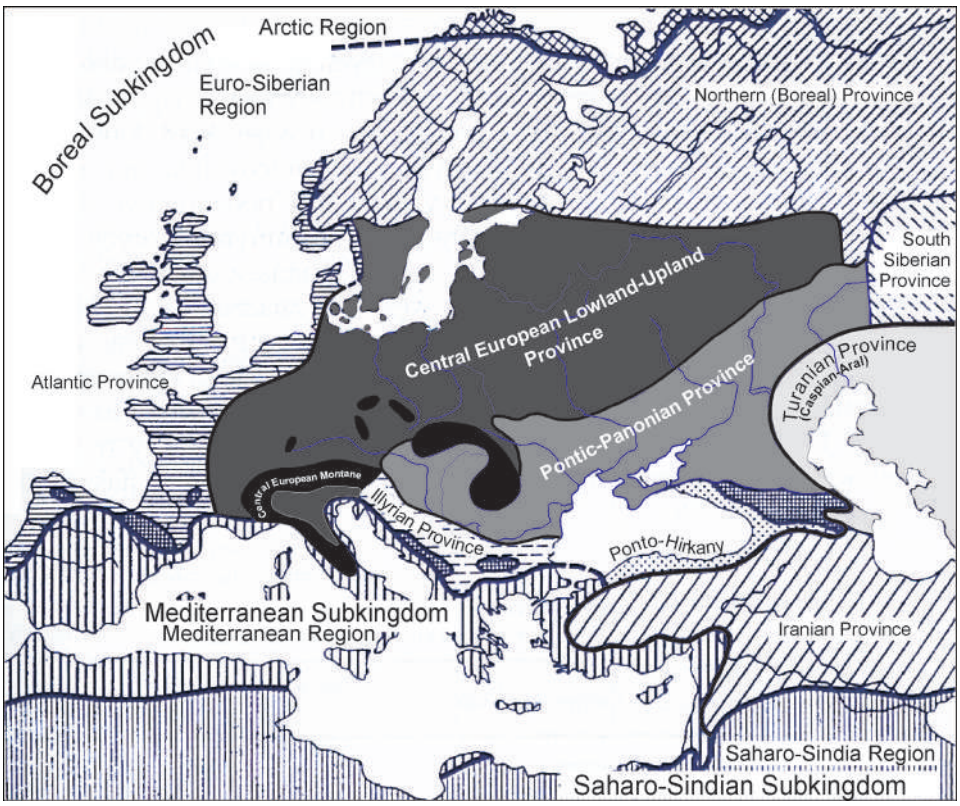


Fig. 6. Geobotanical division of Europe reflecting the affinity (similarity) of florae and giving special prominence to two plant provinces (Lowland-Upland Central European and Pontic-Pannonian) characterizing the Baltic-Pontic Area [from Medwecka-Kornaś 1972, see also Kornaś, Medwecka-Kornaś 2002]

under the higher rank category of Holarctic Domain (*Holarctis*) (Fig. 5). This means that the florae of this vast area show close affinity with one another. In the region of Europe of interest to us here, between the Baltic and Black seas, two lower rank phytogeographic units have been distinguished, namely, Lowland-Upland Central European Province and Pontic-Pannonian Province [Medwecka-Kornaś 1977; Kornaś, Medwecka-Kornaś 2002; Matuszkiewicz 1991] (Fig. 6). The Pontic-Pannonian Province, also known as the 'Sarmatian Domain', encompasses lands surrounding the Black Sea from the north and west, including Podolia and part of Volhynia, as well as lands lying on the Danube as far as the Hungarian Plain, southern Moravia and eastern Lower Austria.

The Pontic-Pannonian Province approaches south-eastern Poland in the area of the upper Bug and San rivers. In the geobotanical division of the country developed

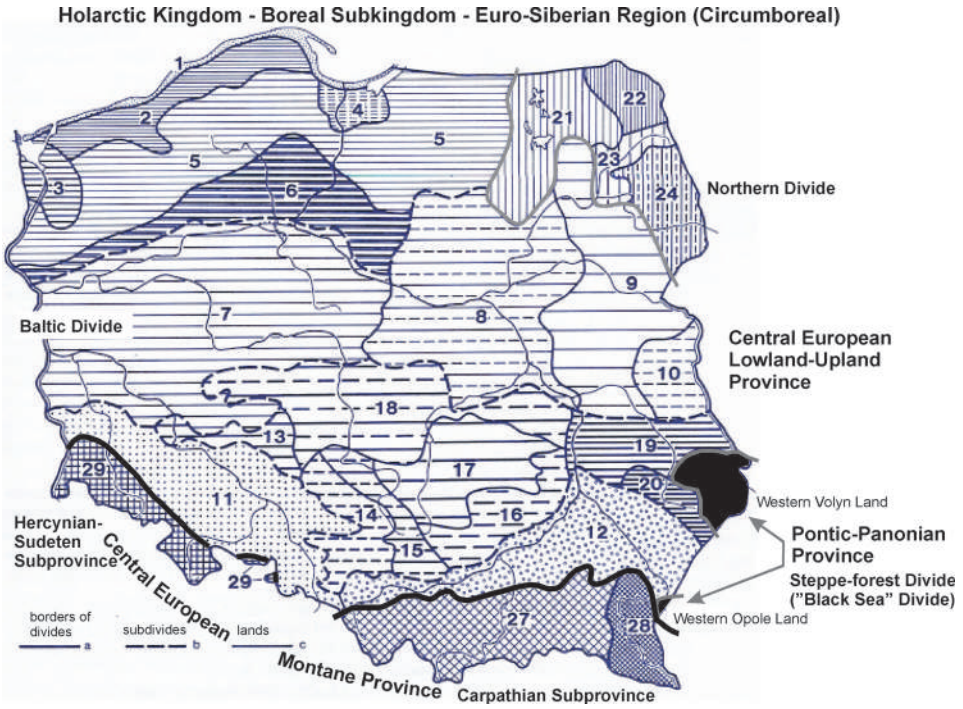


Fig. 7. Geobotanical division of Poland [after Szafer, Pawłowski 1977] giving special prominence to areas genetically related to the environment of eastern Europe and distinguished as Western Opole Region and Western Volhynia Region, belonging to the Steppe-Forest Division ('Black Sea') of the Pontic-Pannonian Province

by W. Szafer and B. Pawłowski [Szafer, Pawłowski 1977], the area was divided, respectively, into the Western Volhynia Region and Western Opole Region, subsumed under the Steppe-Forest Division ('Black Sea') of the Pontic-Pannonian Province (Fig. 7). The distinguished units suggest close floral affinity between western Volhynia and western Opole, on the one part, and the Black Sea Area, on the other part.

The distinctive geobotanical character of Western Volhynia, setting it apart from the other Polish lands, is seen in the nature of oak-hornbeam forests growing there. The forests are marked by the highest continentality index of all the forests of this type in Poland. The index was calculated using the A. Ewert method [Ewert 1972] [see Matuszkiewicz 1991, from Matuszkiewicz, Matuszkiewicz 1985] (Fig. 8A). Important indications of the changes in the degree of continentality of the Polish lands, as reflected in the floral picture, were obtained by analyzing ecological indicator numbers of plants calculated by Ellenberg. The indicators of continentality,

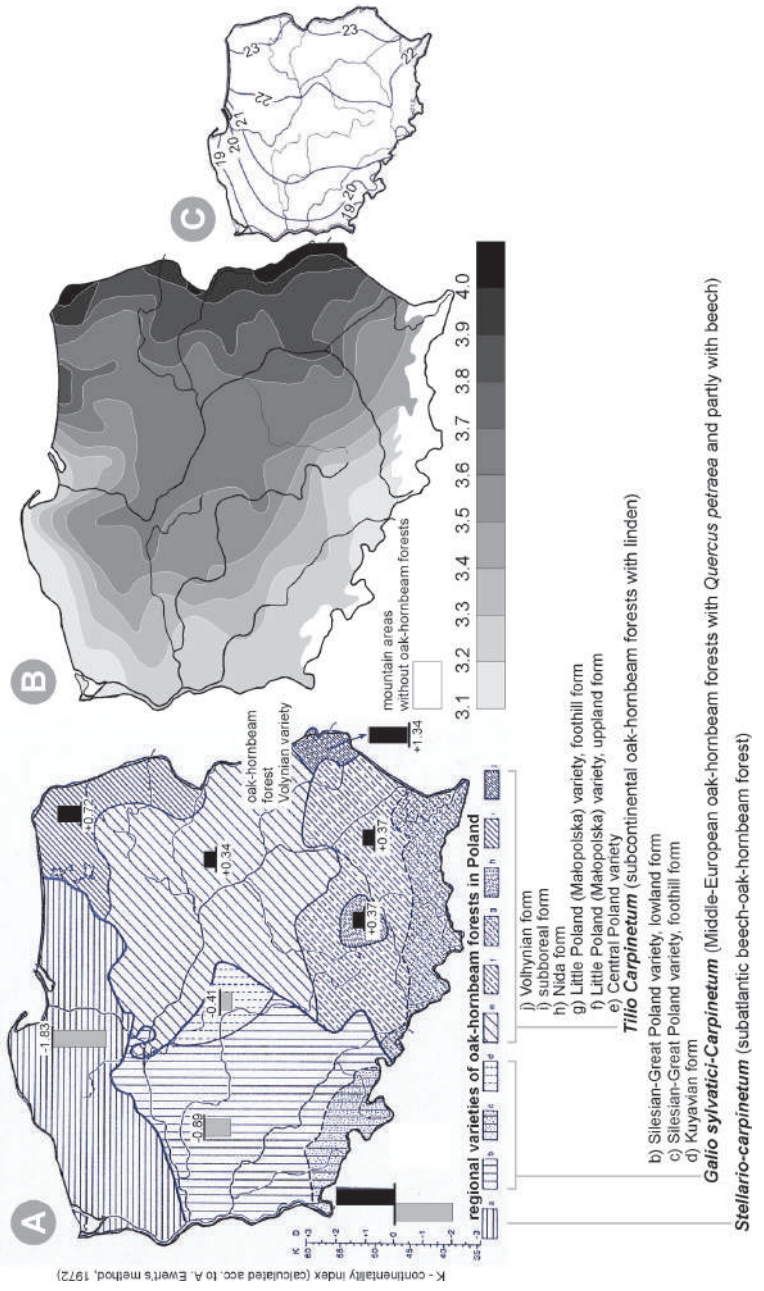


Fig. 8. (A) Types of oak-hornbeam forests in Poland [Matuszkiewicz 1991], (B) changes in the degree of continentality in Poland as seen in the floral composition of oak-hornbeam phytocoenoses traced by calculating the ecological continentality index (Ellenberg's method) [foll. Degórski 1984] and (C) mean annual amplitudes of air temperatures in 1931-1960 [Wiszniewski, Chełchowski 1975]

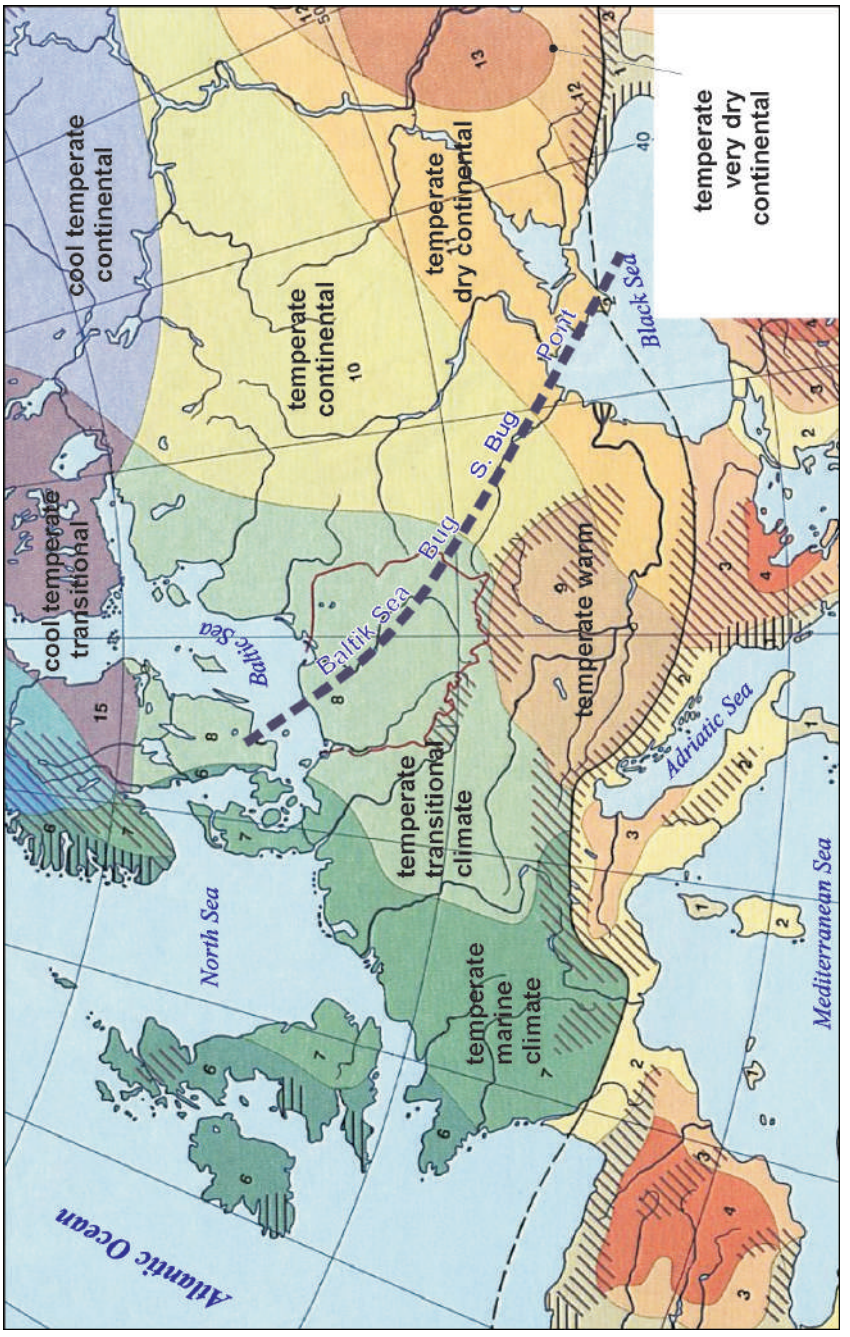


Fig. 9. Climatic zones of Europe showing the transition from a moderately warm and relatively humid climate on the Baltic to a moderately warm and dry continental climate in the Pontic Area [from Lewik 1998, modified]

designated as 'K', calculated for the floral composition of oak-hornbeam forests [Degórski 1984] are the highest in eastern Poland, especially in the south-east, in Volhynia and on the Lublin Upland (Fig. 8B). The areas where the continentality index is high stretch the furthest west in Kujawy, the Chełmno Land and adjacent Pomerania while in Lower Silesia the index drops. The geographic changeability of ecological continentality indices correlates roughly with the distribution of annual amplitudes of mean air temperatures (Fig. 8C).

2.2. CLIMATIC CONDITIONS

The distribution of south-eastern Europe's steppes is related to the moderately warm and dry continental climate which is characterized by high seasonal thermal contrasts and low annual precipitation totals (Fig. 9). Summers on the steppes are hot and relatively dry, while winters are frosty. The annual precipitation totals are between 300 and 500 mm. Low precipitation is the major limiting factor to the development of forest communities. Higher precipitation, between 500 and 700 mm, is witnessed in the forest-steppe zone. A distinctive characteristic of the steppe climate is the deficit of moisture in summer. Dry periods are characterized by Gaussen-Walter pluviothermic diagrams (Fig. 10A). Owing to seasonal temperature and precipitation variations, steppe vegetation follows a clear seasonal rhythm as well. It grows most profusely in spring and early summer. In high summer, when water is scarce, steppe vegetation dries up only to revive somewhat again in autumn. Winter is the period of complete vegetative rest. The regular rhythm of weather and vegetation changes influences the economic activity of steppe peoples, including migrations in search for pastures. The critical factors for the herding economy on steppes include, on the one hand, overly dry summers and overly severe winters on the other.

Snowfall on steppes is low; snow cover is not thick but it supplies a substantial amount of moisture during spring thaws. A characteristic weather phenomenon is relatively strong winds that contribute to the drying of the soil in summer and aggravate eolian erosion [Podbielkowski 1991].

Unlike steppes, deciduous forest areas enjoy moderately humid conditions throughout the year with a surplus of available moisture over evaporation. Seasonal thermal contrasts between summer and winter are less strongly marked here (for a typical pluviothermal diagram of a nemoral zone see Fig. 10B). In the Baltic-Pontic area a climatic gradient is marked when one moves from the north-west towards the south-east, i.e. from a temperate, relatively humid climate to a continental dry one (Fig. 9).

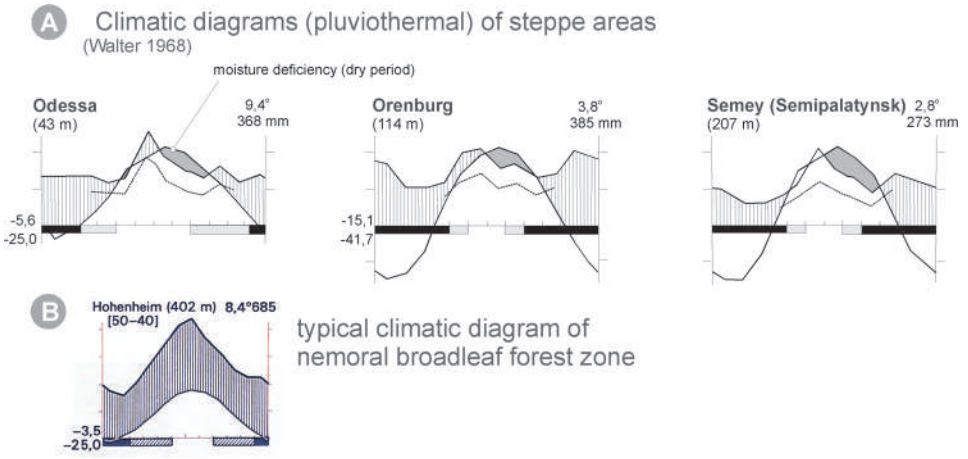


Fig. 10. Pluviothermal (Gaussen-Walter) diagrams showing seasonal changes in temperatures and precipitation in (a) the steppe zone of south-eastern Europe (climatological stations at Odesssa, Orenburg, Semipalatinsk) and (b) deciduous forests of central Europe (climatological station at Hohenheim) [from Walter 1968]

2.3. EDAPHIC ENVIRONMENT

Steppe vegetation reflects a zonal arrangement of soils. In south-eastern Europe, on steppes and forest-steppes, in the continental climate, a dominant type of soil is *chernozems*. They are formed on a loess substratum, loess-like deposits or clays with the participation of herbaceous plants, supplying huge amounts of biomass to the substratum [Bednarek, Prusinkiewicz 1997]. Meadow steppes may primarily produce as much as 15 t/ha of biomass annually, while the same figure for dry steppes is lower and reaches 8-10 t/ha [Wtorow, Drozdow 1988]. The climatic conditions on the steppes are conducive to the accumulation of large amounts of humus. During dry summer and frosty winter periods, the activity of microorganisms is slowed down thus preventing the mineralization of organic remains. This helps humus to accumulate in the upper layers of soil and produce a fertile and thick humus stratum of neutral reaction. In the steppe climate, with small precipitation and strong evaporation, weathering products are much less likely to be leached.

The *chernozems* forming under northern meadow steppes are among the most fertile soils in the world [Wtorow, Drozdow 1988]. The thickness of the humus layer and humus content drop in *chernozem* profiles depending on the amount of available moisture and the prevailing type of vegetation. The highest humus content (10-12%, at times 20%) and the thickest humus layer (100-120 cm) are characteristic

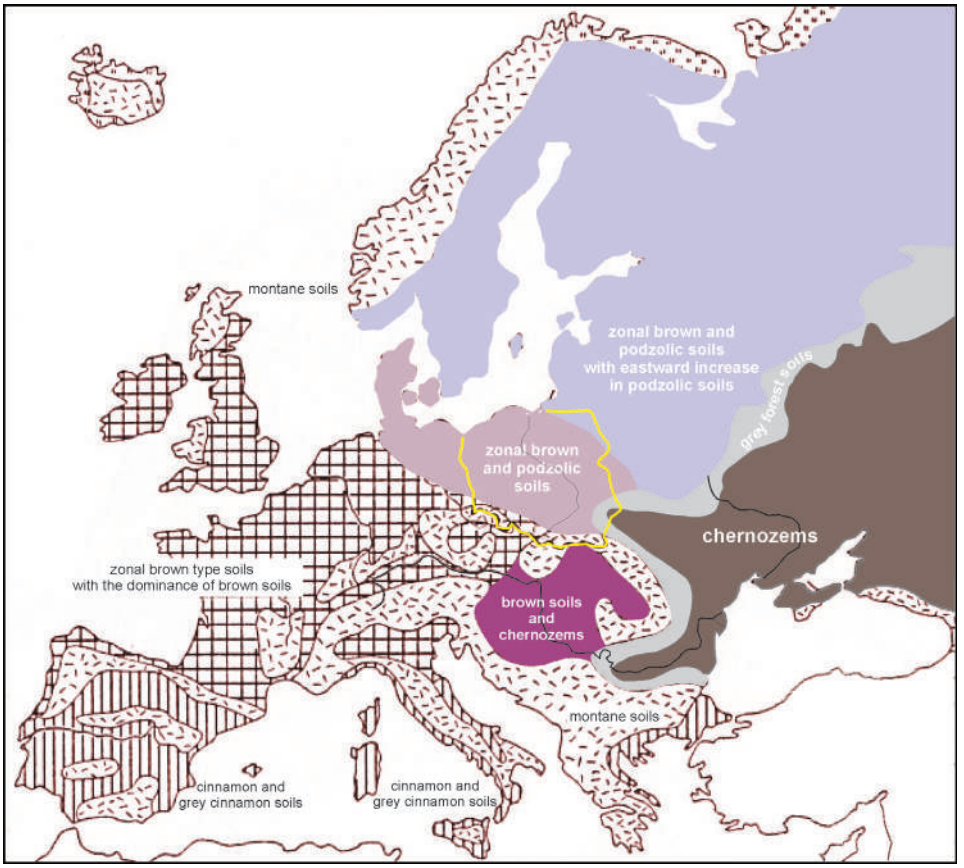


Fig. 11. Bioclimatic and soil zones of Europe with special prominence given to the area between the Baltic and Black seas [Gilewska 1991]

of the *chernozems* proper found in the northern portion of the steppe zone (meadow steppes). Further south, common *chernozems* are found whose humus layer is less thick (65-90 cm) and the humus content is about 6-9 per cent. Southern *chernozems* have the lowest humus content (4-6%) and a relatively thin humus layer (45-65 cm) [Bednarek, Prusinkiewicz 1997]. In the driest steppe areas, as for instance on the Caspian Lowland, chestnut soils (*Kastanozems*) develop.

Chernozems are widespread in Ukraine, stretching like a belt as far as the Urals and Central Asia to continue further east to Manchuria. In Europe, apart from the south-east, they occur as islands among other soil types on the Thracian, Wallachian and Hungarian plains. In Poland, they are found on loess deposits on Volhynia, Lublin and Małopolska uplands.

Differences in the substratum are crucial for determining the type of vegetation which grows in the forest-steppe zone. On a fine-grain substratum, precipitation water slowly percolates down through the soil and is completely absorbed by dense root systems of grasses and dicots. Whereas on a coarse-grained substratum, water percolates through the soil much quicker and deeper, where it can be absorbed by tree roots [Podbielkowski 1991]. This relationship between vegetation and a substratum type can be seen in the intermediate zone of forest steppe where on loose coarse-grained soils forest communities are found while on fine-grained soils open steppe vegetation communities grow. The relationship is responsible for the mosaic distribution of vegetation in the intermediate zone between the forest and steppe.

The steppes of eastern Europe are covered with deposits of loess (Fig. 12). The loess substratum is widespread in south-eastern Europe, forming parent rock for *chernozems*. Their formation, however, depends on climate features and prevailing herbaceous plants.

The Central European Plain, the central part of the East European Plain and the northern part of Western Europe, dominated by deciduous and mixed forests, have different soil covers. On the Central European Plain and on lowlands and uplands located further west brown soils (*Cambisols*) and gray soils (*Luvisols*) are dominant. They developed on Quaternary clay, argillaceous or dusty deposits and are among fertile soils highly suitable for farming. In the northern portion of the Central European Plain and in the north-eastern part of the East European Plain, dominant soil types are *Orthic Podzol and Leptic Podzol,* which form on sandy deposits grown over by coniferous tree communities.

In the zone of deciduous and mixed forests, islands of *chernozem* occur. In Poland, in the drainages of the Vistula and Oder rivers, chiefly in the upland belt, they occur in five regions, namely on the Volhynia Upland (Hrubieszów *chernozems*) belonging to the steppe Pontic-Pannonian Province, Sandomierz Upland (Sandomierz-Opatów *chernozems*), Proszowice Plateau (Proszowice *chernozems*), Rzeszów Foothills (Rzeszów *chernozems*) and Głubczyce Plateau (Opole *chernozems*). *Chernozems* are considered relict soils in Poland. They formed on loess patches under topographically favourable conditions, under steppe and forest-steppe vegetation [after Wicik 2005]. In Poland, degraded *chernozems* prevail. The humus content in the Polish *chernozems* is on average 2.8 per cent.

2.4. GEOLOGY, LAND RELIEF AND PHYSIOGRAPHIC UNITS

Along the line drawn between the Baltic and Black seas goes one of the most important divisions of the continent of Europe – the physiographic border between

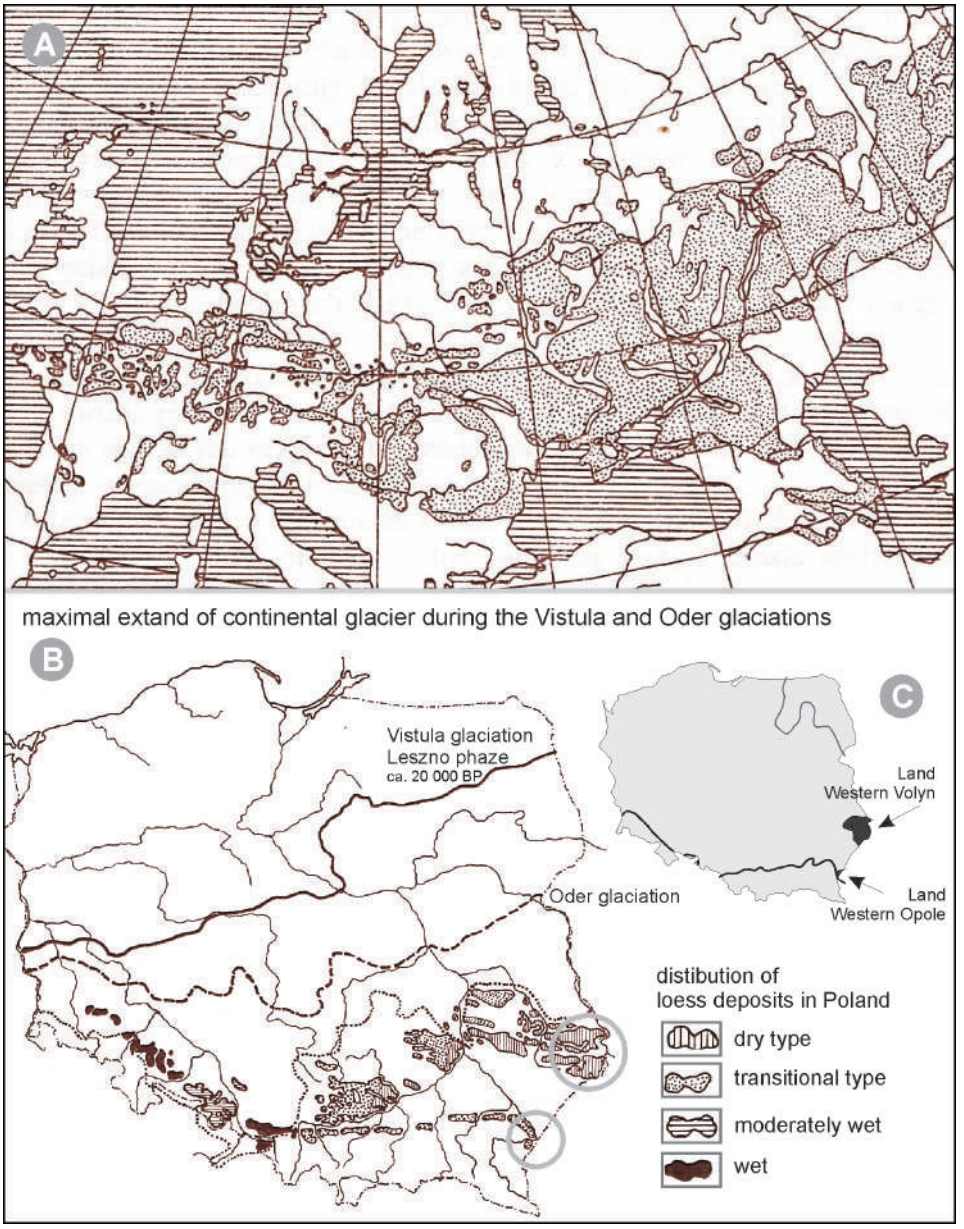


Fig. 12. Distribution of loess covers in (A) Europe [from Jersak *et al.* 1992, originally s.i. Lazukov 1980] and (B) Poland [after Jersak *et al.* 1992] showing (C) areas belonging in terms of geobotany to the Pontic-Pannonian Province (Western Opole Region and Western Volhynia Region) (see Fig. 7)

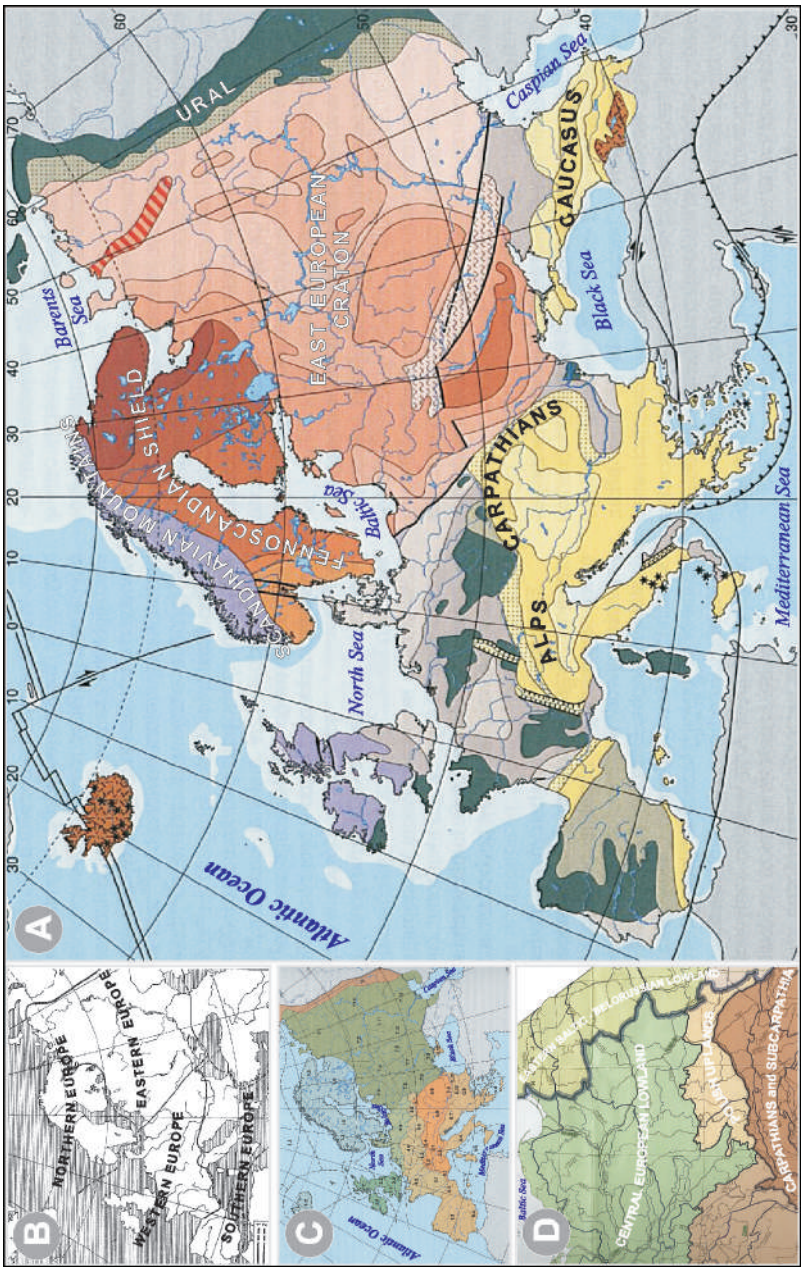


Fig. 13. (A) Tectonics of Europe [from Ramomski 1998] and (B) major regional divisions defining the border between Eastern and Western Europe [foll. Mityk 1986], (C) physiographic division of Europe using the decimal classification adopted by the International Federation for Documentation [from Balon 1998], (D) physiographic division into regions using decimal classification according to J. Kondracki [Kondracki 1998; see also Kondracki, Rychling 1998]

western and eastern Europe. One of the criteria used to draw the dividing line is the geological structure. In this area, Europe's three major tectonic units meet: the Precambrian East Asian Platform, a younger Palaeozoic platform and the area of Alpine folding of southern Europe [Mizerski 2002] (Fig. 13A). The oldest part of the continent, the so called craton formed in the Precambrian period, is made up of the Fennoscandian Shield and Eastern European Platform. It covers the area from the Urals in the east to the Teiseyere-Tornquist dislocation line in the west crossing Poland [Ramomski 1998]. The western younger part of the European continent was formed in the Palaeozoic during the Caledonian and Hercynian foldings. The formations that were uplifted last include the Alps, Carpathians, Crimean Mountains and the Caucasus. They were formed in the late Tertiary, during the Alpine orogeny. The western end of the Eastern European Platform, crossing the central portion of Poland's Baltic coast and continuing south-east, along the outer arch of the Carpathians as far as the Black Sea is deemed the borderline between Western and Eastern Europe (Fig. 13B) [Mityk 1986].

A different approach to the delineation of the border between eastern and western Europe is offered by the physiographic division of Europe following the decimal classification adopted by the International Federation for Documentation (Fig. 13C). The division relies on land contours, geological structures, and Europe's climate and biogeographic differences. Taking into account these factors, J. Kondracki has delineated a border between eastern and western Europe which crosses eastern Poland and runs between two regions of the Central European Plain and Eastern Baltic-Belarusian Plain, i.e. from the Pasłęka River in the north, along a portion of the Pisa and Bug rivers, next between the regions of Polish Uplands and Ukrainian Uplands – along the Wieprz River to reach the Dniester [Kondracki 1998; Kondracki, Rychling 1998] (Fig. 13D).

The land relief between the Baltic and Pontic zones does not create any significant barriers to human migrations, but it is responsible for considerable landscape diversity. In the Baltic zone, glacier accumulation forms prevail (Fig. 14). In the northern portion of the zone, a young glacier landscape, featuring numerous lakes and peat bogs, dominates while in the southern portion, an old glacier landscape, with some loess reliefs, is prevalent. The extent of the landscapes coincides with the limit of the last glaciation. In the Pontic zone, we are faced with plate formations and loess reliefs (see also Fig. 12). In the land relief between the Baltic and Black seas, three separate zones, (1) mountainous, (2) upland and (3) lowland, can be distinguished joined by alluvial plains in the Pripet drainage. Mountain areas and vast swampy lowlands form barriers to travel overland. A convenient land corridor, however, runs along the upland zone, between the Eastern Carpathians and the swampy lowlands in the Pripet drainage.

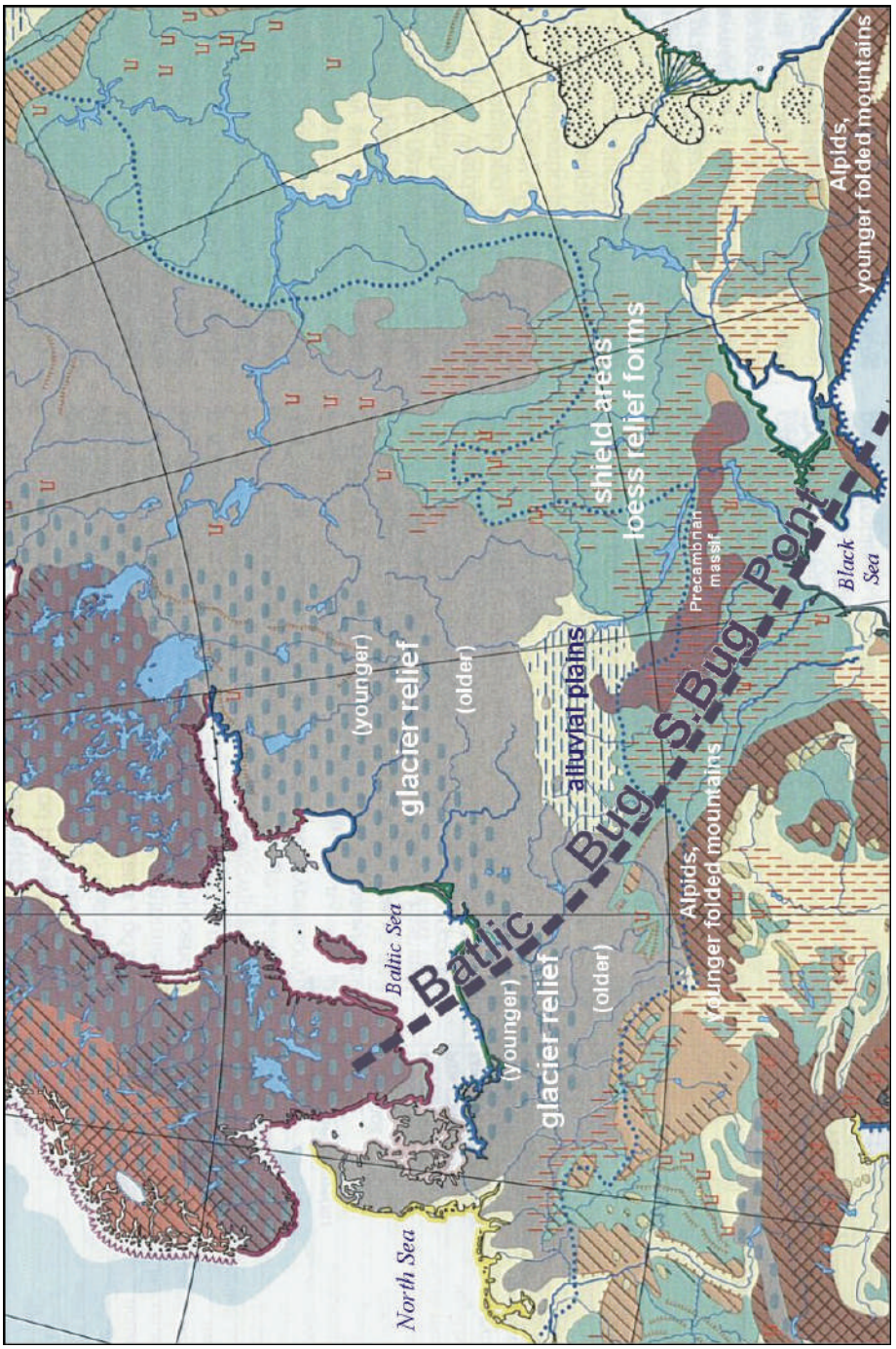


Fig. 14. Relief of Europe between the Baltic and Black seas [from Ziętara 1998, modified]

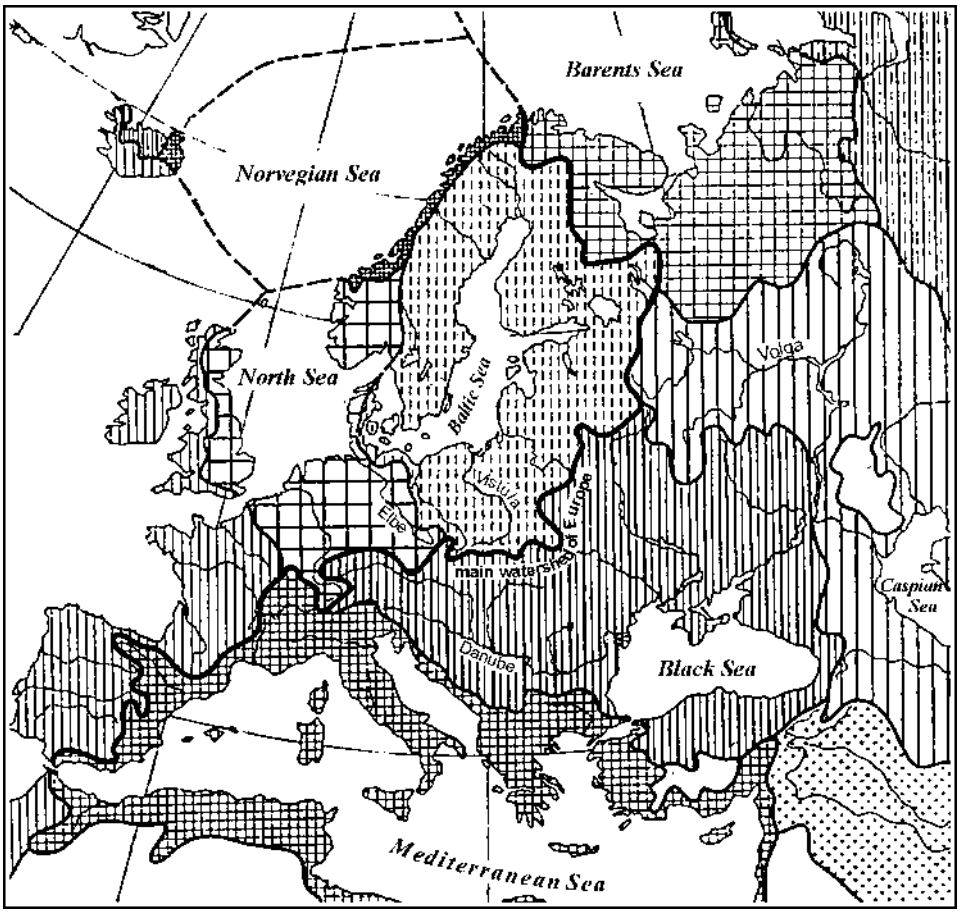


Fig. 15. European watersheds showing the course of the main watershed line separating the Atlantic and Mediterranean catchment areas [from Mityk 1986, modified]

2.5. HYDROLOGY

The Baltic-Pontic Area is divided by the main watershed of Europe. The northern areas, covering the drainages of the Oder, Vistula and Neman rivers, all of which empty into the Baltic, belong to the Atlantic catchment area while the southern ones, covering the drainages of the Danube, Dniester and Boh rivers, which empty into the Black Sea, belong to the Mediterranean catchment area (Fig. 15). Europe's main watershed does not run along the highest mountain ridges. By de-

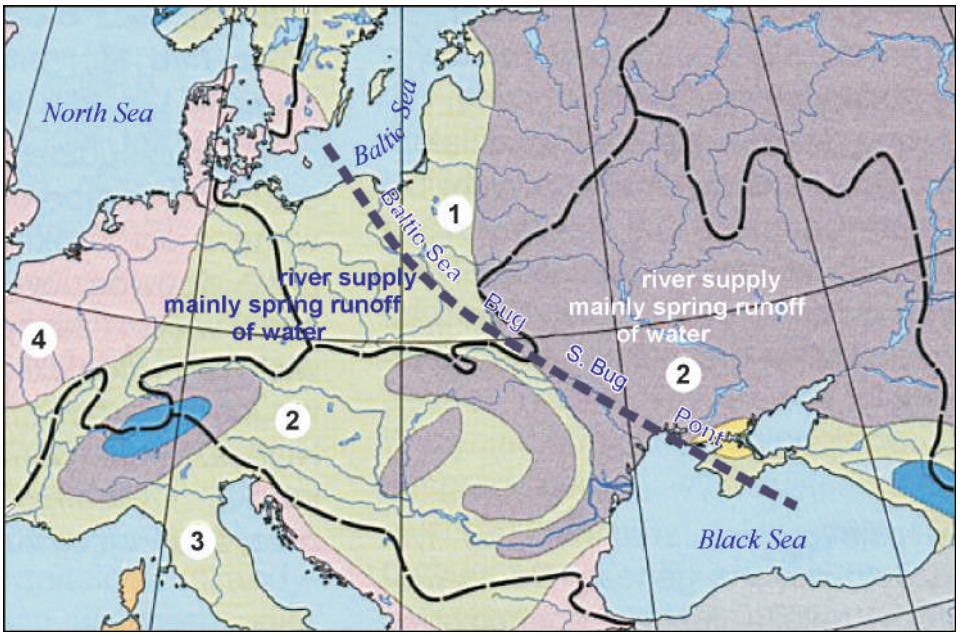


Fig. 16. River supply types in Baltic-Pontic Area against the catchment areas of 1 – Baltic, 2 – Black Sea, 3 – Mediterranean Sea, 4 – North Sea [from Żółkiewski 1998, modified]

scending into uplands and lowlands in many places, it facilitates communication ties [Mityk 1986]. Such convenient routes run north-east of the Carpathian arch where the watershed line descends into the depression of the Przemyśl Gate and moves towards the East European Plain along the edge of Podolia. Here, the watershed runs between the upper San and Bug drainages and the drainages of the Dniester and Pripet rivers. On the Wisznia River (in the village of Rudki), in the depression of the Przemyśl Gate, a bifurcation can be observed whereby some water flows into the San drainage while another part flows into the Dniester drainage [Żółkiewski 1998].

Taking into account land relief and climate characteristics, one can distinguish several types of hydrological regimes in Europe. On the Central European Plain (Elbe, Vistula and Oder rivers), an intermediate type prevails characterized by two maximum floods. In spring, floods due to thaws take place. Second summer floods are caused by rainfall. The lowest water stages occur in autumn. The period when rivers are icebound varies from about 20 days in the west to up to 60 days in the east. The eastern European hydrological regime (Dnieper, Volga, Don) is characterized by high water stages only in spring, with water coming mainly from melting snow (Fig. 16). Floods are caused by snow melt and precipitation. Severe and long winters make the thaws longer and more violent. The lowest water stages occur in summer

and winter. Eastern European rivers freeze for longer periods than those on the Central European Plain: they remain icebound for 100-140 days a year [Żółkiewski 1998]. A long icebound period makes even great rivers passable for about one-third of a year.

3. EVIDENCE OF NATURAL ROUTES

The westernmost frontier between the two environment systems of the forest and steppe zones, north of the Carpathians, runs across the drainages of the upper Bug and Dniester rivers, which at the same time form the watershed between the catchment areas of the Baltic and Black seas. Under the phytogeographic division of Europe, as it has been indicated earlier, it is here that the north-westernmost tip of the Pontic-Pannonian Province reaches, being a domain of steppe elements. The Province reaches Poland's territory in the eastern part of the Lublin Upland, which in terms of geobotanic divisions belongs to the Western Volhynia Region, and in the middle San area, in the vicinity of Przemyśl, belonging to the Western Opole Region. These two areas are considered natural migration routes of steppe plants from eastern Europe towards the west [Matuszkiewicz 1991] (Fig. 17).

3.1. MIGRATION DIRECTIONS OF THE GENUS ARTEMISIA AS A STEPPE COMPONENT IN THE LATE GLACIAL AND HOLOCENE

The migration of steppe components in the east-west direction, across western Volhynia is confirmed by palaeobotanical data obtained by the isopollen method for the Late Glacial and Holocene (Fig. 18). A good indicator of these migrations is the genus *Artemisia*, being a natural component of steppe vegetation. In the times of anthropopressure, *Artemisia* is also found in the so called cultural steppe. In the cool periods of the Late Glacial, *Artemisia* was a natural component of the then steppe-tundra, while in warmer periods (in Allerød and in the early Holocene) it would withdraw from the territory of Poland in the south-eastern direction [Makohonienko *et al.* 2004], to areas dominated today by steppe vegetation. The last period when *Artemisia* expanded its range in Poland, with a maximum representation in Volhynia, was the cooler spell of the Younger Dryas. The Holocene climate warming brought about again a drop in the share of *Artemisia* in the area of Poland.

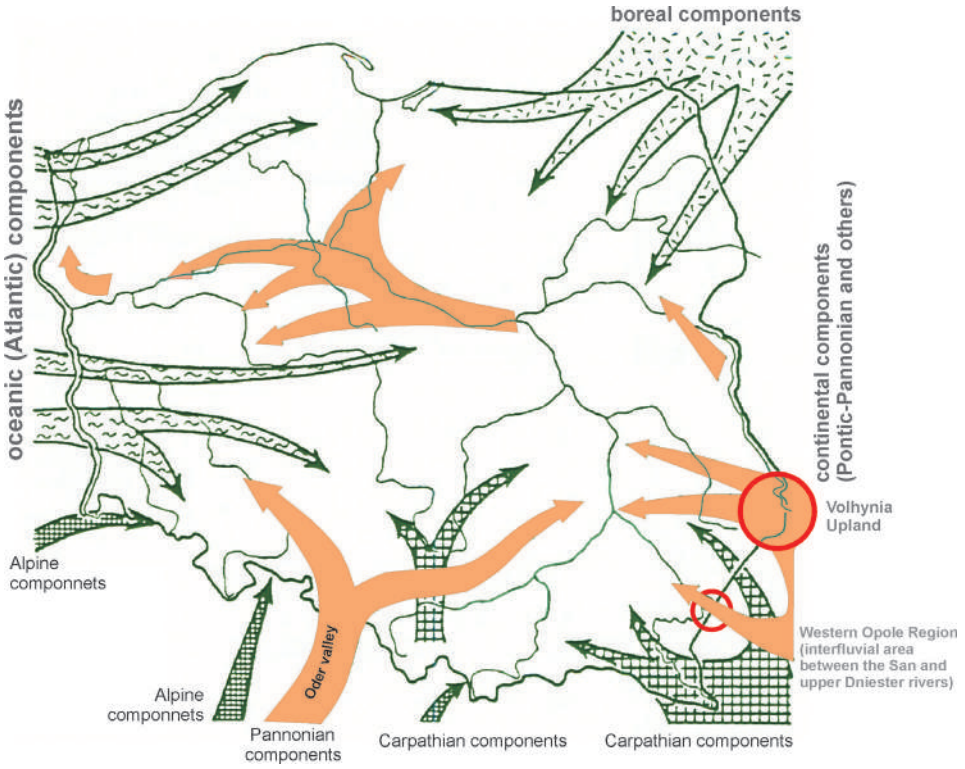


Fig. 17. Migration routes (directions) of geographic elements of Polish flora [Matuszkiewicz 1991]. Pontic-Pannonian elements, originating on the steppes, migrate to the territory of Poland from the East via the Volhynia Upland and the interfluvial area between the San and upper Dniester rivers in the area of the Przemyśl Gate, while from the south, from the Pannonian zone, they move along the Oder valley through the Moravian Gate

However, they maintained a high share only in the south-east, preserving, presumably, their ecological ties with Eastern European steppes. A decline in the share of *Artemisia* can be seen in successive time horizons, set every 500 years, until ca. 7500 BP (dates are given here as radiocarbon uncalibrated dates). In the 7000 BP horizon, a small increase is observed, possibly reflecting the synanthropic spread of *Artemisia*, owing to the activities of the first Neolithic societies north of the Carpathians. A clear change in their geographical distribution is recorded by the 5500 BP horizon, and even more so by the 5000 BP one. The horizons show insular occurrence of a greater share of *Artemisia* presumably related to the development of agriculture in the Middle Neolithic by the populations of the Funnel Beaker and Globular Amphora cultures. In the 4500 BP horizon, a concentration of *Artemisia*

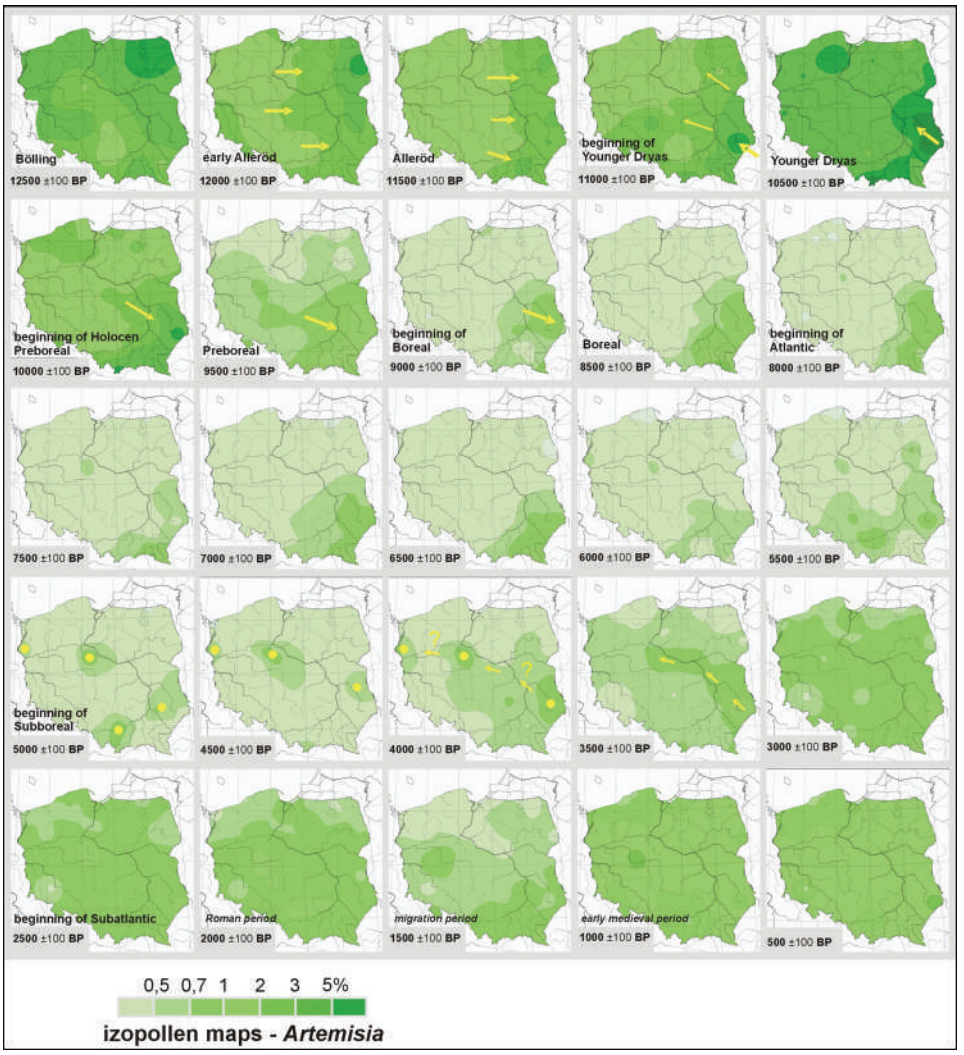


Fig. 18. Changes in the range of *Artemisia* in the Late Glacial and Holocene based on *Late Glacial and Holocene history of vegetation in Poland based on isopollen maps* [Ralska-Jasiewiczowa *et al.* (Eds) 2004, chapter on *Artemisia* – Makohonienko *et al.* 2004]. The isopollen maps of the genus *Artemisia* show the directions of migrations of steppe components and mark the areas where an anthropogenic landsccape ('cultural steppe') developed.

in Kujawy clearly stands out, while they are poorly represented in other regions, including southern and south-eastern Poland. High shares of *Artemisia* in Kujawy seem to be visible as early as around 8000 BP, which may indicate a natural procli-

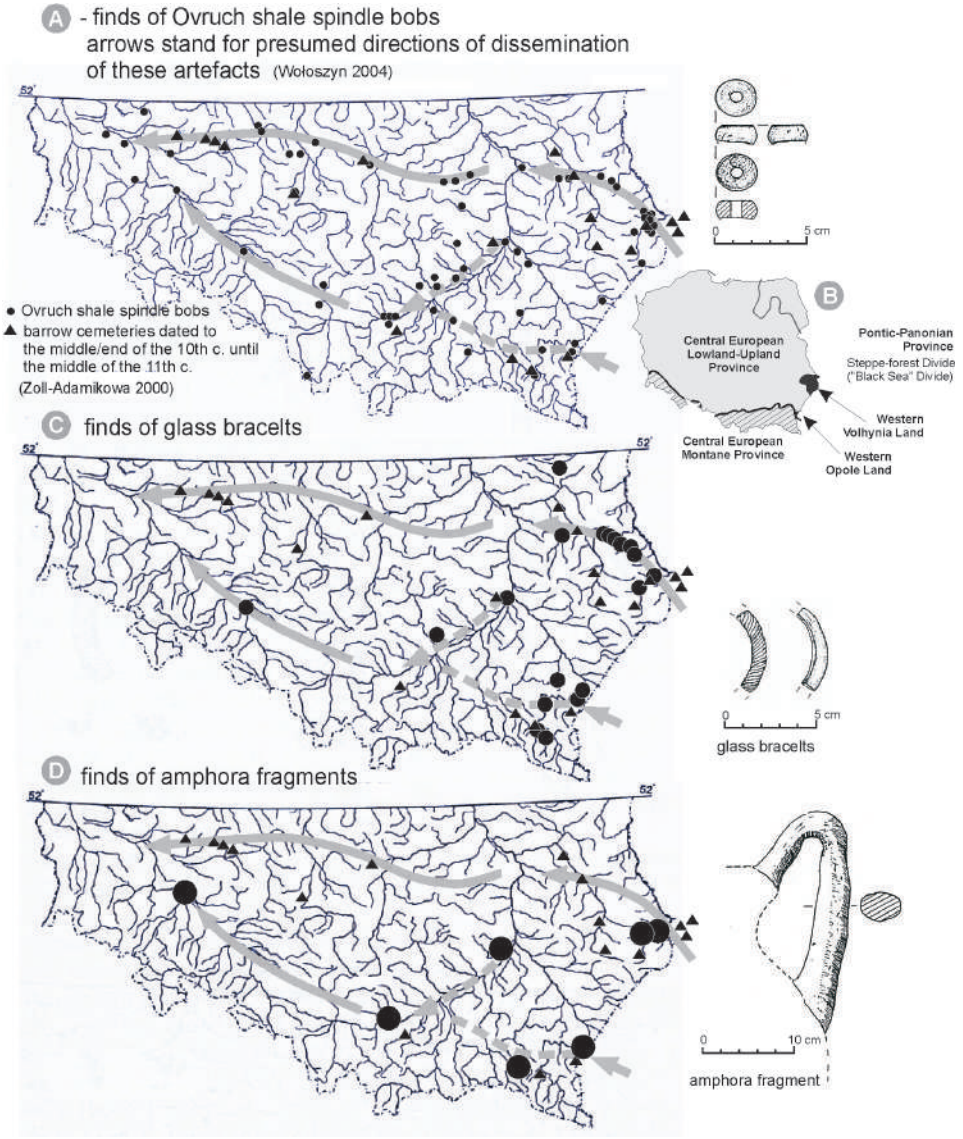


Fig. 19. Finds of artefacts of eastern (Ruthenian) provenance in Poland [foll. Wołoszyn 2004, modified]. (A) finds of Ovruch shale spindle bobs, (B) areas in south-eastern Poland belonging to geobotanic Pontic-Pannonian Province (forest-steppe area), (C) finds of glass bracelts, (D) finds of amphora fragments. Arrows stand for presumed directions of dissemination of these artefacts

vity of the area to support thinned forests or open plant communities. The rise of *Artemisia* should be linked to the spreading of a cultural steppe – an anthropogenic landscape resulting from forest clearings and creating patches of open vegetation.

In the isopollen picture of the *Artemisia* history, attention is drawn to the 3500 BP horizon when a tendency is marked to record higher shares of the plants along the line running from the south-east, across Volhynia, the middle Vistula to Kujawy. The direction, as it seems, was right for the migration of plants, showing continental preferences (see Figs. 8B, 17). The migration may already be seen in the 4000 BP horizon. The spreading of *Artemisia* may have been in this case stimulated by climatic factors, specifically by the increasing drying of soil. Successive periods of high shares of *Artemisia* plants in the territory of present-day Poland are related to the rise of a cultural landscape in the Bronze Age and later periods. To the anthropogenic origins of open communities with *Artemisia* indirectly testify their susceptibility to retreat, brought about by the decline in settlement in the Migration Period (illustrated by the 1500 BP horizon, Fig. 18).

The history of the genus *Artemisia* illustrates the natural directions of exchange of steppe components in the Baltic-Pontic Area. They migrated to the area of present-day Poland along a corridor passing north-east of the Carpathians, across the upland area as far as Volhynia and south of the Pripet drainage, which is marked by the presence of vast swampy areas. The *Artemisia* migration route is a kind of a natural corridor joining Black Sea steppe environments to the forest zone of central Europe. Contemporary botanical data indicate two narrower passages for migration of steppe components in the area in question: via Western Volhynia and the Przemyśl Gate (Western Opole).

3.2. PENETRATION OF CENTRAL EUROPE BY EASTERN CULTURAL ELEMENTS ALONG THE 'STEPPE ROUTE' IN THE EARLY HISTORIC PERIOD

Interesting evidence of relationships between the natural environment and cultural processes in the area in question is supplied by the distribution of Ruthenian provenance artefacts dated to the Early Middle Ages such as Ovruch shale spindle bobs, glass bracelets and amphorae for storing wine. The distribution of these artefacts was studied by M. Wołoszyn [Wołoszyn 2004]. When comparing their chorology with environmental factors, the role of the two geobotanic regions mentioned earlier, namely Western Volhynia and Western Opole, becomes evident as gates through which eastern cultural elements spread across Poland's present-day territory (Fig. 19). It is this way, across the westernmost reaches of the geobotanic steppe region, that the material elements of eastern culture entered the Polish terri-

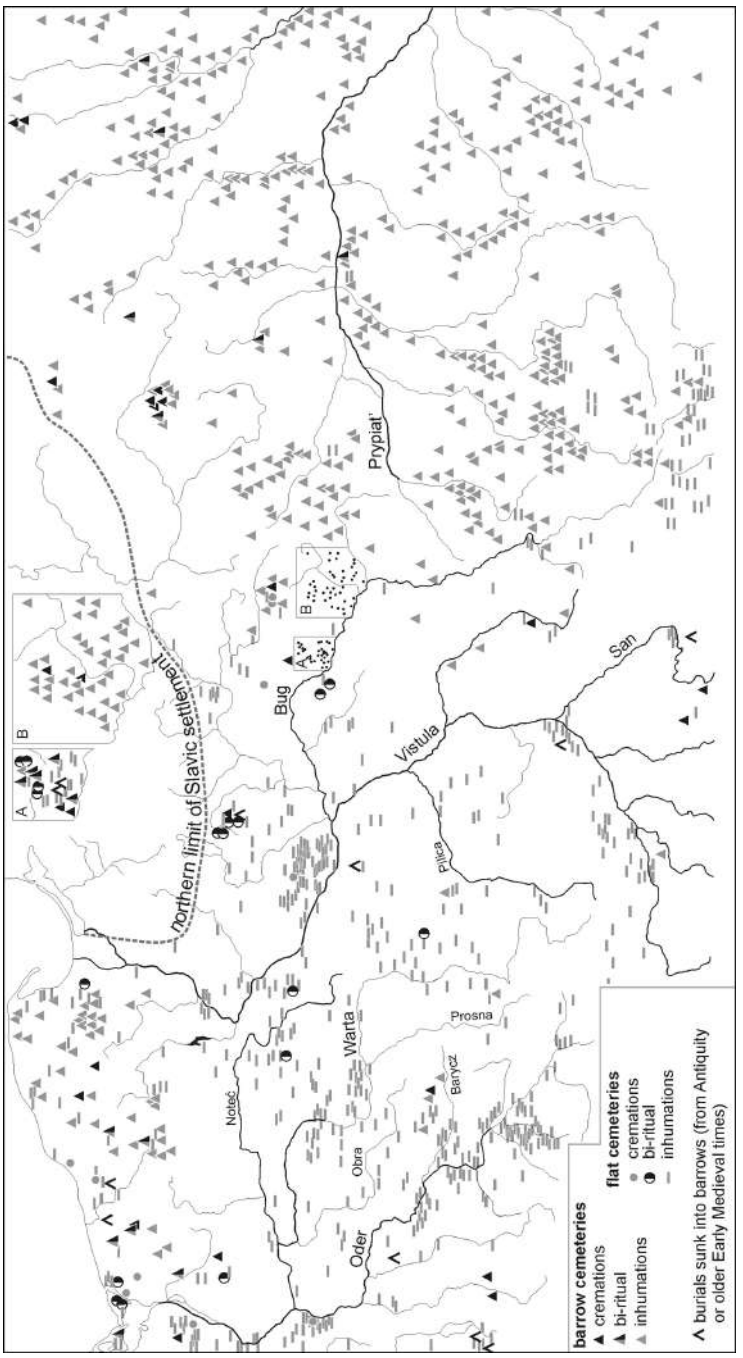


Fig. 20. Slavic sepulchral zones from the middle/end of the 10th to the middle of the 12th century [foll. Zoll-Adamikowa 2000, modified]

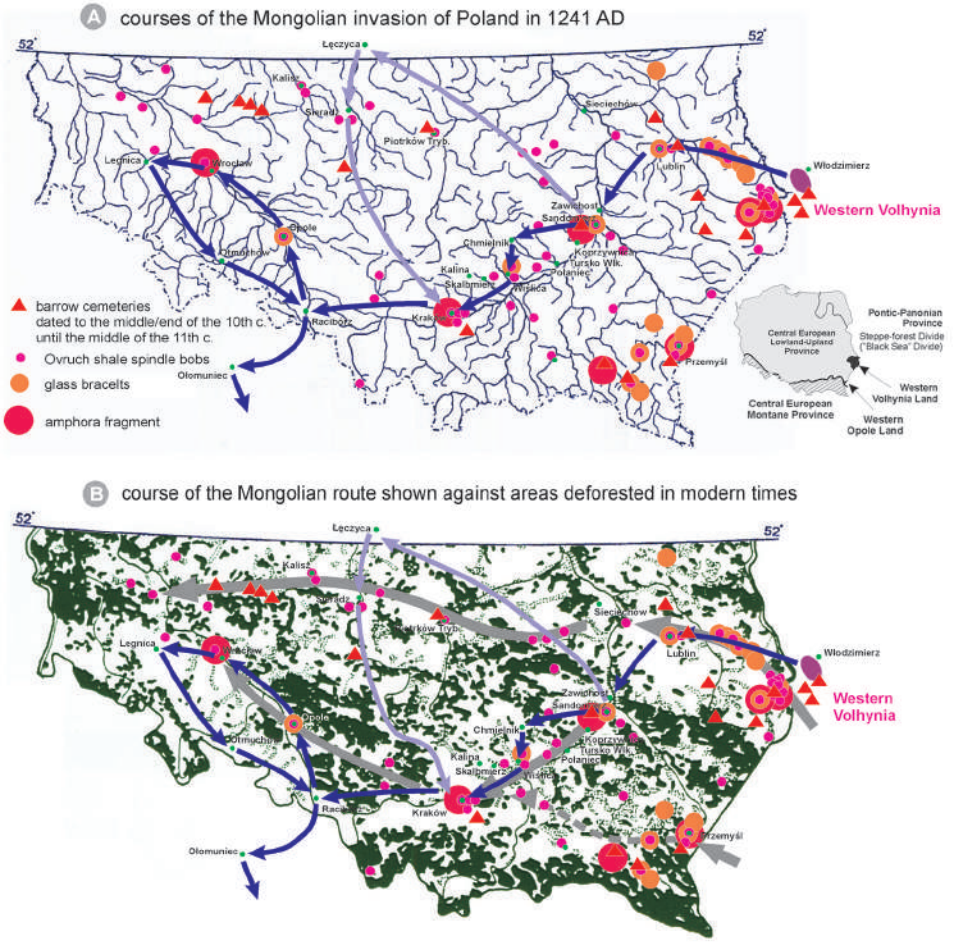


Fig. 21. The route taken by the Mongol army invading Poland in 1241. It ran from Włodzimierz in Volhynia to Legnica in Lower Silesia shown against the distribution of artefacts of Ruthenian provenance (see Fig. 19). (A) Geobotanic areas belonging to the Black Sea environment – regions of Western Volhynia and Western Opole, (B) the course of the Mongolian route shown against areas deforested in modern times (forests are marked in dark colour) [from Breymeyer 1991]

tory, being part of the deciduous and mixed forest zone. The features of the natural environment reminiscent of the eastern steppe (forest-steppe) environment seem to be conducive to the presence here of eastern cultural elements. The distribution of Ovruch shale spindle bobs, glass bracelets and amphorae for storing wine in southern Poland coincides with the location of barrow cemeteries dated to the middle/end of

the 10th century until the middle of the 11th century [foll. Zoll-Adamikowa 2000] (see Fig. 19), which are concentrated east of the Bug river (Fig. 20).

The greatest concentration of artefacts of Ruthenian provenance is found in the vicinity of the Volhynia and Przemyśl gates. From Volhynia, the route taken by the artefacts crosses the Lublin Upland in the direction of Lublin and the Vistula valley where present-day Kazimierz Dolny is situated. The distribution of the finds suggests next two directions of their dissemination. The first runs along the left bank of the Vistula across the Małopolska Upland in the direction of Kraków to cross into the Oder drainage and continue towards Opole and Wrocław in Lower Silesia. The second crosses the upper drainages of the lesser rivers of central Poland (Pilica, Warta, Prosna), passes by present-day Piotrków Trybunalski, Sieradz and Kalisz and continues through the Barycz drainage in the direction of the Oder valley north of Głogów.

The route running from Western Volhynia across the Lublin and Małopolska uplands, along the upper Vistula valley and Oder valley to Lower Silesia was used by Mongols in their invasion of Poland in 1241 (Fig. 21). The Mongols carried out then reconnaissance missions from a camp set up on the right bank of the Bug River, near the town of Włodzimierz. In January 1241, the first reconnaissance party, crossing rivers over ice, passing by Zawichost, reached Sandomierz. Another party, which set out from Włodzimierz in February of 1241, by a similar route moved as far as Skalbmierz. After the reconnaissance, the main military operation was carried out by the Mongolian army in March and ended in its victory at Legnica on 9 April 1241. The route taken by the Mongols largely coincides with the southern dissemination route of goods of Ruthenian provenance, and location of major settlement centres in southern Poland.

3.3. GEOGRAPHY OF HISTORIC TATAR ROUTES IN WESTERN UKRAINE – LAND RELIEF IMPACT ON NATURAL ROUTES

The study of natural routes between the Baltic and Black seas is greatly helped by the tracing of Tatar routes in Ukraine. An excellent input for the study is supplied by the 17th century map *Ukrainae pars qvae Barclavia Palatinatus* (drawn after 1652) (Fig. 22) and descriptions by Z. Gloger in his *Geografia historyczna ziem dawnej Polski* [Historical Geography of Lands of Ancient Poland] [Gloger 1903]. Z. Gloger writes:

Tatars followed almost immutable routes of their own which they used to send parties of horsemen from 'wild fields' deep into Ukraine. A Tatar route was neither a road nor a merchant's highway, but had a peculiar character of its own. Known to all, it was hardly visible. What was known was its general direction, avoiding crossings

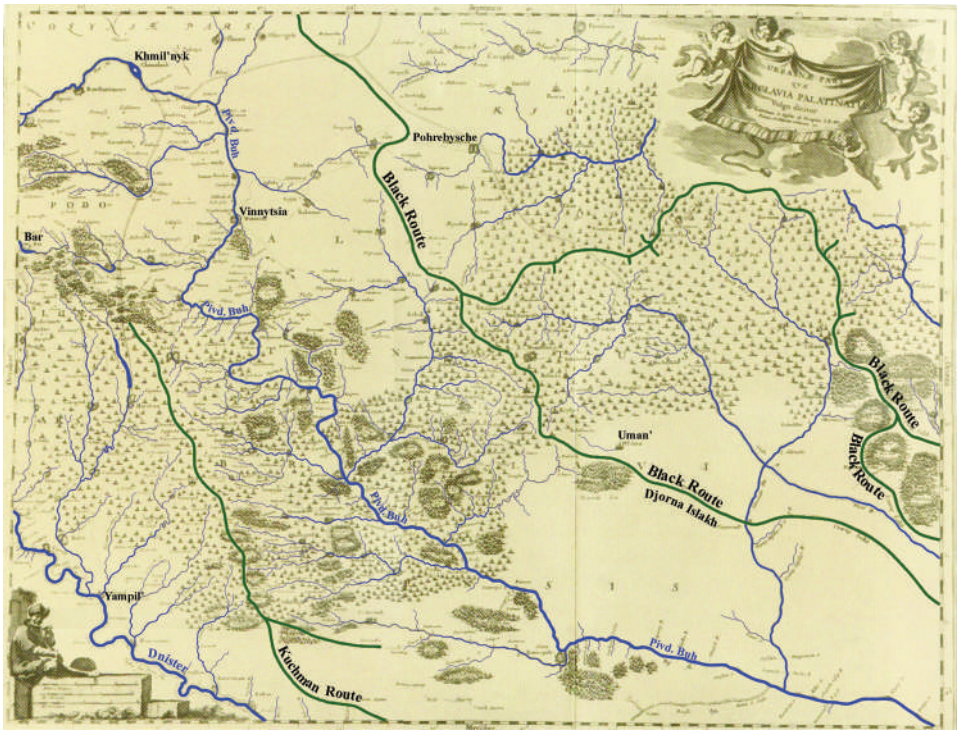


Fig. 22. 17th-century map *Ukrainae pars qvae Barclavia Palatinatus* showing tatar routes: Black Route (*Djorna Islakh*) and Kuchman Route [Atlas 2005]

of large rivers, but individual turns were never known. The width of a route reflected the strength of a detachment of horsemen. Commonly, it extended across 'for two bow-shots' but oftentimes, when the whole horde was moving, it could stretch for a couple of miles. In wilderness, they oriented themselves by observing barrows. The main routes, upon reaching the destination of every expedition by a horde or a smaller detachment, used to break up into smaller units which would overrun a whole country or parts of it singled out earlier. Only along these secondary routes did a hunt go on for residents taken by surprise and their possessions.

The so-called 'Black Route' (in Tatar *Djorna Islakh*) and the Kuchman Route followed the steppe and forest-steppe zones, along elevated watersheds between the tributaries of the Boh and Dnieper as well as the Boh and Dniester. Another route, known as the Muravsky Route, ran north between the tributaries of the Dnieper and Don rivers to Tula and Moscow. Watershed routes following land elevations and avoiding river crossings were used by steppe societies practising nomadic herding and skilled in horse-riding. The traditions of watershed horse routes used by

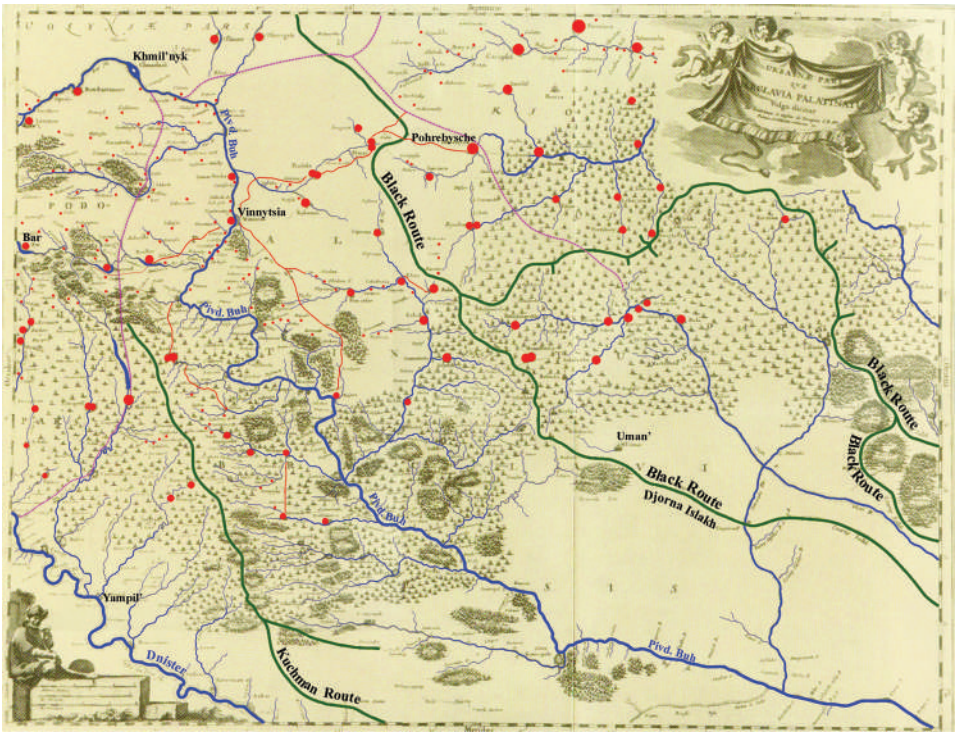


Fig. 23. The 17th century map *Ukrainae pars qvae Barclavia Palatinatus* showing Tatar Routes, settlement network of Slavic populations and roads joining invidual settlements [Atlas 2005, modified]

nomads in the Baltic-Pontic Area may reach back to a very distant past. Plausibly, long-distance watershed routes had grown in importance since the horse began to play a significant role as a means of transport. The breaking in of the horse was a turning point in the process of controlling the space of Eurasian steppes and the development of nomadic herding [Kośko, Klochko 1994]. It is believed that the horse was domesticated in Eurasia, in the distribution range of the wild horse *Equus ferus,* prior to 5000 BC. The beginning of horse-riding is dated to ca. 3500-3000 BC. The oldest documented evidence of the use of the horse bit was found at a site of the Botai culture, occupying areas south-east of the Urals [Anthony, Brown 2000]. This date is also accepted as the time witnessing the rise of typical nomadic pastoral societies with fully developed three attributes of nomadism – breeding large flocks of sheep, use of the horse for riding and a wagon for transport [Anthony 1986; Kośko, Klochko 1994; Anthony, Brown 2000].

The historically documented 'watershed' routes suited well the way of life and acquired skills of horse-riding nomads, adapted to open steppe areas, affording

broad and unobstructed views, especially from hilltops, accustomed to bypassing water barriers and capable of covering long distances in a relatively short time.

3.4. MULTITUDE AND VARIETY OF ROUTES

The 17th-century map of western Ukraine, apart of Tatar routes, shows both settlement and road networks of the then settled agricultural Slavic communities (Fig. 23). What can be seen in the map is their different preferences as to the road system. The Slavic communication routes follow the shortest lines joining neighbouring settlement units. The routes do not avoid river valleys or river crossings, either. Nor do they re-track in any way the watershed routes, taken by Tatars.

The routes of eastern Slavic and Baltic peoples, as can be seen from a comparison of the finds of Arab coins and a reconstructed trade network made by Herrmann, frequently followed waterways and ran along river valleys (Fig. 24). Where watersheds were narrow enough, the water routes could have been connected by portages. The Slavs were known for taking advantage of water transport by using small dugouts (logboats). Mentions of the construction of dugouts by Slavs were made by ancient writers such as Prisci Panitae, Theophylact, Theophanis or Constantinus Porphyrogenitus [Tyszkiewicz 1994]. *Strategikon* by Pseudo-Maurice, written either in the late 6th or early 7th century, informs of the great skill of Slavs to negotiate water barriers and to fight in terrain rich in standing and running waters [after Tyszkiewicz 1994]. With their skills to negotiate water barriers, they helped nomadic Avars in war, of which descriptions have survived in the account of the siege of Constantinople in 626 AD (Easter Chronicle, *Chronicon Paschale* by unknown author).

Another type of known routes in the Baltic-Pontic Area is related to the historic societies of Vlachs (13th-15th century), practising transhumance [Szanter 1997]. Their migrations took place in the mountains and foothills of the Pontic Area along the Carpathian Arch and reaching further north into the Baltic catchment area. The practice of transhumance and seasonal migrations involve regular movement of herds from summer pastures (in the mountains) to winter ones on piedmont plains and in valleys, and keeping a permanent home where crops are grown. Such seasonal migrations are favourable to maintaining contacts with people living on the opposite sides of mountain ranges and establishing trade ties.

The observed differences between several historically identified routes in the Baltic-Pontic Area and the people who used them make me draw two important conclusions. First, the nature and course of a route in a given cultural and natural landscape may depend on the specific society whose needs it serves. The choice

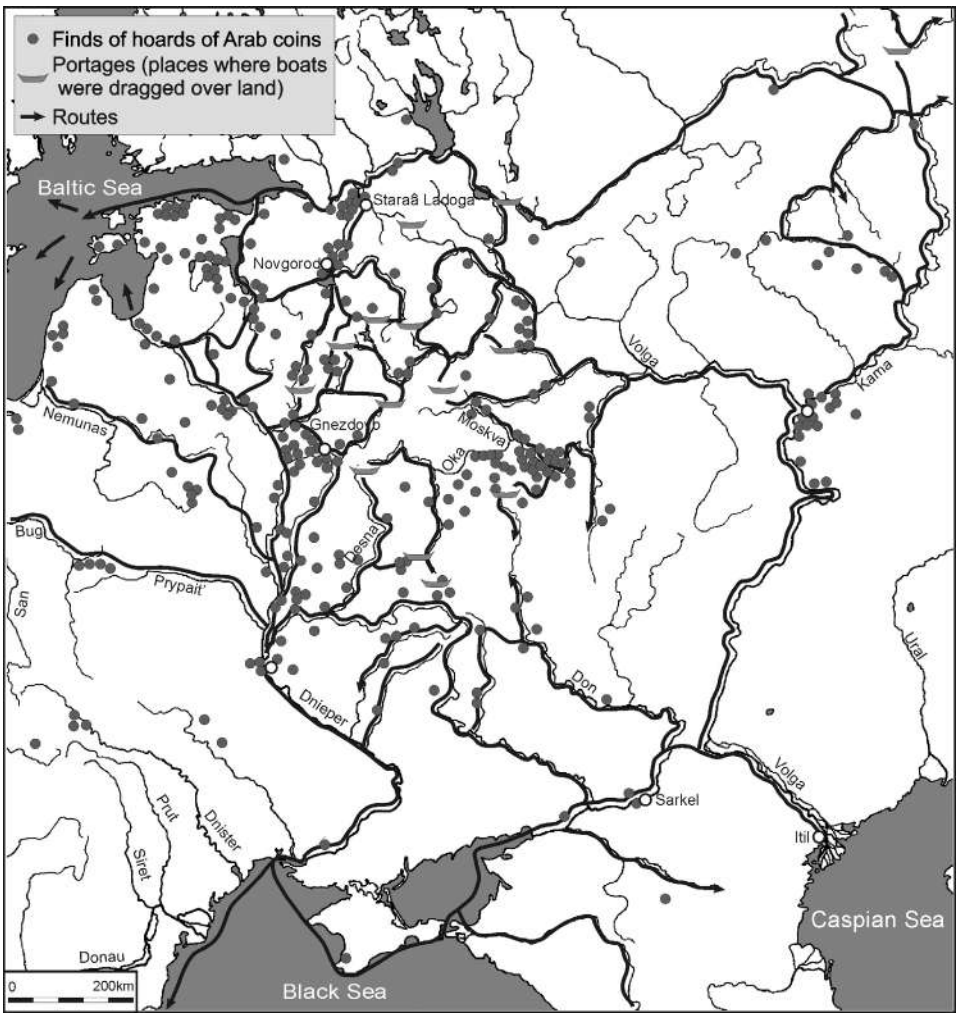


Fig. 24. Finds of hoards of Arab coins against the reconstructed trade routes of eastern Slavic territories [foll. Herrmann 1986]

of migration routes by a given group of people is affected in the cases in hand by the way of life and accumulated experience in the given environment. This, in turn, turns strongly upon the type of economy the group follows. Second, many and varied routes are possible in the diversified natural environments, reflecting different socio-economic preferences and traditions of individual biocultural systems with respect to the adaptation to and the use of given ecological niches. Hence, one has to accept both the possibility of change of route types in time in a given

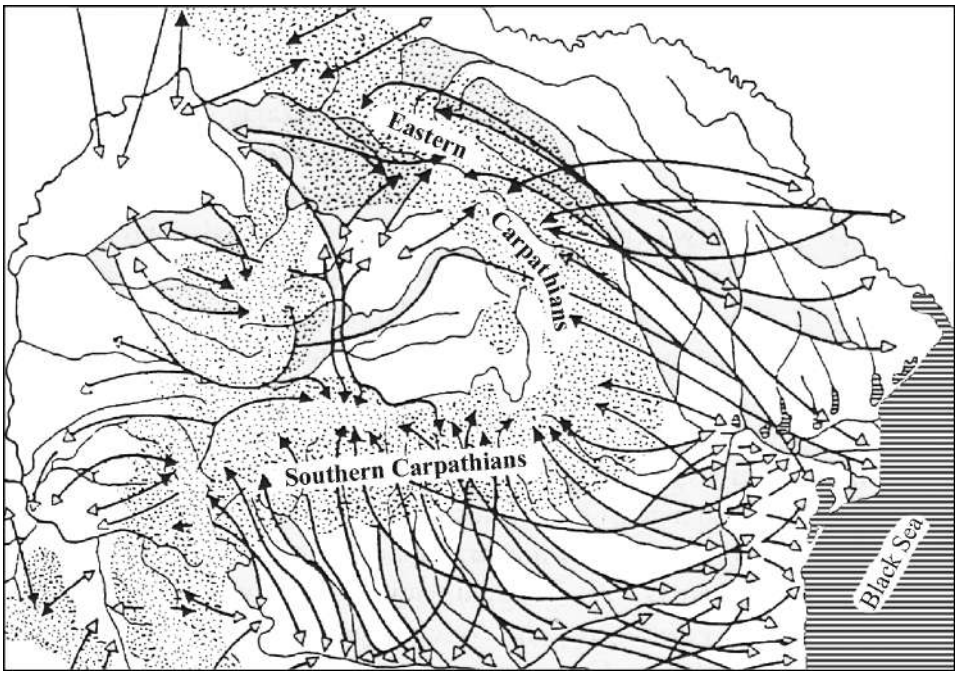


Fig. 25. Routes of herder seasonal migrations in the Carpathians [from Szanter 1997; developed by E. Petrovici, original publication: Kopczyńska-Jaworska 1960]

area (owing to a replacement of one population group by another or a change of the socio-economic system) and co-existence of different route types in the same area, for instance, different routes of long-distance migrations preferred by nomadic steppe societies, and others chosen by settled societies, relying on crop cultivation for subsistence.

The course of routes was certainly strongly affected by the environment conditions. Long-distance migrations across the forest landscape of the Central and East European Plain, with the possibility of penetrating dense forests or panoramically observing the landscape being limited, were facilitated by water routes – travelling on rivers or chains of lakes. The use of boats, known already to Mesolithic societies in this area, was very convenient for the transport of goods. In an open steppe landscape, free from any forest barriers, with a panoramic field of observation, long-distance migrations were naturally helped by routes running along watersheds – elevated tracts of land – which admittedly could be more roundabout than others, but allowed migrants to orient themselves more easily and avoid water barriers. The routes must have been even more popular owing to the use of the horse for transport and riding.

From the point of view of landscape ecology, the development of routes in Europe's forest zone was certainly marked by the changes resulting from the spreading of agricultural economy, referred to as the 'Neolithic revolution'. What they brought about was the gradual development of an open anthropogenic landscape. Open spaces and a relatively permanent settlement network helped overland migrations. Initially, open landscape areas were limited to small 'islands' on specific habitats determined by the range of Linear Band Pottery culture settlement. With time, the areas were expanded and joined together. In Central Europe, assuming that no human activity takes place, the share of forests by area would be clearly predominant. Taking Poland as an example (excluding raised bogs), only a fraction of a percent of the country's territory would be covered by open plant communities and for that limited only to high-mountain habitats and seacoast ones along beaches and dunes in the early stages of their formation [Matuszkiewicz 1991].

Another milestone in the development of overland routes must have been the invention of the wheel and introduction of vehicular transport. In Central Europe, this happened already in the phase of a partial opening of landscape in the Middle Neolithic, among the Funnel Beaker culture populations. The rise of vehicular transport associated with southern Mesopotamia is dated, relying on radiocarbon measurements, to ca. 3600-3400 BC. The spread of this invention of momentous significance across Eurasia was rapid as the oldest representation of a wagon on Central European pottery – Bronocice site on the Małopolska Upland – is dated to the period from 3640 to 3370 BC [see Bakker *et al.* 1999; Kruk 2008b]. The wagon became an inseparable attribute of nomads on the Eurasian steppes.

3.5. ANALOGOUS PENETRATIONS IN OLDER PERIODS OF PREHISTORY

The communication routes joining Pontic steppes to the forest zone of the Baltic catchment area and crossing Volhynia, and Lublin and Małopolska uplands in historic times find analogies as far back as the Neolithic. This is seen in the distribution of flint and stone artefacts originating in Volhynia, in the Dniester drainage, as well as of Świeciechów flint, the outcrops of which are found in the Vistula drainage, close to where the San empties into the Vistula. Both artefact categories are similarly distributed in Poland: the sites where they are found form a belt crossing loess uplands – the Lublin and Małopolska uplands – continuing along the upper Vistula to reach the Oder drainage. A branch of the belt stretches down the Vistula towards Kujawy. Hence, the sites form a great loop covering in the south an area on the Vistula and Oder rivers and in the north moving from Kujawy across the middle Warta drainage to reach Lower Silesia on the middle

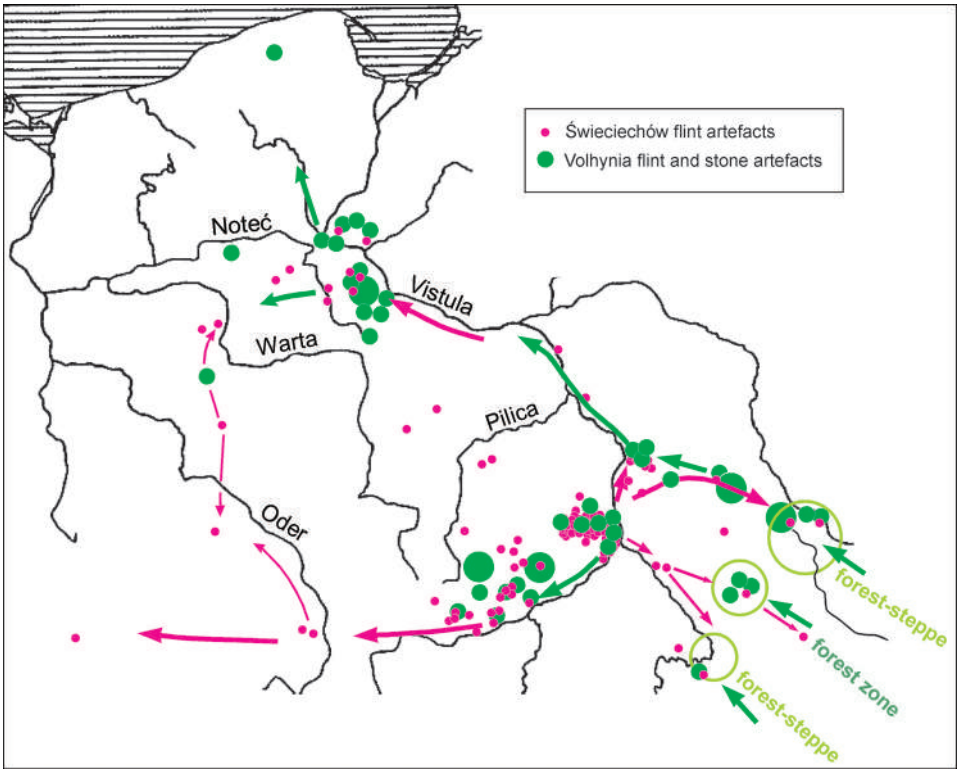


Fig. 26. Distribution of Świeciechów flint artefacts and Volhynia flint and stone [from Cofta-Broniewska, Kośko 2002, modified; foll. Balcer 1975; Chachlikowski 1997] in the Vistula and Oder drainages, showing three corridors along which cultural stimuli moved between the Baltic and Pontic areas

Oder. The chorology of the finds in south-eastern Poland coincides with the distribution route mentioned earlier along which eastern patterns moved in the Middle Ages – via Volhynia and the Przemyśl Gate along a forest-steppe corridor. In both regions, we encounter both Świeciechów flint finds, coming in from the west, and Volhynia flint ones of eastern provenance. The distribution of the flint artefacts in this special area forms yet another corridor running across the forest zone (see Fig. 26).

The distribution of flint artefacts in the zones of old uplands and lowlands corresponds roughly to the geography of settlements of Linear Band Pottery culture communities in the Oder and Vistula drainages (see Fig. 27). The distribution of Early Neolithic settlements in southern Poland was connected with loess areas: the Małopolska Upland on the left bank of the Vistula, the Lublin Upland located between the Bug and Vistula, Western Volhynia and, in the Oder drainage, especially

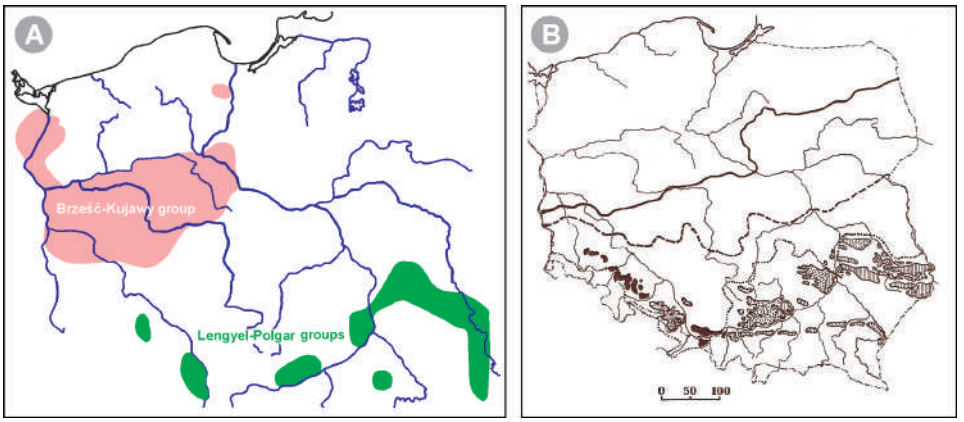


Fig. 27. (A) Distribution of communities from the cultural circle of the Late Linear Band Pottery in the drainages of the Oder and Vistula in the classic and late phases [from Cofta-Broniewska, Kośko 2002, modified; foll. Kamieńska, Kozłowski 1990] against (B) the range of loess covers in Poland

the Głubczyce Plateau. On the lowlands, the settlements concentrated in Kujawy, on fertile black soils, and on the lower Oder, on fertile black soils in the region of Pyrzyce. Dispersed Neolithic settlements are found in Wielkopolska. The major centres of Early Neolithic agricultural economy form a kind of a circle, surrounding the lands of central Poland, between the Warta and Pilica rivers, which were free of this kind of settlement (Fig. 27).

4. ECOLOGICAL BORDER AND CULTURAL FRONTIER

As regards the development of routes, attention should be paid to the emerging relationship between the ecological and cultural patterns in the Baltic-Pontic area. The transitional area between the forest environment of the Baltic zone and the steppe (forest-steppe) one of the Black Sea area, between the drainages of the upper San and Bug rivers, and the upper Dniester drainage appears to be a crucial transitional area between cultural units as well. According to archaeological findings, it was there that a frontier was, separating two great cultural units of the Neolithic – the Funnel Beaker and Tripolye cultures; the latter reached there its north-westernmost limit (Fig. 28).

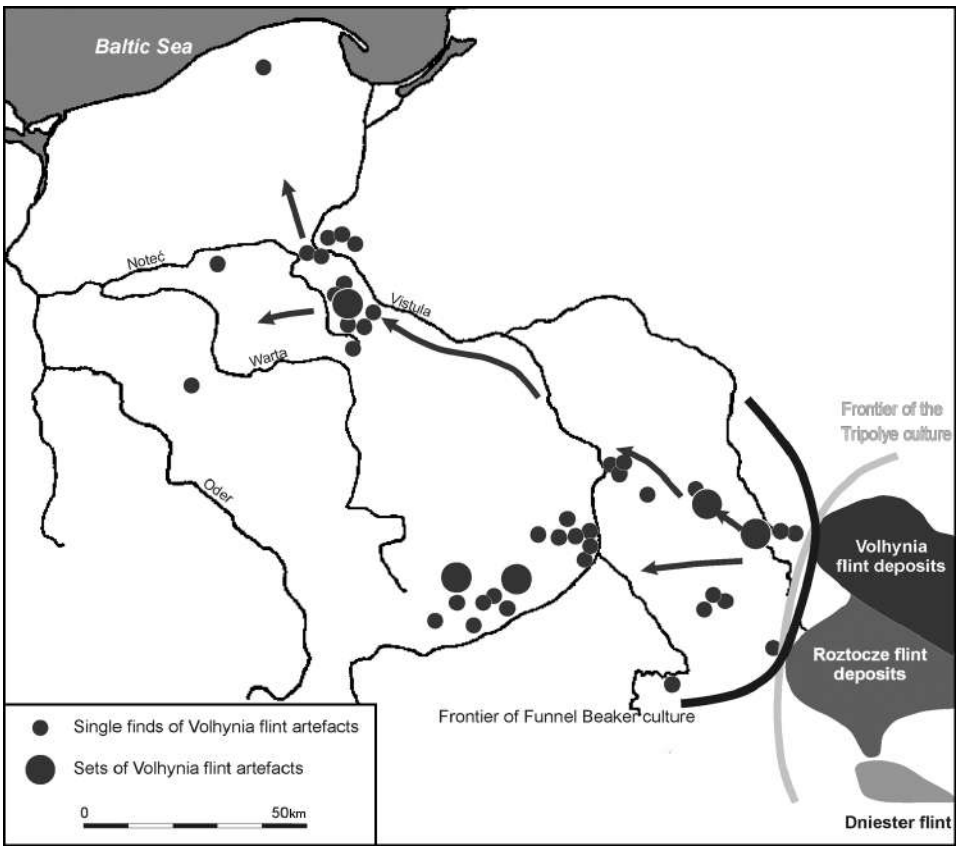


Fig. 28. The cultural frontier between the Neolithic Funnel Beaker (south-eastern limit) and Tripolye cultures against the distribution of Volhynia flint artefacts in the Vistula and Oder drainages, and areas where flint raw materials were found (see Fig. 26) [from Cofta-Broniewska, Kośko 2002, modified; foll. Balcer 1983; Chachlikowski 1997]

The frontier renews itself in a later cultural pattern represented by the communities of the Globular Amphora culture. It marks a transition zone between its central ('Polish') group and the eastern one [Wiślański 1979, Szmyt 2001] (Fig. 29).

Cultural frontiers in this area are marked also in later times, e.g. in the Middle Ages, a line divided there areas of flat cemeteries and those of barrow ones. A list of the latter made by H. Zoll-Adamikowa [Zoll-Adamikowa 2000] links them primarily with the lands in the Pripet drainage (see Fig. 20). It was in this region, only slightly to the west, that the Polish-Ruthenian frontier ran in the 12th century, marking the division into West and East Slavic lands [Parczewski 1991]. The division has survived, only with minor corrections, to this day.

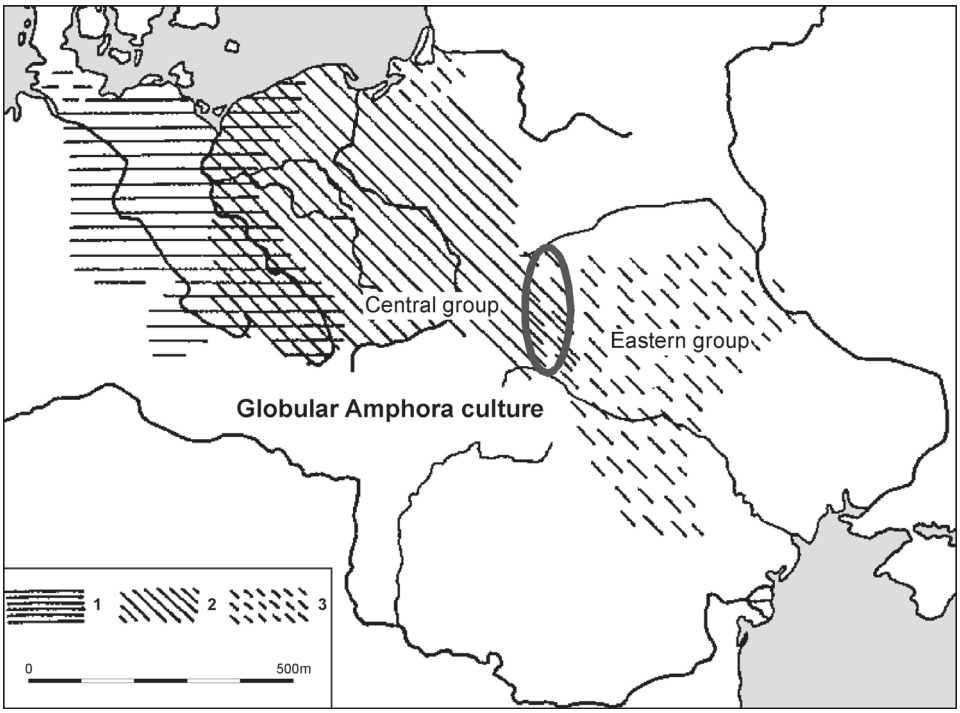


Fig. 29. Ecologiocal border vs. cultural frontier (Globular Amphora culture) in the upper Bug drainage – frontier between the central ('Polish') group and the eastern one [from Cofta-Broniewska, Kośko 2002; foll. Wiślański 1979; Szmyt 2001]

5. MIGRATION ELEMENTS IN POLISH FLORA AND NATURAL ROUTES

Some plant species growing in Poland have migrated from other regions. In some cases, their distribution offers clues as to the region they migrated from and the routes they took. Plant species that have arrived from a single specific region along a specific migration route are grouped together and called flora migration elements (components) in geobotany [see Pawłowska 1977; Matuszkiewicz 1991]. To trace migration routes, the use of palaeobotanic data is highly recommended, but due to their limited availability, plant migration routes are mostly charted by analyzing their present geographic distribution. Migration routes traced in this way can be clearly marked when plant sites are distributed in a manner close to linear or insular. Migration routes become more easily traceable if they are related to the land relief. Natural flora migration routes often run along river valleys, elevations, mountain ridges and ranges, forming bridges enabling migrations.

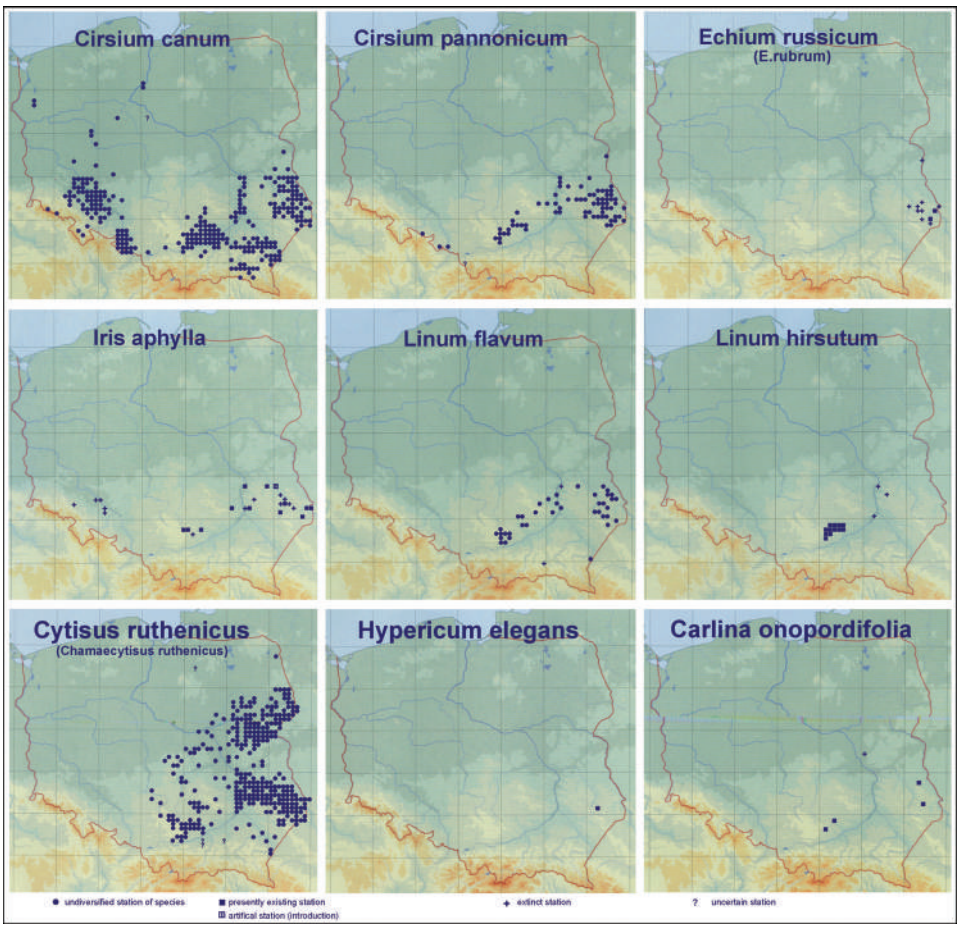


Fig. 30. Insular distribution of some Pontic species in Poland illustrating well the migration routes of steppe elements from the Pontic zone via the Western Volhynia and Lublin uplands towards the Małopolska Upland and further on towards Lower Silesia [foll. Zając, Zając 2001; modified]

For the discussion of natural routes in the Baltic-Pontic Area, of particular interest are species of eastern and south-eastern origin in the flora of the Central European Plain (Fig. 30). Such species are referred to as a Pontic (steppe) element. The Pontic Province ('Sarmatian Domain') encompasses the areas of eastern Europe (see Fig. 18) west and north of the Black Sea, Podolia, the Hungarian Plain, southern Moravia, and the eastern portion of Lower Austria. The Pontic species include plants growing in the continental climate, requiring much light but little water. They thrive on dry, sunny and warm slopes and walls, often among xerothermic grass. Some of them survive on balks, roadsides or plough lands. They are particu-

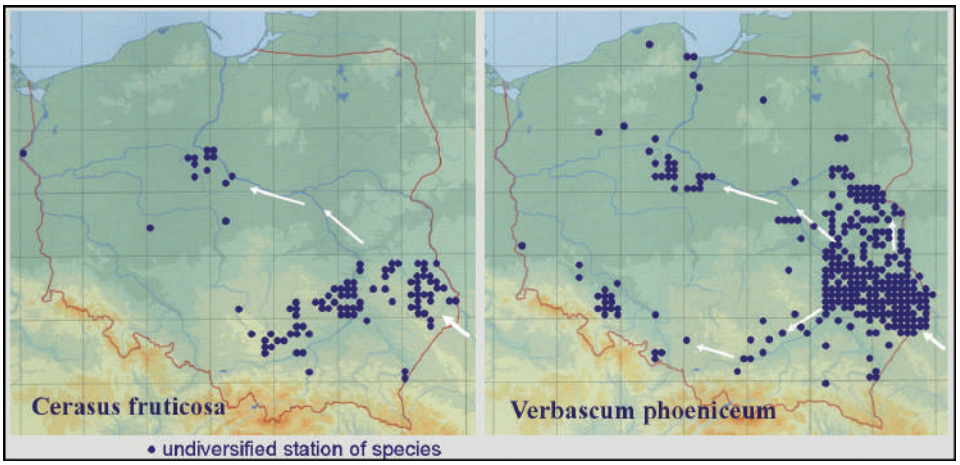


Fig. 31. Pontic species that migrated north from southern Poland along the Vistula Valley [Pawłowska 1977] [species distribution foll. Zając, Zając 2001; modified]

larly frequent on loess and limestone soils. In Central Europe, they are distributed insularly. In Poland, these are above all the Nida Basin, the Western Volhynia, Lublin and Sandomierz uplands, and parts of the Silesian Lowland. The Pontic species are also encountered in the Kujawy Lake District and on the Inowrocław Plain, particularly on the slopes of the Toruń-Eberswald Ice Marginal Valley (Spillway) exposed to the south and lower Vistula and lower Oder valleys [Pawłowska 1977].

It is believed that the natural migrations of Pontic elements took place on a larger scale in the Glacial and Late Glacial periods and in the Early Holocene, prior to the formation of dense forest communities in Central Europe. At that time, the area was covered by open-type vegetation, referred to as steppe-tundra or mammoth steppe. The vegetation was characteristic of the then cold and relatively dry climate with continental features. In W. Szafer's opinion [Szafer 1950] such plants included grasses of the genus *Stipa*, tussock-grass (*Poa*), fescue (*Festuca*), plants of the genus *Artemisia*, or garlic (*Allium*). The greatest number of steppe plants has arrived from the east, most probably from the Podolia refuge via the Lublin and Małopolska uplands (their route followed loess areas, and limestone and gypsum hills).

Later migrations by Pontic species could be helped by human activity, particularly by deforestation, resulting in the rise of open, synanthropic habitats favourable to photophilous steppe plants. The evolution from the mammoth to cultural steppe is well illustrated by the history of the genus *Artemisia*, discussed earlier in the light of isopollen maps (Fig. 18). The cultural landscape is conducive to the growth of steppe plants such as the genus *Artemisia* or steppe grasses as well as some species of steppe fauna (of open habitats) such as brown European hare (*Lepus europaeus*),

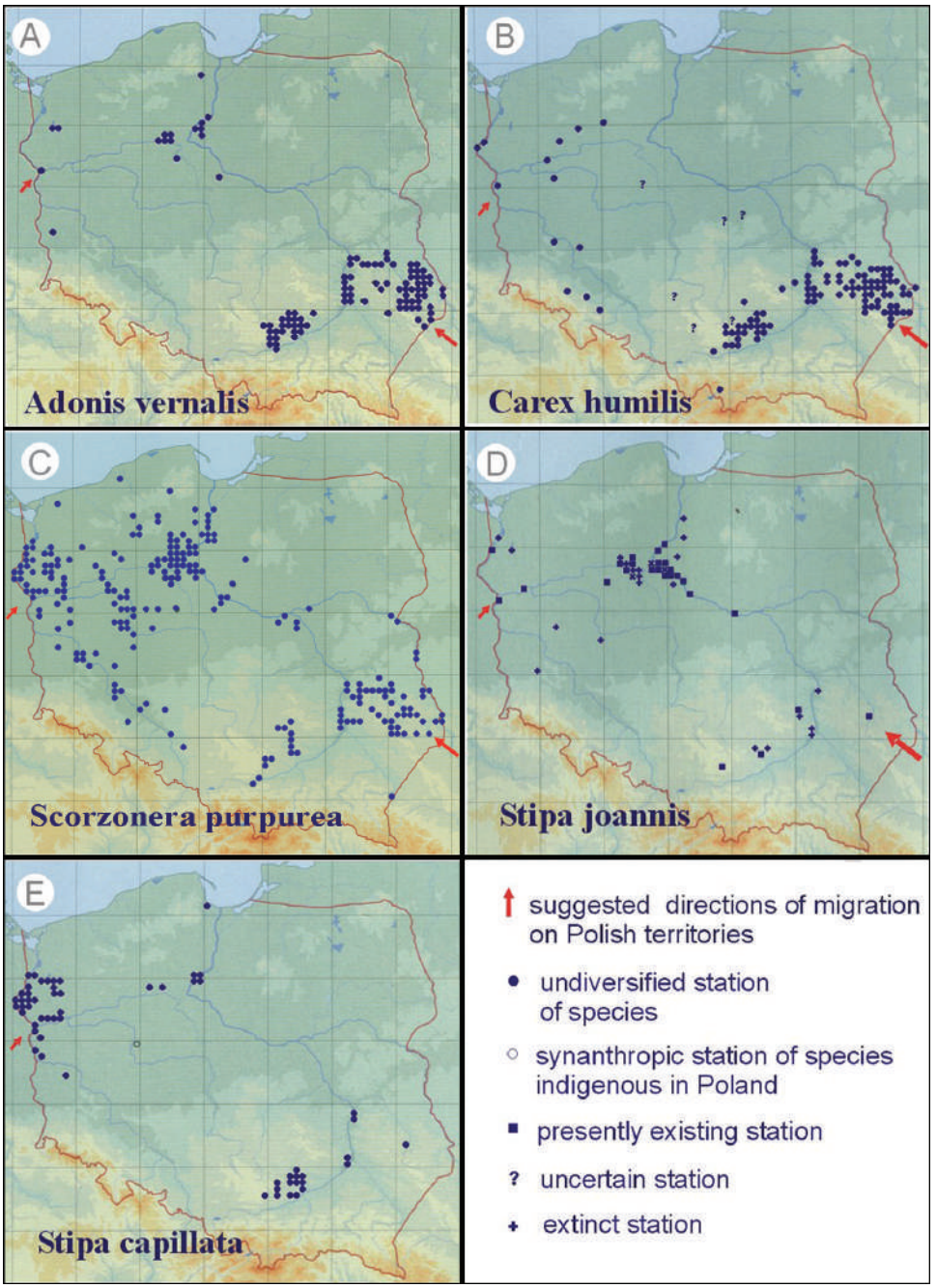


Fig. 32. Pontic species that [foll. Czubiński 1950] arrived at the Małopolska Upland along the south-eastern or southern route and reached Pomerania from the west, from the central German refuge in Thuringia, taking the Brandenburg-Noteć route [species distribution foll. Zając, Zając 2001; modified]

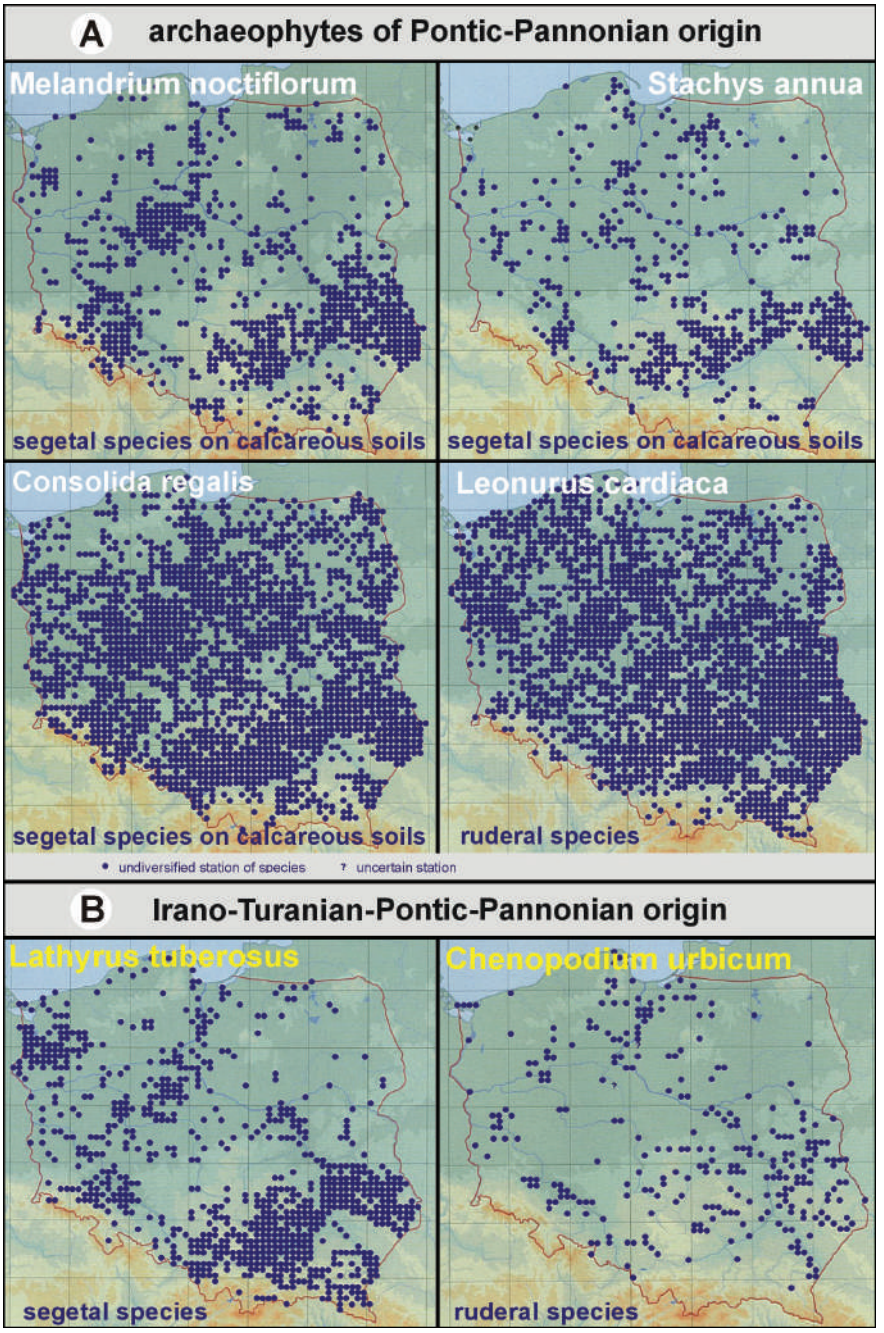


Fig. 33. Distribution of archaeophytes in Poland of (A) Pontic-Pannonian and (B) Irano-Turanian-Pontic-Pannonian origin [identification of the archaeophytes foll. Zając 1988] [dsitribution foll. Zając, Zając 2001; modified]

common hamster (*Cricetus cricetus*), spotted souslik (*Spermophilus suslicus*), European souslik (*Spermophilus citellus*), or birds: grey partridge (*Perdix perdix*), skylark (*Alauda arvensis*), or great bustard (*Otis tarda*) [Tryjanowski, Winiecki 2003].

The chief migration route of Pontic floral elements seems to have followed north the middle course of the Vistula as far as the Kujawy Lake region and Inowrocław Plain (Fig. 31). The region stands out in terms of the incidence of Pontic steppe elements on the Central European Plain (Fig. 31, see also Fig. 32). Some steppe species such as, for instance, the spring Adonis (*Adonis vernalis*) spread across the Plain along two routes: onto the Małopolska Upland along a route from the south-east or the south; further north, onto Pomerania, it must have spread from the west, from the central German refuge in Thuringia, taking the Brandenburg-Noteć route [Czubiński 1950, after Pawłowska 1977]. Other species that point to this direction of migration routes are low sedge (*Carex humilis*), scorzonera (*Scorzonera purpurea*) and feather grasses (*Stipa joannis* and *Stipa capillata*) (see Fig. 32).

An important group of plants for making conclusions as to human migration routes consists of species whose occurrence is related to human activity, mainly anthropophytes – i.e. species alien to a given area but accidentally introduced onto it by man. A classification of anthropophytes distinguishes further so-called old-comers (archaeophytes) – species that migrated prior to the turn of the 15th century (prior to the discovery of America) – from newcomers (cenophytes) – species that arrived later. Among archaeophytes, there is a group of species of eastern origin that can be traced back to the Pontic-Pannonian Province or even to a still broader territory encompassing the Irano-Turanian area. The group is made up mainly of segetal species (field weeds), growing especially on limestone soils, or ruderal ones accompanying human settlements or growing on roadsides. Archaeophytes growing in Poland were identified and classified by A. Zając in a series of works [Zając 1981; 1984; 1987; 1988]. Among the archaeophytes of Pontic-Pannonian origin, some, for instance, *Melandrium album* or *Stachys annua* show insular distribution whereas others, such as *Consolida regalis* or *Leonurus cardiaca* have now a very broad range covering almost the whole country (Fig. 33). The occurrence of these species, originally brought by man and growing in synanthropic habitats, points to the migration routes, running from Volhynia, across the Lublin Upland, towards the Sandomierz and Małopolska uplands and further on in the direction of the upper and middle Oder in Lower Silesia. On the lowland, their insular presence is marked especially in Kujawy and on the lower Vistula. Another cluster is found on the lower Oder. The distribution of these species forms the same kind of a loop as mentioned earlier, crossing in the south the Vistula and Oder valleys, while in the north it runs along the middle Vistula towards Kujawy, Wielkopolska and Lower Silesia. Few positions of the species are found in central Poland, in the drainages of the upper Warta and Pilica rivers. The causes of this 'vacuum' are probably connected with both natural environment conditions and the nature of human activities. A similar distribution is shared by two directional

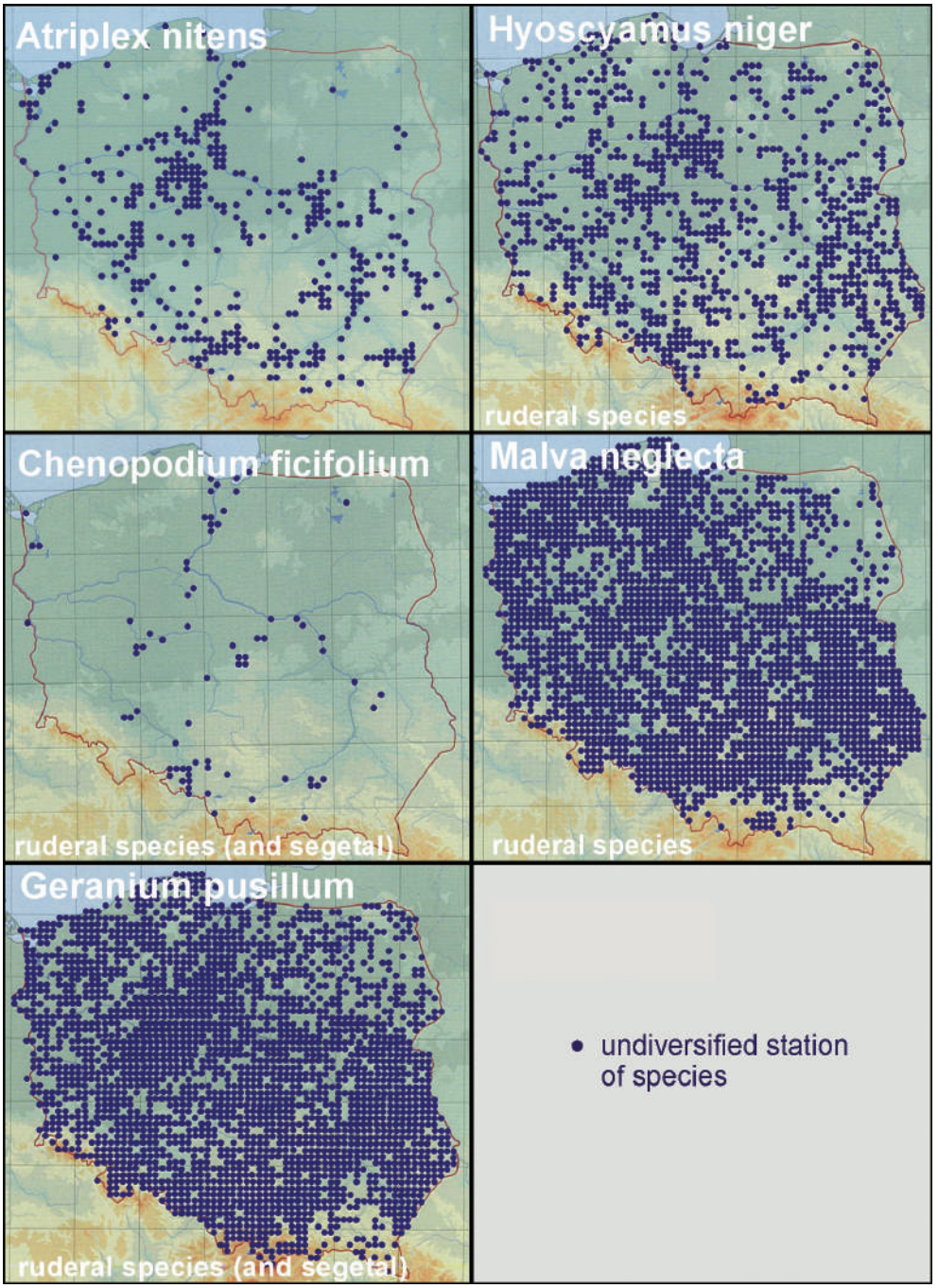


Fig. 34. Geographic distribution in Poland of archaeophytes of Irano-Turanian origin, Irano-Anatolian subgroup [foll. Zając, Zając (Ed.) 2001] [identification of archaeophytes foll. Zając 1987]

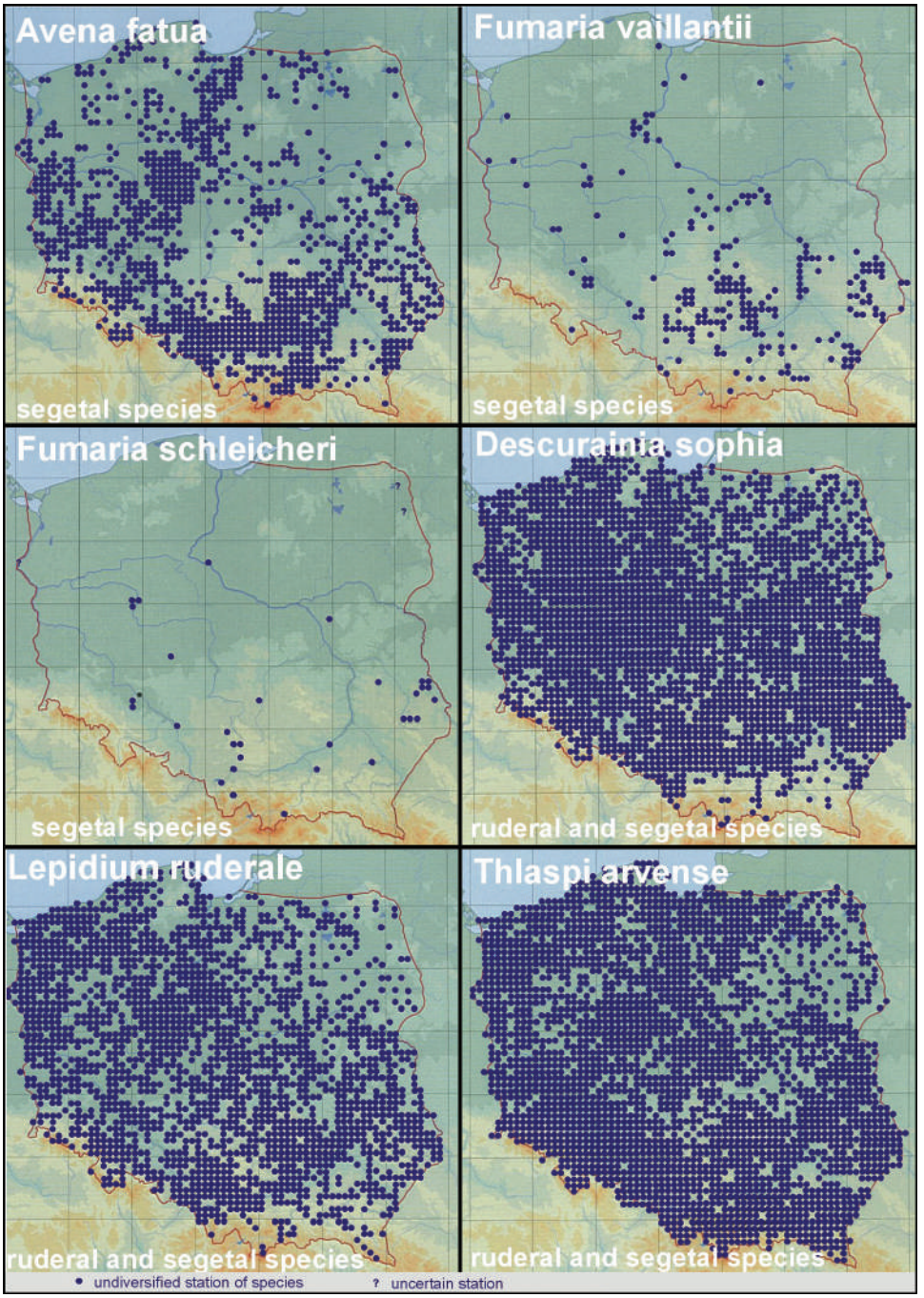


Fig. 35. Geographic distribution in Poland of archaeophytes of Irano-Turanian origin, Central-Asian subgroup [foll. Zając, Zając (Ed.) 2001] [identification of archaeophytes foll. Zając 1987]

elements, having a broader Irano-Turanian-Pontic-Pannonian background, namely tuberous pea (*Lathyrus tuberosus*) and upright goosefoot (*Chenopodium urbicum*) (Fig. 33).

A similar distribution pattern is observable in respect of species migrating from the Irano-Turanian area and belonging to the so-called Irano-Anatolian subgroup, namely *Atriplex nitens, Hyosyamus niger* or *Chenopodium ficifolium* (Fig. 34) and other species from the Irano-Turanian area, representing the Central Asian subgroup such as *Avena fatua*, *Fumaria schleicheri* and *Fumaria vaillantii* (Fig. 35).

Discussing the geography of archaeophytes, we usually face difficulties in determining the time of the beginning of migration of a given species and periods when it intensified. The time perspective of a migration may be established, relying on palaeobotanical data. The migrations of many segetal and ruderal species of southern and south-eastern provenance to areas lying north of the Carpathians took place in the Neolithic and accompanied the introduction of cereal, leguminous, fibre and oil-bearing crop plants.

It is reasonable to believe that the development of an open cultural landscape was a watershed in the dissemination of species from the steppe zone. Their distribution coincides significantly with the geography of Early Neolithic settlement, represented by the Linear Band Pottery cultures. The populations of these cultures opted for areas of special environment features; specifically, they settled on fertile lands with chernozems developed on loess in the old uplands or on fertile black soils on the lowlands. Started ca. 5500-5400 BC, the anthropogenic transformations of these areas, involving the deforestations and consequent hydrological changes brought about by increased direct runoff, which, in turn, caused the drying of habitats, may have helped the migrations of steppe species. In such general terms, the concentrations of steppe elements in the southern Baltic catchment area are in a way ecological indicators of habitats reminiscent of the Black Sea zone known for a fertile substratum and predominance of open-type vegetation. Expanses of open landscape may have also influenced, as it has been observed earlier, the choice of migration routes by specific population groups adapted to or preferring an open-type environment (e.g. communities of farmers or nomads) to the forest one, which was more favourable to populations leading a trapper's life. It seems that the presence of settlements, especially important settlement centres, was by itself one of the crucial factors in determining the course of routes.

Going back to the distribution of steppe elements in the environment prevailing on the southern shores of the Baltic, it is worth taking notice of the geography of continental-type plant communities. Their distribution presented by W. Matuszkiewicz [Matuszkiewicz 1991], expressed as a number of plant communities, concentrates to form a belt stretching from the Western Volhynia Upland and crossing the Lublin, Sandomierz and Małopolska uplands (Fig. 36), and shows a clear relationship to the distribution of loess areas intensively settled from the Neolithic.

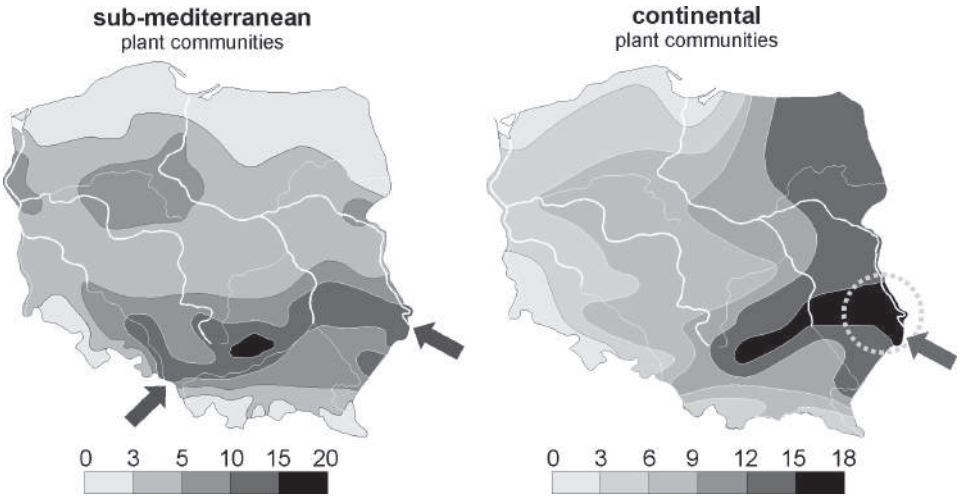


Fig. 36. Distribution of thermophilous sub-Mediterranean and continental plant communities in Poland [foll. Matuszkiewicz 1991]

The distribution of this type of vegetation is strongly reminiscent of the distribution of plant communities characteristic of thermophilous environments of the southern type, known as sub-Mediterranean (Fig. 36). They are most numerous on the Małopolska Upland but they are also frequent in the belt mentioned earlier, reaching further west into the drainage of the upper and middle Oder. The sub-Mediterranean communities have a higher representation, albeit an insular one, on the Lowland as well. One of such areas is Kujawy with the adjacent Chełmno Land and eastern Wielkopolska. Another one is located on the lower Oder in the vicinity of the town of Pyrzyce. The concentration of sub-Mediterranean communities on the Lowland seems to correlate well with areas covered by the intensive Early Neolithic settlement by the Linear Band pottery communities.

6. THE MAIN COMMUNICATION LOOP OF THE UPLAND-LOWLAND ZONE BETWEEN THE BALTIC AND THE CARPATHIANS

On several occasions already references have been made to a marked belt formed in the drainages of the Vistula and Oder rivers by the distribution of flint artefacts, Early Neolithic settlements and steppe (continental) floral elements of Pontic-Pannonian and Irano-Turanian provenance, related to the steppe and anthropogenic environments. The belt describes a kind of a circle, crossing the old

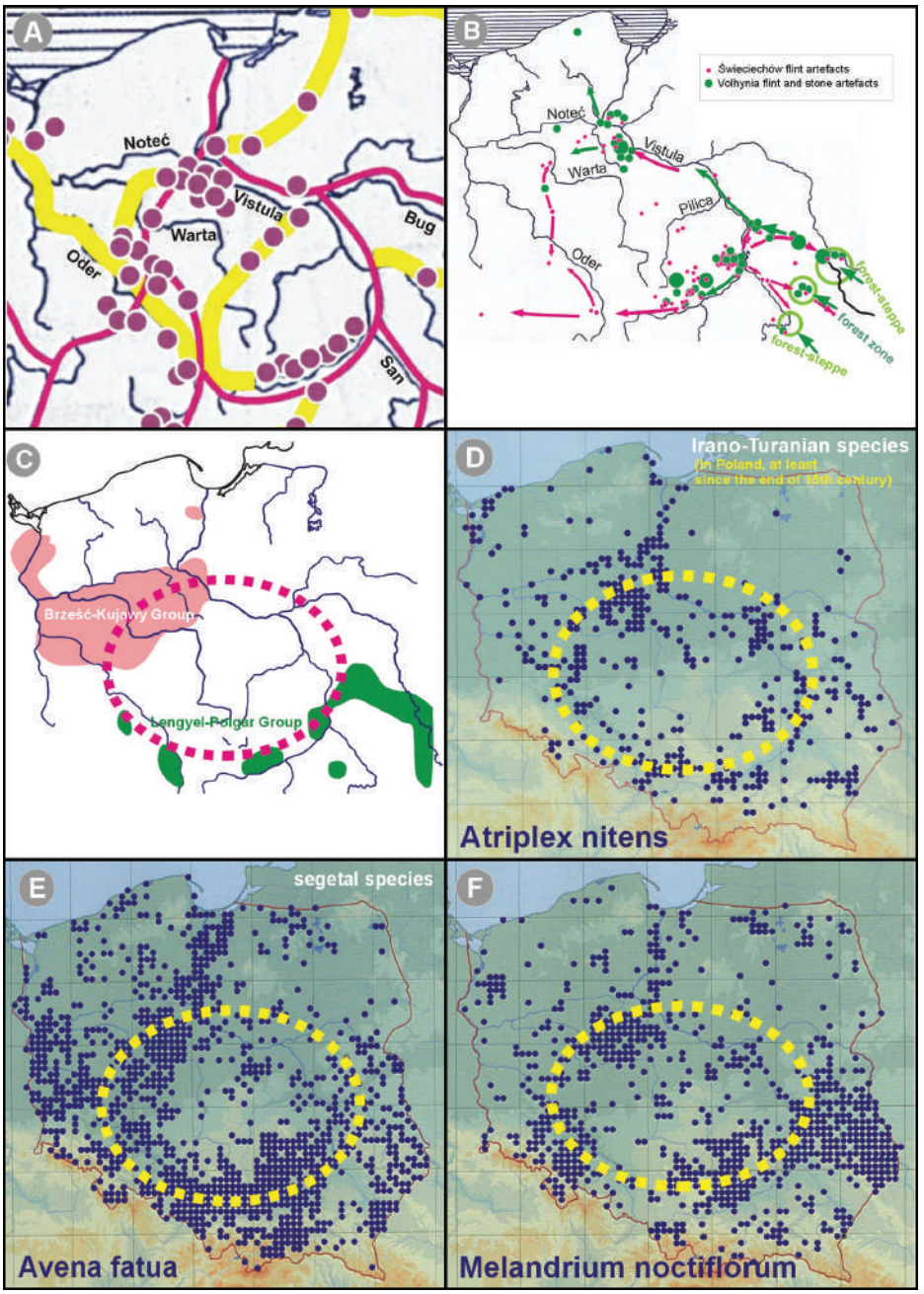


Fig. 37. Great communication loop between the Baltic and Carpathians seen in the archaeological picture (tracing of Bronze Age inter-regional routes, distribution of Świeciechów and Volhynia flint, and Early Neolithic settlements of Linear Band Pottery populations) (see Figs. 1, 26, 27) and in the natural scientific picture (selected archaeophytes of Pontic origin) (see Figs. 33, 34, 35)

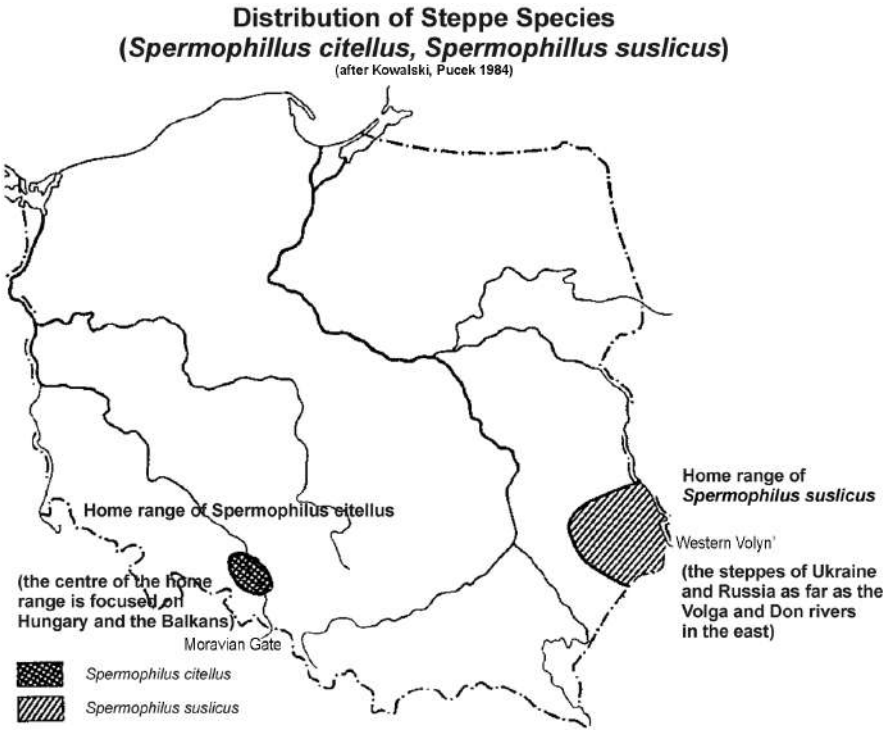


Fig. 38. Distribution of steppe species of the spotted souslik (Spermophilus suslicus) and the European souslik (Spermophilus citellus) in Poland, Volhynia and in front of the Moravian Gate [foll. Kowalski, Pucek 1984] illustrates the migrations of the elements of steppe fauna from the Pontic-Pannonian area

upland and lowland areas adjacent to the valley of the middle and upper Vistula, middle Oder in Lower Silesia, areas located between the Oder and Warta rivers, and Kujawy. The circle surrounds the areas of central Poland which stand out in terms of both cultural and floral patterns. No or few and wide apart communities of Pontic species, characteristic of the steppes of south-eastern Europe, are noted there. This major belt, conveying Early Neolithic material goods and settlement (whose economic-settlement preferences can be called stenotopic – tied to areas of highly fertile soils) as well as selected floral elements, highly coincides with the course of major transit routes of the Vistula and Oder drainages in the Early Bronze Age traced by M. Gimbutas and A. Kośko (see Fig. 37). Reflected in some data, both archaeological and natural scientific, the loop seems to point to the chief communication pattern observed on the Polish lands between the Baltic and Carpathians since the Early Neolithic. In the south, the communication pattern joined the main thoroughfare crossing the Carpathians through the upper Oder valley and across

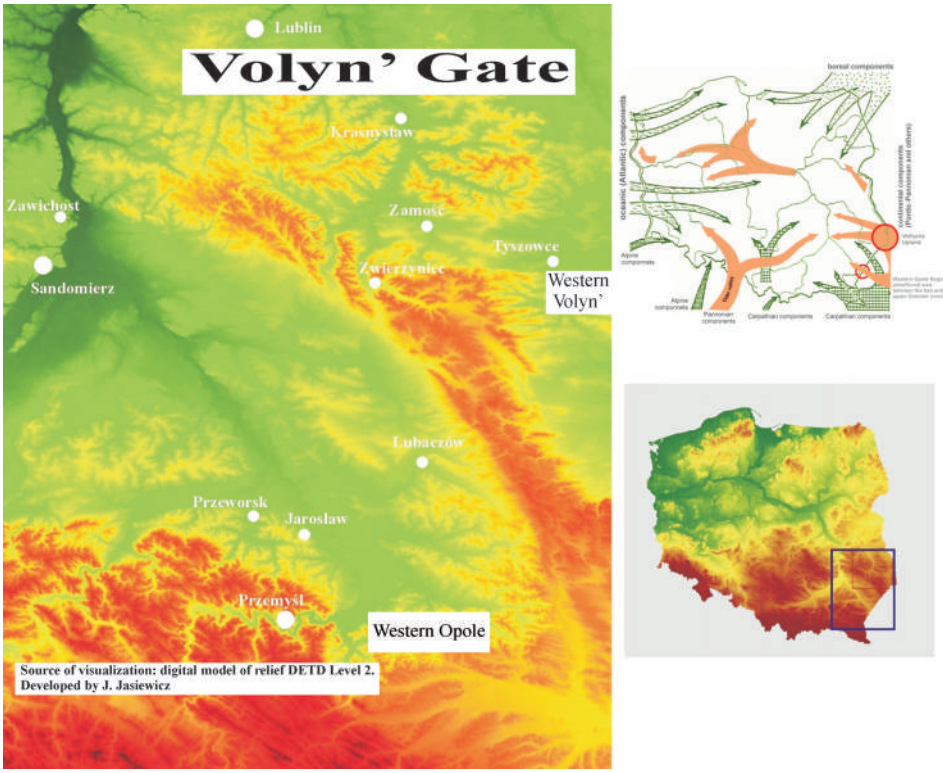


Fig. 39. Land relief of Western Opole (Przemyśl Gate) and Western Volhynia (Volhynia Gate) being the major migration routes of steppe elements from the east, from the Pontic Area, to the forest zone of Central Europe. Digital models of land relief (detd level 2) developed by J. Jasiewicz

the Moravian Gate while in the east it joined the Black Sea biocultural area mainly through the Lublin Upland and Western Volhynia. In the north, its two major branches stretched towards the lower Vistula and lower Oder rivers.

7. WESTERN VOLHYNIA AND PRZEMYŚL (WESTERN OPOLE) GATES – EXCHANGE ROUTES OF CULTURAL AND NATURAL STIMULI WITH THE EAST

Western Volhynia, as suggested by the collected data, was crucial in terms of both cultural and natural indicators. Crossing the region, the route of the 13th-century Mongol raid against Poland correlates well with, on the one hand, the specified

Ruthenian artefacts and, on the other, the distribution of continental species of the Pontic-Pannonian origin, migrating into Poland from the Black Sea Province. In the light of migrations of floral steppe elements as well as cultural stimuli from the east, Western Volhynia and Western Opole were important stopovers on the route from the east. Their role, it may be claimed, was similar to that played by the Moravian Gate on the migration route from the south, from the Pannonian area and, taking a longer perspective, from the Balkans and the Mediterranean, followed by cultural patterns and natural elements. Western Volhynia, as the north-westernmost bridgehead of the great Eurasian steppe expanse north of the Carpathians, was a refuge for the eastern flora and fauna (see the distribution of the souslik in Poland and other steppe species occurring in both the Moravian Gate and in Volhynia, Fig. 38).

An extension of the ecological corridor was formed by a belt of loess uplands in southern Poland, offering habitats preferred by thermophilous vegetation having Mediterranean characteristics (sub-Mediterranean vegetation) and continental vegetation displaying Black Sea characteristics. Understood thus, Western Volhynia ('Volhynia Gate') and the Przemyśl Gate within Western Opole were important points in interregional communication – a kind of a 'pass' between the two major geographic zones of the Baltic-Pontic Area. The nature of the 'pass' seems to be illustrated best by the history of Grzęda Sokalska, settled by Corded Ware culture societies. It comes out as a place of passage and stopover for all corded populations migrating west from the East European steppe zone [see Machnik, in this volume].

A further discussion of routes in the Baltic-Pontic Area, in the context of natural sources, shall analyze the Late Holocene changes in the environment and their potential impact on the shaping of communication patterns. Another issue calling for an analysis is the identification of possible route markers in palaeobotanic and archaeozological sources.

Translated by Piotr T. Żebrowski

Baltic-Pontic Studies
vol. 14: 2009, 72-86
PL ISSN 1231-0344

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CONSTRUCTION ISSUES IN THE NORTH-WEST (CENTRAL EUROPEAN) SECTION OF BALTIC-PONTIC INTER-REGIONAL ROUTES: THE NOTEĆ RIVER CROSSING IN ŻUŁAWKA MAŁA – MUCH ADO ABOUT NOTHING?

The second half of the 4th millennium BC and the first half of the 3rd millennium BC witnessed an extraordinary period in the development of European Neolithic communities. Over the timeframe set out above, the communities went through in-depth, closely interrelated and multi-dimensional transformations representing the so-called "second Neolithic revolution" [Sherratt 1981]. The scope of those transformations embraced both social (progressive social diversification within human groups) and economic domains (intensified animal breeding, dynamic development of specialised craft, establishment of settlements in areas viewed before as distant places, etc.). In this context, the use of land routes as well as the introduction and common use of a cart as a new means of transport, by no later than ca. 3400 BC, were among highly significant factors which contributed to the aforementioned transformations.

1. EARLIESR EVIDENCE FOR INTRODUCTION OF OXEN-DRAWN AND OTHER CARTS

The continuous development of archaeological studies and related expansion of source materials has provided an increasing body of evidence indicating widespread use of oxen-drawn and other carts across the vast territory of Europe in the discussed prehistoric time. The sources can be grouped in the following three categories:

First, use of a yoke where carts were drawn by oxen bearing a single head yoke – may be linked, at least, to the Middle Neolithic Funnel Beaker culture

(FBC) communities. It is evidenced, among others, by a clay yoke of oxen found in Krężnica Jara, Lubelskie region (a fragment of FBC vessel), frequently referred to in publications, or a copper yoke of oxen from Bytyń near Szamotuły, which is equally often mentioned in relevant literature. These and similar finds (including a drawing of a yoke of oxen on stone in a Megalithic tomb in Lohne, Hessen [Małecki 1995: 100; Kruk, Milisauskas 1999: 162] have been consistent with the findings of archaeo-zoology which allow to identify traces of such use of oxen in animal bone material dating back to the Middle and Late Neolith[1]. Notwithstanding the fact that the yoke has been most often associated with agro-technical practices where the category comprises the traces of ploughing found on sites dating back to the Middle Neolith [Milisauskas, Kruk 1991; Kruk, Milisauskas 1999: 158-161], it is equally justified to link the use of animal traction to draw drags or carts, given that the indications of such use of draught animals can be traced back to the Linear-Incised Pottery Culture (LIPC) or the late Linear Band Pottery Culture (LBPC) [Kruk, Milisauskas 1999: 157].

Second, archaeological work on "wet-type" sites has resulted in another important group of finds, including the remains of various road structures built of trunks found in swamp sediments from England, Ireland and Holland in the west to Lithuania in the east [Hayen 1957; Coles, Hibbet 1968; Rimantienè 1980; Coles 1987; Sadowska-Topór 1999: 69-70; Kruk, Milisauskas 1999: 164-165] and wooden solid wheels or even shafts [Schovsbo 1983]. Of equal importance were the tracks (ruts) of a two-wheeled cart stretching for about 20 meters, recorded in Flintbek, Northern Germany, under a Megalithic mound [Zich 1993: 24, 26, Fig. 8; Małecki 1995: 100; Bakker, Kruk 1999: 783-784]. As a consequence of these discoveries, crucial source materials have been collected to evidence the simultaneous use of trackway systems for wheeled carts across vast areas in Europe as early as in the second half of the 4th millennium BC[2] and in the 3rd millennium BC [Bakker, Kruk 1999]. In reference to these finds, the general consensus is that the discovered remains are the traces of tracks padded with wood built to facilitate or simply enable transportation across river valleys to fords which already at that time were gaining in importance in the context of settlement strategies [Clark 1957: 363; Kośko 1981: 155; 1988a: 84-85; Kruk, Milisauskas 1999: 164] or connections between low-lying inhabited islands and higher land (the so called "sweet tracks"; [Coles, Hibbet 1968])[3]. This category of finds, though most useful in na-

[1] For example, buried animal remains identified on site 2 in Żegotki with pathological changes in bones typical of work in a neck or withers yoke [Makowiecki, Makowiecka 2000: 367-368, 371-372].

[2] More precisely, wheeled means of transport spread rapidly form the Mesopotamian area to Europe, ca. 3500 BC [Bakker, Kruk 1999: 788]. In the light of the cart tracks (ruts) found under the FBC Megalithic mound in Flintbek, it can be assumed that wheeled means of transport were known in Central Europe before 3400 BC [Bakker, Kruk 1999: 784]. Similar conclusions can be drawn, based on the outcome of radiocarbon dating for the vase from Bronocice [Kruk, Milisauskas 1999: 169].

[3] The issues discussed have also prompted interest in inland water means of transport [see Ossowski 1999; 2006].

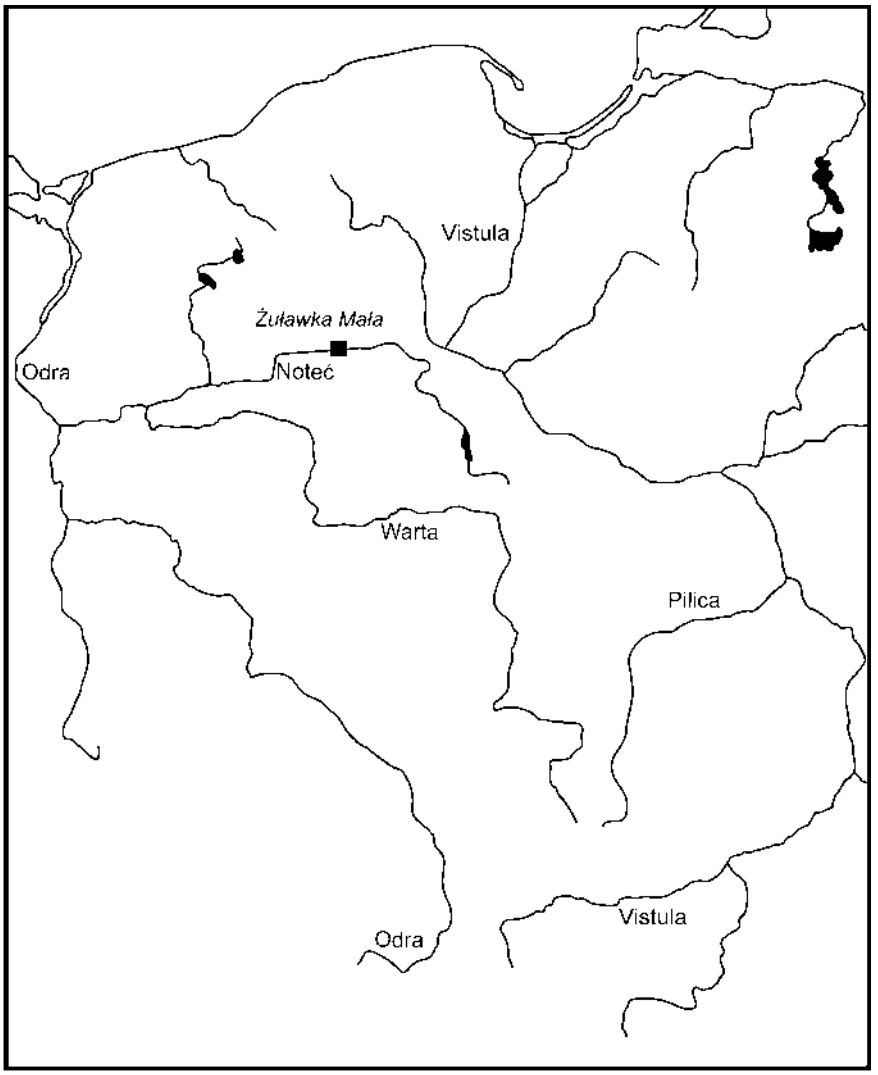

Fig. 1. Location of site 1 in Żuławka Mała

ture for the analysis of the issue in question in this study, is at the same time the most difficult one to make. Usually materials of that type are discovered by accident and become subject to archaeological research only by a fortunate coincidence.

Last, iconography and clay cart models as well as finds in the form of cart parts (wooden wheels, axles, shafts) represent the third group of objects falling within the

scope of this study. Apart from the above mentioned drawing in a megalithic tomb in northern Germany, in particular, more or less realistic representations of carts on the FBC vessels should be noted [Kośko 1981: 152-153, Fig. 31] as well as Sumerian pictographs and clay models of cart wheels found in Asia Minor and the Near East [Bakker, Kruk 1999]. A vessel from Bronocice with a narrative ornament presenting a four-wheeled cart, radiocarbon-dated to 3635 BC-3370 BC, makes an extraordinary find deserving special focus [Bakker, Kruk 1999: 785-786; Kruk, Milisauskas 1999: 166-170]. Relevant publications referring to the use of carts in the most distant time period they occurred in, the 4th millennium BC, interpret it in the context of a religious, ritual and generally spiritual life [Małecki 1995]. Nevertheless, it is also possible to "read" these finds as rather unspecified stories about "things and matters related to everyday life of the FBC communities" [Kruk, Milisauskas 1999: 168]. This very aspect seems to transpire from the reconstructed networks of tracks (so called "tracks of mounds") the origins of which go back to the FBC. Similar finds have been made in the area stretching from southern Denmark through northern Germany to Holland [Bakker 1976]. It appears that at least from the Late Neolith, the area was covered by a complete network of such tracks[4], while the ruts identified in Flintbek may represent a section of one of these tracks and more importantly, a proof of their use by wheeled means of transport [Bakker, Kruk 1999: 783-784]. In any case, it is unquestionable that these finds are of material importance for any attempts to put the cart development process witnessed by the Neolithic communities in low-lying European areas in a chronological order and more precisely, for dating the process at least back to the early second half of the 4th millennium BC[5].

2. CONSTRUCTION ISSUES OF THE NOTEĆ RIVER CROSSING

Find no. 1 made in Żuławka Mała, Wyrzysk municipality, fits into the picture presented above (Fig. 1). In the wake of research carried out in the years 1992-2000, the remains of wooden-ground crossing structures were uncovered – a causeway enabling transportation through the valley and related sediments originating in various periods of the Neolith and Iron ages. Based on the finds, a hypothesis of the exi-

[4] Indirectly, this indicates their supra-regional and inter-regional significance. It is also evident that long-distance contacts or trade enabled by the routes could have been common rather than rare or incidental in nature.

[5] It seems that the find in Slovenia on a marshy site near Ljubljana, i.e. cart wheels made of oak and ash with a radius of 0.7 m and ca. 5 cm thick, along with their axle, has provided unchallengeable evidence in this respect. The find has been radiocarbon-dated to the second half of the 4th millennium BC [Velušček 2002: 41].

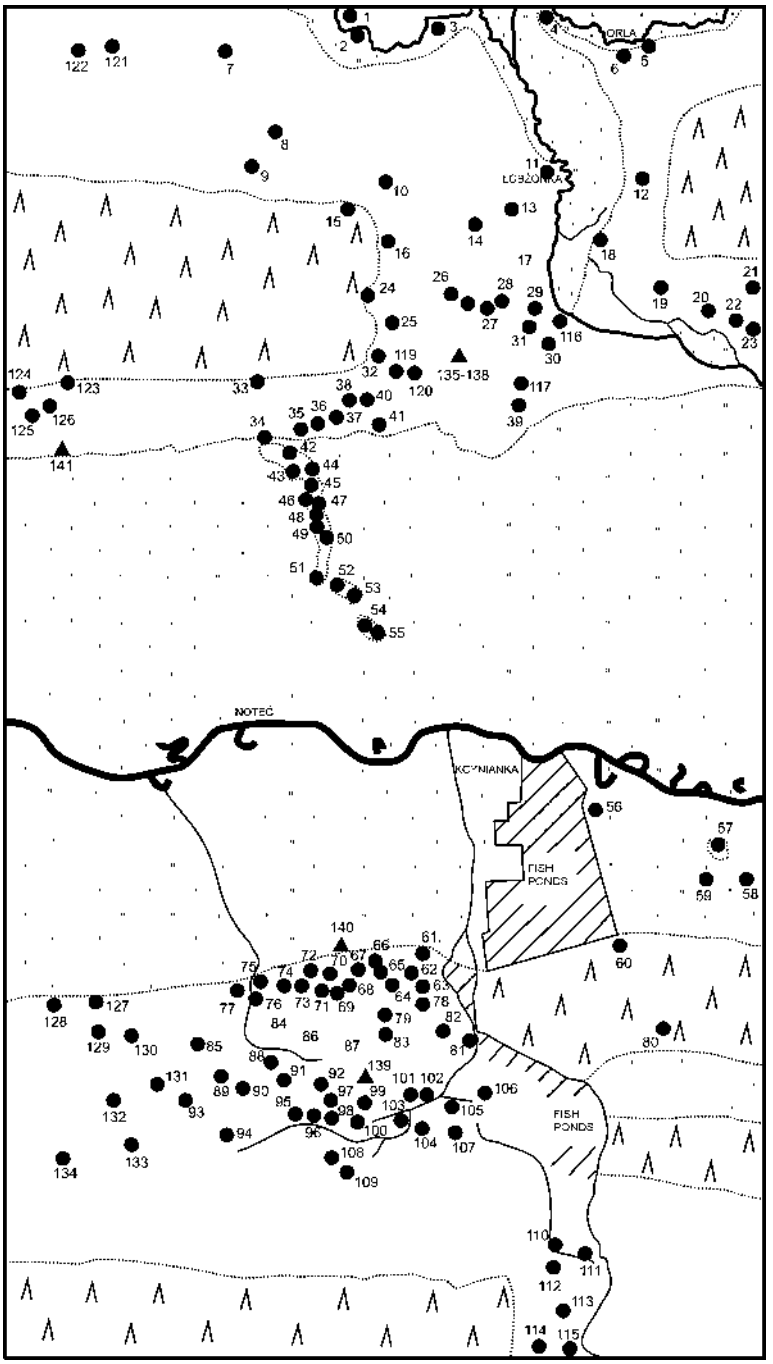

Fig. 2. Neolith and Early Bronze Age site in the Żuławka Mała region

stence of a ford on the Noteć River (Fig. 2) has been put forward. In the context of Polish archaeology, this find is of utmost analytical significance for studies on widely interpreted use of transport and trade routes in the area stretching between the Baltic and Black seas.

The use of the causeway in the Globular Amphora Culture (GAC) community has been subject to the most extensive examination [Nowaczyk, Rola 2009]. As an outcome of related research work, it was revealed that the causeway was built of a body of fascine (horizontal elements, see Fig. 3) strengthened by piles (vertical elements, see Fig. 4). The fascine, being one of the key parts of the causeway structure, covered a strip of 5 m - 7 m wide and about 40 m long. It was built of large pieces of trunks and limbs with a diameter often exceeding 20 cm, used as stabilisers, laid at the bottom of the layer (though not in a predefined order).

In addition, the layer was composed of branches, limbs and woodwork waste (various types of chips) and bark pieces as well as waste left after repair work carried out in the settlement area such as pieces of planks, laths, perches, etc. The facile was filled with sand (from a dune rampart) spilled down to the fascine layer (Fig. 5) whose thickness ranged from 30 cm to 40 cm (Fig. 6, 7). In terms of tree species found on the site, it was recorded that alder and oakwood were used most often [Stępnik 2009], timbers that could be exposed to long-lasting unfavourable wet or swampy conditions without losing their good construction qualities.

The other identified timber types seem to represent an accidental additional component with no major significance for the structure. In contrast, the horizontal wooden piles represented key construction parts of the causeway. The piles ensured stability of the structure preventing its splitting apart or washing away. Similarly as in the case of fascine, the piles were made primarily of oakwood and alder or, less frequently, ash or elm wood. The piles were made of straight sections of main trucks or limbs cut in their lower parts to form a spike. Typically, the piles were between ten and twenty centimetres in diameter, though, there were also stakes of 5 cm - 6 cm in diameter. Occasionally, the piles were made of pieces of stripped branches. Unlike in the case of timber originally used in the settlement, the branches were not carefully worked or decorticated. Depending on the place where they were driven into the ground (abutment area or in the middle of the causeway), the piles were from 30 cm - 40 cm to 2 m long.

In addition, to put it into a chronological perspective, based on radiocarbon and dendrochronological analyses [Krąpiec 2009] it can be assumed that the structure was built in ca. 2490 BC, while the last identified repair work on the site was carried out in ca. 2440 BC (Fig. 8). Given the above, it can be concluded that excavations on site no. 1 in Żuławka Mała, in the years 1992-2000, brought evidence which both in functional and chronological terms matches the view presented above, i.e. the presumption that a network of routes was created in the Late Neolith by these communities.

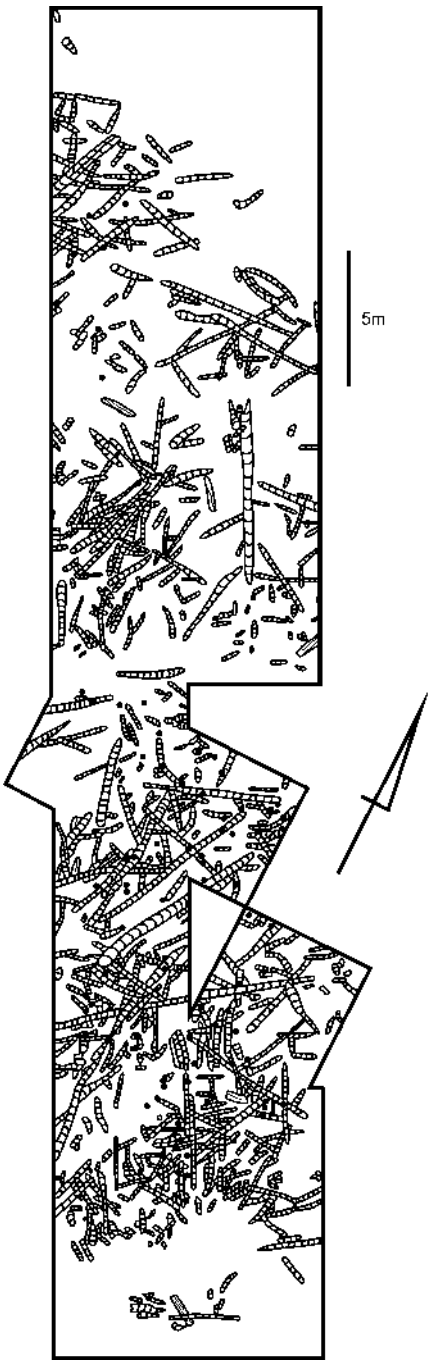

Fig. 3. Outline of GAC artefact bridging construction

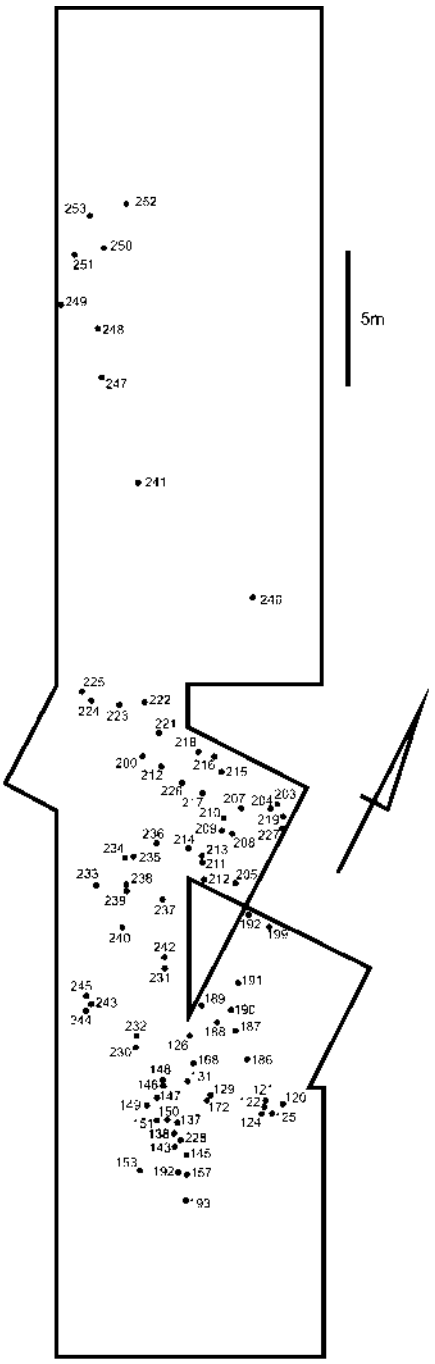

Fig. 4. System of GAC bridging construction poles

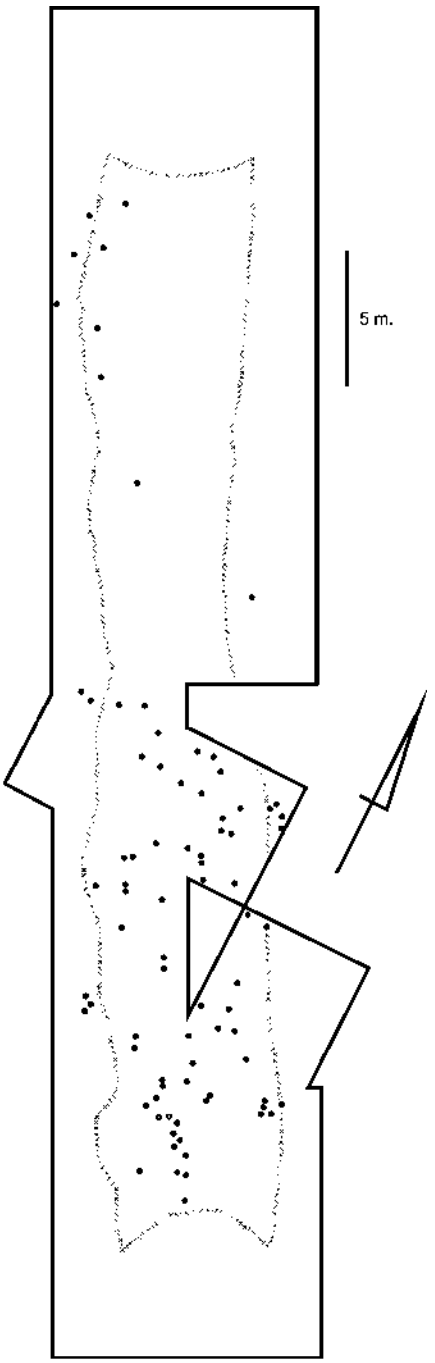

Fig. 5. Extent of fascine application in the system of GAC bridging construction poles

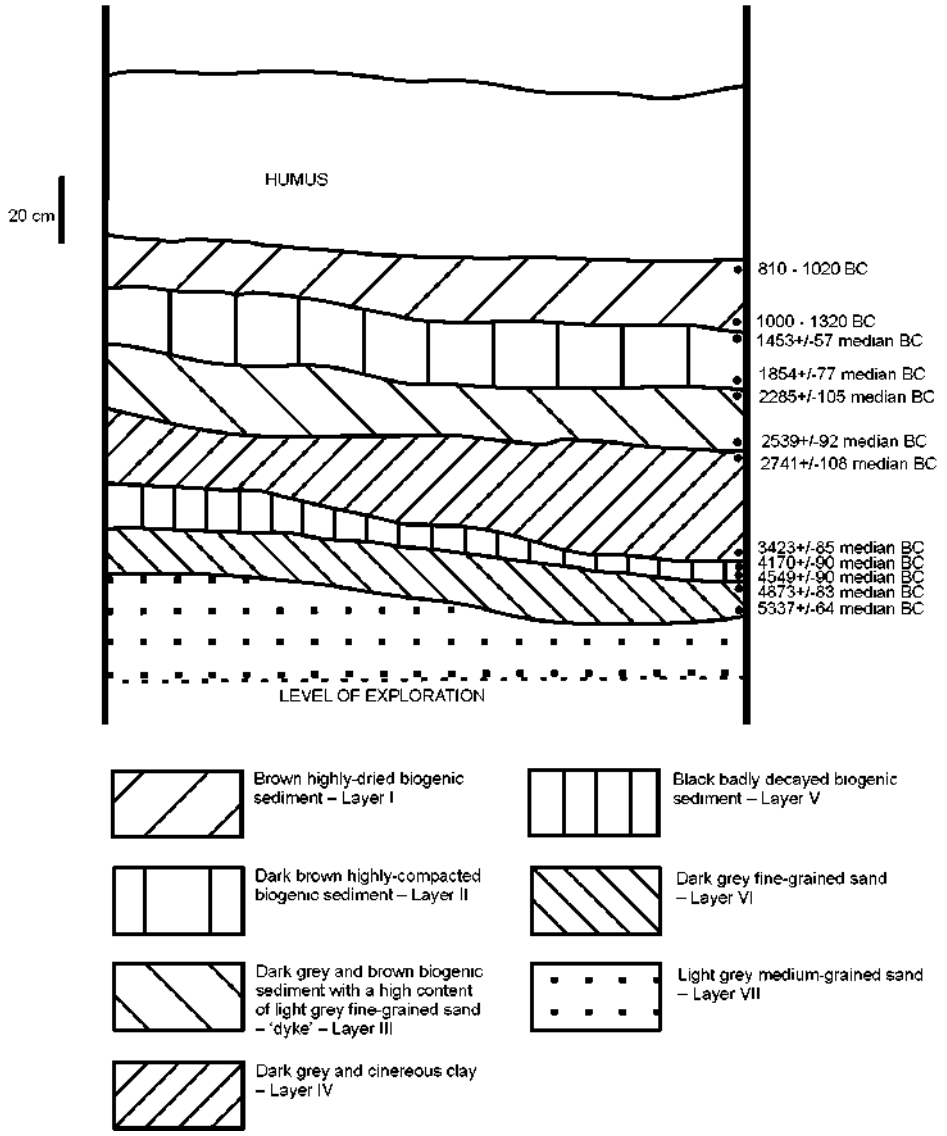

Fig. 6. Radiocarbon profile of excavations with GAC artefact bridging construction

Moreover, for the first time in the history of Polish archaeology, researchers discovered crossing structures made of wood (in particular, the causeway of the GAC community) which represented a section of the actual crossing through the Noteć River valley (or more precisely, which represented construction methods enabling

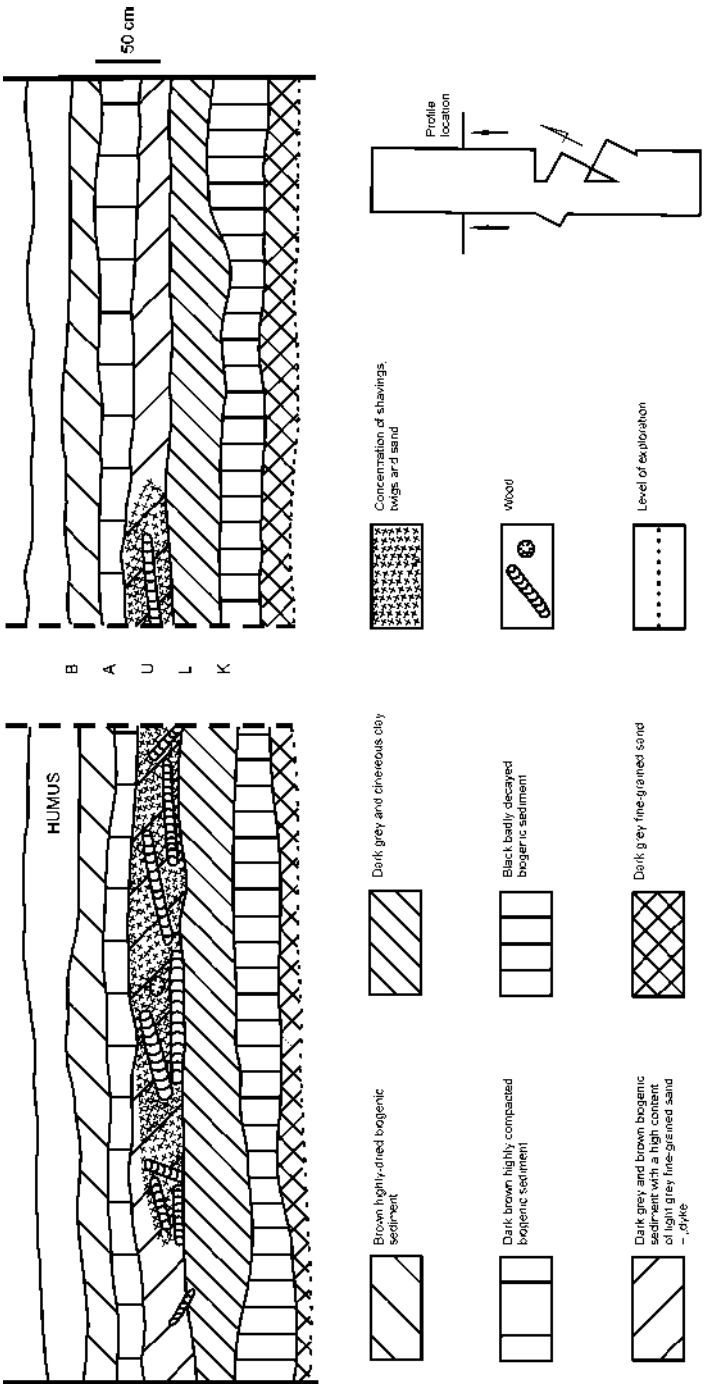

Fig. 7. Transverse profile of GAC bridging construction

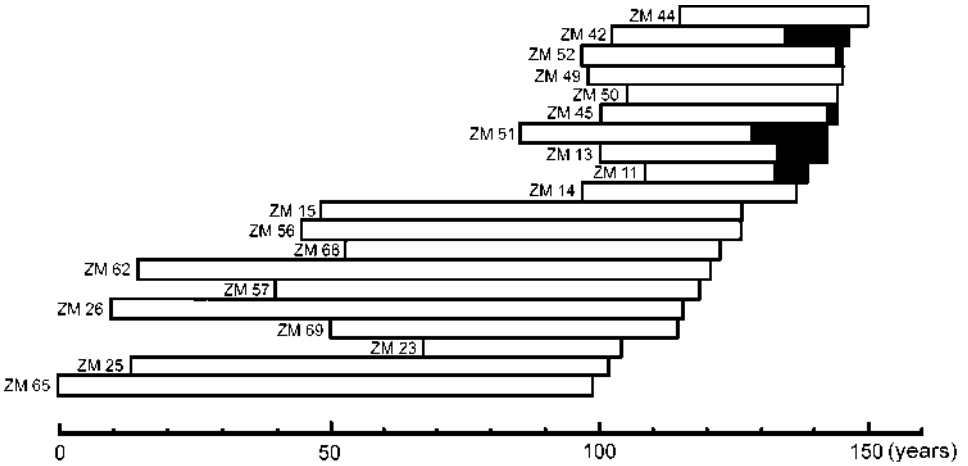

Fig. 8. Relative configuration of radiocarbon dating samples from causeway wood. Hatching denotes the outer core

the causeway crossing) and the oldest known evidence of land routes in the Polish Lowland [Rola 2006; 2008]. Based on these finds, it has been identified that there were various types of routes in the area with some being of greater importance than others. These channels connected individual Neolithic settlement centres, thus creating a complete network of both regional and inter-regional contacts. Most of the routes continued to be in use in subsequent millennia and periods until historical and also modern times. These were marked out in line with the "least effort principle" that is "they offered the easiest, quickest, most efficient route connecting two points" [Bakker 1976: 66]. The greater the significance of a given route, the more careful were the technical works enabling transportation, which gained in special importance at the turning point in the history of transport systems, i.e. upon the introduction and increasingly common use of carts and probably also horses. This very fact is well illustrated by the discoveries made on the Somerset plain in England where a few structures enabling transportation across swamps and peat bogs, dating back to the beginning of the 3rd millennium BC, were uncovered. Owing to that find, it was identified that the oldest routes were characterised by light-type structures enabling the movement of people only. If compared to other discoveries, it can be concluded that later structures such as the "more massive, track known as the Abbot's Way may have been built to allow movement of heavier traffic" [Coles, Hibbet 1968: 257].

Against this background, it appears that crossings through rivers, swamps or wetland were the most crucial points of the transport network developed in the Late Neolith. At the same time it needs to be noted that these crucial points, once

selected, were then being transformed into more stable (permanent) parts of the transportation system. These crucial points and only these points, in principle, required structures representing technical facilities of the routes [Rola 2008]. Each time relevant construction work was undertaken, it was determined by a few factors such as the nature of an obstacle, the means of transport to be used on a given track or frequency of going along the track. The remains of specific structures or, in more general terms, the technical facilities of crossing areas that are now being discovered appear to be the sheer consequence of the need for a transport network. However, it should also be noted that between the points of the network there was a whole range of other transport options with the course of tracks determined by various factors such as layout of the existing settlement network, season or weather conditions.

In the context of finds made to date, the activities of GAC communities in the area of the Polish Lowland can be closely linked to setting out and controlling the transportation system, both in terms of local and regional significance as well as supra-regional and wide-ranging scope (probably, similar features were displayed by the Mrowiny or Radziejów FBC group). The close of the 4th millennia BC saw the so called eastern (Pontic) exodus of the Globular Amphora Culture (GAC) communities as a consequence of which its settlers emerged in the territory of Eastern Europe [Szmyt 1996; 1999a]. Over the above time period, the system of main transport and trading routes connecting the areas stretching between the Baltic and Black seas, initiated already at the close of the Mesolithic Age, became well established. Such a system enabled both the circulation of cultural patterns and movement of groups of settlers along the following three main routes: the Volhynian, Podolian and Seret [Klochko, Kośko..., in this volume]. Each of these channels was probably linked to the network of alternative, intersecting tracks selected to suit specific weather conditions or seasons. Such transport and trading channels have found their distant reflection in the so called Cossack Black Sea Routes [Kośko, Klochko..., in this volume].

Therefore, the assumption that the local community was familiar with all types of crossings (starting from the simplest causeway crossings and ending with wooden and wooden-ground crossing structures) seems to be well-grounded, in particular, given the fact that the network of GAC routes was probably dense in the area of interest in this study. In the light of discussion pertaining to the introduction in the late Neolith of new means of transport, it should be highlighted that the bulk of crossings on the main communication channels were organised in a manner enabling the use of various vehicles, probably including four-wheeled carts drawn by pairs of oxen as evidenced by the find made in Żuławka Mała.

The routes marked out by the GAC communities, in particular, the crossing areas during this period in the basin of the middle and lower Noteć, now among those most extensively analysed, have become permanent features of the cultural

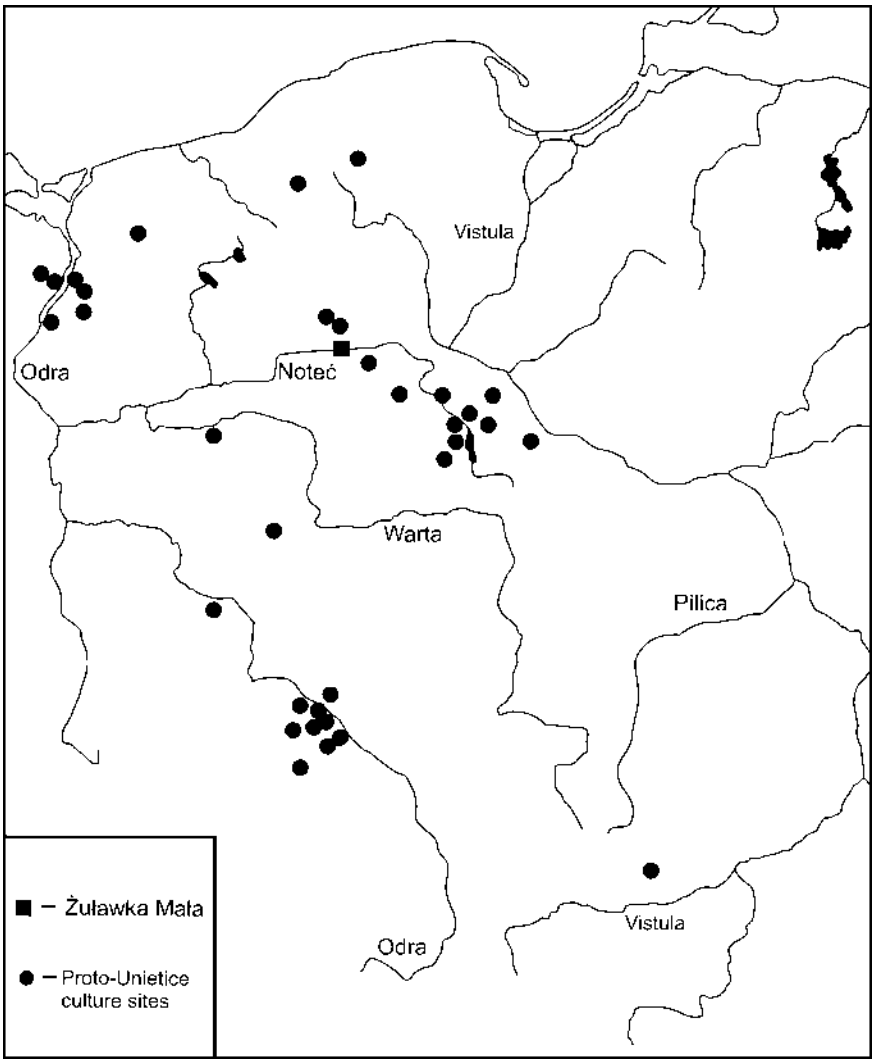

Fig. 9. The Żuławka Mała crossing in terms of PrUC dispersion in the Odra and Vistula inter-region [Kośko 1991, with appendices] ■ – Żuławka Mała; ● – The main extent of PrUC Central European sites

landscape. Furthermore, the history of the crossing areas discovered on the Noteć and dating back to the Late Neolith did not come to an end with the decline of the GAC settlement. These areas and their transport systems were used by communities in subsequent periods (Fig. 9) and this is supported by sound evidence from the

Middle Ages. In addition, some of these tracks and fords were abandoned as late as at the turn of the 20th century when technological advancement, following the development of railway connections and to a lesser extent, modern roads, enabled transportation across hitherto inaccessible areas.

*

In the light of present knowledge, it is evident that the basins of the Bug and the Vistula rivers in the area stretching between the Baltic and the Black seas as well as the North European Plain and Western Europe were covered by a dense and relatively stable network of transport routes, in this case archaic roads. Furthermore, these routes were actually the foundation of a system underlying cultural circulation. The transport network at that time enabled, both at a local and regional scale, the movement of human groups, exchange of various goods and dissemination of new concepts and inventions. The promptness of the aforementioned cultural transfer processes is indicated, among others, by the rapid development of the oxen-drawn cart. Additionally, the speed of the invention's adaptation points out to the fact that in the 4th millennium BC and the 3rd millennium BC, various communities scattered across vast areas in Europe, irrespective of their assigned archaeological classification, were ready to adopt this type of vehicle. Therefore, a comparable "engineering" advancement which allowed the communities to build structures necessary from a technological perspective for the use of carts should be highlighted in this context.

The view presented in this study of route networks, tracks and crossing areas allows to assume it was a prevalent phenomenon with its traces spread across the area subject to research. Although still today each find of relevance to the analysed issue is hailed as a wonder, the uniqueness of those discoveries should be deemed purely a reflection of the existing stage of research work. Undoubtedly, further development of research and the resulting increase in the base of source materials will devalue the status of such finds. This, however, will not impair the significance of both the crossing in Żuławka Mała and other, similar sites identified as part of efforts to reconstruct the functioning of prehistoric communities.

Translated by Ryszard J. Reisner

Baltic-Pontic Studies
vol. 14: 2009, 87-102
PL ISSN 1231-0344

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WAYS OF AMBER IN THE NORTHERN PONTIC AREA. AN OUTLINE OF ISSUES[1]

In memory of Professor Curt W. Beck

1. OLDEST INFORMATION

References to deposits of some kind of fossil resins in the Northern Pontic Area and data on their excavation, often connected with their long-distance export, appeared in the literature already in antiquity. According to W. Tuckij [Tuckij 2005: 37] already Pliny the Elder mentioned amber deposits in Scythia in the first century AD. Some historians claim that ancient Greeks had quite precise knowledge on the places where amber occurred in the Northern Pontic Area [Evans 1914: 44-45; Tuckij 2005: 37]. There are also Early Medieval records of the common use of amber on the Dnieper [Evans 1914: 44, where he cites the opinions of Prof. V. Chvojko of Kiev]. Popular knowledge of amber deposits in Ukraine has been a permanent feature of social awareness for centuries.

[1] The author wishes to thank Professors M. Szmyt (Poznań), V.I. Klochko (Kiev), P. Makarowicz (Poznań) and V. Otroshchenko (Kiev) for insightful discussions and valuable information.

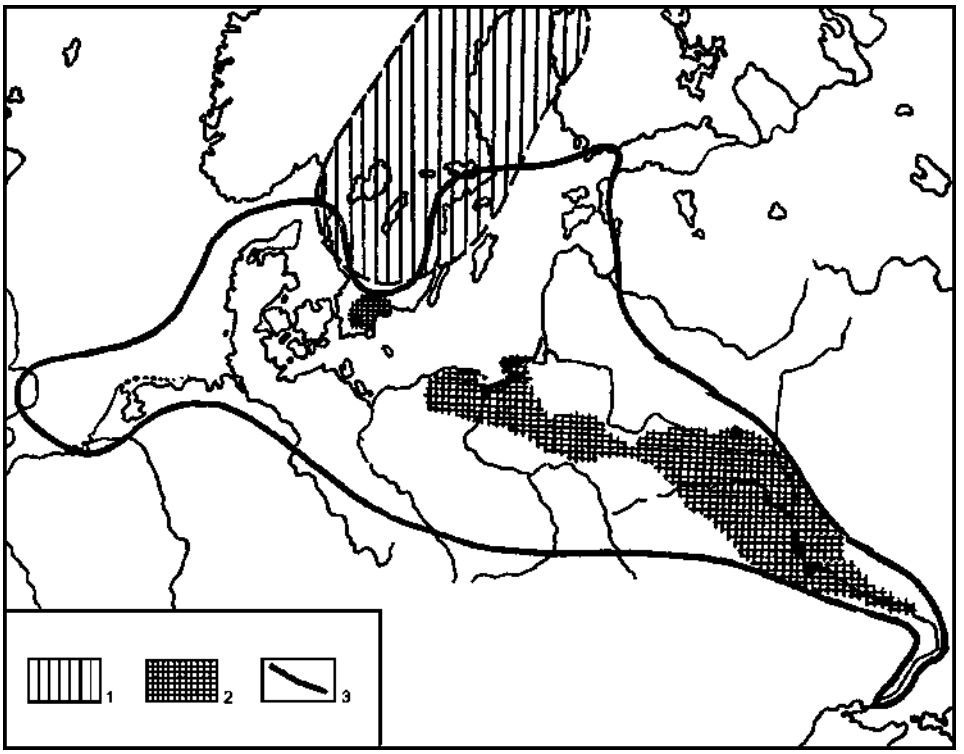

Fig. 1. The range of original amber deposits in central and eastern Europe [following Katinas 1971, Fig. 12]. 1 - Forest of "amber" trees, 2 - amber of Palaeogene deposits, 3 - boundary of distribution of redeposited amber

2. AMBER DEPOSITS IN UKRAINE

The earliest scientific records of amber outcrops in Ukraine date back to the early 18th century (cf. G. Rzączyński's information of 1721 quoted by W. Tutskij and L. Stepanjuk [Tutskij, Stepanjuk 1999: 53]). Fully scientific interest in the geology of amber deposits in Ukraine developed in the late 19th century. A precursor in this respect was P.A. Tutkowski. His investigations of 1890-1913 resulted in the first scientific descriptions of places and nature of amber deposits [after Tuckij 2005: 37]. A map of original (Tertiary) and secondary deposits of amber charted by V. Katinas [Katinas 1971] shows that original amber deposits stretch like a narrow belt from Pomorze in northern Poland to the basin of the lower Dnieper in southern Ukraine (Fig. 1). In the Eocene, the area was covered by a shallow sea into which a num-

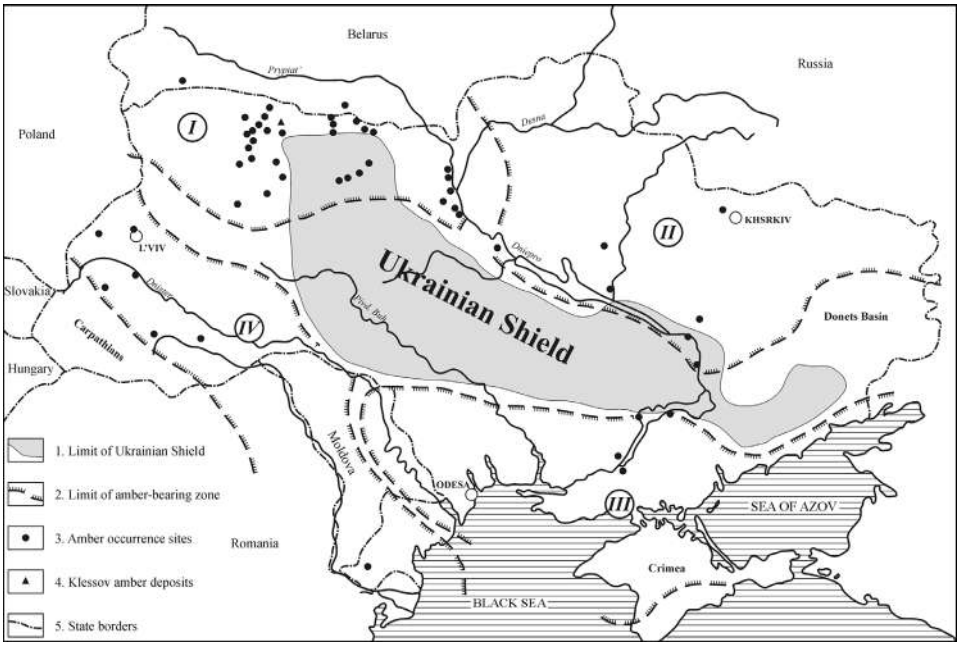

Fig. 2. Amber deposits in Ukraine [following Tuckij 2005]

ber of rivers emptied that carried amber-bearing tree-trunks. The delta of the most important of these rivers called the Eridanus, in reference to the Greek mythological tradition, was located in the Gulf of Gdańsk [recently: Kosmowska-Ceranowicz 2005]. Two other deltas are known: Parczew on the Lublin Upland [Kasiński, Tołkanowicz 1999] and –of the greatest interest to us here – Klesov in western Ukraine [Tutskij, Stepanjuk 1999]. Explored geologically sufficiently well today, the Klesov deposits [Tutskij, Stepanjuk 1999], are believed to be the main, but not the only place, where amber is found in the Northern Pontic Area. So far, a record has been made [Tuckij 2005: 38] of 50 places where fossil resins occur in Ukraine (Fig. 2). Certainly, the origins of the amber are varied. The oldest analyses of the chemical composition of amber from the middle Dnieper basin (specifically from outcrops located between Mezhygoriye and Tripolye), made in the early years of the 20th century by Prof. Olshausen of Berlin, show that the material contained 6.0-6.2% of succinic acid [Evans 1914: 45], i.e. the same amount as succinite – Baltic amber. Later, the figure was confirmed by infra-red spectroscopy which is currently believed to be the most reliable method of identifying succinite and other varieties of fossil resins [a great role in this connection was played by an American researcher, Prof. Curt Beck, who has recently died, cf. Beck 1966]. Current spectroscopic analyses

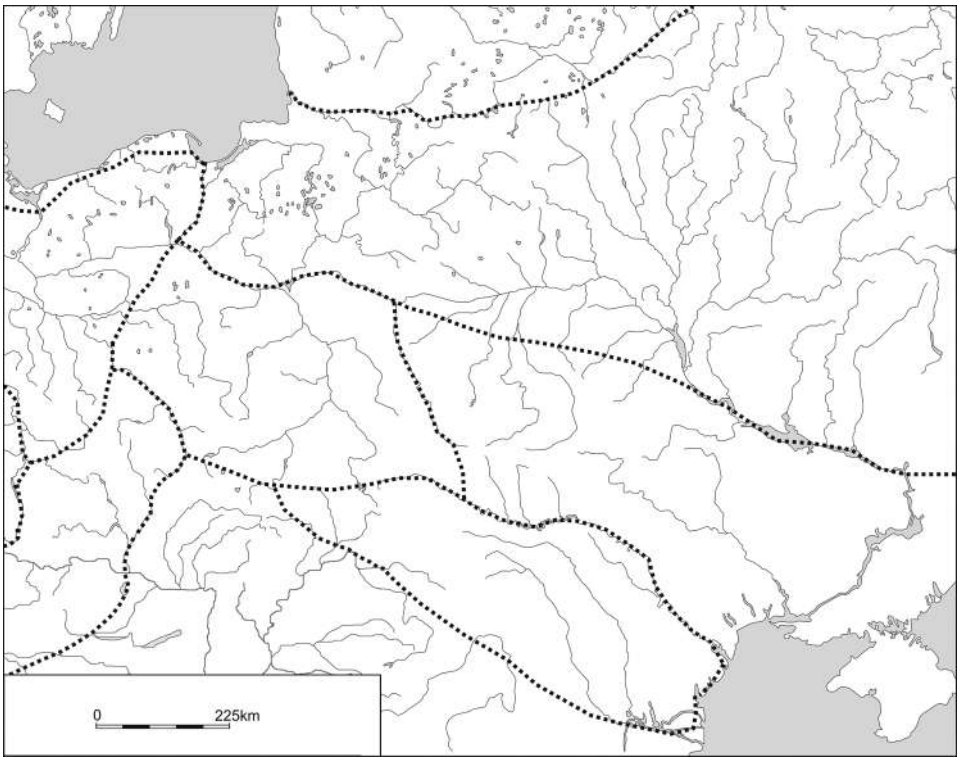

Fig. 3. Routes of interregional ties in central and eastern Europe in the Bronze Age [following Gimbutas 1965]

have confirmed that a vast majority of Ukrainian deposits are made up of classic succinite, i.e. amber identical with that found on the southern shores of the Baltic [Kosmowska-Ceranowicz 1983]. Only in the south-western part (next to the Carpathians), can one presume the existence of outcrops of another type of fossil resin, namely rumenite. The question, however, calls for more research.

The oldest records of archaeological amber finds in Ukraine date back to the turn of the 19th century. One of them concerns the investigations carried out by W.B. Antonowicz in 1895 and mentions amber objects found together with a stone axe in a village of Wiszewicze (Vyshevichi) near Radomyśl [after Tuckij 2005: 36, cf. item 26 on the list below].

It must be stressed here that information about the existence of local (Ukrainian) deposits of amber reached the international community of archaeologists early and sometimes by surprising channels. As early as 1914, A. Evans had surprisingly precise data on the subject. Relying on the account of Prof. V. Chvojko of

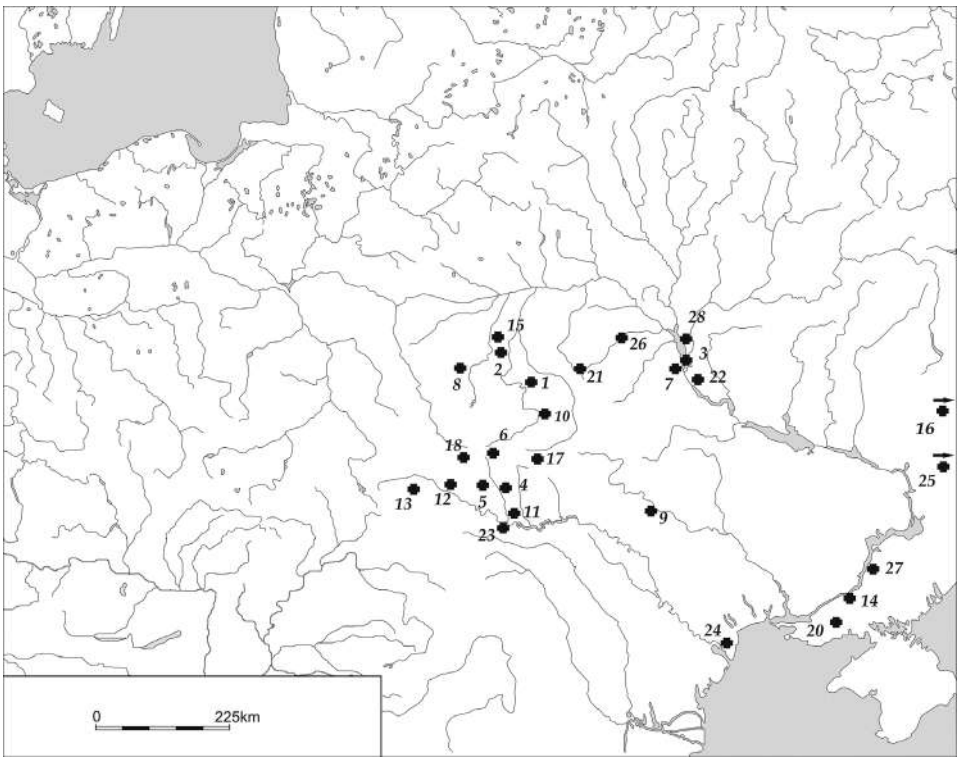

Fig. 4. Map of amber finds in Ukraine. Numbers on the map correspond to items in the list included in the text

Kiev, he described amber deposits on the middle Dnieper (between the localities of Mezhygoriye and Tripolye), where peasants found amber while fishing or collected it from places where once drained ponds or lakes had been or still gathered the material after it had been washed out by rain in valleys. The information, however, did not play any significant role in building models of amber dispersion in prehistory. The Ukrainian deposits were always largely ignored and yielded, in terms of significance, to the Jutland [de Navarro 1925] and Sambian [Czebreszuk 2007a] centres in individual explanatory models. Only in the late 1950s and early 1960s did two models of the cultural significance of amber exchange in the Pontic Area appear in the literature. They were developed by two great scholars: N. Sandars and M. Gimbutas.

The first model related directly to the main interpretation trends of archaeology as it was then. In 1959, N. Sandars suggested that the route of amber passage south, which directly connected the Baltic to the Black Sea, became active only in the 'European' Iron Age [Hood *et al.* 1959: 239], i.e. in the 1st millennium BC. With

any certainty the route can be claimed to have been active, in her opinion, only in the 7th century BC. This view, however, in light of currently available information, must be rejected outright.

M. Gimbutas [Gimbutas 1965] presented an entirely different picture by showing a network of routes crisscrossing central and eastern Europe especially in the latter half of the 2nd millennium BC [Gimbutas 1965: Fig. 15]. For the first half of the 2nd millennium BC (Early Bronze Age in central Europe), she chartered in detail the course of the amber route in Europe (Fig. 3) joining the shores of the Baltic to northern Italy and Greece [Gimbutas 1965: 47-52]. To justify her claims, she cited many specific data and referred to a vast number of publications. With this context, in sharp contrast stands her pronouncement on the European ways of amber in the said period. She mentions only amber from the cemetery in Sofievka [Gimbutas 1965: 52], which, relying on our current knowledge, is dated, however, to a period ca. 1000 years earlier [Kadrow 1995a; Kovalukh *et al.* 1995].

In M. Gimbutas' opinion, a significant change in this respect took place about the middle of the 2nd millennium BC (Middle Bronze Age in central Europe) when amber spread from the areas lying on the Baltic not only towards Greece, as it did in the preceding period in prehistory [Gimbutas 1965: 89], but also across the eastern part of central Europe as far as the Northern Pontic Area and further on to the eastern Caucasus [Gimbutas 1965: 89]. To justify her claims she gives meaningful examples of geographically distant finds of amber such as a cemetery at Khorochoj in Dagestan, north-eastern Caucasus [Gimbutas 1965: 89, Fig. 47:6], cemetery at Trialeti in Georgia [Gimbutas 1965: 89], or a cemetery at Agha-Evlar, Persian Talysh, northern Iran, chamber grave no. 1 [Gimbutas 1965: 89].

A direct elaboration on the conception developed by M. Gimbutas, the model of a corridor of contacts joining the Vistula, via Bug, Southern Bug (Boh) and Dnieper rivers, to the Black Sea was built by A. Kośko and other researchers associated with the *Baltic-Pontic Studies* series.

The question of the role of amber in enlivening long-distance exchange in the Northern Pontic Area above all calls for some groundwork to be completed first. What is particularly necessary is making a catalogue of sources, listing their numbers and kinds, which admittedly requires extensive studies. The present contribution does not claim to have such informative ambitions. The intention of the present author is to make the first step, opening space for future discussions.

The most comprehensive picture of amber finds in Ukraine was given by O. Vangorodska in 1985. Essentially, she can be considered a continuator of M. Gimbutas' ideas, although she does not quote her a single time. The number of prehistoric amber artefacts she collected from Ukraine is not large. Moreover, they need to be critically approached as they reflect the state of knowledge a quarter of a century old.

Below, a list of potential amber finds is presented together with short critical comments. The objects were unearthed in the part of Europe in question and date back to the Eneolithic and the Bronze Age.

1. Aneta, amber beads (number – ?) [Vangorodska 1985; Szmyt 1999a, Cat. 1A, item 1, see there for older literature], Globular Amphora culture.
2. Berezhnica [Vangorodska 1985], Corded Ware culture (?).
3. Cervonyj Chutir, grave 53(61), 1 amber bead (?) [Vangorodska 1985; Videiko 1995: 46] and grave 170 (28a), 2 amber beads [Vangorodska 1985; Videiko 1995: 56, Fig. 41:4], Sofievka group of the Tripolye culture.
4. Chorostkiv, amber disc [Vangorodska 1985; Sveshnikov 1985, Chart 9; Kadrow, Machnik 1997: 145-146], I. Sveshnikov assigned the object to the Podolia group of the Carpathian culture [Sveshnikov 1985, Chart 9, no. 25, within the Podolia group], whereas S. Kadrow and J. Machnik deemed it characteristic of the Mierzanowice culture [Kadrow, Machnik 1997: 145]. In year 2007 P. Jarosz and P. Włodarczyk claimed the find as Corded Ware Culrute without any doubts [Jarosz, Włodarczyk 2007: 81] and published one radiocarbon date: Poz-9450; 3515 ± 35 BP, 2470-2340 BC.]
5. Dovga, 10 amber beads [Vangorodska 1985; Szmyt 1999a, Cat. 1A, item 14, see there for older literature], Globular Amphora culture.
6. Dusaniev, amber disc fragment [Vangorodska 1985: 46; Sveshnikov 1985, Chart 9]. According to I. Sveshnikov, it shows links to the Podolia group of the Carpathian culture to which J. Machnik refers as a group of the Corded Ware culture [Machnik 1979a: 52].
7. Gatne [Vangorodska 1985; *Davna istoriya* 1997, Chart 11], called by O. Vangorodska the Corded Ware culture, in *Davna istoriya* [1997], however, she calls it the Middle Dnieper culture [*Davna istoriya* 1997, Chart 11, item 94 on the list of Middle Dnieper culture sites].
8. Gorodok, settlement, Corded Ware culture [Vangorodska 1985; Sveshnikov 1985, Chart 9, [?] culture, number on map: 39]; O. Vangorodska believed this, however, to be a different kind of fossil resin, known as rumenite [Vangorodska 1985: 47].
9. Hordeevka, cemetery, see comments below [Berezanskaya, Kločko 1998].
10. Ivanie, sun amber disc [Vangorodska 1985; Szmyt 1999a, Cat. 1A, item 20, see there for older literature], Globular Amphora culture.
11. Kotsiubintsy, amber disc [Vangorodska 1985: 46; Szmyt 1999a, Cat. 1A, item 32, see there for older literature], Globular Amphora culture.
12. Kolokolin, amber disc fragment [Szmyt 1999a, Cat. 1C, item 27 see there for older literature], Globular Amphora culture? Corded Ware culture?
13. Komarov, barrow 33, 3 amber beads [Makarowicz 2009b, see there for older literature], Trzciniec Horizon.
14. Lukianovskiy, barrow, one biconical bead [Vangorodska 1985: 47-48, see there

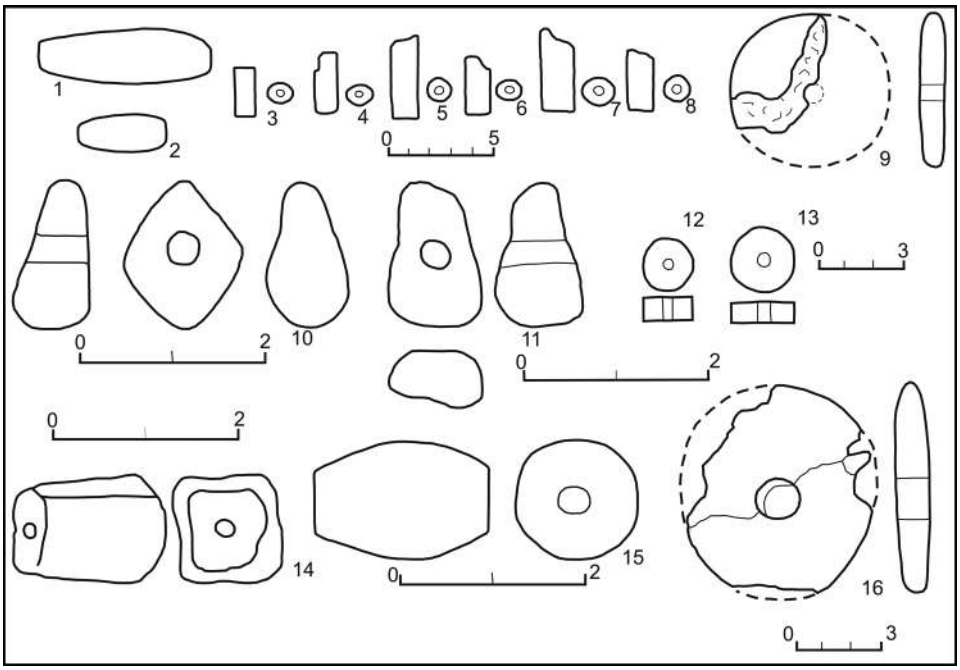

Fig. 5. Amber artefacts from Ukraine. 1-2: Zavalivka, grave 1 (not to scale); 3-8: Dovga; 9: Dusaniev (not to scale); 10: Novomikilskie, barrow 1, graves 6; 11: Voroshylovgrad, barrow 3, grave 9; 12-13: Striltshe; 14: Zapovitne, barrow 1, grave 1; 15: Shirokie, barrow 2, grave 2c; 16: Chorostkiv

for older literature], included in the Belozerka culture.

15. Mała Osnica, cementary, amber bead [Makarowicz 2010, see there for older literature], Trzciniec Horizon.
16. Novomikilskie, barrow 1, grave 6, two amber pendants [Vangorodska 1985: 47], the Donets culture of the Catacomb Cultural Circle.
17. Ostapove [Vangorodska 1985], Globular Amphora culture (?).
18. Rokitne, barrow 2, fragment of a subrectangular pendant with a central perforation [Sulmirski 1968; Fig. 19:21; Machnik 1979a: 66; Vangorodska 1985], Corded Ware culture, phase III, according to J. Machnik. O. Vangarodska, relying on I. Sveshnikov's findings, described the object as characteristic of the second stage of the Upper Dniester type of the Carpathian culture [Sveshnikov 1974]. Highly unusual in form (Fig. 5), the artefact has only one analogy: in a grave at site Opatowice 1 in Kujawy [Czebreszuk 2007b: 225-226; Kwiatkowska 2007], dated to the period of proto-Bronze, i.e. to the period of 2300-2000 BC [Czebreszuk, Szmyt 2007: 284].
19. Rusanova [Gimbutas 1985: 233], no specific data are available.

20. Shirokie, barrow 2, grave 2c, together with the find from Zapovitne – 3 biconical beads [Vangorodska 1985: 47-48], included in the Belozerka culture.
21. Skolobiv, 3 amber beads [Vangorodska 1985; Szmyt 1999a, Cat. 1A, item 52, see there for older literature], Globular Amphora culture.
22. Sofievka, the investigations by M. Videiko have also revealed that there are no amber finds at the cemetery in Sofievka proper, which has been suggested by O. Vangorodska [Vangorodska 1985: 45].
23. Striltshe [Machnik 1979a: Fig. 2:43; Vangorodska 1985; Kadrow, Machnik 1997: 146-147], believed by S. Kadrow and J. Machnik to have been a manifestation of Mierzanowice culture settlement.
24. Usatovo, large amber bead from barrow I-4 [Patokova 1979: 49-51; Vangorodska 1985], Usatovo group of the Tripolye culture.
25. Voroshylovgrad, barrow 3, grave 9, two quadrilateral-section beads [Vangorodska 1985: 47], Donets culture of the Catacomb Cultural Circle.
26. Vyshevichi II, single amber object [Szmyt 1999a, Cat. 1B/41b], Globular Amphora culture.
27. Zapovitne, barrow 1, grave 1, together with the Shirokie find, three biconical beads [Vangorodska 1985: 47-48], included in the Belozerka culture.
28. Zavalivka, grave 1, two amber beads [Vangorodska 1985; Videiko 1995: 129, Fig. 74:1], Sofievka group of the Tripolye culture.

The above list should, no doubt, be shortened by striking out the following three features: Gorodok (item 8), Sofievka (item 22) and Striltshe (item 23). The remaining items can be considered, with a varied degree of probability, in further studies. Furthermore, it must be stressed that in the case of amber finds in the Northern Pontic Area we deal with obvious underestimation, resulting from poor research advancement. This situation urgently needs to be changed, most desirably, by a research project based on a search query of archival and museum data. Some hope for such a change is offered by the Hordeevka find, item 9 on the above list, [Berezanskaya, Kločko 1998], where Bronze Age grave assemblages have been recorded rich in amber artefacts [see Klochko..., in this volume; Shumova 2005; Ślusarska 2003a; 2003b;...in this volume]. The quantity of amber discovered in Hordeevka alone exceeds tens of times the total amount of finds unearthed on all other Eneolithic and Bronze Age sites in the Northern Pontic Area.

The oldest amber finds in the discussed area are known already from Palaeolithic sites, specifically from the town of Dobroniczivka [not included in the above list, cf. Vangorodska 1985: 45]. The quoted author claims that there are no amber finds dated to the Neolithic [for a brief discussion of periodization and chronology in the discussed areas see Klochko 2001a: 10-11] and that they reappear in the Eneolithic [Vangorodska 1985: 45]. Similarly to M. Gimbutas, she claims that amber finds appear in the course of the 3rd millennium BC in different groups on the Dnieper and west of it. Significantly, the finds come from places close to the

richest deposits of Ukrainian amber (cf. the location of the Klesov delta). Amber is known then from the Sofievka and Usatovo groups of the Tripolye culture, the Globular Amphora culture and Corded Ware culture, which belongs already to the Early Bronze Age in Ukraine (Fig. 5). What is worth emphasizing in this context is the significance of a find related to the Usatovo group in Usatovo-Velikiy Kuyalnik [Patokova 1979: 49-51; Vangorodska 1985: 45]. The find is the oldest instance of amber discovered on the shores of the Black Sea.

However, the most numerous amber finds occured at that time in association with the Globular Amphora and Corded Ware cultures, i.e. with unequivocally central European groups. The abundance of amber finds is observable throughout the 3rd millennium BC [Szmyt 1999a; Czebreszuk 2003], i.e. in the Late Eneolithic and Early Bronze Age. Amber from this period is found at Sofievka-type cemeteries on the middle Dnieper. Specifically, we know of tubular amber beads from graves 53 (61)? and 170 (28a) at a cemetery in Krasny Khutor [Videiko 1995: 46, 56, Fig. 41:4] and at a cemetery in Zavalovka, grave 1, [Videiko 1995: 129, Fig. 74:1c, d]. Typologically, amber associated with all the three cultural contexts (Globular Amphora culture, Corded Ware culture and Sofievka group of the Tripolye culture) shows clear affinities to central European patterns especially those related to the Globular Amphora culture; to mention only two: sun discs or tubular beads. Thus, in terms of provenance, the amber is unequivocally related to the north-west (Vistula drainage). Taking into account, however, the fact that the finds were made close to the local sources of the material, the possibility that the demand for amber was locally satisfied cannot be excluded altogether. Yet O. Vagorodska's view that the material was imported from the south-east Baltic [Vangorodska 1985: 48-49], relying on the presumption that the local (Ukrainian) amber is of a different variety, seems to be going too far in light of the current knowledge. For the material from Ukraine's richest Klesov deposits is of the same geological provenance as the deposits on the Baltic [Tutskij, Stepanjuk 1999].

In the course of the second half of the 3rd millennium BC, 'Amphora' style discs continue to be encountered in the broad environment of the Corded Ware culture in eastern Europe [Gimbutas 1985: 252]. An important find going back to that period is a subrectangular pendant with a central perforation from Rokitne (item 18 on the list) classified as phase III of the local Corded Ware culture [Machnik 1979a: 66]. By analogy to a well dated find from Opatowice, Kujawy, it can be argued that the pendant originated with north-western exchange ties, and goes back to the late 3rd millennium BC.

Other amber artefacts that we know of come from the Donets culture of the Catacomb Cultural Circle. They are two finds from eastern Ukraine: Novomikilskie (item 16 on the list) and Voroshylovgrad (item 25) deprived of any clear typological or genetic connotations. Interestingly enough, E. Kaiser's studies of the western Catacomb culture (between the Dnieper and Prut rivers), dated by her generally

to the latter half of the 3rd millennium BC [Kaiser 2003: 78], showed a complete absence of any amber goods [Kaiser 2003].

In light of the current knowledge, in the first half of the 2nd millennium BC, hence in the Middle Bronze Age, there is a gap in the appearance of amber goods in the Northern Pontic Area. However, it is highly probable that it is a result of an unsatisfactory state of research.

Only since the middle of the 2nd millennium BC did the share of amber finds increase in the Northern Pontic Area. In the Belozerka culture (hence in the late 2nd millennium BC), on the lower Dnieper, the material was recorded on three sites: Lukianovskiy barrow (item 14), Shirokie (item 208) and Zapovitne (item 27). It took the form of biconical beads – a common form from the Baltic to as far as Italy in the developed Bronze Age hence of little distinguishing power for provenance discussions. In the years immediately following the middle of the 2nd millennium BC, in western Ukraine, on the middle Southern Bug (Boh) River, we are faced with an usual feature: a cemetery in Hordeevka [Berezanskaya, Kločko 1998; Ślusarska 2003a; 2003b]. The cemetery is exceptional throughout the Northern Pontic Area and incomparable to any other Belozerka culture finds most proximate in time [Vangorodska 1985: 48; Berezanskaya, Kločko 1998: 18-20]. O. Vangorodska claims that in the whole latter half of the 2nd millennium BC in Ukraine, besides Hordeevka, there were only few finds of amber, with all of them being located immediately east of the lower Dnieper. Hence, it follows that Hordeevka was then an isolated discovery, which makes the cemetery even more exceptional. The more exceptional it is, the more attention it deserves.

At the Hordeevka cemetery, amber goods were recorded in as many as 21 graves. Theses are the following barrows: 5 (grave 1), 6, 7, 10, 11, 12, 14, 15, 16, 17, 18, 21, 24, 26, 27, 28, 31, 32 (grave 2), 34, 37 and 38. In the initial stages of cemetery development, the goods were beads, almost with no exception, with a vast majority of them being of the biconical type and of different sizes [Ślusarska 2003a]. In several graves, bead assemblages are very numerous. Over 100 objects were found in barrows 6, 11, 16, 21, 24, 28, 31 and 38. These are burials included in the first three phases distinguished at the cemetery: phase I (6, 24, 28), phase II (11, 16, 21), phase III (31, 28). Amber was not so numerous in the last phase (IV), although it did occur then (see barrows 32, 34 and 37). It was also then that other bead varieties appeared, specifically Tiryns and Allumiere types.

Biconical beads are very common Bronze Age finds across vast areas from Italy in the south-west to Greece in the south and the Baltic Sea in the north. Thus, they can hardly be treated as a significant chronological or genetic marker.

Among Hordeevka amber beads, two types deserve special attention, namely, Tiryns and Allumiere (Fig. 6), which are encountered only in the late stage of the use of the cemetery. What is interesting here is the question of their provenance. In the opinion of central and eastern European researchers they should be linked to the

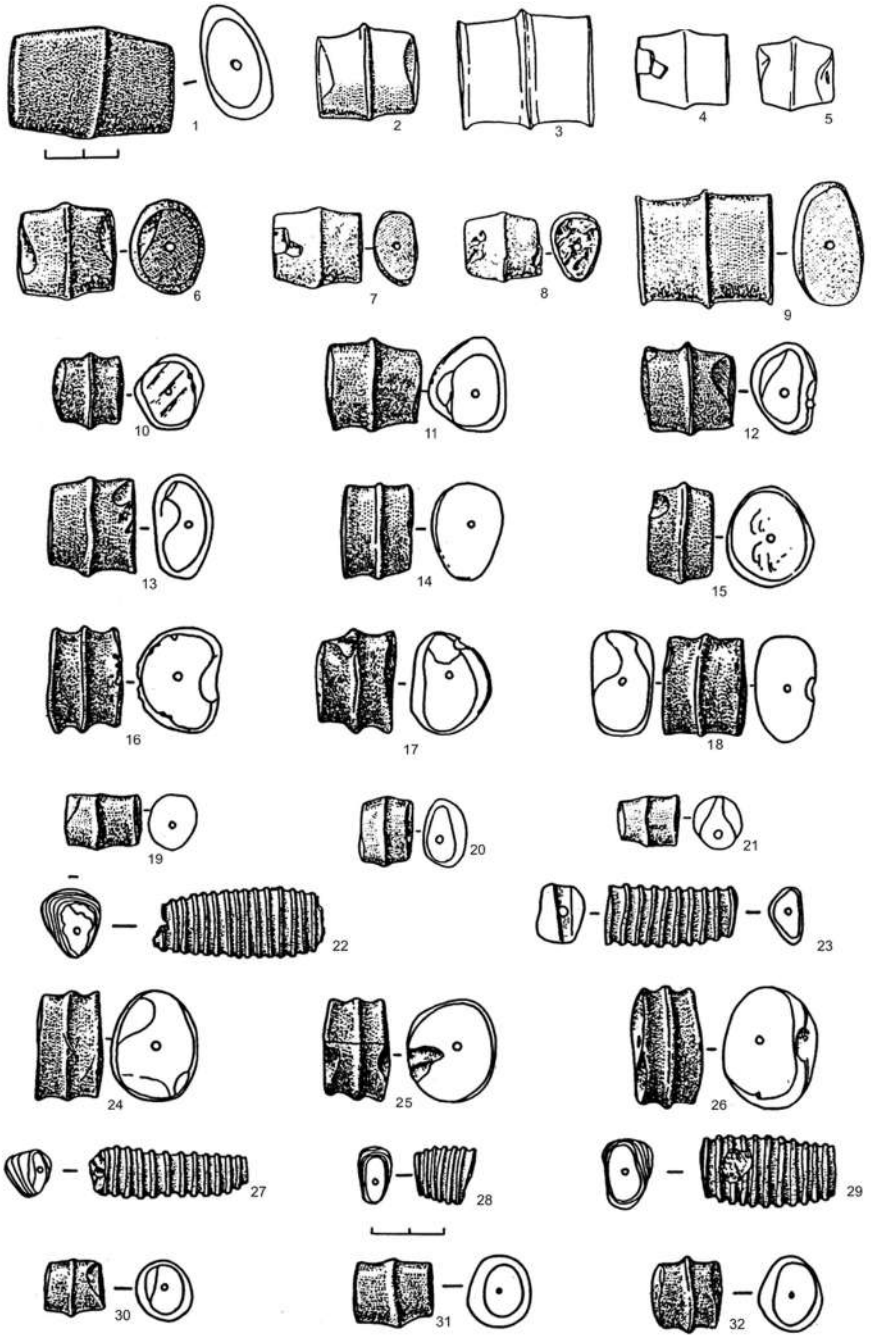

Fig. 6. Tiryns and Allumiere type beads from Hordeevka [following Berezanskaya, Kločko 1998: 1-9: barrow 31, 10-32: barrow 38]

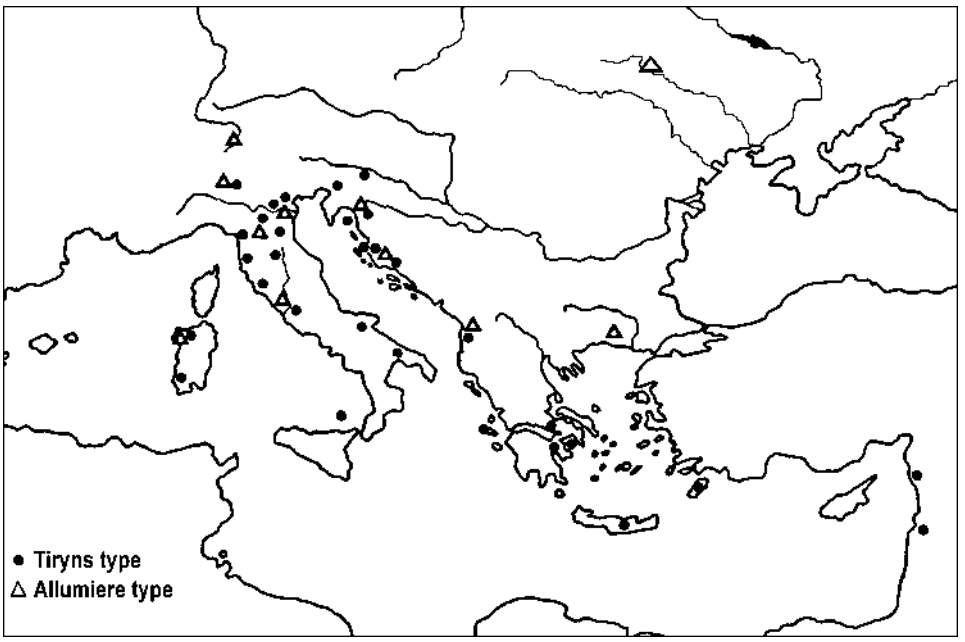

Fig. 7. Distribution of Tiryns and Allumiere type beads [following Harding 2000 with amendments]

eastern Mediterranean, specifically to the late Mycenaean culture, after the watershed of 1200 BC, which in relative chronology corresponds to the Late Helladic IIIC and Submycenaean periods [Berezanskaya, Kločko 1998; Ślusarska 2003a; 2003b]. A slightly different opinion is shared by scholars studying the Mycenaean culture to whom these artefacts are rather alien to this culture's tradition. They are considered one of the cultural elements making up a package characterizing the period 'after the catastrophe', which often means it could have reached the Mycenaean oecumene with migrants. Describing amber from the Tiryns hoard, G. Karo linked it to the 'North' already in 1930 [Karo 1930b: 139]. Also Ch. Souyoudzoglou-Haywood [Souyoudzoglou-Haywood 1999: 85] and A. Vianello [Vianello 2005] believe that a clear concentration of amber finds on the Ionian Islands (north-western Greece) is related rather to the contacts with northern Italy than with the Mycenaean culture. A similar approach is taken now to the provenance of Tiryns and Allumiere beads; it is now ever more often discussed in the context of lands from the Po valley, across *Caput Adria* as far as the western Balkans [Harding 2000: 190-191] (Fig.7). In this context, Hordeevka may be also treated as a place on a east-west route, joining the Carpathian Basin, across the Carpathians, to the Northern Pontic Area. As scholars investigating the cemetery show, in Hordeevka, we deal with a broad range

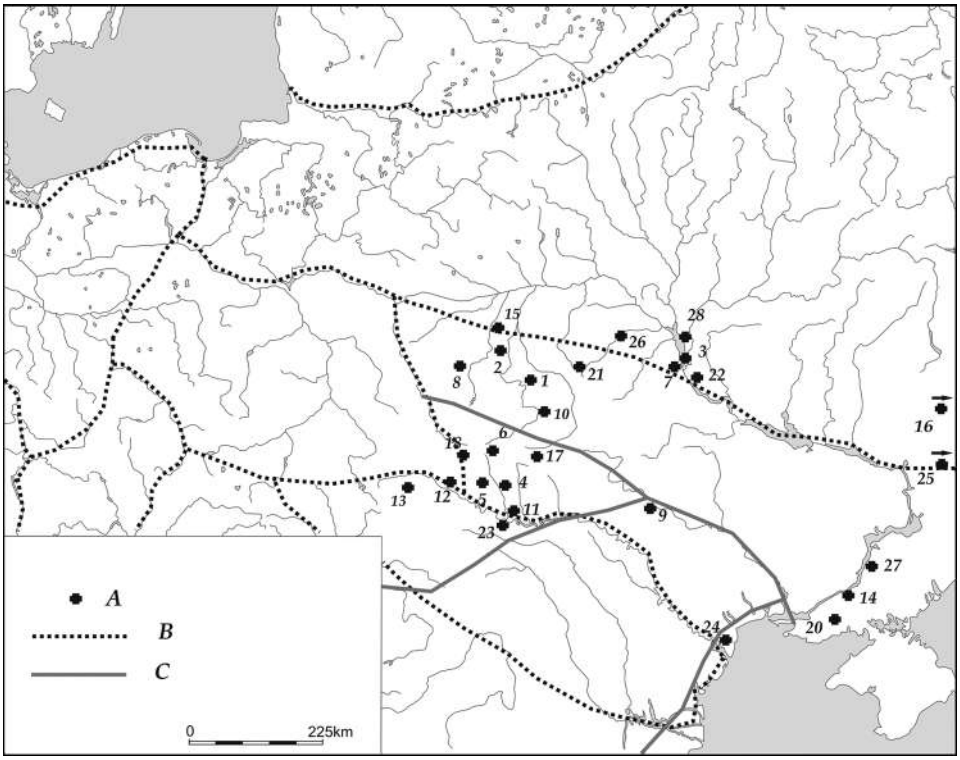

Fig. 8. Map of long-distance amber routes in Central and Eastern Europe. A - sites with amber finds, B - course of routes [according to Gimbutas 1965], C - suggestions of amendments to the route network

of varied long-distance influences [Berezanskaya, Kločko 1998] to mention a few: metals showing analogies to the Tumulus culture and the Urnfield culture (generally 'Carpathian'), traits of 'steppe' societies, finds typical of the so-called 'higher culture' (horse harness) and an early presence of iron goods (possible connections to Anatolia).

The location of the cemetery was not random when one considers either amber deposits (close to significant Klesov deposits) or the network of long-distance ties. With respect to the latter, we certainly deal here with a junction of routes going from the north-west towards the south-east (Baltic – Black Sea) and from the west towards the east (Carpathian Basin – Black Sea steppes) (Fig. 8). There is no doubt that the former route was extended as far as the Aegean in the south. What is only controversial here is the question whether the extension was a sea route (across the Black Sea) or a land one (along the western shores of the Black Sea). The question calls for more specific research in the future.

3. SUMMARY

The question of adaptation of amber goods by the prehistoric inhabitants of the Northern Pontic Area and the role of the material in setting up long-distance ties in this part of Europe is very insightful but hard to analyze. Although we have only begun to tackle it, it is possible already to present some conclusions and research recommendations.

1. There is no doubt that Ukrainian amber, in terms of physicochemical properties, was identical to Baltic one. Hence, there is no way of distinguishing one from the other.
2. Ukrainian deposits (especially in the Klesov delta) were known and available already in antiquity.
3. The oldest cultural contexts of systematic occurrence of amber goods were related to the following cultures: Tripolye, Globular Amphora and Corded Ware.
4. A hypothesis may be accepted that north-western influence (central European) triggered interest in amber in the Northern Pontic Area in the early 3rd millennium BC. This, however, does not exclude the possibility that the demand for amber was satisfied by local deposits, especially when one considers the fact that amber finds are concentrated in their vicinity.
5. The hypothesis about the north-western origins is borne out by typologically unequivocal (central European) character of Globular Amphora and Corded Ware culture finds in Ukraine.
6. Moreover, it must be stressed that in the 3rd millennium BC no local amber style developed in the discussed area.
7. It is possible then that amber had a share in building the Baltic – Vistula – Bug – Southern Bug – Black Sea route (corridor), which is evidenced, next to the information given above, by the first amber find on the Black Sea coast discovered in Usatovo-Vielikij Kujalnik in a tell-tale location: close to the place where the Sothern Bug empties into the Black Sea (Fig. 8).
8. In the late 3rd and in the early 2nd millennia BC, there is a decline in amber finds, although the find from Rokitne (item 18 on the list) testifies to the maintaining of ties with the north-west (Kujawy).
9. A smaller quantity of archaeologically recorded goods may reflect a poor state of research or an actual stagnation in amber use. Single objects are known only from the Corded Ware culture and the Donets culture of the Catacomb Cultural Circle, hence solely in its eastern oecumene (no amber has been found in the Catacomb culture west of the Dnieper).
10. The middle of the 2nd millennium BC saw a renaissance of amber trade. What is uncertain is the degree to which the revival is related to the local deposits and

to which to contacts with central Europe (through a network of long-distance routes). The latter is more probable as shown by typological data.

11. Likewise in the 3rd millennium BC, the typology of the goods is foreign, but without north-western analogies as was the case previously. In this case they should be linked to the Aegean or northern Italy/western Balkans. Taking into account the dispersion of Tiryns and Allumiere type beads, the latter location seems to be more probable.
12. In the period in question, there must have been in place a more complex system of circulation of information and goods that joined central Europe to the western Balkans, *Caput Adria* area and northern Italy, the Adriatic, Aegean, and Anatolia.
13. How far was the Black Sea coast involved in the network? This question is not clear although it is highly probable that the Baltic – Black Sea route was extended in the south as far as the Aegean and Anatolia (Fig. 8).

The above conclusions must be treated with great caution only as signposts for future research. For there is absolutely no doubt that the quantity of amber finds from the Neolithic and Bronze Age in the Northern Pontic Area is underestimated. There should also surface some Neolithic finds. We are still before a fundamental stage of research, which would provide a basis for many analyses, namely the building of a current catalogue of prehistoric amber finds from the area in question, relying chiefly on a search query of finds kept in museum storage facilities. Only then will it be possible to say whether any local style of amber finds developed there and, if so, what kind of and in what cultural contexts.

Translated by Piotr T. Żebrowski

Baltic-Pontic Studies
vol. 14: 2009, 103-123
PL ISSN 1231-0344

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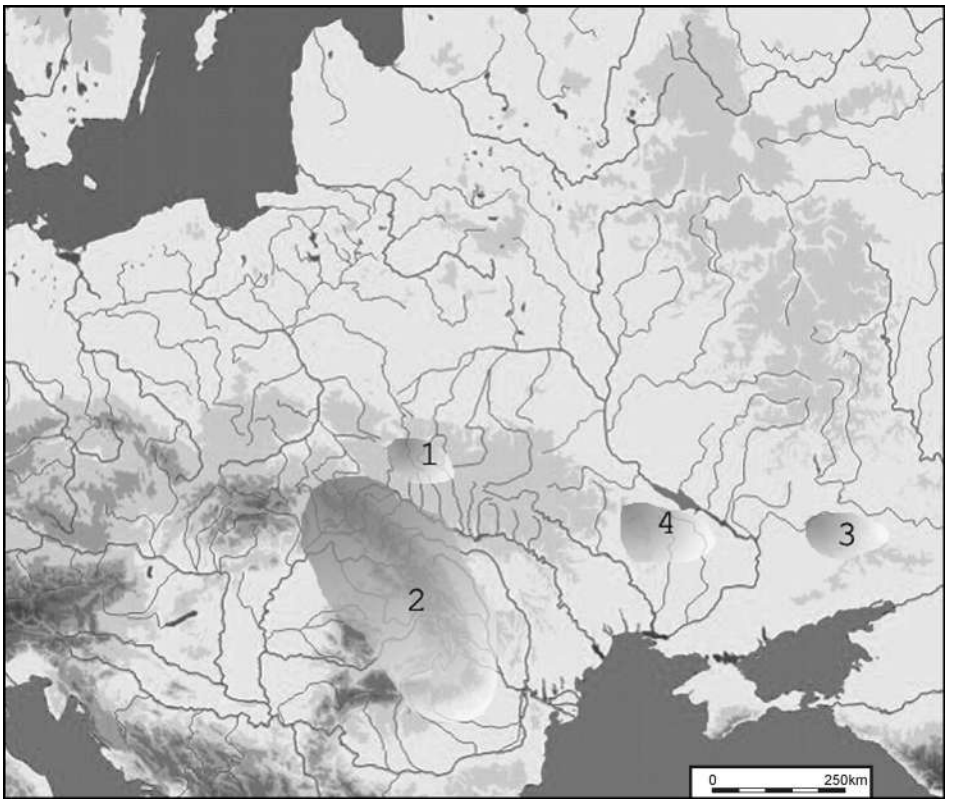
COPPER ORES OF THE NORTHERN PONTIC REGION AS RAW MATERIALS FOR PRODUCTION ACTIVITY IN THE PALEOMETAL AGE (BASED ON THE STUDY OF THE KARTAMYSH ORE MINING AND METALLURGY COMPLEX)

The article aims at analyzing the state of knowledge about Ukrainian copper ores as a raw material for manufacturing activity in the paleometal age.

The research undertaken in the Donets Basin in this field not only resulted in the discovery of the presence of evidence of ore mining and metallurgy in the region, but also, based on the example of the Kartamysh ore mining and metallurgy complex, allowed identification of large-scale manufacturing production in the paleometal age.

The issue of metal production (copper–bronze) in the paleometal age is one of the most topical research themes in the archaeology of Eastern Europe. We define such production as a combination of consecutive closely interconnected technological operations or production cycles aiming at obtaining metal products as the final output. Such technological operations in metal production include ore excavation (mining and extraction cycle), ore enrichment (mining and enrichment cycle) and ore melting (fusion, metallurgical cycle). This chain of production operations in the system of metal production is completed with the metal processing cycle. Hence, in a broad sense, metal production – in our understanding of the notion – in addition to copper ore extraction, its enrichment and ore melting, includes metal processing, which aims at obtaining finished products.



Map 1. Map of Ukraine's copper ores which could be extracted and processed in ancient times (after V.I. Klochko). 1. Virgin copper from the Volhynia area; 2. Carpathian copper ore basin; 3. Copper ores of the Donets basin; 4. Kryvyi Rih basin

1. IDENTIFICATION OF RAW MATERIAL BASE AVAILABLE IN THE PALEOMETAL AGE

For ore mining and metallurgical activity to emerge and function in ancient times, the necessary condition is ownership of available raw materials, exploration of which would be possible by the indigenous (local) population in that period. The territory of Ukraine, as well as of Eastern Europe, is generally poor in copper resources but does not lack them completely. Presently known copper ore deposits belong to the Ukrainian crystalline massif. They occur in its central part, in the area of the Sea of Azov, in the north-western part of the massif, as well as in the Volhynia – Podolia plate in basalts of the Rivne region.

Furthermore, copper ore deposits are known in the Donets Basin region and the Transnistria, where they belong to the Palaeozoic thick layer of sedimentary rock and are represented by copper-containing sand-stone and shale. Generally speaking, the copper ore deposits registered there by geologists [the Nosov brothers 1865, 1868; Tanatar 1931; Małkowski 1929; Gerschoig 1940; and others] presently have no industrial value, but they could have been used in the paleometal age.

This view has been actively advanced lately by Ukrainian researchers such as V.I. Klochko [Klochko 1994a; 2004] and L.A. Chernykh [Chernykh 2003; 2005] (Map 1).

However, there is a different view, formed in Eastern European archaeology due to the studies by Russian researchers E.N. Chernykh [Chernykh 1966; 1978a], N.V. Ryndina [Ryndina 1971; 1993; 1998], and V.S. Bochkarev [Bochkarev 1995; 2006]. Its argument is that the manufacturing activity of the ancient population of Ukraine in the Eneolith – Bronze Age was of a predominantly metal processing nature. Their studies focus primarily on identifying metal processing centres in the Northern Pontic region, which would be dependent on imported – Balkan, Caucasian, or Volga – Ural – raw materials. Therefore, by turning Ukraine into an "oreless" zone, the Russian researchers, in fact, reject the possibility of active ore mining and metallurgical operation here in the paleometal age. The exception is the territory of the Donets Basin, where the existence of a full cycle of metal production is still recognized; however, unfortunately, its role in the development of manufacturing activity of the ancient population of the Eastern European steppe and forest-steppe remains underestimated.

Analysis of the studies of the so-called "metallurgical trend" [Chernykh 1976; Ryndina 1998; Orlovskaya 1990], performed by L.A. Chernykh, highlighted a possibility of different interpretations of chemical groups of metal [Chernykh 2003], while the studies by V.A. Galibin generally challenge the principle methodological foundations of E.N. Chernykh's concept [Galibin 1990; 1991].

Revision of E.N. Chernykh's conceptual principles and provisions of copper – bronze production on the territory of Ukraine in the Eneolith – Bronze Age has been traced in the works of V.I. Klochko [Klochko 1994a; 2004; and others]. The researcher pointed out to the presence of ore deposits in the Right-Bank Ukraine, their easy availability due to outcropping, as well as to traces of ancient extractions with the evidence of production tools and fragments of Corded Ware pottery (Velykyi Midsk and the Rivne region) [Małkowski 1931]. Based on the area's geological and geo-chemical study results, the researcher allows the possibility of the deposits' usage in pre-historic times, including during the Trypillia era [Klochko *et al.* 2000; 2003; Klochko 2004]. However, these are still assumptions, though not groundless ones. Regrettably, no purposeful investigative search for ancient ore mines, nor archaeological research has been undertaken in the copper ore occurrence areas of the Right-Bank Ukraine, more precisely,

in the Pre-Carpathian region, the Carpathians and the Volhynia region. Obviously, this fact explains to a large extent researchers' views about the predominantly metal-processing nature of production performed by that population of that region of Ukraine.

A broad circle of researchers shared the same view on the production activity of the population of the Left-Bank Ukraine, which allegedly had been of a metal-processing nature. The opinion that tribes of the Srubnaya culture populating the Northern Donets river basin had almost completely avoided ore mining and metallurgy, expressed as long ago as in the early 1970s [Chernykh 1972] has not been confirmed. Similarly, time has refuted the perspective that the Don River basin had been a periphery of the ancient metallurgy and metal processing system of the south-western part of Eastern Europe [Pryakhin 1996]. Importantly, the very idea of the Srubnaya culture centre of metallurgy and metal processing had been based for a rather long time on results of studies performed within the confines of the Volga – Ural region [Chernykh 1970].

2. DONETSK ORE MINING AND METALLURGICAL CENTRE (DOMMC)

In recent years, the Bronze-Age Donetsk Ore Mining and Metallurgical Centre (DOMMC) has gained increasing significance in connection with massive excavations of Bronze Age monuments in the area of manifested copper deposits in the Donets river basin, as well as the monuments located nearby, which have produced clear evidence of production activity. Its identification is connected with the name of S.I. Tatarinov who studied 27 ancient ore mines on the territory of the Bakhmut hollow and explored some production sites and settlements of ancient ore miners and metallurgists of the late Bronze Age [Tatarinov 2003; 2005].

Specialization of everyday household monuments is a typical feature of the DOMMC, based on its reserves of sulphides and oxidised copper ores. These monuments are connected with extraction, enrichment of copper ore, metal melting and production of metal objects, i.e., all cycles of metal production are represented in the sites [Brovender 1997].

The Bronze-Age Marmysh ore mining and metallurgical complex is the most noteworthy among the known monuments in the Bakhmut hollows. It is located near the village of Novozvanovka, Popasnaya district in the Luhansk region, in the eponymous ore deposit area [Pryakhin *et al.* 2003; Brovender 2005; 2006; 2007; 2008a, b; Brovender, Zagorodnyaya 2007; and others].

The territory of 0.4 sq. km contains three quarries, five underground ore mines, a vast technogenic area used in the ore enrichment process, and two settlements of ancient ore miners and metallurgists.

Up to 3 km large, the Kartamysh ore bearing area is outstanding in terms of a very high proliferation of carbonated plant organics that contains the highest percentage of copper compared to other ore-bearing areas of the Donets Basin. The embedded ore bodies contain up to 3%, and solid ores up to 60% of copper (concretions and pseudomorphoses by carbonated organics). Four ore horizons up to 0.8 m thick and several kilometres long, represented by lens-shaped bodies of solid and embedded ores, are traceable within the ore bearing area. The mineral composition of ores includes chalcocite and, to much lesser extent, bornite and chalcopyrite. Malachite and azurite are developed in the oxidation zone [Lurie 1988].

3. DOCUMENTATION OF METALLURGICAL ACTIVITY TYPES

3.1. QUARRY-TYPE ORE MINING SITES (CHERVONE OZERO-I-III)

The scale of ore mining in the area is truly remarkable. The largest quarry cup of the Chervone Ozero-I mining ore was ellipse-shaped and reached 100 x 70 meters (Photo 1). The height of the rock refuse is over 6 m. The exact depth of the mine is unknown due to substantial thickness of the alluvia. The quarry's slopes were strengthened with stone walls to prevent them from scattering and washing away. Preliminary calculations suggest that as much as about 60 thousand tons of copper ore had been extracted there. Assuming the content of copper was only 5%, it is easy to calculate that that ore mining site alone had produced about 3,000 tons of metal.

The most impressive was a twin quarry of the Chervone Ozero-II ore mine that stretched from the west to the east along the edge of the sand range. Its large eastern cup was 145-30 m in size and up to 8 m deep (the alluvia not counted). The western cup was 76 x 35 m in size and from 3 to 5 m deep. A 3-metres–wide linking cross-piece, preserved between the cups, had been probably left for more convenient transportation of ore across the quarry. The volume of copper ore extracted there was over 30,000 cubic metres.

The third open mining area of the Chervone Ozero-III ore mine was shaped like an oval, stretched in the north-western direction; it was 40 metres long and

Photo 1. Quarry of the Chervone Ozero-I ore mine

5 metres deep. The volume of the ore excavated in that mine amounted to about 4,000 cubic metres [Pryakhin *et al.* 2000].

3.2. UNDERGROUND ORE MINES (CHERVONE OZERO ORE MINE IV)

Underground ore mines had been located at the top of a sandstone ridge and were initially fixed on the surface by the funnel-shaped pits up to 8 metres in diameter and up to 2 metres deep. Their compact location proves that the technology of exploration by minor vertical pits (mining shafts) had been used (Photo 2). Some of them had been linked together with horizontal drifts (pits 1 and 2). We found a slanting mine shaft that had gone deep obliquely into the rock. Because of the danger of collapse during the study of the underground pits, exploration was stopped 3.8 metres deep before safe working conditions could be organized on the site.

P h o t o 2. Chervone Ozero –IV ore mine. Ore workings 1. Mine shaft

The condition of the mine's walls allows an assumption that the destruction and digging out of sandstone, which had contained thin layers of copper sulphides, had been done with the use of stone hoes, pickaxes and hammers [Brovender *et al.* 2005]. The finds made at the technogenic part of the Chervone Ozero-I ore mine included multiple stone mining tools and bone tools made of animal ribs and scapulae. Judging from tracelogical research results, these tools had been used for digging and scooping in the process of taking off the upper layer of soil, as well as for cleaning and preparing crevices in the base rock for breaking it. The stone tools had been made out of quartz sandstone, which occurred in the same layer of sandstone and sometimes came to the surface. Possibly sandstone had been broken with the help of wooden wedges that had been hammered into crevices in the rock until it would break into pieces.

The best researched underground mine in Kartamysh is mine 1 where there are reasons to speak about its ancient origin, since a cult grave of an ancient ore miner was found on the site (Photo 3, Fig. 1).

Photo 3. Chervone Ozero – IV ore mine. Ore workings 1. Burial of an ancient ore miner

The grave was discovered in the southern part of the vertical shaft of ore mine 1, on the terrace dug 2.7 metres deep into the base rock. The size of the burial pit was 2.15 x 1.3 metres.

At the bottom of the pit, a human skeleton was found within a stone box made of two slabs of copper-bearing sandstone, placed in the pit and linked together to form a right angle. The skeleton lay on the left side, head to the east, with some deflection to the south. Behind the back, near the skull there was a ceramic pot with a neck ornamented along the perimeter with slight press-ins made with a stick and the outer surface of the bottom was decorated with a solar symbol. Also, an animal rib had been placed in front of the buried man's face. Importantly, there were pieces of rich copper ore (chalcocite) inside the vessel, and the animal rib (burial dowry) had largely resembled bone mining tools that had been found in large numbers in the technogenic sector.

The buried man had been placed under a thick stone layer, on the surface of which another ceramic vessel with an ornamented body had been found. There were many animal bones between the rocks used for the filling.

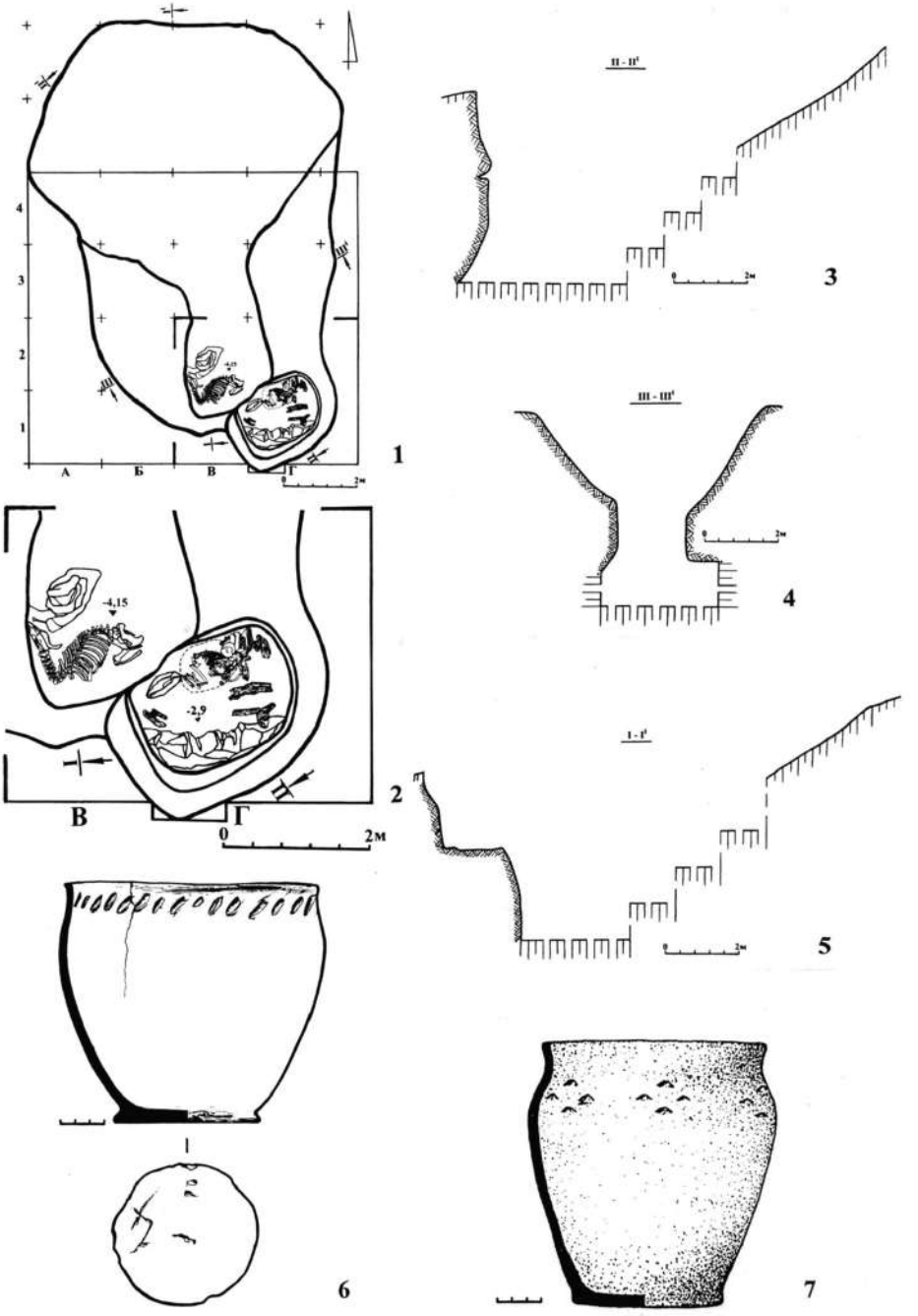


Fig. 1. Chervone Ozero ore mine- IV. Ore workings 1. Burial of an ancient ore miner

Generally, the burial rite and the nature of the ceramics suggest referring the buried man to the Berezhnovka-Mayovka Srubnaya culture of the Late Bronze epoch, with clear features of life-time production specialisation of the dead man. The grave dates to 1650 – 1550 cal. BC.

Near the underground mines there was a primary ore enrichment production area (breaking and sorting), as well as a waste pile of accurately pounded empty rock mass. The volume of the rock waste amounted to several dozens of cubic metres.

3.3. CHERVONE OZERO-I ORE MINE TECHNOGENIC AREA

A major technogenic area in the largest quarry of the Chervone Ozero-I ore mine that had been used for ore enrichment. Three cultural–chronological horizons were discovered within the studied space of the monument. The finds included foundation pits of production facilities.

The north-western part of construction 2 contained an orbed group of pieces of copper-bearing sandstone with a relatively free space in the middle (production complex 1). Among the stones and over them there had been animal bone and stone tools, functionally connected with the ore mining and ore enrichment cycles. The discovered complex resembles remainders of a ground-based metallurgical furnace that had been destroyed by time. Pieces of charcoal were also found on the site. The production complex had been virtually heaped from above with a large number of working tools, which indicates the existence of a special kind of ancient production cult in the Donets Basin area. A mining tool cult was mentioned by A.K. Margulan, a researcher of ancient mining in Dzhezkazgan, Kazakhstan. The finds at the bottom of old mines and the foundations of the rock waste piles in the region he had studied, included accurately placed mining tool hammers, large pickaxes, and wedges. Often such collections had been made out of pieces of broken stone tools.

One matter of substantial interest is a trench, the earliest among the studied complexes in the technogenic area. The trench was 1.6 – 2.2 metres wide and 0.4 metres deep, and filled with ground technogenic sand made of copper sandstone. Its filling contained four groups of broken ceramic vessels and remainders of a wooden cup. The object was partly studied and as yet its purpose has not been clearly defined, though there are reasons to believe that it had been used as a “bath” for water enrichment (gravitation) of ore.

Practically all the material found in the area of excavation of the technogenic sector is culturally homogenous. The proof of that is the same type of ceramic, bone and stone objects found on the site.

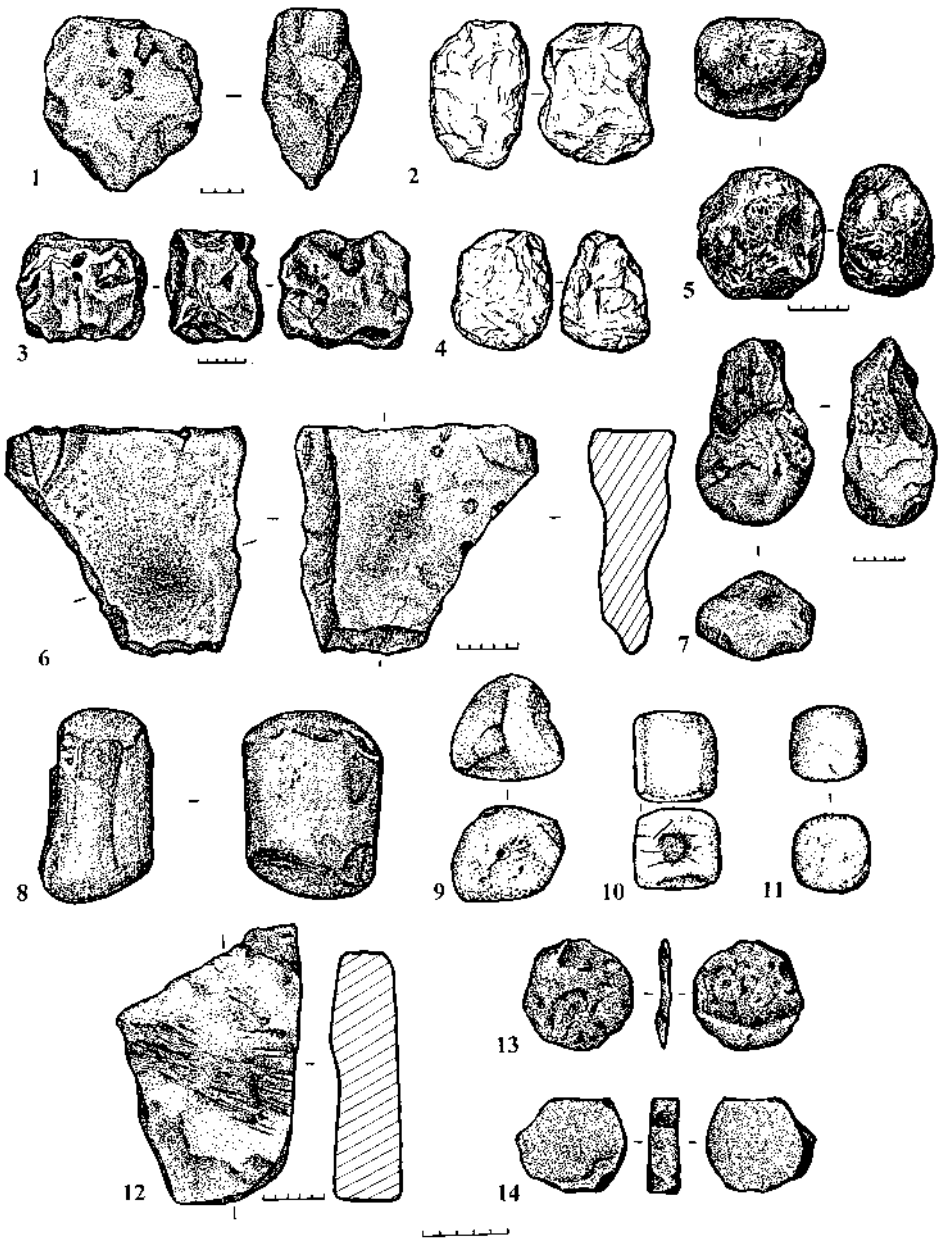


Fig. 2. Technogenic site of the Chervone Ozero-I ore mine. Metal production tools

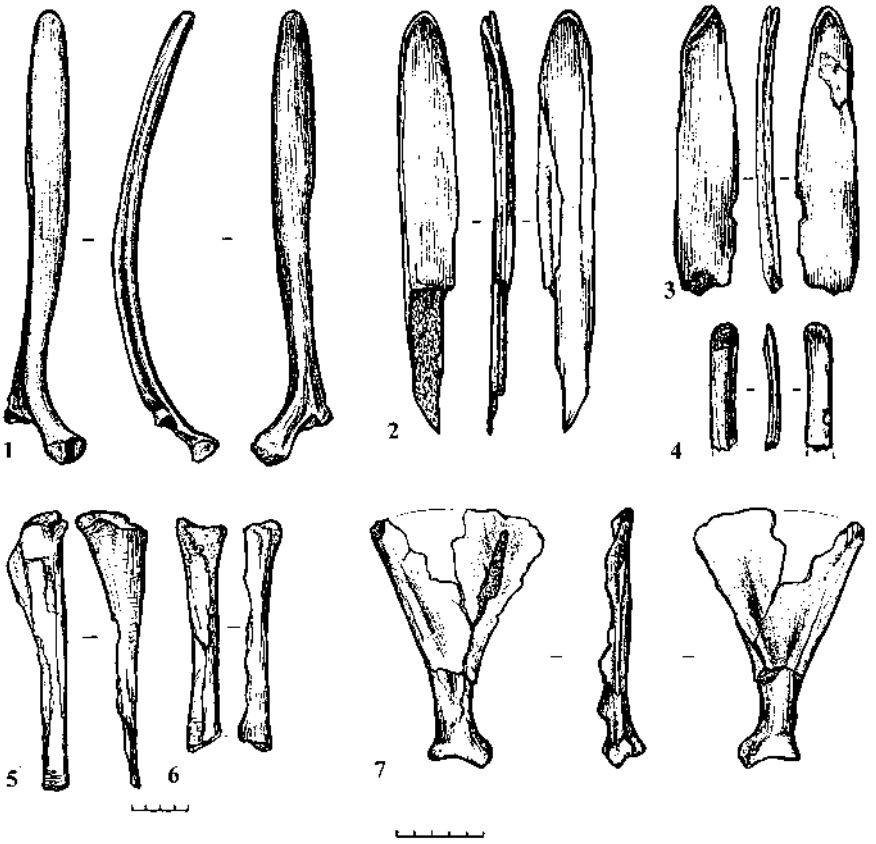


Fig. 3. Chervone Ozero settlement-1. Bone tools

The excavation in the technogenic sector produced a large number of bone tools, among which there were dozens of intact and fragmented tools made of animal ribs and scapulae displaying traces of typical copper green substance (ore mining shovels and tools that had been used in the ore enrichment process), as well as stone tools (hoes, pickaxes, hammers, ore-grinding slabs, ore-powdering stones) and fragments of ceramics (Fig. 2).

The 164 square metres of the technogenic sector, studied in the course of the excavations, had a cultural layer of over 1 metre thick and contained about 400 ceramic fragments of 55 vessels, including three intact vessels. Such a large number of ceramics found there can be explained by the monument's specialisation.

The metallurgical cycle in the technogenic sector is represented by plate-shaped pieces of *shein* (0.2-0.6 cm thick, 24 objects), a burnt piece of copper sandstone, on

the surface of which there was a splash of flowing copper slag, a clinkered stone, dross and clinkered ceramics.

Another interesting archaeological object found is a heating construction (a furnace) located on top of the waste rock pile of the Chervone Ozero-I ore mine. The traces of fire on the walls of the construction and pulp-like slag at the bottom allow assuming that it had been used for ore roasting.

Five radiocarbon dates were obtained from the animal bones taken from the technogenic sector of the Chervone Ozero-I ore mine (Table 1).

The time of operation of that sector falls within the range of 1650–1450 cal. BC.

3.4. CHERVONE OZERO SETTLEMENT-1

Chervone Ozero settlement-1 was located near the Chervone Ozero-I ore mine and adjoined the southern and south-western slopes of its waste rock pile. The sector of 352 square metres was studied in the area that directly adjoined the southern slope of the waste rock pile of the Chervone Ozero-I ore mine.

The objects found in that sector include a complex of stone constructions that had formed a curve around the sacrifice pit, filled with animal bones and covered with a thick stone covering. The stone constructions, arranged 1-2 metres from each other, were six pits with the walls strengthened with vertically places sandstone slabs. At the bottom of one of the pits there was a group of fragments of the lower part of a vessel. Hence, one may speak about the study of yet another complex that illustrated the intricate system of production cults of ancient ore miners.

All of the finds are homogenous and connected with the population of the Berezhnovka-Mayovka Srubnaya culture. The production instruments and other indicators of production activity, found in the Chervone Ozero-1 settlement, represent all the cycles of metal production: ore mining (hoes, hammers); ore enrichment (ore-grinding platforms or slabs, ore-grinding and ore-pounding stones); metallurgical (clinkered ceramics), and metal processing (fragments of stone casting forms, abrasives) (Fig. 3, 4).

Construction 1 was found in the sector of the Chervone Ozero-1 settlement, studied near the south-western slope of the waste rock pile of the Chervone Ozero-I ore mine (Photo 4).

Construction 1 is a semi-dug-out, dug in the soil by 0.42 m (and by 0.2 m into the mainland rock); it was square in shape and oriented along the north-west–south-east line. Its size was 6.8 x 5.6 metres. The bottom of the construction was tub-like and slightly lowered in the middle. The foundation pit walls were strengthened with pieces of copper sandstone and in some places they reached as high as 0.3 m.

Table 1

The technogenic section of the pit Chervone Ozero-I. The metallproduction instruments.

#	Location	Laboratory number	Date ^{14}C	
			BP	BC/AD
1	Chervone Ozero I, dig I, sq. 2-V, sample No. 1	Ki-9698	3290±60	1σ 1681-1671 BC 1657-1651 BC 1637-1515 BC 2σ 1729-1725 BC 1689-1435 BC
2	Chervone Ozero I, dig I, sq. 2-G, sample No. 2	Ki-9699	3270±60	1σ 1619-1493 BC 1475-1457 BC 2σ 1685-1431 BC
3	Chervone Ozero I, dig I, sq. 2-B, sample No. 3	Ki-9700	3310±60	1σ 1681-1671BC 1659-1651BC 1637-1521 BC 2σ 1737-1711BC 1693-1489BC 1481-1447BC
4	Chervone Ozero I, dig I, sq. 4-B, sample No. 6	Ki-9701	3255±60	1σ 1603-1543BC 1539-1489BC 1481-1447BC 2a 1683-1669BC 1661-1649BC 1639-1411BC
5	Chervone Ozero I, dig I, sq. V -3 sample No. 7	Ki-9702	3320±60	1σ 1681-1669BC 1659-1649BC 1637-1523BC 2σ 1741-1703BC 1697-1493BC 1477-1453BC
6	Chervone Ozero IV, ore mine 1, grave 1, human bones	Ki-9703	3340±60	1σ 1685-1599BC 1587-1577BC 1571-1527BC 2σ 1851-1849BC 1767-1763BC 1747-1495BC 1475-1459BC
7	Chervone Ozero IV, ore mine 1, grave 1, human bones	Ki-10202	3290±110	1σ 1685 - 1440 BC 2σ 1880- 1840 BC 1830- 1790 BC 1785- 1370 BC 1340- 1320 BC
8	Chervone Ozero I, dig 1, bones from animal grave (excavations of 2001).	Ki-10203	3370±100	1σ 1770- 1760 BC 1750- 1520 BC 2σ 1890- 1435 BC

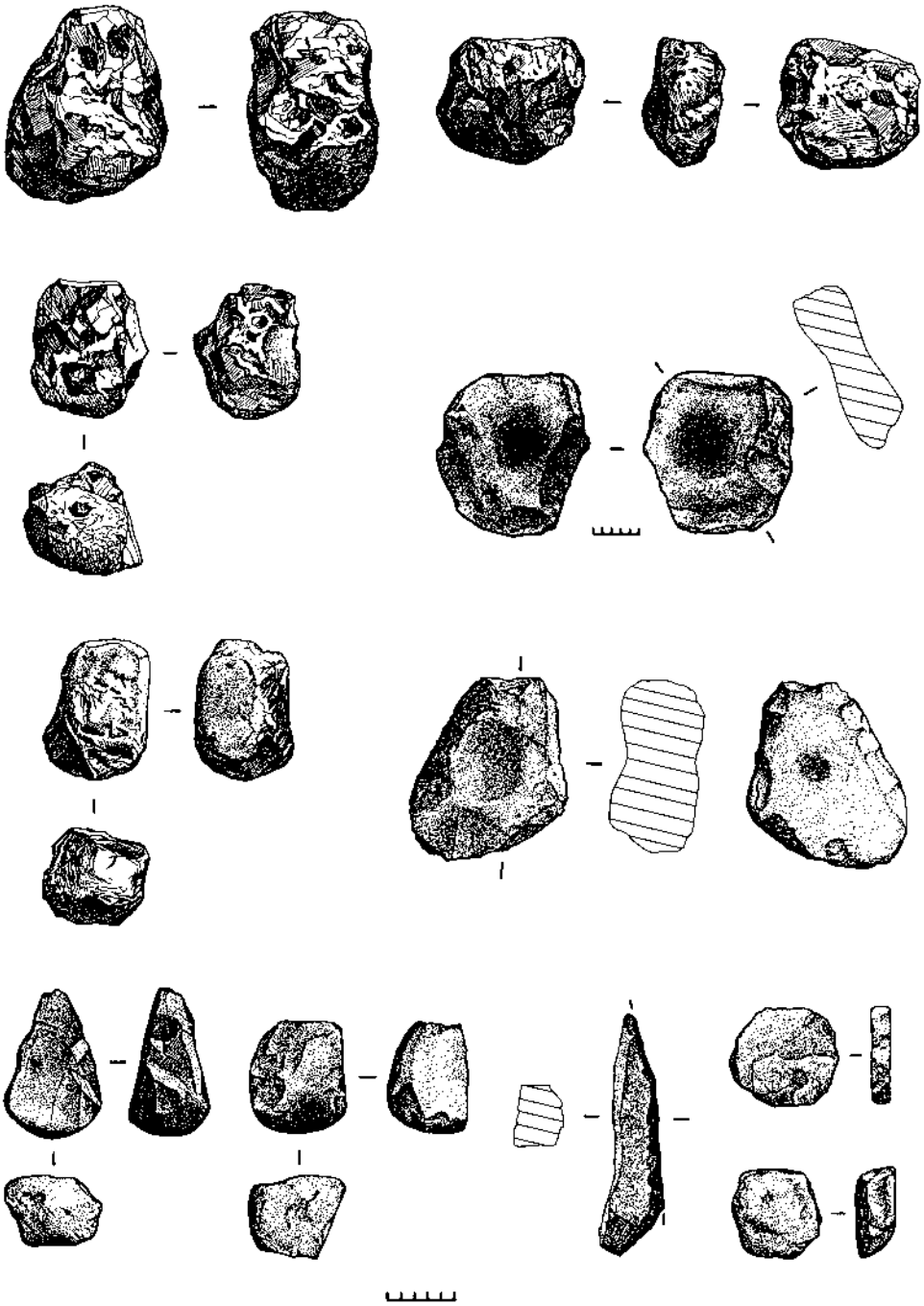


Fig. 4. Chervone Ozero settlement-3. Metal production tools

Photo 4. Chervone Ozero settlement 1. Construction 1

At the bottom of the central part of the construction there was a pile of finely pounded pieces of copper sandstone, among which there were inclusions of charcoal. Outside the construction, near its north-eastern corner, there was a roundish pit filled with animal bones.

Of special interest is a sacrifice stone, found 4 metres to the north from construction 1. The find of a large piece of quartz sandstone has, on its flattened upper surface, a clearly identifiable cavity which transforms into a hollow chamfer closer to the edge. The size of the stone is 0.7 x 0.5 x 0.6 m and resembles a bound hammer, an ore mining tool most frequently used in Kartamysh.

The finds from the area of that dig are culturally homogenous and connected with the population of the Berezhnovka–Mayovka Srubnaya culture. The production instruments included tools of the ore extracting cycle (hoe, hammer) and the metal processing cycle (abrasives).

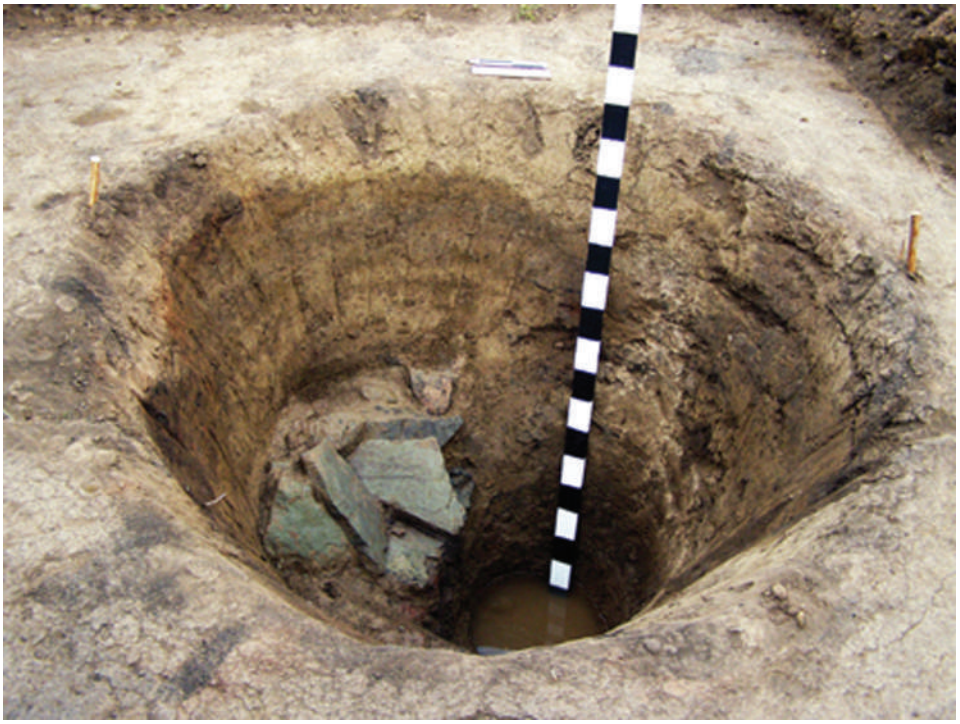


Photo 5. Chervone Ozero settlement 3. Construction 2. Ancient well

3.5. CHERVONE OZERO-3

Chervone Ozero settlement-3 is one of the most expressive monuments of ancient production activity of the Donets ore-mining and metallurgical centre [Brovender 2005; 2006]. The settlement was located in the valley of a dried-out river, 300 m to the south-east from the quarry of the Chervone Ozero-I ore mine. The total studied area of the excavations was 376 sq. m.

The excavation process unearthed an "estate-like" housing and economic complex of two constructions. One of them (used for housing) had a stone wall foundation. The constructions were rectangular in shape and oriented along the south-east – north-west line. The space of the construction 1 (housing) was about 30 sq. m., while the space of the construction 2 (production) was about 47 sq. m.

The most interesting construction is construction 2 which has given evidence of the organization of production activity of the Srubnaya culture and historic community. The researched complex contained tools of the ore mining, ore enrichment,

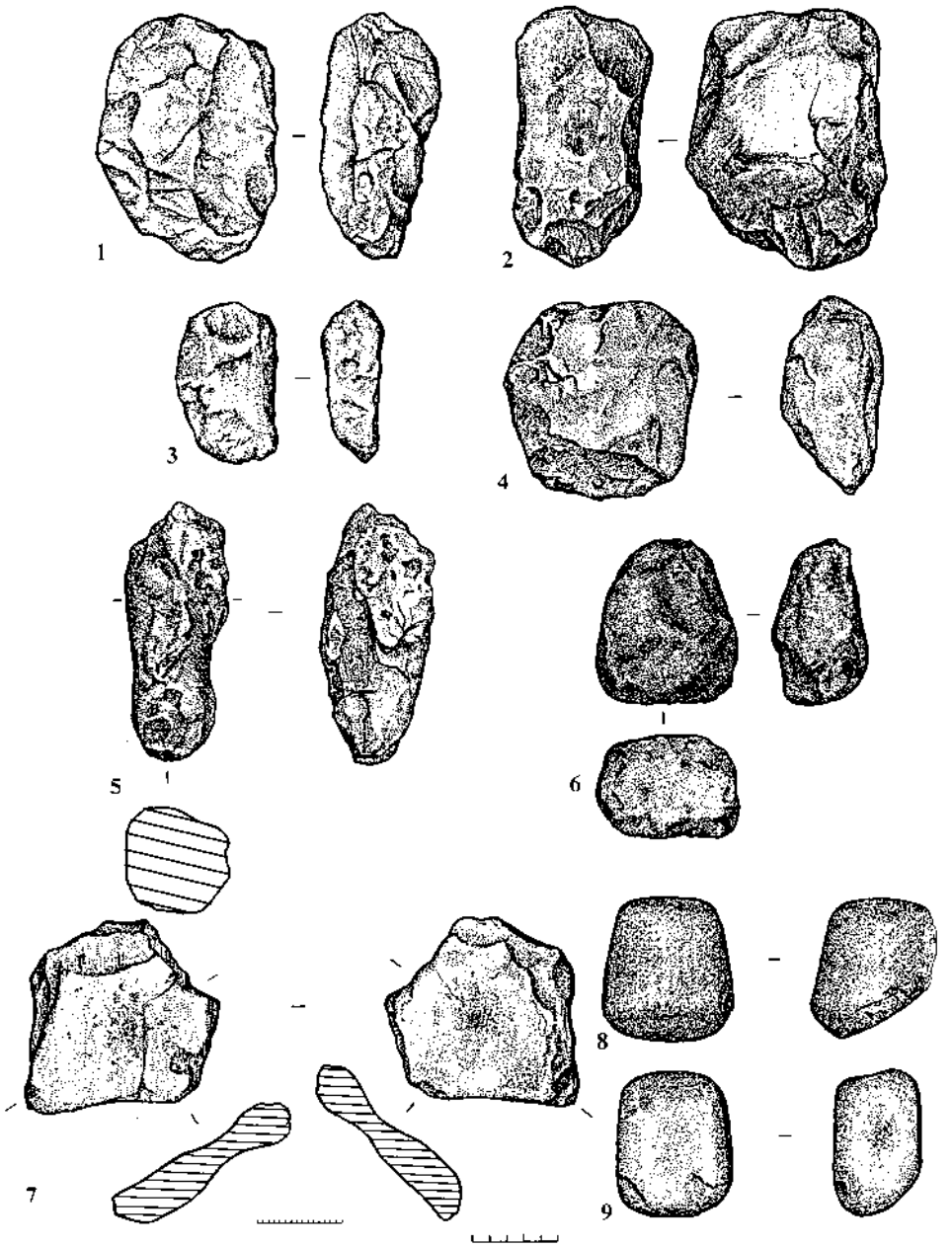


Fig. 5. Stone tools from settlement Chervone Ozero-3

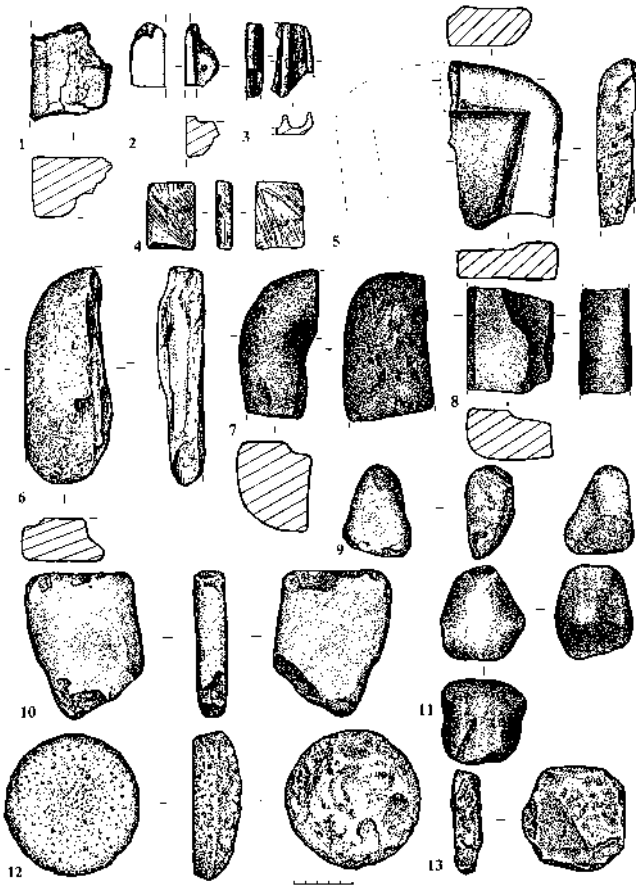


Fig. 6. Stone and ceramic tools from settlement Chervone Ozero-3

metallurgical and metal processing cycles, i.e., of all the constituents of a metal production system (Figs. 5, 6). The evidence of the metallurgical and metal processing cycles were the most numerous among the objects represented at the settlement.

Careful preparation of ore concentrate is one of the conditions of successful ore melting and metal production where water plays an important role in the process. An ancient well (Photo 5), found in the territory of construction 2, answered the question that had remained open for a long time: "where did the ancient ore miners get water if the territory of the Kartamysh ore deposit, according to S.I. Tatarinov, had been practically waterless?" [Tatarinov 2003].

Water enrichment of ore at the Chervone Ozero-3 settlement had been done in large ceramic vessels, as proved by a pile of fragments of a broken pot, dug in

the soil, found near a group of furnace pits. Some remainders of cemented ore concentrate were found at the bottom of the pot. Probably the copper ore had been dried and roasted in the furnace pits located nearby. The ore concentrate prepared for melting had been put in a metallurgical furnace, remainders of which were found at the western corner of construction 2. The metal obtained here had been brought immediately for further processing: casting, forging, grinding and sharpening.

Construction 2 contained fragments of broken casting forms made of various kinds of raw materials: clay, sandstone and talc shale. The talc shale had been imported, most probably, from the Azov Sea Province or the Dnieper area.

The productive complex researched at the Chervone Ozero-3 is not unique in the Donets Basin's copper ore deposits. Similar complexes have been known to exist at other manifestations of ore deposits in the Bakhmut lowland (Vyskrivske, Kyslyi Buhor, and Klynove) [Tatarinov 2003].

Therefore, the field studies of monuments of the Kartamysh archaeological micro-district produced evidence of production activity of the Berezhnovka–Mayovka Srubnaya population, with the most numerous finds of tools belonging to the ore excavation and ore enrichment cycles. There were also finds indicating metallurgy and metal processing, but these cycles had been of secondary importance and satisfied only the local needs of the Kartamysh dwellers. Today there are reasons to believe that the Kartamysh ore mining complex had specialized in copper ore excavation and enrichment. The huge amount of excavated ore could not have been processed locally, as there had been not enough timber. There are no doubts that enriched copper ore (concentrate) had been transported to the timber-rich territories (e.g., the Siversky Donets basin), where there had been specialised metallurgical settlements like the Usovo Lake, the main consumers of copper ore concentrate [Brovender 2008]. From there, metal – in the form of ready-made objects – proliferated to the territory between the Dnieper and Don rivers.

There are reasons to presume the possibility that the Donets Basin copper had been explored even at a still earlier period, in the Early and Middle Bronze Age [Kubyshev, Nechytailo 1991; Pryakhin 1995; Bratchenko, Sanzharov 2001; Chernykh 2005; Litvinenko 2005; Nechytailo 2005; Savrasov 2006; and others]. However, the materials suggesting that possibility are, regretfully, indirect (e.g., concentration of production instruments in the graves and the settlements near manifested ore deposits; a higher proportion of metal objects in the Donets Basin graves). Unfortunately, no evidence of production activity of the Early and Middle Bronze Age population in the territory of manifested ore deposits in the Donets area have been found so far. In this connection, further field studies are indispensable.

4. CONCLUSIONS

No doubt, the notion that peoples of the Ancient World could have used Ukraine's copper ores in the Paleometal Age, put forward by V.I. Klochko at the end of last century [Klochko 1994a], was expressed with good reason. There is a need for further field research in the area of Ukraine's manifested copper ore deposits, with the use of modern research techniques. Success in that direction will contribute to accessing a quality new level of general historic generalisations, including that on the Dnieper–Donets cultural genesis centre identified by V.V. Otroshchenko [Otroshchenko 2005a], a component of which is deemed by the author to be the presence of copper ore deposits in the Donets Basin (Donets ridge).

Translated by Inna Pidluska

Baltic-Pontic Studies
vol. 14: 2009, 124-155
PL ISSN 1231-0344

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COMMUNICATION ROUTES AND OVERLAND TRANSPORT MEANS IN WESTERN ASIA IN THE BRONZE AGE (4TH TO 2ND MILLENNIUM BC)

1. INTRODUCTION

The origins of communication routes reach back to the most distant past of the Near East and are related to the rise of trade, which was the most important factor in laying out the course of roads in antiquity. The routes connected areas rich in raw materials to populous lands, where receptive markets were. However, the buyers had to have a surplus of their products to be able to 'pay' for imported goods. Hence, stable trade relations are characteristic of the cultures that are sufficiently rich and developed. Both conditions were fully met by Mesopotamia and other regions of the Near East in the Copper and Bronze Ages.

Especially in the case of southern Mesopotamia, considered to be the cradle of state civilization, trade and import of basic raw materials was necessary for the development of local societies because the region did not have any deposits of ores or rocks, nor any timber resources of its own [Potts 1997]. To supply them there, there had to emerge a system of exchange, taking advantage of roads and communication routes. We can speak of stable trade in the Near East beginning at least with the middle of the 4th millennium BC when a state civilization rose there which needed a continuous supply of raw materials from outside to develop. It was then that the archaic state of Uruk emerged in the south and developed economic ties with many lands of central and western Asia, and Egypt. Thus, as early as the 4th

millennium BC, different regions of the Near East were joined by a network of communication routes, starting a vigorous exchange of goods, accompanied, certainly, by ideas, among peoples inhabiting the regions. In the archaeology of Mesopotamia, the Uruk period saw the beginning of the Bronze Age that engulfed then most of the ancient East. In many respects this is a watershed as many important developments in material and spiritual culture, including organized trade and writing, originated in this very period [Leick 2001: 40-48].

Vigorous trade, started in the 4th millennium BC, was typical of the region's economy until the modern times when the development of transport means and the flood of goods manufactured elsewhere disturbed it permanently. The present analysis covers the period of the Bronze Age, which continued in the Near East from the middle of the 4th almost until the end of the 2nd millennium BC. Its end falls on the 13th century BC or basically the decline of the age. It was then, in the so-called Amarna Period, that the political situation stabilized as an order that may be called an alliance of powers. It provided favourable conditions for the circulation of goods, which is characteristic of the penultimate phase of the Late Bronze Age in western Asia. The process is recorded in the Amarna Letters, archives of Boghazköy and other dispersed records [van Koppen *et al.* 2006: 134-181]. The basic source of data relied on here, at least until the middle of the 3rd millennium BC, is archaeological excavations as satisfactory written records appear rather late. Texts coming from the Early Bronze Age may only serve as a secondary source, supplementing archaeological data.

The major aim of the first part of this paper is to trace trade routes under changing political conditions and to show to what degree political developments influenced trade and the course of roads. This is important inasmuch as in the course of the two thousand years, the Near East witnessed continual ethnic, political and economic changes that had an impact on the course of trade routes and the circulation of goods. Another important question that shall be taken up here is overland transport means that were used in travelling along the routes. Taking up this question is important inasmuch as more recent archaeological discoveries and text publications cast doubt on the traditional picture where a dominant role was given to boats and, secondly, to beasts of burden, without allowing for any alternative to them. It appears that special attention is deserved by other means of overland transport next to donkeys. Until recently they have been marginalized by scholars studying trade and long-distance exchange [Klengel 1979]. The following analysis shall not include Egypt, which, admittedly, witnessed successive stages of intensive development in periods contemporaneous to those experienced by the lands of western Asia, but it prospered in a slightly different geographical and political context. A closer historical analysis shows that joining it to the axis of Mesopotamia, Syria, Anatolia – the major regions of the Orient – does not seem expedient.

2. THE COURSE OF ROUTES IN THE NEAR EAST IN THE BRONZE AGE

2.1. FROM THE URUK PERIOD TO THE FALL OF SUMERIAN CITY-STATES

The evidence of trade of the Uruk culture, whose major centres were located on the lower Euphrates and Tigris rivers, is quite spectacular. It points to the economic ties of Sumer both with the lands lying in its immediate vicinity – on the Persian Gulf, the middle Tigris and Elam in the east – as well as those further afield such as Syria and Turkey in the west. Still another group is formed by distant lands lying on the southern shores of the Persian Gulf and in central Asia such as Afghanistan, eastern Iran and India. These remote, almost mythical lands in the south and east appear as sources of raw materials for Sumer in the texts of the 3rd millennium BC and are called Dilmun (Bahrain), Makkan (Oman), Meluhha (Indus drainage), Aratta (Afghanistan) and Kimash (Fars Mts.). Roads running east from southern Mesopotamia are evidenced by the import of lapis lazuli, which was brought to Sumer from Afghanistan along two routes. A more important southern one ran crossing into India (Mohendjo-Daro, Harappa), across southern Iran (Sahr-i Socha, Tepe Yahya), towards Elam (Susa) and further on along the coast of the Persian Gulf to Mesopotamia. This course of the route is borne out by Uruk pottery found in the cities of southern Iran (Tepe Yahya) [Klengel 1979: 26; Postgate 2005: 208-209]. The other, northern route, crossed the plains of north-eastern Iran (Tepe Hissar) in the direction of the central Zagros Mountains and the Diyala Valley [Klengel 1979: 29; Astour 1995: 1403-1404; Postgate 2005: 208-209]. Next to the land routes, there was a very important seaway along the coast of the Indian Ocean and the Persian Gulf, via Bahrain (anc. Dilmun), to Uruk along which goods from the east and south were shipped to Sumer. The existence of the seaway is shown by many finds on Bahrain, which could have been an entrepôt used by this trade, and a strong presence of the land of Dilmun in royal inscriptions and mythological texts from the 3rd millennium BC [Klengel 1979: 36-40; Astour 1995: 1403; Bass 1995: 1421-1422; Reiter 1997: 155; Postgate 2005: 209]. Scholars agree that next to lapis lazuli also silver and copper were originally brought to Mesopotamia from Iran, from the Fars Mountains (Kimash), and Oman (Makkan) [Meissner 1920: 347-348; Leemans 1960: 117; Astour 1995: 1405; Yoffe 1995: 1391; Reiter 1997: 78, 152, 209; Postgate 2005: 218]. The goods shipped east in return for these metals included mostly grain, oil and pottery. There is no doubt that thanks to huge surpluses of agricultural crops, especially corn, they were among chief exports throughout the history of ancient Mesopotamia [Kramer 1977; Kapełuś, Kropiwnicka 2003: 11-28]. It is possible that apart from these goods also textiles were shipped there. Southern Mesopotamia was famous for its textiles at that time and later as well [Larsen 1976: 87-88; Postgate 2005: 212-213]. Archa-

eological finds and a clear trace in the literary tradition testify to the fact that the trade was quite vigorous and long-lasting [Postgate 2005: 211; Kramer 1977: 62-64].

For a long time a shroud of mystery covered the share of northern Mesopotamia in the development and trade of the Uruk culture. On the one hand, the geographical unity of the north with Sumer, in particular navigable rivers, suggested that the country called Subartu by the Sumerians, must have played a significant role in trade already at that time. On the other hand, no evidence of this was found in the texts of the 3rd millennium BC, which are usually considered reliable for an earlier period as well [Reiter 1997]. In principle, they are silent on the point of trade with the north. The gap, however, was made up for by archaeological discoveries in the valley of the middle and upper Euphrates and Tigris rivers. The discoveries unearthed many settlements, displaying material culture very similar or even identical to that of the Uruk culture. The most important of them include Habuba Kabira, Qraya, Birecik, Jebel Aruda in the drainages of the Euphrates and Khabur rivers, Tell al-Hajj in the Taurus Mountains and Nineveh on the upper Tigris. Some scholars suggest that some of them can be simply considered colonies of the Uruk culture, which would testify to a direct penetration of the north by Sumer at so early a time [Bieliński 1991]. The reason for this, next to the access to a quite convenient waterway, supposedly was the abundance of raw materials in the Amman and Taurus mountains, and in the Transcaucasia. The goods imported from distant areas lying in present-day Syria and Turkey could have included gold, bronze, copper, timber, and some kinds of rocks. Among the last-mentioned category was obsidian, which is well documented [Kelly-Buccellati 1990: 120; Reiter 1997: 152; Postgate 2005: 207]. The most spectacular find testifying to such exports from the Transcaucasia and Taurus Mountains to southern Mesopotamia involves a deposit of quern stones in Yarim Tepe, northern Mesopotamia. In the opinion of the discoverers, the stones were exports shipped south and testify to vigorous trade in such goods in the 4th millennium BC [Postgate 2005: 207]. The northern centres named above lie for the most part in the drainage of the upper Euphrates and Tigris, which must have played the role of major communication arteries joining Uruk to Syria and Anatolia (Karanovo VI) [Thissen 1993: 220]. The goods that were shipped north from Sumer may have included grain, textiles and some luxury articles such as seals [Leemans 1960: 116; Yoffe 1995: 1392; Postgate 2005: 208]. Lying on the route running north from Sumer, Syria could have mediated an exchange between southern Mesopotamia and Egypt, where the impact of the Uruk culture is clearly observable in the 4th millennium BC. The route from Syria to Egypt could have crossed the sea via Byblos, staying in contact with Egypt since ca. 3000 BC, or via Palestine, where traces of trade with Uruk have also been found [Bard 2000: 62-64, different view by Grimal 2005: 38]. Hence, it can be seen that beginning as early as the 4th millen-

nium BC, southern Mesopotamia was crisscrossed by communication and trade routes. Forming a hub where routes from many distant lands converged and crossed one another, the cities of Sumer could have been a place where merchants from different parts of Asia exchanged their wares. As far as northern Mesopotamia is concerned, in the 4th millennium BC there are no traces of east-west roads which would join the upper Tigris drainage to Syria and bypass the south. Thus, southern Mesopotamia with the Uruk culture was a hub of these routes and trade.

Of course, outside southern Mesopotamia there were cities of local significance. Recent discoveries show that the development of urban civilization can be observed as early as the 4th millennium BC in Anatolia, too. It may have been propelled by metallurgy because, owing to rich ore deposits, in particular of copper, and timber resources, the cities of Asia Minor began to supply these raw materials to neighbouring countries already at that time. Speaking of metal, originally it was a natural alloy, the so-called arsenical bronze, which was delivered to Cyprus and the Cyclades [Muhly 1977: 75; Reiter 1997: 290; Śliwa 1997: 49-51; Sahoglu 2005: 340; Webb *et al.* 2006: 273; 276]. The inception of the process, however, is rather obscure and, except for Arslantepe and Kurban Hüyük, no significant evidence of it has been found [Mellaart 1982: 9; Śliwa 1997: 41]. This early stage of development of Anatolian cities did not last very long anyway as it was interrupted by the massive migrations of Proto-Hittite populations from the east. However, already ca. 2800/2700 BC, a network of new cities developed there which marked another stage in the history of Anatolia. From then on, it became an important partner in trade with adjoining countries.

The crisis of the Uruk culture that affected southern Mesopotamia ca. 3100/3000 BC must have had an adverse impact on trade contacts and exchange among the various lands of the whole Orient. It was then that Uruk colonies in Syria collapsed that had hitherto provided communication between southern Mesopotamia and Egypt; traces of Sumerian influence there break off abruptly then [Astour 1995: 1406; Bard 2000: 65-66]. A decline was suffered also by colonies and towns cooperating with Uruk on the upper Khabur and Tigris rivers. Obviously, a limited economic exchange must have continued because in the Jemdet Nasr period following Uruk and the Early Dynastic Period a slow development of many Sumerian cities is observed, leading to the emergence of city-states. Everything points to the fact that Syria avoided the crisis of the turn of the 4th millennium BC and entered the period of prosperity of local urban centres. The first stage of the process is evidenced chiefly by the pottery of the region which appeared in Palestine, western Mesopotamia, Cilicia, Anatolia and even as far as the Diyala River Valley, east of the Tigris [Ławecka 2006: 180; Koliński 2007a: 110]. In effect, this period of the Early Bronze Age in Syria is sometimes called 'the period of urban culture development' [Śliwa 1997: 142-143]. In time, the centre of the region shifted

to Ebla around which Syria's all economy and politics had concentrated since the middle of the 3rd millennium BC [Milano 1995: 1223]. Ebla's heyday is dated to 2500-2300 BC, the period from which come records of its international politics in northern Mesopotamia and rich tombs. The latter produced Egyptian vases bearing the names of Khephren (4th Dynasty) and Teti I (6th Dynasty) [Klengel 1979: 62-63; Śliwa 1997: 280; Olbryś 2007: 100-101]. Next to Ebla, the period saw the rise of other cities such as Halab, Qatna, Hamat, Emar, Haçor as well as Byblos and Ugarit on the Mediterranean coast [Salles 2001: 212-215; Olbryś 2007: 100-101]. Slightly less intensive but clearly visible, a period of growth on the upper Khabur River in northern Mesopotamia was marked by the rise of important urban centres such as Tell Brak, Tell Leilan, and Tell Mozan [Milano 1995: 1220; Koliński 2007b: 358]. On the upper Tigris, Hamazi, known from the Sumerian King List, grew then as well as Nineveh and Tell Taya, which are documented by texts and archaeological data [Ławecka 2006: 84-87]. The rise of Syrian centres brought about a new trade route from the Diyala River Valley to Syria via Nineveh, the upper Khabur and Balikh rivers. It was an extension of the lapis lazuli route from Afghanistan along which the mineral and tin were imported now to Ebla and Qatna [Leemans 1960: 123; Klengel 1979: 63-64; Astour 1995: 1406]. An arm of the route extended from the Diyala Valley through Mari on the middle Euphrates, and joined the route from Mesopotamia to Syria. This contributed to the rise of urban centres on the middle Euphrates, in particular Mari [Klengel 1979: 75; Muhly 1985: 281-282]. Continuous exchange of goods led different centres of both regions to start political cooperation as well, which can be seen in the relations of Ebla with Emar, Mari, Nagar and Kish [Astour 1995: 1406; Ławecka 2006: 178-179; Koliński 2007b: 354-355]. With time, these states, likewise the cities in the south, began competing for political domination in both Syria and Subartu [Liverani 1993: 5-9; Milano 1995: 1226-1227].

With the lapse of time, after the crisis of the turn of the 4th millennium BC, trade in southern Mesopotamia again gained momentum as new city-states, likewise Uruk earlier, could develop to a large extent by importing basic raw materials. The sophistication of material culture and trade in the first half of the 3rd millennium BC is evidenced by the discoveries at Ur. Among many hoards found in the city's so-called royal tombs are goods made of lapis lazuli imported from Afghanistan, metals (copper, bronze) from Anatolia, and gold and obsidian brought from the Transcaucasia [Leemans 1960: 116; Maxwell-Hyslop 1977: 85; Bieliński 1985: 365-366; De Ryck *et al.* 2005: 265; Ławecka 2006: 176-177]. In northern Mesopotamia, this is well illustrated by the discoveries at Tell Mozan of large amounts of ceramic and metal (bronze) vessels of local origin and dated to the same period. They suggest the existence there of advanced metallurgical centres which may have even been technologically ahead of those located in Anatolia [Kelly-Buccellati 1990: 122]. Slightly later texts from Lagash testify to contacts with Dilmun, Makkan

and Meluhha and speak of raids into Subartu, i.e. northern Mesopotamia [Leemans 1960: 116]. Therefore, it can be claimed that in the middle of the 3rd millennium BC trade in the Near East entered again a period of prosperity, which must have been a result of economic and political relations having stabilized throughout the region.

With regard to Anatolia, since the middle of the 3rd millennium BC its cities had begun to develop rapidly and established economic contacts with the Aegean, Transcaucasia and Mesopotamia. Among the leading ones were Hattusha, Kanesh, Tarsus, Arslantepe (Melid), Alaca Hüyük and Ikiztepe (Zalpa), some of which were at their heyday then [Klengel 1979: 103; Bryce 2005: 72; Zimmerman 2007: 29-30]. According to Sahoglu the development was propelled by advances in metallurgy following the discovery of large ore deposits in the Taurus Mountains already in the first half of the 3rd millennium BC [Reiter 1997: 288; Sahoglu 2005: 341]. The west of Asia Minor saw then the development of Troy, the second layer of which, falling on the period of 2500-2300 BC, represents a highly developed culture of a city-state. Its wealth is visible in multiple examples of jewellery and objects made of gold, silver and other precious metals found at the site. A study of pottery and other goods from Troy II indicates influence coming from northern Syria, the Transcaucasia, central Anatolia and the Balkans [Jansen 1995: 1224]. This means that the city could have lain at the crossroads of cultural influences radiating from the Balkans and Asia Minor. Communication routes, existing then in central and eastern Asia Minor, led from southern Anatolia across Cilicia (Tarsus) to Syria, and from eastern Anatolia (Alaca Hüyük, Kanesh) to the upper Euphrates Valley (Arslantepe) and south into Syria [Koliński 2007a: 112; Olbryś 2007: 101]. In the opposite direction, the routes stretched west from southern Anatolia and via Izmir and Troy reached Mainland Greece and the Balkans [Jansen 1995: 1224]. Among transported goods metal objects and pottery merit a mention. With regard to Anatolian influences in Thrace, Sahoglu claims that they were strong enough to speak of Anatolian settlements on the other side of the Dardanelles. The system of trade routes closely joining the two countries and enabling exchange that developed then Sahoglu calls 'Anatolian Trade Network' [Sahoglu 2005: 343-349]. Interestingly enough, the influences that were quite strong in the 3rd millennium BC weakened later as if ties between Europe and Asia had been broken off. The breaking off could have been caused by migrations induced by the Minoan culture, emerging in the Aegean Sea [Mee 1994: 139-141]. The instability of situation in the borderland between Asia Minor and the Balkans is seen in the frailty of successive development phases of Troy, specifically phases III-V, dated to 2300-1700 BC [Jansen 1995: 1125]. An important export commodity from Anatolia to the neighbouring countries, tin bronze superseded natural arsenical bronze in the middle of the 3rd millennium BC [Reiter 1997: 288].

A watershed in the development of communication routes and trade in the Near East is marked by the rise of the state of Sargon of Akkad at the turn of the 24th century BC. Already in the lifetime of its founder, it stretched from the Persian Gulf to Syria and possibly to the Anatolian frontier [Meissner 1920: 346; Michałowski 1993: 73; Kuhrt 1995: 48-50]. The founding of a uniform state occupying such a huge area must have intensified interregional exchange. What's more, the Akkadian Empire's sphere of influence encompassed some neighbouring countries such as Elam in western Iran and the coast of the Persian Gulf. This, in turn, gave access to the sources of raw materials, hence contributing to the development of economy and trade [Michałowski 1993: 75]. The empire was at its peak in terms of territory in the reign of Sargon's grandson, Naram-Sin, who not only expanded the empire's frontiers but also founded the second capital at Nagar (Tell Brak) in the north [Olbryś 2007: 102]. This must have intensified trade, especially in so-called Subartu. Archaeological excavations in the region showed that urban centres located there had surpassed Syria in development, which naturally shifted the economic centre of gravity in this direction [Milano 1995: 1226-1227]. For the stimulation of trade, it was important that Naram-Sin incorporated urban centres in northern Syria (Ebla, Armanum) and on the upper Tigris (Amida, present-day Diyarbakir, north of the Tur Abdin Mts.) into his empire. Thereby the Akkadian Empire overcame the region of Elazig rich in raw materials, gaining access to many natural resources [Astour 1995: 1405; Ławecka 2006: 176-177]. It could have been then that a trade route was blazed from the middle Tigris to Anatolia, which played an important role in trade in the early 2nd millennium BC [Klengel 1979: 103-104]. In the records from this period there is a clear tendency to stress contacts with and imports from the lands lying in the south and east such as Dilmun, Makkan and Meluhha known from the oldest texts. The inscriptions of Akkadian rulers mention goods and merchants from these lands coming to the port at Akkad by water [Leemans 1960: 116; Michałowski 1993: 73]. Unfortunately, the period was on the whole rather short and an attempt to maintain Akkad's control over northern Mesopotamia ended in a fiasco several decades after Naram-Sin's death, although his successors tried hard to keep these areas under control [Koliński 2007a: 104]. Generally speaking, it must be admitted that in the times of the Akkadian dynasty, communication routes in Mesopotamia returned to their north-south course. It was a result of the domination of the south and the decline of Syria's cities, in particular Ebla, which was destroyed several decades before the invasion of Akkadians [Postgate 2005: 59, for different opinion see Milano 1995: 1228].

Still unsettled, the question of Sargon's empire's contacts with Anatolia continues to vex the researchers who disagree how far could the empire's influence reach.

The well-known Babylonian epic Sargon, the King of Battle, discovered in the archive at Tell el-Amarna, tells of the ruler's militarily punishing the Anatolian city of Purushanda for not showing respect to his envoys (merchants?). Scholars often thought this legend to be of little value as in their belief Sargon's empire could not reach that far with its influence [Michałowski 1993: 77-82; Oguchi 1999: 96; Postgate 2005: 216]. However, excavations in south-eastern Anatolia have shown that Purushanda and other urban centres of the region were rich and important enough to attract Sargon's or Naram-Sin's interest. The latter certainly crossed the border of present-day Turkey [Klengel 1979: 62; Bryce 2005: 6; Sahoglu 2005: 341-345]. The trade route from Akkad to Anatolia may have followed the Euphrates, deviating from it to call at Ebla and Halab (Armanum). Its other arm, since the times of Naram-Sin (latter half of the 23rd century BC), who laid waste to Syrian cities, may have passed through Nagar and Urkesh on the upper Khabur River and continued further north across the Mardin Pass [Koliński 2007b: 346].

After the collapse of the Akkadian empire towards the end of the 22nd century BC, a short dark period occurred related to the rule of the Gutians in the south. Then, both written records and archaeological evidence became poorer. A traditional belief held that the downturn that occurred then was caused by the migration of the Hurrians in the north and the Amorites in the west [Ławecka 2006: 33]. In more recent studies, a major cause is believed to have been a natural one, specifically, a huge volcano eruption that supposedly took place in the Aegean Sea ca. 2300 BC [Weiss, Courty 1993: 143-145; Koliński 2007b: 347-350]. Mass ethnic migrations and an economic downturn were unfavourable to trade, although it must have continued to a limited extent. This is borne out by the texts of Gudea of Lagash, dated to the 21st century BC, who mentions trade expeditions to Mari, lands on the upper Khabur, Elam and Dilmun [Leemans 1960: 124; Klengel 1979: 71; Astour 1995: 1402-1408]. The Lagash texts show that in the Khabur triangle there were many Hurrian kingdoms, which, in turn, indicates gradual stabilization. The information is significant inasmuch as Lagash did not combine economic penetration with political expansion, hence its trade ties may reflect real mechanisms operating in trade then [Klengel 1979: 67]. Once the Gutians, ca. 2050 BC, had been removed, Mesopotamia was dominated by the Monarchy of the III Dynasty of Ur. In many respects, the kingdom strove to continue the traditions of the Akkadian empire. The economic conditions, however, under which Ur rulers had to operate, were not as favourable as under the rule of the Akkadian dynasty. The reason was the failure of Ur rulers to subdue the areas on the middle and upper Euphrates and Khabur as well as Syria, which is being debated by scholars [Limet 1977: 55; Steinkeller 1987: 37-40; Stępień 2006: 44-46; Szeląg 2007: 8]. There is no doubt, though, that these lands were joined to the south by a communication route following the Euphrates and featured prominently in Ur trade, ranging as far as Byblos, which appeared then for the first time in Mesopotamian texts. Economic ties between Mesopotamia

and Anatolia were maintained through the use of routes following the Tigris and crossing the Khabur triangle, which is evidenced by the development of the region's urban centres [Koliński 2007b: 354-355].

The records of Ur's trade show that it was completely under the control of state administration and was tied to the kingdom's foreign policy. The kingdom of Ur was surrounded by allied and dependent states that supplied it with some goods as a tribute and certainly were open to trade [Stępień 2006: 64-68, 76-77]. What is also worth mentioning is a considerable internal integration of the kingdom's economic system, which is called a centralized or bureaucratic economy [Steinkeller 1987: 25-29; Szeląg 2007: 8-10]. The economic structure of the kingdom of Ur allows us to understand general mechanisms governing the then trade. It is known that the kingdom's regions paid different tributes to the monarchy; the south paid tax in grain or craft products whereas the north paid a levy of live animals [Steinkeller 1987: 31-37; Stępień 2006: 73-76; Szeląg 2007: 8]. This form of taxation can be explained by the fact that the animal tax imposed on the northern regions was cheaper to service as it did not require any means of transport; theoretically, however, goods form the north could be sent down the Tigris. The fact that it was not done could indicate that the waterway from the north was considered troublesome and was not used very often. This, in turn suggests, that still at the turn of the 3rd millennium BC, means of transport were too poor to support long-distance trade on a large scale. It must have been resorted to only for the purpose of importing the most necessary or valuable goods. The geographical shape of the kingdom of Ur made communication and trade routes run north-south and branch eastwards across the Zagros Mountains and westwards along the Euphrates. Economic texts from the times of the Ur III Dynasty concerning trade traditionally speak of merchants from Dilmun and Makkan, and lands located in Iran [Szeląg 2007: 3]. In this period Meluhha is not mentioned anymore in the context of trade and in the 2nd millennium BC Mesopotamian texts mention Dilmun only. This gives the impression of the shrinking of Sumerian and Akkadian merchants' trade horizons in the south. Some scholars suggest that this could have been a result of the growing importance of trade centres on Bahrain, which excavations on the island seem to suggest [Postgate 2005: 216-217].

As it has been said, the kingdom of Ur did not include western Mesopotamia nor Syria within its borders; the two countries were fragmented into independent political entities. Some of them were political satellites of the kingdom of Ur, which entailed economic cooperation as well. This age of Syrian history is poorly known because of the absence of any texts and paucity of data supplied by excavations. In the opinion of scholars, the region was going through a crisis then, known by the name of 'Amorite period', although some doubts are expressed whether the crisis was caused by the migration of this people as the infiltration by Amorites did not encompass urban areas [Olbryś 2007: 101]. Nevertheless, there must have flourished local trade in Syria at that time, although it is little known to us. What

evidence we have is the growth of cities on the Syrian coast that had economic ties with the eastern Mediterranean, Egypt and Anatolia. One should also mention Ebla here that prospered again then and regained its economic significance [Milano 1995: 1228]. Unfortunately, this phase in the city's development did not yield any texts that could tell us more about its political standing. With regard to Anatolia, it also found itself in the period of absorbing another wave of migrants. They were Hittites who did not, however, do much damage to the then political and economic systems especially in the eastern part of the region [Śliwa 1997: 40-41; Bryce 2005: 8-9]. A wave of new settlers coming to Asia Minor destabilized briefly its economy and disturbed its politics, especially in the centre and west of the peninsula. Yet, the texts from Kanesh dating to an only slightly later period show that there existed stable political and economic systems focused on the 'great king' of Purushanda and rulers of smaller states dependent on him [Postgate 2005: 214]. The system attracted potential trade partners, and merchants from Ur could successfully do business there. Although texts are silent on this point, such trade contacts are borne out by both pottery and tools made of Anatolian bronze quite frequently found in the south [Koliński 2007a: 109-110].

2.3. COMMUNICATION ROUTES OF THE 1ST HALF OF THE 2ND MILLENNIUM BC

After the fall of the kingdom of Ur in the middle of the 20th century BC, Mesopotamia broke up into a number of kingdoms and the next two centuries witnessed continuous struggle for reunification under the rule of one of pretenders. The area's most important kingdoms in the Old Babylonian period in the south were Isin, Larsa and Elam, with the last-mentioned taking an active role in the events in Mesopotamia. On the middle Euphrates the leading centres included Mari, while on the Tigris the most important ones were Eshnunna, Ekallate and Assur. In Syria, a clear hegemony was maintained by Halab, together with Ebla subordinated to it; another political power to be reckoned with was Qatna. To sustain economic development, these kingdoms had to procure important raw materials through trade, hence, despite political fragmentation and mutual hostilities, trade clearly thrived. This is borne out by many texts, including letters and itineraries, which shall be discussed below. The role of trade and the importance of routes is visible in intense competition for control over important route sections, e.g. the estuary of the Tigris and Euphrates rivers and urban centres in the south itself [Charpin 2004: 57-127]. Further north, the control of the middle course of the Tigris and the Diyala Valley was an important prize of war as it allowed the winner to control the Tigris route and access to the pass across the Zagros Mountains in the

direction of Iran [Charpin 2004: 129-152]. Still further north, on the upper Tigris, a struggle for domination continued among the cities of Assyria proper. Next to Assur, one should mention Ekallate, Eshnunna and Elam, as well as perhaps Mari, whose interests overlapped in this region [Yuhong 1994: 62-92]. Not less important, a section of the middle Euphrates and the Khabur emptying into it served as routes leading north and west. The kingdoms that participated in the power struggle for control over the region were Mari, Terqa and other lesser kingdoms existing there as well as external powers such Halab, the Kingdom of Subartu under Shamshi-Adad or even Eshnunna and Elam [Yuhong 1994: 93-109]. As far as Syria is concerned, it was dominated by the kings of Jamhad (Halab), with Qatna and Urshum being powers to be reckoned with. Syria's road routes were well connected to northern Mesopotamia via Emar, Karkemish and to Anatolia via Urshum and Hahhum [Kelly-Bucellati 1990: 123; Astour 1995: 1415; Olbryś 2007: 100-101]. Extending south from Amman and Alalach, they reached western Palestine via Kadesh, Haçor and the Beq'a Valley and continued towards the Egyptian border. In classic antiquity the route was called via maris [Klengel 1979: 80; Astour 1995: 1416].

The great importance of trade can be clearly seen in records and law collections from the period in question. The Code of Hammurabi, sections 100-107, and sections 5-6 of the Hittite Laws contain provisions aimed at facilitating trade and ensuring security of trade operations and people involved in it [Driver, Miles 1956: 187-202; Klengel 1979: 89-91; Stępień 1996: 100-101; Hoffner 1997: 217-218]. However, some letters show that rulers did not hesitate to strike at the economy, including enemy's trade, to reach specific political aims. A perfect example is letter AbB 11 193, sent by Sin-muballit, Hammurabi's father, to one of his commanders in which he orders the commander to attack caravans approaching enemy cities to strike fear into their hearts [Leemans 1968: 211-212]. The fact that trade persisted despite such obstacles proves that it was profitable enough to attract people ready to take the risks under any political circumstances. In addition, one should also take into account other factors, which have been left out so far, like nomads and bands of robbers on steppes, which could have made trade difficult [Klengel 1977: 68-70]. Relying on letters from that period, of which from Babylonia alone 3,000 have been published to date, one can get the impression that despite the political situation trade was universal and took on ever more complex organizational forms. A new development in this respect, both in the south and north, was private commercial companies. The capital invested in them varied greatly from rather small amounts of a few shekels of silver to substantial ones, especially in the north, of several dozen minas of gold [Larsen 1977: 124-126].

The first half of the 2nd millennium BC yielded the most interesting archives of commercial documents in the whole history of the ancient East. The texts were discovered in a district of Kanesh, eastern Anatolia, which as early as the 1st half of the 3rd millennium BC played an important role in the local economy as well

as in trade extending over a broader area. In the early 2nd millennium BC, these activities unexpectedly intensified greatly thus allowing us to build a model facilitating the understanding of trade throughout the Near East. The most extensive monograph devoted to the trade settlement at Kanesh and business done by merchants residing there is G. Dercksen's The Old Assyrian Copper Trade in Anatolia published in Istanbul in 1996 [also Larsen 1976; Veenhof 1995]. The Old Assyrian trade flourished between the upper Tigris drainage and eastern Anatolia. Kanesh is situated on the plain that in this east forms a kind of a gate to the Konya plain, interspersed with interrelated urban centres, including Purushanda and Hattusha. In the east, Kanesh had access to a route leading to the upper Euphrates valley, i.e. to northern Syria and Mesopotamia. Hence, the city was ideally located to be an intermediary in trade between the lands in the east and west [Postgate 2005: 214; Koliński 2007a: 110-111]. On the opposite side, Kanesh's partner was Assur, located in the eastern portion of northern Mesopotamia, on the route from the Persian Gulf, along the Tigris. The route was joined by another from the east, crossing Eshnunna or Nuzi. The commodities shipped to Assur, next to locally produced goods, included, for the most part, others originating in countries located in the south and east. Of vital importance was the import of tin from Central Asia, from the south of Iran (Fars). The commodity was the chief export to Kanesh [Leemans 1960: 123; Astour 1995: 1404; Yoffee 1995: 1393; Postgate 2005: 212-213]. Actually, it is hard to tell when exactly Assyrians began to settle in Kanesh as the material culture of the incoming populations did not differ much from the indigenous ones. Therefore, for a more accurate date one can rely only on texts, and the historical and political context. As the monarchy of the III dynasty of Ur fell ca. 1939 BC, it is believed that the cooperation between Assur and Kanesh started soon afterwards, still before the end of the 20th century BC. However, the hill on which the settlement was located had been inhabited earlier [Śliwa 1997: 55]. Hence, it cannot be ruled out that the contacts between northern Mesopotamia and eastern Anatolia, occasioned by the trading colony, were established earlier as well [Klengel 1979: 104-105]. The greatest collection, numbering 20,000 texts on the life in the colony in its heyday, so-called Kanesh II layer, is dated to the latter half of the 19th century BC. Soon later, the decline of the outpost began after a short revival in the period of Kanesh Ib2. Hence, the Kanesh texts illustrate the growth, prime and decline of the settlement.

The texts from the prime time of the trading colony at Kanesh present a rather comprehensive picture of its life. We know that it had its self-governing body (bit karim), its internal rules and regulations, settled relations with a local ruler and even its own tax system [Larsen 1976: 283-288; Klengel 1979: 104-105; Veenhof 1995: 861-863; Bryce 2005: 22-24]. What is of particular interest to us, the settlement was the end of a very long trade route, extending from Assyria to Anatolia for about 1,600 kilometres. It ran from Assur first to centres located in Djebel Sinjar (Qatara, Razama), continued north-west to Shekhna (present-day Tell Leilan) and

the Mardin pass, where the important economic and political centre of Urkesh (modern Tell Mozan) lay [Ritsvet 2008: 589]. There, the route could have turned north towards Amida (Diyarbakir) and then west as far as the Upper Euphrates Valley extending north. This is shown by the presence there of Khabur pottery and another, having clear south Mesopotamian traits [Parker, Dodd 2003: 35-36]. Another branch of the route crossed Shekhna, the Khabur triangle and continued due west until the crossing of the Euphrates. It turned in the direction of Anatolia in northern Syria, passing through Urshum.

What's important about the course of the route from Assur to Kanesh is its great diversification and division into several crucial sections that were marked by successive Assyrian outposts such as Eluhhut, Nihriya, Burudum, Urshum, Zalpa (in Syria), Timilkia and Hahhum, which merchants from Assur liked to call at. Along the trail, three kinds of trading colonies were located: next to karum, we know of smaller posts called wabartum and ešertum [Dercksen 1996: 64; Veenhof 2008: 165]. It must be stressed that the trade involved exchange of very large quantities of goods and used caravans of as many as 200 beasts of burden. What was shipped westward included primarily metals (tin and copper) and textiles originating mainly from Babylonia. In the opposite direction, caravans carried mainly silver, gold and bronze goods. Thus, it was actually one-way trade and scholars agree that from the west to Assur, merchants carried mostly if not exclusively profits that they later invested in the next expedition to Anatolia [Veenhof 1995: 864]. In the case of the major commodities, i.e. tin and textiles, Assyrian merchants were intermediaries in a long-distance commercial exchange, reaching distant lands. As it has already been mentioned, tin in all probability came from the Fars Mountains in southern Iran, while textiles were manufactured at Assur and Babylonia [Reiter 1997: 209; Postgate 2005: 213]. Neither commodity ended its journey in Kanesh, but was transported further to western Anatolia where more colonies of Assur merchants were located. Next to the karum at Kanesh, we know of Assyrian trading colonies in Purushanda, Wahshushana, Hattusha and Zalpa at the mouth of the Kizilirmak river on the Black Sea coast. The fact that even the last-mentioned one contained an Assyrian trading colony (wabartum) may mean that it was an important commercial centre, having ties to the cities on the Black Sea coast [Astour 1995: 1410; Oguchi 1999: 98]. A more important of the Anatolian routes, followed by Assyrian merchants, extended from Kanesh via Purushanda in the south-west to western Asia Minor and then north-east to the Black Sea coast [Astour 1995: 1410; Dercksen 1996: 63; Veenhof 2008: 165]. The other route continued from Hattusha and Amkuwa to Zalpa. It is possible that Assyrian and Anatolian goods went further north, to cities on the Black Sea coast. Hence, it seems quite certain that Assyrian merchants made themselves at home in Anatolia and took advantage of the local economic situation, although they were not allowed to trade in goods of local origin. It must be added that such Assyrian trading colonies were set up not

only in the west and north but also south of Assur, for instance, at Nuzi and Sippar in Babylonia [Postgate 2005: 212-213].

In conclusion, the trading colony at Kanesh, because of its size, was certainly exceptional. However, we know of many other karum type outposts in the Near East that were attached to urban centres in both southern and northern Mesopotamia. The term karum itself originally meant a harbour or a pier where a commercial district of a city developed – a frequent element of Mesopotamia's cityscapes [CAD K: 231-232; Stol 2004: 939; Postgate 2005: 213-215]. It follows from the Kanesh archives that despite its great significance for the economy of a given region, trade in a karum did little to bring the two communities closer together. Merchants from Assur kept apart from the indigenous population, used their own calendar, language and even for the most part Assyrian servants [Postgate 2005: 215]. The indigenous inhabitants of Kanesh did not absorb cultural novelties from the strangers, either, despite the fact that Assyrian merchants used the Akkadian language and cuneiform script. However, the dialect and script that were later adopted in Anatolia originated from Babylonia and arrived there from Syria [Klengel 1979: 110; Postgate 2005: 215]. To the significance of Assyrian trade with Anatolia testifies the fact that Assur rulers took special care of it. Specifically, they took much effort to remove any problems merchants might encounter in their profitable endeavours. Towards the end of the colony's existence, a royal official even appeared there, called waqil tamkari or merchant overseer. This, however, may indicate a desire to bring trade under the control of the royal palace [Postgate 2005: 214-215]. In addition, the significance of the karum at Kanesh is underlined by the rivalry between Assur, and Mari and Syrian cities reflected in late texts and pottery from Kanesh [Klengel 1979: 79; Koliński 2007a: 113]. Apparently, the competitors lay in wait for a crisis in trade with Assur in order take over this profitable activity. The penetration of Anatolia by trade agents from Mari and Syrian cities was possible also because the tin from Iran reached the middle and upper Euphrates from whence some of it was shipped to western and southern Syria and Palestine [Leemans 1968: 209; Klengel 1979: 78-80; Muhly 1985: 282; Reiter 1997: 213-214]. In this connection, it is worth mentioning that the 'tin route' from the east through the Diyala Valley turned also in the direction of southern Mesopotamia, Larsa and Ur on the Persian Gulf, although it is hard to tell whether tin reached these destinations through the Diyala Valley or through Assur [Leemans 1968: 193, 206; Reiter 1997: 213-214]. All these branches of the 'tin route' from the east, from behind the Zagros Mountains, were a continuation of a single route beginning at the Iranian Mountains of Fars. Movement of goods along this eastern portion of the route spanned even greater distances and must have been even more intensive than that we know from Old Assyrian trade. Unfortunately, due to the absence of any written records, we know few details of this fascinating development in its Iranian part.

Another watershed in the political and economic history of the ancient East, hence in the course and operation of trade routes as well, took place in the latter half of the 18th and early 17th centuries BC. It coincided with the reign of three rulers, namely, Shamshi-Adad I, king of northern Mesopotamia, Rim-Sin, king of Larsa and the whole south, and Hammurabi, king of Babylon. Shamshi-Adad I, next to northern Mesopotamia and the Khabur triangle, subdued the middle course of the Euphrates with Mari. It was his kingdom that was crossed by communication routes used by merchants from Assur on their way to Kanesh. Due to wars waged by Shamshi-Adad, roads leading west and north from Mesopotamia were often unsafe or even blocked for some time, which had an adverse effect on Anatolian trade. It is possible that because of wars fought by Shamshi-Adad with Yamhad in Syria, merchants from Assur had to follow the route crossing the Mardin Pass and passing through Amida and Hahhum to avoid crossing the border between the warring countries. Because of the route towards Iran, crossing the Zagros Mountains, the king of Subartu, as this was the name used by Shamshi-Adad in respect of his kingdom, attempted to impose his control on Eshnunna in the Diyala Valley, but failed in his efforts. This must have been the reason for charting a new route to Iran along the Little Zab Valley, which bypassed Eshnunna. In the opinion of Oguchi, the Great Zab River in the north could have been used for that purpose, which finds from Shemshara seem to suggest. However, if this had been so, tin from the east would have reached Nineveh, which certainly did not participate in this trade [Oguchi 1999: 98-100]. This route, too, was blocked by Turukku peoples, pressing on Assyria from the east. Hence, the supply of tin to Assur from the east finally ceased, which brought about an end to Old Assyrian trade in the late 18th century BC [Larsen 1976: 88-89; Oguchi 1999: 95].

Around this time, southern Mesopotamia was dominated by Larsa that gained control of the mouth of the Tigris and Euphrates rivers in the south, including the region's largest urban centres such as Ur, Larsa, Nippur and Uruk. In terms of economy, the kingdom's role was highly significant as the most important routes crossed it on their way to the Persian Gulf and Elam. Also, the population of the kingdom formed a major market and had a considerable production potential. In the buffer zone between Larsa and Subartu, there lay a number of smaller kingdoms of which more important ones were Babylon and Eshnunna mentioned earlier. This period of relative stability lasted for about 20 years and ended with wars that engulfed the region soon after 1700 BC. From the chaos, Babylon emerged victorious and its ruler, Hammurabi, after five years of fighting was able to bring the whole southern Mesopotamia, Diyala Valley and Mari under his control and incorporate into his kingdom. Northern Mesopotamia with Assur and Ekallatum became Babylon's client for a short time [Kuhrt 1995: 113]. In this way, this young kingdom whose centre lay in the area formerly occupied by Akkad became a power on the scale of the whole Near East. The kingdom of Babylon exploited economically

its geographical location, but faced serious limitations as well. Hammurabi did not conquer Syria which could still obstruct routes going north and west. Additionally, Babylon was in conflict with Elam, which made eastern trade difficult despite having control of the Diyala Valley. The latter caused problems as well since the king of Babylon is known to have put down rebellions there and his son, Samsuiluna, fortified the region because of a new threat posed by Kassites [Kuhrt 1995: 115-116]. Samsuiluna, however, lost control over the estuary of the Tigris and Euphrates rivers in the south, allowing his country to shrink considerably whereby it lost favourable conditions for economic development. Hammurabi's achievements, nevertheless, inspired awe in his contemporaries and descendants, making Babylon the cultural capital of the then world. As regards trade and communication routes at that time, it follows from letters and other texts that merchants were very active then. This is true for both private ones and those working for institutions. They were active throughout Mesopotamia but the directions particularly preferred in their expeditions included the east (Elam), north (Arrapkha, Ekallatum, Assur) and north-west (Mari, Tuttul and Emar) [Leemans 1960: 89-109].

As regards economy and trade in northern Mesopotamia and Syria in the latter half of the 17th century and in the 16th century, i.e. in the times when they were not satellites of Babylonia, the situation is hard to describe with any certainty as no uniform political organism existed then in this area. Archives from Nuzi, one of the kingdoms located in the area, show that Hurrian kingdoms prospered there. Soon after the fall of Babylon in 1531 BC, they formed Mitanni federation, extending from the upper Tigris River as far as western Syria. Its centre was located at Washshukanni on the upper Khabur River. It is very probable that still before the rise of the federation, these petty kingdoms were interconnected by trade and east-west routes [Oguchi 1999: 95]. To a rather uniform character of these kingdoms and their economic prosperity testify texts from Nuzi, Emar and Alalah and the spreading of the so-called Khabur pottery indicates a rather uniform character of their material culture [Oguchi 1999: 96; 2006: 54]. The course of the then communication routes is not known to us but we can only suspect that still before the rise of the Mitanni federation they ran east-west with a deviation to the south in the east and branches running north and south in the west.

As far as the history of Anatolia is concerned, a single development of utmost importance for the region and the whole Near East in the first half of the 2nd millennium BC, was the emergence of the Hittite state. At least since the end of the 18th century or soon after the collapse of Assyrian colonies at Kanesh and other Anatolian cities, aspirations to achieve unity by the urban centres of Konya Plain and its fringes had manifested themselves. As it has already been mentioned, in the light of the Kanesh texts, the most important city in terms of politics was Purushanda, situated in south-central Anatolia. However, it was not this city that played a crucial role in the integration of the region as the earliest records point to Zalpa and

Kushar, located in the northern and north-eastern parts of Anatolia, respectively. Zalpa controlled the mouth of the Kizilirmak River on the Black Sea coast, which might mean that it was well-poised to develop into a political power. The role of this city in Anatolia's contacts with the Northern Pontic Area is manifested by the fact that the Black Sea was called the Sea of Zalpa by Hittites and the location of the furthermost trading colony of Assur merchants [Bryce 2005: 90]. Kushar, in turn, was located further east in the foothills of the Pontic Mountains. Sources show that Zalpa's rulers first and Kushar's later succeeded in bringing under their control all the major urban centres of Konya Plain, including Purushanda, Kanesh and Hattusha, building thus Anatolia's first vast kingdoms. In Bryce's opinion, the reason behind the struggle and rivalry for dominance over eastern Anatolia could have been the desire to control the trade route to Assyria [Bryce 2005: 34]. These first attempts at statehood disintegrated soon and a lasting unification of central Asia Minor succeeded only at the third attempt. This happened in the early 16th century BC and was the work of successive rulers of Kushar [Kuhrt 1995: 225-228].

The first rulers of united Anatolia immediately undertook outside expansion, the economic grounds for which are quite obvious as it was directed westwards at Arzawa and the kingdom of Wilusa, identified with Troy. The kingdom had started on the second period of rapid expansion around that time (Troy VI). The city took on even more monumental appearance than in the 3rd millennium BC and its material culture shows links to the centres of central Anatolia, Transcaucasia and Mycenaean Greece while Troy's ships may have penetrated the Black Sea. The important position of Troy in western Turkey is borne out by the Hittite texts that often mention strenuous efforts by Hatti kings to maintain control over it [Bryce 2005: 245-246, 340-342, 359-361]. The other direction of expansion by early Hittite rulers was Syria. There, local political and economic power was wielded by the kingdom of Yamhad with its capital at Halab [Bryce 2005: 75-77]. Murshili I, the third ruler of the united Hittite kingdom, conquered Halab ca. 1536 BC whereby, after mere one hundred years of existence, the Hittite monarchy acquired a solid base for economic and political stabilization, extending from the frontier with northern Mesopotamia, Syria and the upper Euphrates to the Dardanelles. The kingdom of Hittites not only controlled important trade routes but also rich deposits of raw materials, making other Near East countries reckon with it. A good example is the kingdom's relations with the Hurrian monarchy that extended over northern Mesopotamia and Syria. The latter was conquered by the rulers of Mitanni at the time of the first crisis suffered by the Hittite kingdom at the turn of the 16th century BC. The reason for the rivalry between the two powers was their shared desire for controlling Syria and south-eastern Anatolia, which were crossed by very important trade routes of the Orient. Consequently, any stabilization in this area was possible only with one of the monarchies having the upper hand. And so, in the 15th century BC, the Hurrian federation gained the upper hand, while in the 14th and 13th

centuries BC the Hittite empire enjoyed supremacy. In fact, in over 200 years of co-existence, the two kingdoms virtually never had peaceful relations, instead there was always fierce rivalry between them [Kuhrt 1995: 289-295, Bryce 2005: 189-193].

2.4. COMMUNICATION ROUTES OF THE AMARNA PERIOD

The fall of the Old Babylonian kingdom, which occurred in the latter half of the 16th century BC following the Hittite invasion, and the rise of the Mitanni federation meant a beginning of a new period in the political and economic history of the whole Orient. A new order taking shape in the Near East was brought about by the territorial expansion of Mittani. However, before this came to pass fierce conflicts between kingdoms raged. In the 15th century, for over half a century, the Hurrian monarchy fought with Egypt over the control of Syria in the south-east and engaged in conflicts with the Hittite kingdom in the north-west time and time again. Possibly, hostile relations may have existed too between Mitanni and Babylonia, ruled then by the Kassites who had come to power there after the Hittite invasion [Kuhrt 1995: 339-341]. In the long run, a conflict with Mitanni was not in the interest of Egypt or Babylonia, hence ca. 1420 BC a peace agreement was concluded with Mitanni, stabilizing the economic and political situation throughout the region for half a century. The Tell el-Amarna archive shows that it was a kind of Near Eastern belle époque which for the first time in the region's history saw a free exchange of missions and goods in the area from the Persian Gulf and the Zagros Mountains to Egypt and Anatolia. The letters speak of vigorous exchange of diverse goods, especially ready-made luxury items, ornaments, clothes, chariots and horses. The last mentioned commodity was greatly valued especially by Egyptian monarchs. The Amarna letters show only the Egyptian perspective of the exchange, thus in principle we do not know what pharaohs offered in return to their Asian trade partners apart from gold; curiously enough it was cheaper than silver in Egypt [Avruch 2000: 160-163]. What is intriguing about the exchange is the course of the longest caravan route, joining Babylonia to Egypt. The unresolved question is whether it took a shorter way along the Euphrates, across south-eastern Syria, or on its way it reached the upper Khabur and the Mitanni capital. Looking on slightly earlier Old Babylonian itineraries, one thinks that the latter course seems more probable.

In the 15th century BC, no profits from the international commercial exchange were made by Assyria and the Hittite kingdom, which found themselves under a strong influence of Mitanni. After almost 70 years, as a result of fierce fighting in the middle of the 14th century BC, it was them that prevailed over their oppres-

sor and replaced it in the political system and commercial exchange [Bryce 2005: 174-177, 189-193]. A new order, which emerged in the latter half of the 14th century BC, differed considerably from the previous one as Syria, overrun by Hittites, was closely tied to Anatolia, while northern Mesopotamia, after a short domination of Hittites in the early 13th century BC, found itself within the orbit of Assyria. Having hostile relations with the Hittites, Assyria attempted to find a recompense for being denied access to Anatolian raw materials in expanding into the Transcaucasia (Nairi) [Leemans 1968: 209, Bryce 2005: 347-351]. Finally, a conflict ensued between the two kingdoms, with the Hittite state suffering a defeat. On the opposite end, Assyria attempted to take control over the Diyala Valley and the road to Iran, causing wars with Babylonia. The fighting brought destruction to an important trade centre at Nuzi [Kuhrt 1995: 356-357]. Assyria's hostile relations with the Hittite state in the west and Babylonia in the south, as well as an economic blockade on both sides, prevented the country from taking advantage of its favourable geographic location until the end of the 13th century BC. It must have made do with its own resources to be found between the Zagros Mountains in the east and the upper Euphrates in the west as well as in the Transcaucasia.

The new situation that took shape in the Amarna period exerted an especially strong impact on Syria that was divided into two spheres of influences. First, in the 15th century BC, the division was made by Egypt, which annexed southern and western Syria including the Mediterranean coast, and Mitanni, which controlled northern and eastern Syria. The division actually followed a natural distinction between the coastal zone and the farming-steppe one, which was very clear already earlier. For the Mitanni kingdom, the possessing of Syria was vital and we know that petty Hurrian states existing there, such as Alalah, Halab, Karkemish or Emar, played a very important role in the geopolitics of great kings from Washshukanni. In effect, eastern and northern Syria integrated even more with northern Mesopotamia while western and southern Syria, together with the Levantine coast and Palestine, associated themselves with the eastern Mediterranean and Egypt. As regards the trading routes of central Syria at that time, the role of the route running from the Orontes Valley south, in the direction of Palestine and Egypt, was strengthened likewise the route from the Euphrates to the Mediterranean via Halab and Alalah, which served as Mitanni's gateway to the sea.

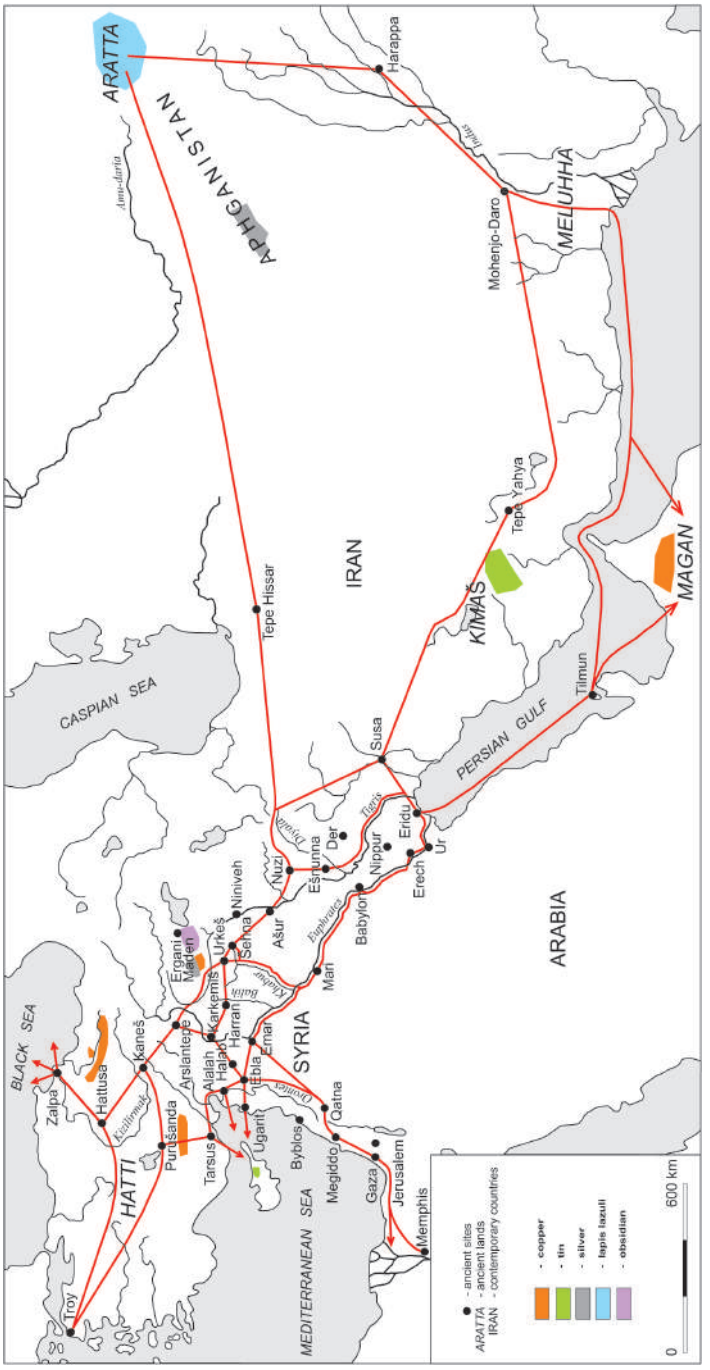
In the latter half of the Amarna period, from the middle of the 14th century BC until the invasion of the Sea Peoples, as a result of Egyptian-Hittite wars, eastern and northern Syria came under Hittite rule. The new masters set out to integrate it into Anatolia. This was an important novelty for the region, the more so as this involved severing it from northern Mesopotamia ruled by Assyria since the early 13th century BC. Hittite rulers attached great importance to sovereignty over Syria and founded there two Hittite kingdoms, at Karkemish and Halab, ruled by the sons of the great king from Hattusa [Bryce 2005: 190-192]. Due to hostile economic policies

and a blockade in the east, the Hittite part of Syria more and more succumbed to Anatolian influences, reinforced even more by a Luvian colonization. As a result, Syria was considered part of the land of Hatti until the end of the first half of the 1st millennium BC. To the lasting character of the Hittite or Luvian impact on Syria testify the post-Hittite kingdoms that emerged there in the late 2nd millennium BC and greatly affected the region's history in the 1st millennium BC.

3. MEANS OF TRANSPORT AND CONDITIONS OF TRAVEL

It is a common belief that owing to an easy access to rivers, the most important means of transport almost throughout the Near East in the Bronze Age were boats. Indeed, the major civilization centres were located on great rivers or their tributaries. Their waters over long sections are quite calm and navigable. As key evidence of the role of navigation in the early history of the Orient serves the example of the Euphrates in the trade contacts of southern Mesopotamia and Syria. The example seems to be borne out by the location of the so-called Uruk colonies in the 4th millennium BC that were indeed founded on the middle and upper courses of both waterways. In this way they had direct communications with the metropolis [Astour 1995: 1407-1408]. Also later, merchants from the cities of Sumer and still later from Sumer and Akkad often imported different raw materials and goods from the north using boats. In the light of inscriptions of Gudea, king of Lagash, from the 21st century BC, boats could serve trade of the south with lands on the middle or even upper courses of the Tigris and Euphrates rivers [Limet 1977: 57; Astour 1995: 1408; Postgate 2005: 208].

However, the opinion that boats were commonly used for trade in the Orient must be reviewed because, next to some weak points in the theoretical aspect, it cannot be defended anymore in the face of recent research results, especially in the field of archaeology. First and foremost, even in the case of centres located on the same river, commercial exchange over longer distances in both ways could not rely solely on boats. It is easy to imagine a trip by boat downstream, but for travel in the opposite direction other means of transport were used. Texts from the 3rd and 2nd millennia BC, including private letters (e.g. AbB 2 83, 87, 177), show that for travel upstream merchants from the south used donkeys for carrying goods north [Klengel 1979: 87]. Theoretically, they could sell the beasts of burden at their destination and buy boats with the money to carry them downstream [Dercksen 1996: 61]. This solution seems rather doubtful as donkeys sold in large numbers at the destination of an expedition would fetch a low price for animals of the highest quality that they



Map 1. Trade routes in the ancient East from the 4th to the 2nd millennium BC

were [Stol 2004: 871]. In the case of northern Mesopotamia and Syria, the situation was made even worse by a strongly developed breeding of donkeys there, which would have made any such transaction even less feasible [Klengel 1979: 97]. Also, the buying of boats in the north would have been rather expensive if merchants from the south had purchased them there often. Theoretically, these could have been simple rafts using inflated animal hides, built on the spot [Bass 1995: 1421-1423]. One can doubt, however, whether such makeshift 'boats' could carry heavy loads for many days it took to sail downstream hundreds of kilometres. Another inconvenience related to the use of boats for the transport of goods over long distances was the need to control the whole waterway or at least ensure safety to the expedition. For having to keep to the stream meant that no obstacles posed by the political situation could be avoided. All these inconveniences would be tolerable only in the case of commercial exchange managed by large institutions, royal palaces or temples, having at their disposal substantial material and human resources. Such institutions did not have to take care to make such expeditions highly profitable. Both early literary texts and later records, mentioning the import of precious materials for the court, show that such imports were not part of regular trade but were brought in fulfilment of royal orders. It is possible that in such cases boats or rafts were bought or built on the spot and used to transport such raw materials [Kramer 1977]. It was for such institutions that goods were initially brought from the north by boat. The water transport, however, was too expensive for private trade, which can be seen in 2nd millennium BC texts, and thus it ceased to be widely used [Postgate 2005: 218].

The opinion that boats were a common means of transport could be true for southern and central Mesopotamia. Sumer and Akkad are in principle a single country crisscrossed by many canals and branches of the Tigris and Euphrates rivers. The rivers flow calmly in their lower courses, which makes navigation easy. Therefore, the use of boats for transport in the south could be widespread since the earliest times. With the passing of centuries, information on the use of boats for transport is ever more frequent to reach a peak during the reign of the III dynasty of Ur. It follows from these records that boats had a very high cargo carrying capacity of as much as 90,000 litres of grain (approx. 70 tonnes) and sailed on the two rivers and their branches from the Persian Gulf to the cities of northern Babylonia and the Diyala Valley in the north and Mari on the middle Euphrates [Bass 1995: 1422-1423]. At least in part, Sumerian cities maintained contacts using boats and ships with the outer world, in the first place with seaside countries such as Elam, Dilmun (Bahrain), Makkan (Oman) and Meluhha (India). For this purpose, the largest and strongest ships were built so that they would withstand undulation of the sea [Postgate 2005: 218]. A certain drop in the use of large-tonnage boats is observed in the first half of the 2nd millennium BC when Mesopotamia, and the valleys of major rivers too, were cut by borders of many countries, frequently at odds with one another. The partitioning of the region prevented inland navigation

from developing. Yet, boats remained the chief means of transport in southern Mesopotamia until the end of the Bronze Age, which is evidenced by the provisions on navigation laid down in Hammurabi's Code of Laws (Sec. 236-240) [Driver, Miles 1956: 429-432, 473-475].

The use of other means of transport, apart from boats, was necessary from the earliest times to maintain contact between southern Mesopotamia and the lands that were not joined to it by waterways: eastern Iran and Afghanistan [Oates 1991: 24-25; Selz 1991: 32-34; Astour 1995: 1405]. Here, certainly caravan transport was used as described in literary works devoted to the early rulers of Uruk [Kramer 1977]. Organization of such transport was rather troublesome as caravans had to make regular stopovers, replace injured animals, find water to drink by people and animals, etc. Additionally, it was necessary to hire right people to handle goods and animals, and defend a caravan against possible assailants. On long routes, stretching for over a thousand kilometres, there could always happen something out of the ordinary which called for special precautions [Leemans 1968: 212]. As regards the use of wagons in the earliest periods of trade, we do have evidence of their existence, but their use for the transport of goods is rather improbable. The earliest wagons that we know from mock-ups clearly served ritual-ceremonial purposes [Bollweg 1999: 187-191]. There is no doubt, however, that they were soon adapted to more practical tasks.

The situation in northern Mesopotamia and Syria looked similar: merchants frequently had to resort there to land transport. Apparently, for transport purposes could be used the valleys of four major rivers: the Tigris, Khabur, Euphrates and Orontes; however, their north-south course did not ensure in many instances any connection between countries rich in raw materials and those which needed them. Hence, the use of other means of transport then the boat in the north resulted from the domination there of east-west roads connecting the Zagros Mountains to Syria and Anatolia in one direction and the west to Assyria, the Diyala Valley and Babylonia in the opposite direction. The roads, however, did not coincide with the river courses in the area. Even in the kingdom of Mari, located on the middle Euphrates, which thus had access via the river and the Khabur to neighbouring countries, the dominating means of transport were donkeys and wagons. This can be seen in Hammurabi's letter to Zimni-Lim, king of Mari, in which the ruler of Babylon, meaning means of transport, writes straightforwardly to his ally: "Your country is donkeys and wagons, mine is boats" [Limet 1977: 54; Astour 1995: 1403; Stol 2004: 872]. This short sentence, deprived of any justification, gives the impression of referring to some well-known fact. Hence, the letter suggests that the means of transport most widely used in the north were beasts of burden and wagons. Since the former are a gift of nature which can be easily adapted to carry goods, it was them who served as the most important means of transport. In effect, a classic view related to long-distance trade throughout western Asia, from India to the coast of

the Mediterranean Sea, from the 4th millennium BC until the construction of the railways, was caravans of pack animals, initially donkeys and later camels.

Pack animals, however, were not a sufficient means of transport as not infrequently such goods had to be carried which could not be loaded onto animals, e.g. logs of wood or blocks of stone. For such loads another means of transport had to be found. It was, of course, the wagon, mentioned in letters, business texts and codes of laws. However, until the end of the 3rd millennium BC relatively few of them had been used. The oldest references to transport wagons date back to the middle of the 3rd millennium BC in Ebla. They mention two- three- and four-wheel wagons, including a four-wheel wagon of the queen [Astour 1995: 1402]. The representations of the early wagons from the so-called Standard of Ur and the Stele of the Vultures show the vehicles to be rather simple structures unable to carry goods over longer distances at least initially. To the use of wagons in transport point texts from Kanesh. It follows from them that in the early 2nd millennium BC, wagons were an important means of transport in the north next to the donkey. What's more, Old Assyrian texts suggest that wagons were used in trade often enough to make the expression 'wagonload' a measure of the amount of goods [Gökçek 2006: 196]. What else can be seen is the fact that it was a standard practice to rent wagons together with oxen and drivers. Although this was quite expensive but allowed merchants to cut down considerably on the number of animals and personnel. As it has already been mentioned, it follows from records that a single caravan could have up to 200 donkeys, loaded with 12 tonnes of goods in total. This required hiring several dozen men to handle goods and animals and to protect them. The task was made simple by the use of wagons that could carry over 1.5 tonnes of goods i.e. as much as was carried by 25 pack donkeys. This could have greatly improved trade and contributed to its growing in size so much. The data we have from the period of Kanesh II allow us to estimate the aggregate amounts of goods transported. It turns out that in the course of 50 years of the most intensive trade between Assur and Kanesh about 100,000 bales of canvas and 80 tonnes of tin were transported. This amount of tin was enough to produce 2,000 tonnes of bronze, taking the average content of tin in bronze to be 10-11 per cent [Muhly 1985: 279; Reiter 1997: 289]. Admittedly, the use of wagons in caravans could have slowed down the journey but the savings were very clear. It follows from the texts that under normal conditions a one-way journey took about six weeks to complete, which might not be long enough for a caravan using wagons [Dercksen 1986: 61-67; Astour 1995: 1408-1409; Veenhof 1995: 864].

A broader use of wagons both in the south and north is borne out by the Old Babylonian and Elamite texts which until the end of the Bronze Age supply many examples of renting wagons and comments concerning such vehicles (Riftin 113, MDP 10 103, MDP 22 131). And so, a text from Ur tells about the requesting of 30 transport wagons (UET V 24). Also, in the Nuzi archives we find an archival note

which mentions 16 tablets concerning wagons of this type (eriqqum) (PBS 2/2 140, RA 36 170, CAD E: 296). As can be seen from excavations, individual countries had their characteristic wagons, which is confirmed, as it seems, by a letter from Mari in which we read about requesting a 'Mari type' wagon (ARM 4 12, CAD E: 296). In turn, the use of wagons for transport in the south is evidenced by the provisions of the Laws of Hammurabi and Laws of Eshnunna that set rates for the renting of vehicles with draught animals (LH para. 271 & 272, LE para. 3). The rates were very high: in Babylonia it cost 180 litres of grain to rent a wagon with oxen and a driver per day and 40 litres to rent a wagon only. The Laws of Eshnunna provided for a slightly smaller charge for the renting of a wagon with oxen and a man to handle it of 100 litres of grain [Roth 1997: 131, 217, Gökçek 2006: 188-196].

A lot of information on the use of wagons in the economy, especially in trade, comes from the Mari archives. A letter was found there which mentions a transport of timber on wagons from Qatna to Ekallatum. These must have been particularly sturdy wagons because the load was transported over a distance of 500 km [Charpin 2004: 163-165]. From the times of Zimri-Lim, there are records of the use of wagons during war expeditions, in the first place for carrying siege machines and troops as well [Astour 1995: 1402]. Details concerning capacity and teams of draught animals show that there were two types of transport wagons in use in northern Mesopotamia: heavy ones for the carriage of bulky loads, drawn by oxen, and lighter ones, for the carriage of lighter goods and people, drawn by donkeys. What may be misleading is the fact that both types were referred to as eriqqum [Astour 1995: 1402, Gökçek 2006: 185]. The Mari texts speak of a quite dense network of land routes, especially in Syria, that joined numerous urban centres of the region. Interestingly enough, the roads in Syria only rarely coincided with the local waterways, hence a dominant role must have been played there by land transport, relying on pack animals and wagons. This is borne out by the finds of several models of such wagons in the region. Topographic studies show that Syria's communication routes were used in this way until the invasions by the Sea Peoples in the 13/12th century BC., when many local trade centres were destroyed [Astour 1995: 1415].

The most spectacular source providing evidence of the use of wagons in transport and trade in the Orient is terracotta models of wagons published by J. Bollweg in her extensive work Vorderasiatische Wagentypen im Spiegel der Terracottaplastik bis zur Altbabylonischen Zeit. This is a surprisingly large collection including almost 200 wagon models of which a clear majority were designed for other purposes than economic ones. Their number and variety show that they must have played an important role in the transport of goods, starting from as early as the middle of the 3rd millennium BC. The oldest of those that may have been used for transport are dated to the first half of the 3rd millennium BC. They were found in Tell Chuera and Tell Brak in northern Mesopotamia [Littauer, Crouwel 1979: 19; Bollweg 1999: 29]. These were sturdy vehicles with a side planking and, which is important, a covering

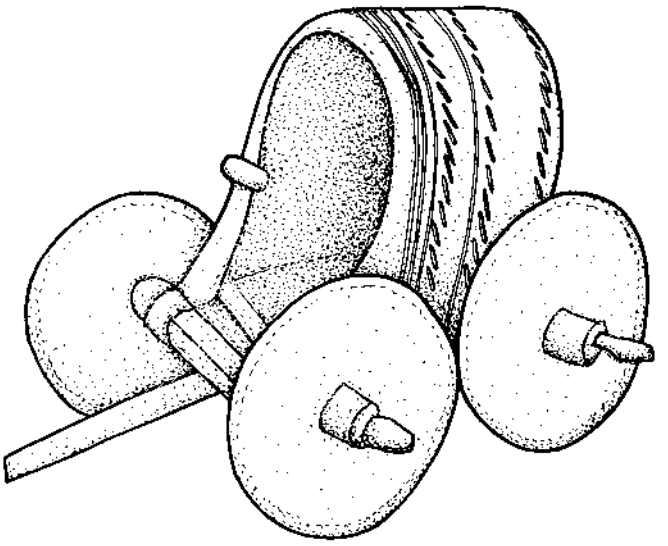


Fig. 1. Syrian wagon of the 3rd millennium BC. Tepe Gawra (2440-2150 BC) [Bollweg 1999: Fig. 126]

supported on bows. The covering was certainly designed to protect goods against rain not infrequently encountered on the uplands of northern Mesopotamia, Syria and Anatolia. The introduction of this improvement indicates a permanent adaptation of wagons to land transport already since the middle of the 3rd millennium BC. From the latter half of this millennium we have a rich collection of wagons in the so-called Akkadian style. They come from both the east of the region (Nuzi, Tepe Gawra) and Syria (Tell Bi'ah, Hamah, Gaziantep, Tell el-Hamman), where, as it has been already observed, the course of communication routes made traders use pack animals and wagons [Bollweg 1999: Fig. 122 – Tell Bi'ah, 124 – Hamah, 125 – Terqa, 126 – Tepe Gawra, 133 – Tell el-Hamman]. Also, from the north, come more rare models of wagons designed for religious purposes, which testifies to the wide use of the invention [Bollweg 1999: 42-43, 141-144 and Figs. 156, 161, 165 and others]. Syrian and northern Mesopotamian wagons are presented by Bollweg in Figs. 94 (Tell Maşin), 95, 122 (Tell Bi'ah), 124 (Hamah), 126 (Tepe Gawra), 130 (Gaziantep?), 133 (Tell al-Hamman?), 134 (Syria), 135 (Syria), 136 (Syria).

Highly interesting observations on the way merchants travelled in the Old Babylonian period are supplied by few itineraries dated to this period. The texts were published by A. Goetze [Goetze 1953] and W.W. Hallo [Hallo 1964]. There, we

can find a brief description of the routes covered by merchants over long distances. The best known of them is a short description of a journey from Larsa to Emar. According to the itinerary, travelling to their destination, the merchants chose to visit Asyria and the Khabur triangle, making the journey considerably longer. Consequently, they first travelled on ships to the Diyala Valley and continued along the middle Tigris River as far as Assur and Ekallatum, where they turned west. The next centres visited by the merchants were Apqum in Djebel Sinjar, Shubat-Enhil and the cities of the Khabur triangle. There they visited Urkesh and Ashnakkum, where the route from the east to the west crossed the north-south route [Klengel 1979: 104; Astour 1995: 1414; Stol 2004: 889-891]. Travelling further west, the Larsa merchants reached Harran where they turned south on the Balikh to reach Tuttul and moving along the Euphrates, they reached their destination [Astour 1995: 1410-1414]. It is hard to tell what the reason was for taking such a roundabout way if one remembers that from Larsa to Emar there ran a direct north-western route. Most probably, likewise Assyrian merchants, the traders from Larsa visited more attractive economic centres to buy more goods. Possibly, they traded them on their way to raise their profits. On the other hand, it is possible that the shortest way from Larsa to Emar, along the Euphrates, was simply too dangerous for political reasons [Leemans 1968: 212]. In sum, their round trip took slightly over half a year. The text itself seems to bear out Leemans's thesis on the Old Assyrian trade, holding that on successive legs of their journey, Old Babylonian merchants used different means of transport. Among them were boats and donkeys, and, possibly, in Subartu wagons were used as this scholar suggests that this type of transport could have existed between Assur and Shubat-Enlil during the reign of Shamshi-Adad I [Leemans 1960: 134].

Another interesting itinerary dating back to the late 18th century BC is a brief report on the expedition of the king of Mari to Ugarit. It was a diplomatic and business trip in which merchants from Mari, and perhaps from Babylon and Elam as well, participated or at least goods from these two countries were transported [Muhly 1985: 281-283]. Interestingly enough, the trip began in the Khabur triangle and continued west, too, across the upper Balikh River and via the cities of Emar and Halab to reach its destination where merchants from Cyprus and Crete were encountered. The archive of Zimri-Lim from the 18th century BC shows a very broad economic horizon of the kingdom of Mari. Contemporaneous texts mention in different contexts countries and cities from Dilmun (Bahrain) in the south, Susa in the east, Hattusha in the north and Crete in the west [Klengel 1979: 76-80]. Besides, the contacts of Crete and Cyprus with the Levant are documented already in the latter half of the 3rd millennium BC [Knappett *et al.* 2005: 47; Webb *et al.* 2006: 282]. Although the texts do not mention this, the king of Mari's expedition must have used many wagons and pack animals because the monarch, according to custom, travelled with his wives and part of the court. Obviously, in such a case

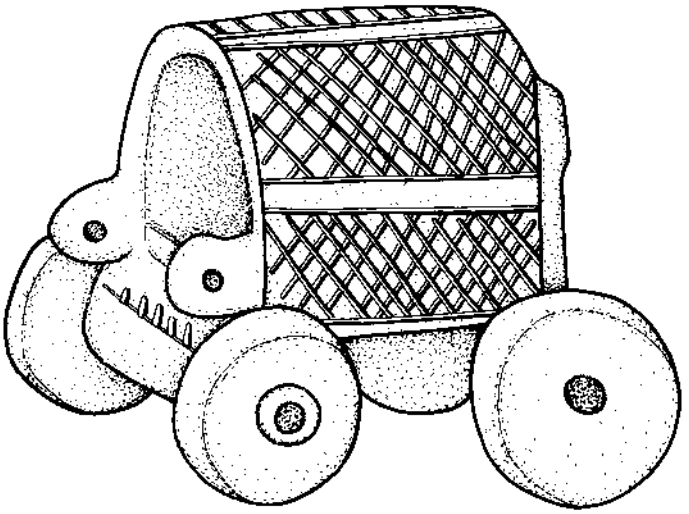


Fig. 2. Anatolian wagon of the 3rd millennium BC. Gaziantep (latter half of the 3rd millennium BC) [Bollweg 1999: Fig. 130]

wagons were necessary. Shamshi-Adad I's expedition in the direction of Qatna in southern Syria must have looked alike as he travelled to fetch a local king's daughter who was to marry his son. Also in this case, wagons must have been necessarily used. Although Shamshi-Adad himself travelled only as far as Terqa on the middle Euphrates where he was to wait for the arrival of his prospective daughter-in-law [Charpin 2004: 163-165].

One could expect that wagons becoming a more popular means of transport should bring about the adaptation of roads to the use by such vehicles. In principle, nothing of this kind can be observed except for one case, known as the 'wagon road' mentioned in the texts from Nuzi [Leemans 1960: 134; Astour 1995: 1403]. The city was located in the foothills of the Zagros Mountains and was a hub of routes from Iran to northern and western Mesopotamia, Syria and Anatolia. In addition, the area was crossed by the roads from the south to the north of Mesopotamia. Hence, it is possible that the commercial traffic there was so heavy as to make the construction of roads a sheer necessity. In Leemans's opinion, similar roads may have existed between Assur and Shubat Enlil in the reign of Shamshi-Adad and between the cities of the south and north, located close to one another, such as Assur and Ekallate, Babylon and Sippar, etc. [Leemans 1960: 118]. This may be also suggested by references to the renting of transport wagons in the texts from Elam, which is

an upland and mountainous country. From this area come models of as many as 13 wagons [Bollweg 1999: Figs. 19, 22, 24, 29, 42, 112, 127, 148, 149, 152, 153, 163] and although none of them was classified as a transport wagon, the existence of a road adapted to vehicular traffic seems to have been necessary. Likewise, texts from Kanesh suggest the existence of such a road between Kanesh and Purushanda, which is mentioned the most frequently as a destination of expeditions setting out from Kanesh into the interior of Anatolia [Dercksen 1996: 64]. The existence of permanent highways fitted even with some kind of traffic signs is suggested by literary works which mention enemies who remove signs to throw the country into chaos [Astour 1995: 1401].

As regards transport in Anatolia itself, its rivers are navigable only to a small extent and, therefore, merchants must have commonly used donkeys and other means of transport. The oldest wagon in Anatolia proper was found in Alaca Hüyük, north-east of Hattusha, and was dated to the last phase of the Early Bronze Age (24th/23rd century BC). As it has already been said these were the times when Anatolian cities flourished and their trade network covered the whole of Asia Minor and neighbouring countries [Sahoglu 2005: 341-344]. The emergence of wagons in Anatolia could have been a result of Syrian influences, which were particularly strong at that time [Ławecka 2006: 177-178]. One can wonder whether, owing to the Anatolian trade network covering also the Transcaucasia and Thrace, the wagon as a very important improvement in trade, was borrowed for use in transport in these regions as well as in the Balkans or Ukraine. Perhaps, as evidence of this type of transfer of technological or rather civilization achievements from the Near East to Europe could be considered Northern Pontic four-wheel wagons documented by iconographic representations and remains, dated also to the late 3rd millennium BC [Kośko, Szmyt 2007]. As far as Anatolia is concerned, the wagon was since then a permanent element of economic and public life in this area, which is evidenced by the representations of wagons in ritual scenes [Littauer, Crouwel 1979: Figs. 38, 57, 58; Bollweg 1999: 19, 24-25, 28]. The Kanesh texts illustrate well the significance of wagons for the comparative study of different regions because they describe the borderland of three important countries of the Orient: Anatolia, northern Mesopotamia and Syria. Hence they suggest that the situation was shared by all three of them. The use of still another means of transport in Anatolia is suggested by Dercksen who claims that merchants from Kanesh sometimes hired large groups of porters to send their wares to other cities. It seems, however, that in the long run it was not a good solution as hiring porters was rather expensive [Dercksen 1996: 61-63].

The Amarna letters show that in the latter half of the 2nd millennium BC, the most popular means of transport, especially of envoys visiting the royal courts of the Orient, became the chariot, playing also a very important role on the battlefields of those times [Stillman, Tallis 1984: 136-148]. Then, missions set out for foreign

countries in several such vehicles, most often five, and this must have been the reason for keeping roads in good order at least close to capitals or other important places of a country. The letters often mention gifts sent for the other party; among the most valuable objects chariots are listed regularly, with their different categories and horses to draw them being sometimes given as well. In letter no. XV/XVI, a reference is made to a royal chariot, of a better quality, and two chariots not meant for the king, of a poorer quality [Moran 1992: 2, 7, 21-23, 37-41]. Chariots and teams of horses as royal gifts for allied rulers are mentioned in e.g. Amarna I, III (material for ten chariots and horses for ten teams), XI (a request for chariots from Egypt), etc. We can surmise that next to light chariots, in which envoys travelled, expeditions were equipped in light wagons to carry gifts. Sometimes, a mission included members of a royal family, in particular daughters about to be given in marriage. Then, such a mission could have up to several thousand people. On such occasions, a large number of vehicles must have been absolutely necessary [Moran 1992: 21-22, EA 11]. Finally, to a great significance and popularity of chariots in the then Near East testifies a greeting very often used in letters found in the archives. Among people and institutions who are wished happiness chariots are regularly mentioned: "All is well with me. May you, your household, your wives, your sons, your country, your chariots, your horses, your officers do very well" [Moran 1992: Introduction: 32]. Although the Amarna period ends in the 13th century BC, the situation was undeniably true for international relations in the Orient until the end of the Bronze Age in the 13th century BC.

4. CONCLUSIONS

It follows from the above analysis that from the dawn of history in the Near East through successive millennia the region witnessed continuous and intensive development of trade routes and commercial exchange. The development continued despite recurrent political upheavals and collapse of successive, ever more developed statehood structures, extending in stages to more and more distant lands. The spreading of trade was accompanied by ever more complex means of transport. The course of communication routes adjusted to the development of human societies, which needed specific raw materials and goods to be found in other countries. The intensity of trade, in turn, was proportional to the rate of development of individual cities and states. As a rule, the routes led from mountainous regions to lowlands where urban civilizations flourished. In the Near East this resulted in the east-west

or north-south arrangement of the road network. Also, routes often followed river valleys because it was there that important cities were located.

Among the means of transport, boats and pack animals dominated. They had been used since the beginning of permanent settlement in western Asia. Being the most advanced invention in the Near East trade, the transport wagon, when appeared in Iran, Mesopotamia and Anatolia already in the middle of the 3rd millennium BC, was an important breakthrough which showed that trade and communication were more intensive than appeared from written records. The two kinds of sources culminated in the early 2nd millennium BC to render a picture known as the Old Assyrian trade. Traditionally, it was viewed as an exceptional development but perhaps it should be treated as typical of the times and region. Undeniably, it shows how far commercial exchange advanced and how well trade was organized in the first half of the 2nd millennium BC. The extensive commercial exchange among different countries of the Orient resulted in the spreading of other inventions and novelties related to the economic and spiritual advancement of the region. It can be safely claimed that the spreading of writing in successive countries outside Mesopotamia was a side effect of the growth in commercial exchange.

Finally, it must be stressed that it is not known where the limits of the system of trade and routes, which developed in western Asia, were. What we know though is that it operated in the Orient, whence numerous written records come, but it is possible that it extended to other regions. We know that it covered parts of Iran and possibly the shores of the Black Sea. The strong positions of Zalpa and Wilusa (Troy), and numerous references to the kingdom of Ahhiyawa encountered in Hittite texts suggest that they were important points of contact between the civilizations of the Orient with the cultures of prehistoric Europe. Staying in close contact with the Hittite kingdom, such centres and Ahhiyawa could have contributed to the transfer of civilization achievements of the Orient in the direction of the Balkans and Ukraine. This is highly probable, although poorly documented as yet. Therefore, one can expect that next excavation seasons on the Black Sea will show the scope and consequences of such contacts in ever greater detail.

Translated by Piotr T. Żebrowski

Baltic-Pontic Studies
vol. 14: 2009, 156-175
PL ISSN 1231-0344

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COMMUNICATION SPACE OF THE NORTHERN PONTIC AREA AS VIEWD BY AEGEANS

INTRODUCTION

In the literature on intercultural exchange and the course of communication and trade routes, one can encounter several differing views and theories concerning these issues (from simple descriptions to complex theoretical explanations frequently presented in the form of tables, formulae and charts).

Early studies of these questions within archaeology chiefly consisted in the analysis of the objects of material culture and their reliable verification as elements of intercultural exchange [Stjernquist 1966: 7]. Later, in the 1960s, 1970s, 1980s and especially in the 1990s, the study of these questions was characterized by the borrowing of theoretical and philosophical concepts from other branches of learning, and from both the humanities and natural sciences at that [Irwin-Williams 1977: 142]. Hence, adopted by archaeology, the idea of interdisciplinary studies made it possible to carry out complex comparative analyses. They, in turn, contributed to the finding of solutions to some major research questions.

The occurrence of certain objects of material culture in the Northern Pontic Area and in the eastern Mediterranean, especially in the Aegean, justifies putting forward a hypothesis about the existence of a network of intercultural, perhaps trade, exchange operating between the two areas. Certain similarities in the sphere of ceremonies and rituals, as for instance types of burials and the funerary rite,

recorded both on the Black Sea and in the Aegean, seem to support the hypothesis. The links discussed in this paper[1] are dated to the 2nd millennium BC.

For organizational considerations, the paper is divided into two major parts: the purpose of the first part is to present the development of contacts between the eastern and central Mediterranean and Mainland Europe in the Bronze Age, whereas the second part deals with specific examples (of material culture and certain elements of rituals and ceremonies) providing evidence for the contacts.

1. THE DEVELOPMENT OF INTERCULTURAL CONTACTS BETWEEN THE EASTERN MEDITERRANEAN AND MAINLAND EUROPE IN THE BRONZE AGE

The societies of central and eastern Europe (northern and western as well), although they evolved independently of the eastern Mediterranean, they were not totally isolated from it. Developed in the Near East (in particular in Anatolia, Egypt and the Levant), urbanization, socio-ideological and politico-economic patterns slowly but profoundly changed they way this part of Europe looked [Werbart 2001: 1]. Urbanization processes were followed by significant changes in material culture (weapons, textiles, means of transport, household utensils, etc.), ideology and symbols (ornaments, rituals, including communal feasts and drinking), social organization (rise of elites and internal stratification of society) and the growth of metallurgy.

There is no doubt that the cultural and trade contacts that developed in the Bronze Age meant a lot for both the societies settling Mainland Europe and the populations of the Mediterranean. Also, it can be safely claimed that the value of objects from the north known from the Aegean was as high as goods of southern provenance found in central, eastern, western and northern Europe [Pydyn 1999: 15]. In particular, the exchange of amber turned out to be of great significance for central European communities as the transcontinental amber route, developed in the 16th century BC and directly joining the Baltic Sea with the Adriatic and the Black Sea, in the opinion of many scholars underpinned a later development of European core centres [Sherratt 1993: 46; Kristiansen, Larsson 2005].

Upon the analysis of archaeological data, it appeared to be possible to distinguish four development phases of cultural contacts between the eastern Mediterranean (Asia Minor) and the Aegean, on the one part, and the remaining parts

[1] I would like to cordially thank Prof. Aleksander Kośko, Ph.D. and Prof. Marzena Szmyt, Ph.D. for their inspirations to present this paper in the Baltic-Pontic Studies series, Prof. Janusz Czebreszuk, Ph.D. for his help and support and Justyna Cieszewska, M.A. for the opportunity to discuss with her the question of the presence of Mycenaean objects in the Northern Pontic Area. In addition, I am grateful to the whole community of the Dept. of Polish Prehistory for their inspiration and always selfless help.

of Europe on the other [Sherratt 1993; Kristiansen 1998: 363; Kristiansen, Larsson 2005]. What's interesting here is the fact that researchers frequently date individual phases differently. For instance, K. Kristiansen and T. Larsson [Kristiansen, Larsoon 2005: 118-120] dated the first phase to 2300-1900 BC, whereas A. Sheratt [Sherratt 1993: 22-24] dated it to 1800 BC. The phase was characterized by the domination of the Minoans and communities settling Asia Minor. The intercultural contacts that developed then were based on a traditional network of indirect relations between the Balkans, Carpathian Basin and Black Sea [Bouzek 1985], which had started already in the late 3rd millennium BC [Gerloff 1993; Maran 1997; 2007; Kadrow 2007: 324]. The exchange of information between the societies of the eastern Mediterranean, and southern and central Europe concerned above all the metal (chiefly bronze) sheets technology.

The existence of some relations between areas on the Danube, Transylvania and the remaining areas of central Europe is evidenced by the occurrence in these areas of riveted daggers, rings and lunulae of *Lockenring* and *Ösenring* types as well as pendants and beads made using bronze metal sheets technology [Sherratt 1993: 22]. Known also from these areas, ceramic vessels resembling Aegean kantharoi are excellently exemplified by a vessel with a cut-off rim, resembling one of ceramic types from the Middle Minoan period I-II, was found in Hungary in a context dated to ca. 2000 BC [Bouzek 1996: 180]. The proliferation of wound-wire pins (*Schleifennadeln*) and ring ingots in Moravia and the Levant may also testify to the existence of such relations [Kristiansen, Larsson 2005: 118].

The second phase corresponds to the second period of the Bronze Age and was dated to 1800-1600 BC by A. Sherratt [Sherratt 1993: 24-29]. According to K. Kristiansen and T. Larsson [Kristiansen, Larsoon 2005: 120-127], however, the beginnings of the phase should be dated to 1900 BC. A part of the second phase and the beginning of the third coincide with the rise of the Mycenaean culture in the Aegean and the period of shaft graves (1800/1700-1500 BC). It was then that cultural and trade contacts, which had been established earlier, intensified and encompassed almost the whole world known then [Bouzek 1996; Lichardus, Vladár 1996; Kristiansen 1998; Kristiansen, Larsson 2005: 120]. The goods that were traded within this exchange network included in all probability tin, copper, amber, gold [Gerloff 1975; Sherratt 1996; Needham 2001] and other perishable products that have not survived.

In this period, in the Aegean and on the Mainland of Europe, social stratification began to take shape. Then, on Greek Mainland, there appeared rich burials (e.g. at Mycenae and Messenia, on Aegina) in which, next to locally made goods, a large number of imports were found, coming from Crete, the Middle East, Egypt along with amber from northern Europe, a horse harness from the Carpathians or the Northern Pontic Area and probably gold and copper from the Carpathian Basin and Transylvania [Hüttel 1977; 1982; Harding 1984; Kull 1989; Sherratt 1993: 25].

The processes of the emergence of aristocracy are especially well seen in central Europe in the classic phase of the Úntice culture [Kadrow 2001: 59; Bátora 2006], in the Wessex culture in Britain [Gerloff 1975], in the Carpathian-Danube Otomani and Füzesabony cultures [Meier-Arendt (Ed.) 1992] and on the Eurasian steppes [Lichardus, Vladár 1996; Bátora 2006]. In Bronze period A1b, dated according to H. Vandkilde [Vandkilde 1996: 140] to 1950-1700 BC, these areas witnessed rich burials in barrows, the so-called 'princely graves' (Leubingen, Helmsdorf, Łęki Małe, Bush Barrow, Sintashta), in which along locally-made high quality objects, imports frequently coming from very distant places were found as well.

The spreading of these innovations, which reached central and eastern Europe chiefly via the central and eastern Mediterranean, can be divided into two major phases: the first took place in 3000-2000 BC, when production diversified as a result of adaptation of new patterns, while the second that began after 2000 BC witnessed a much quicker pace of cultural development of individual societies within the territory [Werbart 2001: 1].

Also, in the second phase, metallurgic production intensified leading to the rise of powerful core centres on the continent where bronze and precious metals were worked. In many cases, to win access to new raw material deposits, it was necessary to establish new cultural and trade contacts [Harding 1984; Vagnetti 1993].

In late phase A2 and early B1 of the Bronze Age (corresponding to the late Middle Minoan III A/B and PH I/II A), dated to 1750/1700-1600/1500 BC, the exchange network, covering the shores of the Black Sea and the Pontic Area, was stretched along the Danube as far as the Carpathian Basin and further north [Kristiansen, Larsson 2005: 125]. Developing in central Europe at that time, Úntice culture societies (1800-1600 BC) quickly joined this network of inter-regional and long-distance contacts, encompassing the area from Scandinavia to the eastern Mediterranean [Werbart 2001: 3].

In the 2nd millennium BC, an especially high degree of social and economic sophistication was shown by the societies of the Carpathian Basin – a consequence of its location on the north-south route, which facilitated the inter-regional contacts of populations inhabiting it with Scandinavia, areas on the Black Sea and the Mycenaean world [Kristiansen 1998: Fig. 1]. Not entirely unimportant were deposits of copper and gold in the Carpathian Basin. In addition, the area, together with Moldova, was a major centre of horse breeding, which supplied the populations of north-western Anatolia and the Aegean [Sherratt 1993: 26]. Together with horses, steppe-Carpathian harnesses made of bone and antler, and decorated with compass ornaments spread across the Mediterranean [Sherratt 1993: 26].

The third phase lasted from 1600/1500 BC according to K. Kristiansen and T. Larsson [Kristiansen, Larsson 2005: 127] whereas A. Sherratt [Sherratt 1993: 29] believes it spanned the period from 1600 to 1300 BC. The phase was characterized by a consolidation and a greater regularity of cultural and trade contacts of Myce-

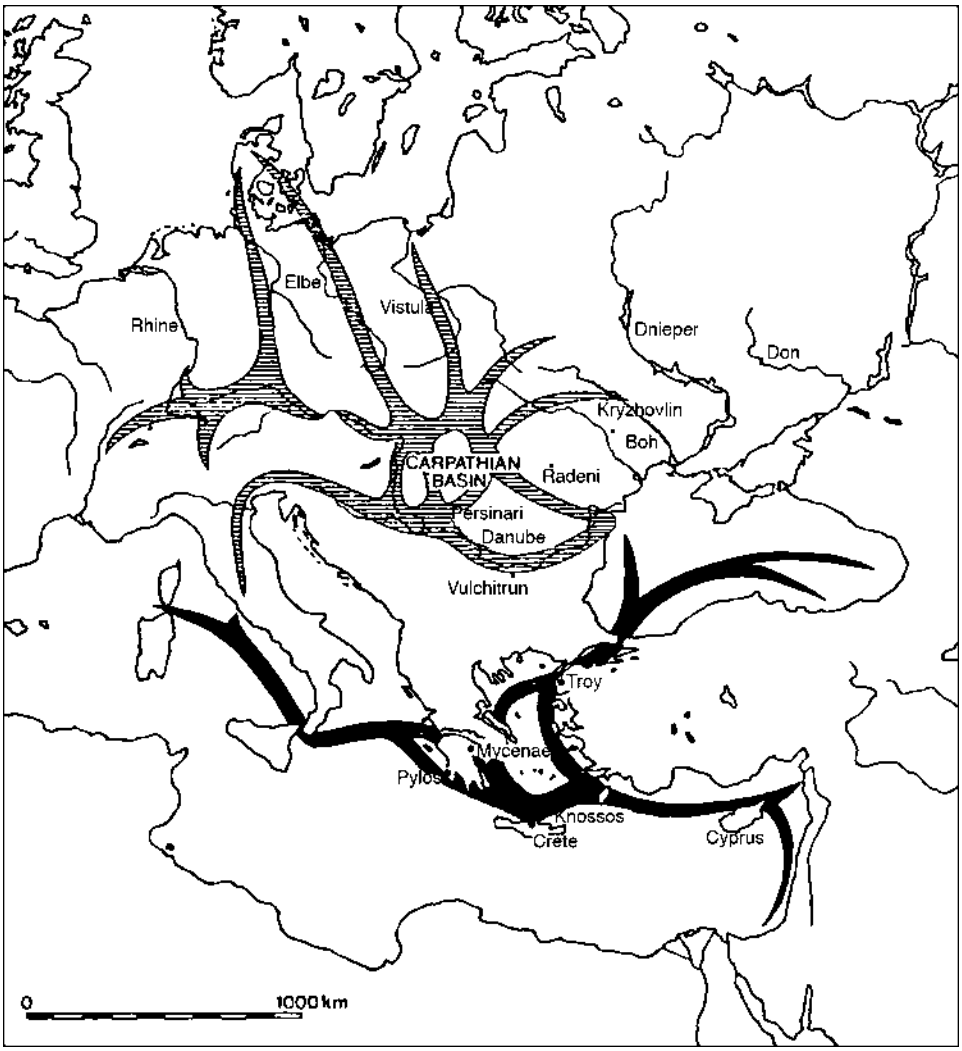

Fig. 1. Routes of cultural and trade exchange in Europe in 2000-1500 BC: land routes developed in central Europe (hatched areas) and sea routes crossing the mediterranean and Black Sea (areas in gray) [Sherratt 1987: 62, Fig. 5.6, amended by the author]

naean communities with the eastern Mediterranean, Italy and the western portion of central Europe; in the final period the contacts shifted to its eastern portion [Sherratt 1993: 29-33; Kristiansen 1998: 363-4; Kristiansen, Larsson 2005: 127-130].

At that time, Mycenaean societies continued to expand territorially. The Balkans, as a periphery of the Aegean, became the destination of political and eco-

nomic expansion by the societies [Hänsel 1982; Hochstetter 1982; Teržan *et al.* 1999; Hänsel, Teržan 2000], which followed then a sea route along the coast of the Adriatic to establish contacts with the highly developed Terramare culture of northern Italy. This culture, in turn, across the Alpine Pass, was open on central Europe [Brea *et al.* 1997; Pearce 1998; Artursson, Nicolis 2007: 331]. The relations that had developed in the preceding phase between the Wessex culture and Brittany (ancient Armorica/Aremorica) and between the Carpathian Basin and central Europe were severed [Kristiansen, Larsson 2005: 127]. Soon, however, new interactions were initiated with Tumulus societies only taking shape then [Sherratt 1993: 31]. In addition, the prestige chain exchange between rulers of individual groups facilitated direct and indirect contacts with southern Scandinavia, especially Jutland [Kristiansen 1987; Quillfeldt 1995; Gillis *et al.* 2004].

A very interesting issue, indicating the development and/or intensification of communication, and cultural and trade contacts along the north-south line, is the finds of oxhide ingots and stone anchors of the Mediterranean type in the Black Sea drainage basin. In the opinion of some scholars, these objects determine the range of sea trade in the period from the 15th until the end of the 13th century BC [Pare 2000: 24] as they occur across the Mediterranean [Gale, Stos-Gale 1986]. Moreover, they clearly show that people sailed also across the Black Sea in the Bronze Age [Frost 1970; McCaslin 1980; Harding 2000: 181, 2005: 299; Paschalidis 2007: 438].

Nevertheless, cultural and trade contacts of European and Mediterranean societies in the period dated to 1600/1500-1300 BC were rather indirect and the movement of goods between them irregular [Sherratt 1993: 33]. The goods that were transported along the trade routes (amber and metal routes) did not move the full length of the trails. The only commodity that around 1600 BC began to move along their full length, from the beginning to the end, was Baltic amber. Large amounts of the commodity appeared (already in the preceding, second phase) in the Mediterranean [Harding, Hughes-Brock 1974] and north of the Black Sea [Klochko 1998; Ślusarska 2007].

The fourth and final phase corresponds to the Late Bronze Age in central and eastern Europe while in the Aegean it coincides with the end of the Bronze Age and the Sub-Mycenaean and Sub-Minoan periods [Warren, Hankey 1989]. Dated to 1300-700 BC [Sherratt 1993: 33-38], the phase was characterized by a rising tide of anxiety in its initial years. The anxiety set on the Mediterranean world in 1200 BC, causing a partial collapse of trade networks and a decline of some political and economic centres (Fig. 2). Nevertheless, the situation offered new opportunities especially for marginal zones and some enclaves, for instance Cyprus, where centres of bronze metallurgy developed at that time [Sherratt, Sherratt 1991].

In this context, it is interesting to see how societies settling central Europe and the areas on the Black Sea participated in the crisis. An attempt to answer this question shall be made later in the text.

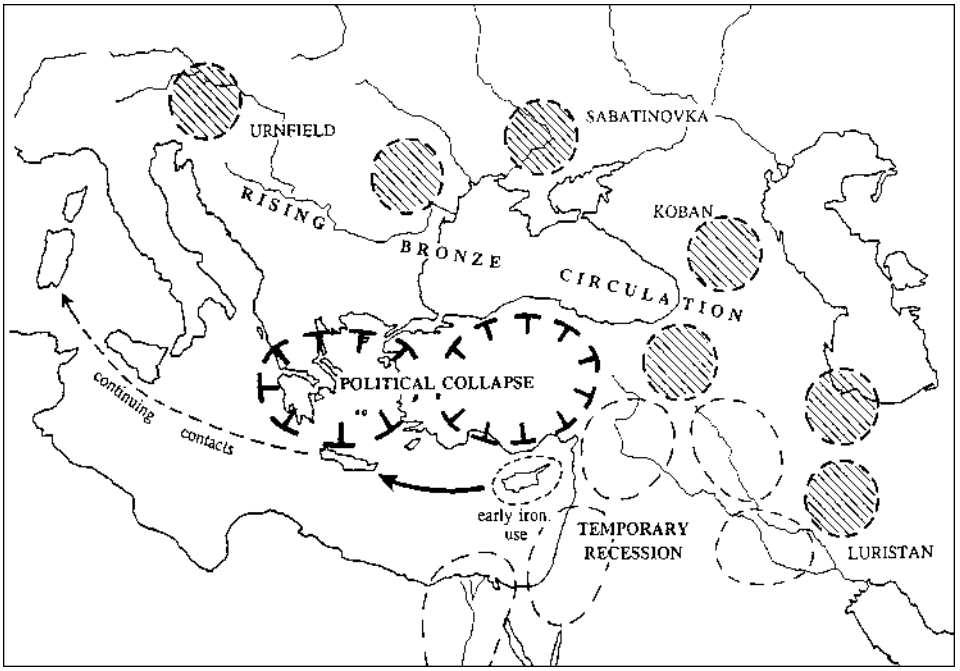

Fig. 2. The range of crisis in the aegean and the development of bronze metallurgical centres in marginal areas (hatched circles) dated to the late bronze age (12th century BC) [Sherratt 1993: 35, Fig. 10]

In the period of Post-Palatial economy, a majority of cultural and trade contacts of Mycenaean societies loosened; however, contacts with southern Italy were maintained and stretched as far as the Po Valley. Many objects of material culture (Tiryns amber beads, Peschiera daggers, a cup imitating type Vaphio from Lake Ledro in Trento and Mycenaean pottery fragments) show that Italy was an important link in the exchange of goods and cultural patterns [Artursson, Nicolis 2007: 335]. The patterns were of both central European provenance, for instance the technology of metal casting and changes in the manner of dressing as illustrated by the appearance of pins and fibulae [Harding 1984], and eastern Mediterranean one, e.g. the technology of making objects from thin sheets of metal or a new type of wheels [Pare 1987].

The proliferation of these patterns across the vast expanses of Europe was related to the rise of the Urnfield complex, which was independent in terms of its economy and organization from the Late Bronze core/peripheries system that collapsed then [Sandars 1983; Sherratt 1993: 36].

2. EXAMPLES OF INTERCULTURAL LINKS BETWEEN THE SOCIETIES OF THE BLACK SEA AND MEDITERRANEAN BASINS

The second part of the paper discusses individual examples of both material culture objects and selected elements of the ritual and ceremonial sphere, as for instance, the funerary rite and related rituals, testifying to the existence of suggested interactions. The part has been further subdivided into three smaller sections reflecting the development of social processes and pointing to geographical locations of the greatest intensity of cultural pattern exchange between the societies in question.

2.1. THE AEGEAN CIVILIZATION AND THE NORTH

Here, I would like to recapitulate the findings by Slovak and Hungarian archaeologists who pointed to the genetic ties with the cultures of the Eurasian steppes shown not only by the Carpathian cultures but also by those settling the eastern Balkans and by the Mycenaean culture [Lichardus, Vladár 1996: 25-29; Makkay 2000]. This hypothesis, however, has many opponents [for instance, Dickinson 1977: 51-56; Renfrew 1998: 260; Kadrow 2001: 200].

Its proponents have included in the repertory of northern traits found in the Aegean, *inter alia*, burials underneath a single barrow, burials in stone cists, shaft graves and some rituals related to the funerary rite [Lichardus, Vladár 1996: 34-36]. For example, one of such rituals is the position in which a dead body was placed in the grave (supine, with legs drawn up and positioned vertically) that was observed in burials from Circle B at Mycenae (Gamma, Mi and Ni, most probably in grave Zeta as well) [Mylonas 1973: 44, 102, 150, 161], in Hungary and on Rumanian and Bulgarian steppes [Ecsedy 1979]. In the opinion of the scholars, burials of this type appeared for the first time in the developed phase of the Yamnaya culture [Häusler 1998: 146, 155].

Moreover, an analogy is shown, according to the scholars, by the special manner of preparing the grave known from the Yamnaya culture (lining the bottom of the grave with mats, carpets, hides, furs or timber and bark) [Ecsedy 1979: 37-38] and observed also in graves Gamma and Nu [the bottom was lined with textiles or hides – Mylonas 1973: 38, 406]. From Circle B of shaft graves (graves Alfa, Beta, Eta, Iota, Gamma, Zeta, Mi and Omicron) and later from tholoi, we know of timber structures (roofs, wall and chest foundations) lined with stone pavements or mats of dry branches and leaves, covered with a thin layer of clay [Mylonas 1973: 403; Dietz 1991]. Analogous examples were observed in Yamnaya culture graves [Penner 1998:

181; Makkay 1992: 217, 220, 226]. In the opinion of the scholars [Lichardus, Vladár 1996: 35], the internal organization of graves, too, erecting grave stelae (known from Mycenae, Yamnaya and Catacomb cultures) and the fact that these are multiple burials, containing family/elite members, testify to the similarities between religious and ceremonial spheres of the discussed areas.

In this context, a find from Mycenaean grave Gamma is particularly intriguing. In the grave, in a small gold vessel yellow ochre was found, which is the first such example known in Bronze Age Greece [Andreou *et al.* 1996: 573-574]. The use of ochre in the funerary rite of the Yamnaya and Catacomb cultures was common [Ecsedy 1979: 39; Ślusarska 2006: 144]. Equally interesting is the occurrence of modelled grave masks in both Catacomb culture and Mycenaean shaft graves (and in inventories of many other societies) [Dickinson 1977: 53; Huxley 1996: 146; Lichardus, Vladár 1996: 35; Mallory, Adams 1997: 92; Ślusarska 2006: 146].

It is worth mentioning here that osteological studies of skeletons from shaft graves at Mycenae, both from Circle A and Circle B, revealed that people buried there had differed greatly from the standards of physical anthropology of Middle Helladic populations. Men from Grave Circle B were taller by 5 cm on the average and were more stockily built [Angel 1973: 386]. In the opinion of scholars they represent an older type of population from eastern and northern Europe, the so-called Nordic-Caucasian type [Angel 1973; Dolukhanov 1999: 80; Day 2001]. Completely different conclusions followed from the study of female skeletons, which showed strong Mediterranean characteristics. Relying on these data, S. Penner [Penner 1998] put forward a hypothesis that populations from the northern part of the continent migrated towards the Aegean, supposedly giving rise to the Mycenaean dynasty. Interestingly enough, also the *Iliad* stresses the greater-than-average height of Mycenae's ruler, Agamemnon, in comparison to the other companions of his [Homer II: 444-450].

Long-distance ties of steppe populations with the Carpathians, Aegean and Anatolia [David 1997; 2001; Penner 1998; Boroffka *et al.* 2002] can be seen in movable finds, too, above all in a package consisting of artefacts related to the chariot and horse harness made predominantly from bone and antler. A single item of major significance here is the disc cheek-piece. Other finds include new weapon types (lances, bronze battle-axes, short swords) [Kadrow 2001: 200; Kristiansen, Larsson 2005: 181]. Additionally, certain analogies can be found in the ornaments of ceramic vessels and metal objects known from the Mycenaean culture, Anatolia and societies living in central and eastern Europe known as the spiral ware culture complex (Otomani, Wietenberg, Füzesabony, Tei, Monteoru, Komarov, Trzciniec, Vatin, Verbicioara) that emerged towards the end of the Early Bronze Age [Kadrow 2001: 199]. The Caucasian-Anatolian analogy is visible also in portable clay ovens and shell ornaments used in the areas under discussion [Kadrow 2001: 200].

A clear example of north-south ties is the chariot that appeared for the first time on Eurasian steppes, owing, in principle, to the invention of a spoked wheel or a wheel with a perpendicular rod which made the vehicles lighter and faster [Pare 1992]. From the mid 2nd millennium BC come examples of chariots drawn by horses; they have been found in Armenia and on the steppes of southern Russia and Ukraine [Piggott 1983: 95]. The latest radiocarbon measurements of fragments of such vehicles found in graves in the Samara district (*kurgan* cemeteries at Utyovka and Potapovo) and in the southern Urals (Sintashta and Krivoe Ozero) have shown these to be the oldest known specimens of chariots in the Old World (the obtained dates fit into the interval from 1950 to 1800/1750 BC). Moreover, they have confirmed the hypothesis that vehicles of war originated on the Volga River and in the Urals [Kristiansen, Larsson 2005: 178; Kuznetsov 2006: 643]. It should be stressed here that there is evidence of the use of chariots in the steppe and forest-steppe zones in the Northern Pontic Area earlier, namely, in the Catacomb culture [cf. Pustovalov 1994].

In the opinion of many scholars, horses together with harnesses and chariots appeared in southern Europe in the mid 2nd millennium BC (1700/1600 BC) as a result of the long-distance exchange between western steppes, Moldova, the Carpathian Basin, north-western Anatolia and the Aegean [Hiller 1991: 211; Gillis *et al.* 2004: 34; Kristiansen, Larsson 2005: 181, 184]. For instance, the studies of the horse harness have shown numerous similarities between steppes, the Northern Pontic Area, areas on the Danube, the Urals and Kazakhstan (Sintashta) as well as the Mycenaean world (Mycenae, Kakovatos, Dendra, Athens) [Kuzmina 1980: 8-21; 1994: 171-189; Vasilev *et al.* 1995: 33-34]. Circular bone cheek-pieces of the steppe and Pontic types are known from graves IV and V at Mycenae [Karo 1930a: 113; Dickinson 1999: 21], others, made of terracotta, bone, including ivory, and bronze were found, by way of example, in the House of Shields at Mycenae, chamber grave no. 15, a fill outside the western wall of Mycenae's citadel and tholos A at Kakovatos or grave no. 7 at Dendra [Wace 1960: 40-44]. Additionally, in shaft grave IV, a wooden whip handle was found covered with a hammered gold foil bearing a repoussé spiral design [Penner 1998: 74-75]. Close analogies to this object come from a grave in south-east Ukraine (Srubnaya or Timber Grave culture) on the Dnieper and from southern Russia (Istomin near Samara) [Makkay 2000: 48].

Together with elements of horse trappings, the ritual of horse burials spread in the Aegean, known for instance from the cemetery in Aidonia, Argolis (not far from Mycenae), where in an unrifled single shaft grave, remains of a horse were found with its head severed [Demakopoulou 1996: 24-25]. Also, in the dromos of another grave, a skeleton of a horse lay underneath which jaws of fourteen other horses had been deposited [Demakopoulou 1996: 24-25]. Similar burials are known from the Urals and the Volga drainage [Gening 1979: 19-20, 23-24; Hiller 1991: 215]. Interestingly enough, osteological studies of four horse skeletons found in graves at

Dendra, in a context dated to the late phase of the Middle Helladic period, have shown that they belonged to a breed developed on the steppes [Payne 1990].

Scholars studying north-south intercultural ties report certain analogies in the area of weaponry as well. First, they have considered the bow and arrows a characteristic piece of equipment of steppe warriors, especially in the Urals and on the Volga [Lichardus, Vladár 1996: 35]. At the same time, they point to numerous finds of similar arrowheads in shaft graves (Circle A, grave IV; Circle B, graves: Delta, Lambda and Nu) [Karo 1930a; Mylonas 1973: 422]. In the opinion of S. Penner [Penner 1998: 181-210], these are the earliest specimens of points known in Greece, showing rather close analogies to those from the Borodino hoard [Penner 1998: 186] and the inventories from burials dated to the Early Bronze Age in the northern Caucasus and on the lower Volga. Typologically similar spearheads are also known from the Levant (Byblos, Kültepe), however, in the literature they are dated to 2000/1900-1750 BC. Other elements known from steppe cultures and Mycenaean Circle B shaft graves include tanged knives and lances [Penner 1998].

An interesting discussion developed among archaeologists concerning the provenance of helmets made of wild boar's tusks. The earliest specimens (dated to the Middle/Late Helladic period) of perforated plates made of wild boar's tusks in Greece were found at Mycenae in Circle A, graves IV and V [Makkay 2000: 46]. Plates known from the Pre-Mycenaean period (Middle Helladic period), found at Malthi, Asea, Eutresis and Phaistos, are few and do not provide clear evidence that they were used as an outer covering for helmets. Moreover, the technology of making perforations differs, according to scholars, from that used in the Mycenaean period [Kilian-Dirlmeier 1997: 40-45; Bloedow 1999: 287-288]. Therefore, J. Makkay [Makkay 1982: 6-14; 2000: 47] and J. Borchhardt [Borchhardt 1972: 20-22] came to a conclusion that helmets of this type appeared first on the steppes, in the area between the lower Danube and the Volga (including north-eastern Bulgaria) in the developed phase of the Yamnaya culture and in the early phase of the Catacomb culture. Also, graves dated to the Middle Bronze Age in the Carpathian Basin contain perforated plates made of wild boar's tusks which must have served as an outer helmet covering [Makkay 1999: 49]. This means that this custom was known in both Greece, and central and eastern Europe. However, a different opinion is held by I. Kilian-Dirlmeier [Kilian-Dirlmeier 1997: 50] who claims that helmets made of wild boar's tusks were an invention made independently in the Aegean, in particular on its mainland.

In the opinion of some scholars, the new inventory, rituals and customs that were introduced to Greece in a short period of time (Middle/Late Helladic periods) may be related to the situation that prevailed in the cultures of the steppe and forest-steppe zones in the Early and Middle Bronze Age [Makkay 2000: 60-61], reflecting transformations in social, economic and religious spheres. According to the scholars, these changes commenced in the steppe zone, in the Sintashta cultural complex, on the Tobol River, east of the Urals [Lichardus, Vladár 1996: 55-56].

The investigation of the site suggested a strongly stratified social group headed by military aristocracy. Moreover, a sophisticated chieftain system was in place there or even an early archaic state comparable to the Mycenaean civilization [Gening *et al.* 1992]. A complex inner social organization and proto-urban settlement plans, which were recorded at the site, indicate connections to Anatolia as well [Kristiansen, Larsson 2005: 174].

In the opinion of scholars, Sintashta populations migrated south to assimilate with Middle Helladic societies; by adopting local customs, pottery and other objects the newcomers formed a special 'cultural hybrid' [Makkay 2000: 61].

Regardless which hypothesis concerning the origins of the Mycenaean culture is adopted [Anatolian – Renfrew 1998: 260 or Pontic – Lichardus and Vladár 1996: 26], it remains a fact that there are numerous ties between and analogies in many spheres of life between the Aegean and the steppes and forest-steppes of the Northern Pontic Area. They form an irresistible impression that a cultural exchange between the societies in question preceded the Greek colonization of the Pontic Area.

2.2. THE BLACK SEA BASIN

Our understanding of ties and relations between the societies of the Mediterranean and the populations of the Balkans, central and eastern Europe and the steppes, in light of the recent archaeological discoveries and research projects, must radically change[2] [Kristiansen, Larsson 2005: 171]. The presence of objects of eastern Mediterranean provenance, including Aegean (Fig. 3), in the Black Sea basin shows that a communication route must have joined the Northern and Eastern Pontic Areas to the Mediterranean in the period preceding the Greek colonization of these areas.

For geographical reasons, a vital role in the organization of the route of cultural and trade exchange was played by the populations of the Troad, primarily of Troy, serving as a link and controller of access to the Black Sea [Sherratt, Sherratt 1991: 372]. Eastern Balkan pottery found in Troy and eastern Mediterranean objects (and/or their imitations) unearthed in the Black Sea basin prove that the Sea of Marmara was not a barrier to communication. E. Bloedow [Bloedow 1988: 50-52] believes that the Trojan War was an attempt to deprive Troy of the monopoly of controlling the entrance to the Black Sea and the excavation of West Pontic copper deposits. A reminiscence of such expeditions could have survived in the myth of the Argonauts' journey [cf. Cieszewska..., in this volume].

[2] The paper ignores objects of material culture, which, in the present author's opinion, are too controversial; cf. Fol, Schmitt 2000; Lichardus 2001.

A majority of southern elements found in the Black Sea basin and Pontic objects known from the Mediterranean originated in contexts dated to Bronze Age D and Hallstatt A1 (1300/1200 BC). This was a rather special period of prehistory as the Mediterranean world was affected by a political crisis (decline of Egypt, fall of Hittite, Mycenaean and Mitanni states as well as the city-states of Syro-Palestine) and an economic one (disruption of trade routes, collapse of palatial-type economy) of which one of the causes was the migrations of the so-called Sea Peoples. It is suggested that this conglomerate of societies included groups of the central European Urnfield culture [Sandars 1978; Bouzek 1985] and the Coslogeni-Noua-Sabatinovka complex [Klochko 1990: 10-17; 1993].

The hypothesis that the Sea Peoples (or at least some of them) were of northern origin is borne out by material-culture objects known from the eastern and central Mediterranean. Among them are Dremailovka type spearheads from graves at Ialyssos on the island of Rhodes, at Enkomi on Cyprus and on Crete, in Iolkos in Attica and in Thessaly [Sandars 1963: 149; Höckmann 1980; Müller-Karpe 1980]. From Knossos come North-Pontic-type flat axes, knives and kettles as well as amber beads showing technological and stylistic affinities to specimens known from the cemetery at Hordeevka, situated on the right bank of the middle Boh River (Southern Bug) [Klochko 2001a: 280]. At Enkomi, a spearhead was found having a leaf-shaped blade and a short socket. It had been made following the type of Belogrudovka culture artefacts [Klochko 2001a: 282]. From Ugarit comes a dagger known from the inventories of the Sabatinovka and Belozerka cultures; curiously enough the find was accompanied by a sword bearing a cartouche of the pharaoh Merneptah whose reign is dated to 1224-1214 BC. It is him who tells about the Sea Peoples in an inscription at the Karnak temple and on the stele of Merneptah (also known as Victory Stele) [Müller-Karpe 1980]. In addition, contexts dated to Late Helladic II-III in Mainland Greece, the Cyclades, Asia Minor and Sardinia yielded different types of arrowheads of North Pontic provenance such as shafted arrowheads, bush-based arrowheads, three-petal arrowheads, sharpened arrow-shafts [Buchholz 1962: 29; Müller-Karpe 1980; Klochko 2001a: 201]. Known in the Northern Pontic Area, casting moulds of such arrowheads indicate their provenance and places where they were made; they must have reached Greece together with northern populations forming part of the Sea Peoples when they migrated south [Klochko 1993].

Here, one should mention another rather interesting find, namely, the so-called barbarian pottery which E. French [French 1969: 136] considered as belonging to a separate ethnic group, distinguished in Mainland Greece within Late Helladic III C.J. Rutter [Rutter 1975: 26] pointed to the similarities between the pottery and vessels coming from the western Balkans, especially from the Coslogeni group. He also saw some analogies in Noua-Sabatinovka cultural complex, which developed in steppe and forest-steppe zones. However, it must be made absolutely clear that the technological traits of vessels found in Greece display a wide horizon of similarities:

to vessels known from Epirus (north-western Greece), Thrace and Thasos [Harding 1984: 220], to Coarse Ware from Troy, to north and south Italian pottery, and finally to north-western Balkan (Coslogeni-Noua-Sabatinovka) and central European pottery [Rutter 1975: 26; Lewartowski 1989: 123].

In view of the above, it has been suggested that the rulers of city-states and kingdoms in the eastern and central Mediterranean hired mercenaries from central and eastern Europe to serve in their armies [Sandars 1978; Kristiansen, Larsson 2005]. The suggestion seems to be supported by wall paintings and reliefs in Egyptian temples and tombs depicting warriors wearing clothes and carrying weapons that indicate their northern origin [Klochko 1990; 1991; 1993; 2001a].

Many objects of eastern Mediterranean and Aegean (Mycenaean) provenance were recorded also in the Northern Pontic Area, in the Volga River drainage and in the Urals. After studying them, in particular the so-called hoards, scholars formulated a hypothesis about a trade and cultural exchange route joining Eurasian steppes with the Balkans and further on to the Mediterranean [Subbotin, Cherniakov 1982: 20-21]. A. Harding [Harding 1975: 200] has suggested also that such objects are markers indicating that Minoan-Mycenaean artisans were active on the Black Sea. This claim is supported, according to its proponent, by the presence there of Aegean pottery dated to 1500-1300 BC.

The literature mentions many artefacts of Aegean and eastern Mediterranean origin found in the Northern Pontic Area, e.g. a hoard from Kosorisiv, Mykolaiv district, containing an Aegean double axe [Tallgren 1926], a hoard from Chtetkov, Kirovohrad district, consisting entirely of eleven sickles and six Aegean double axes (*labryses*) [Gimbutas 1965: 90] although metal analyses suggest that they were manufactured locally [Chernykh 1976: 106] and a hoard from Kozorezov comprising two double axes and twelve sickles [Gimbutas 1965: 89-90, Ślusarska 2007: 374]. Double axes of southern provenance are known from the town of Kerch on the Crimea [Buchholz 1983: 90, 94; Bouzek 1985: 4, 45], from Yekaterinoslav and from the seaport of Berezan; however, the last mentioned artefact had been lost before 1926 [Bouzek 1985: 46; Paschalidis 2007: 439]. Single finds of Aegean double-axes were recorded in the Dnepropetrovsk district and in the town of Bulgarovo, Burgas district [Tallgren 1926: 173; Harding 1984: 241]. In addition, along the Black Sea coast, close to Cape Kaliakra, in the town of Cherkovo, Burgas district, and in Sarköy, oxhide ingots were found [Harding 1984: 241], most probably of Cypriot origin [Lichardus *et al.* 2002: 160-167, 173-176; Paschalidis 2007: 438]. The copper ingot from Cherkovo bears traces of inscriptions in a linear script interpreted to be a Cypriot-Minoan dialect [Harding 1984: 49; Hiller 1991: 209-210]. Stone anchors, in turn, were recorded in Sozopol, on Cape Kaliakra, at Troy and in a deposit from Sarköy (which comprised also a Syrian and a Mycenaean sword, Mycenaean double axes and sickles characteristic of Anatolia and Pontic areas) on the coast of the Sea of Marmara [Catling 1964: 297; Hiller 1991: 209]. In total, the Black Sea basin has

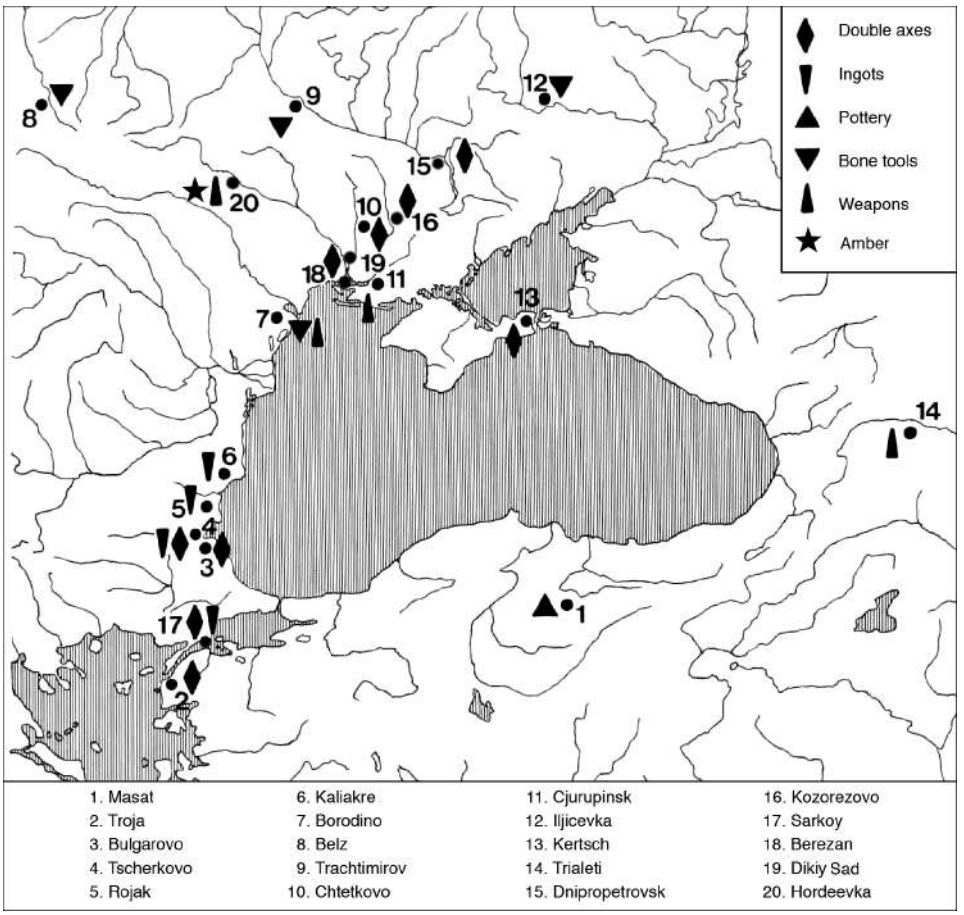

Fig. 3. Distribution of selected mediterranean elements in the Black Sea basin in the latter half of the 2nd millennium BC [Hiller 1991: pl. LVIII; Paschalidis 2007: pl. CVIII e; amended by the author]

yielded 150 anchors [Hiller 1991: 209], dated in principle to the Late Bronze Age [McCaslin 1980].

Broad, transcontinental contacts joining central Europe, forest steppes and steppes to the eastern Mediterranean and the Aegean are evidenced by many hoards of metal vessels found in the Black Sea basin. They are also markers of the exchange of knowledge and technological skills in metallurgy and ornamentation. The most important and most frequently cited examples include the hoards from Borodino in Bessarabia [Harding 1984: 200; Sherratt 1993: 26; Kaiser 1997] and Vulchitrun, Pleven district [Bonev 1995: 277-289].

The Borodino hoard, unearthed 100 km from the Black Sea coast, comprised 17 objects: two silver arrowheads, four axes made from semiprecious stones and fragments of a fifth, three stones, perforated maces, a silver dagger with a gold inlay, a silver pin and several other objects preserved only in fragments. What is most controversial about the hoard is the form and ornamentation (chiefly spiral) of the objects as well as their origins, any analogies they may have and their chronology. By and large, scholars can be divided into those who favour an early dating of the hoard, contemporaneous with the period of shaft graves [Hachmann 1957: 171; Hänsel 1968; Goldmann 1981], and others who tend to date it to a late period, namely to the 14th-12th century BC [Gimbutas 1965; Bochkarev 1968; Safronov 1968; Schickler 1974]. Analogies to ornaments on Borodino hoard elements and to their forms can be found in both the Mycenaean world and in Carpathian Basin cultures. Hence, it is not possible to identify without any doubt where their inspirations came from nor to trace their provenance. For instance, stone maces were popular and widely geographically distributed in the Bronze Age [Hachmann 1957: 172; Safronov 1968: 90-91]. In turn, axe forms found in the Borodino hoard are also known from Troy (layer II) and the Caucasus (Koban phase). In the case of the dagger, the inlaid ornament shows analogies to weapons found in shaft graves, dated to Late Helladic I (Aegean-Anatolian technique); however, the only specimen so far of a similar dagger dates back to the Koban phase (Caucasus), i.e. the 11th to 9th century BC [Safronov 1968: 119]. The ornaments of the pin show, in turn, strong Greek influence [Bouzek 1985: 39-41, 84; Hiller 1991: 211; Harding 2000: 228]. The Borodino arrowheads display many more analogies, for instance, to objects found in Hungary; however, if one takes into account ornamental motifs, they also have analogies in the Northern Pontic Area [Sulimirski 1971: 711-712, 719].

The other hoard came from Vulchitrun and comprised 14 gold objects – vessels with a single (kantharos) or double handle (a kind of bowl), three cups, five small 'lids' with handles, two bowls decorated with silver, and vessels resembling three joined leaves [Sherratt, Taylor 1989: 116; Bonev 1995: 277]. The objects were decorated using reliefs, inlaying and engraving techniques. It must be stressed here that no other hoard has raised so many controversies so far with respect to origins and dating as the Vulchitrun hoard. B. Filov [Filov 1925: 233], for instance, identified the objects as Proto-Bulgarian and dated them to the 7th-8th century AD. J. Andrieşescu [Andrieşescu 1926: 10-11, 25-27] pointed to their similarity with the finds from Mycenaean graves 4 and 5, Shaft Circle A, considered them to be closely linked to the complex of Carpathian and Danube cultures and dated them to the former half of the 2nd millennium BC. Similarly, to 1600-1400 BC, the hoard is dated by A. Sherratt and T. Taylor [Sherratt, Taylor 1989: 127]. P. Reinecke [Reinecke 1926: 51-52], in turn, claimed that the hoard had Cimmerian-Early Scythian origins and found it wrong to refer to Aegean traditions in this context. Since then, attempts to trace the provenance of the hoard have been made by many

scholars [*inter alia*: Mikov 1958; Venedikov, Gerasimov 1973; Venedikov 1987; Bonev 1995].

A jug from Vulchitrun bears a strong similarity to the kantharoi known from the Mycenaean world and it seems that it was modelled on this tradition. A similar example of this type of a gold-sheet vessel was found in Krizhovlin, Odessa district; this is also the north-westernmost example [Chernyakov 1981: 151-161]. Five similar vessels have been found in Radeni, Romania, too. All the vessels from the three hoards show the same technology and ornamentation horizon, and most probably chronological one as well [Sherratt, Taylor 1989: 124]. Dippers (kyathoi), included in the Vulchitrun hoard, were a leading ceramic form in the Aegean, but also, however later, were popular in the area stretching from the Carpathian Basin to the north-western shores of the Black Sea [Bonev 1995: 284]. A triple, joined vessel resembling leaves has no direct analogies; however, similar specimens are known from the Lower Danube, Mycenaean centres, above all from Late Bronze contexts in Cyprus [Buchholz, Karageorghis 1972]. Vulchitrun gold discs have no direct analogies, either; in terms of their ornaments a similarity may be found to decorations encountered in the Carpathian-Danube area (especially in a Lower Danube culture with inlaid pottery) and the Minoan-Mycenaean world [Bonev 1995: 285]. Hence, it seems appropriate to date the hoard to Late Helladic III or ca. latter half of the 14th century, or ca. 1300 BC [Bonev 1995: 286-287]. The Vulchitrun hoard is exceptional in every respect (ornamentation, manufacturing technique, vessel shapes), which made Chernykh [Chernykh 1978b: 282] formulate a hypothesis that it had been made by culturally independent skilled itinerant goldsmiths.

On the shores of the Black Sea, several other hoards have been discovered consisting of precious metal objects (chiefly vessels and weapons) and showing close analogies to the Aegean world. For instance, hoards from Potapovo, Utjevka, Ţufalău, Măcin, Vulchitrun, Kryzhovlin, Rădeni and Hajdú-Bihar comprised hand-made objects and others made using lathes [Sherratt, Taylor 1989; Lichardus, Vladár 1996; Klochko 2001a: 165]. In the case of a gold sword, too, being part of the hoard from Perşinari, near Târgovişte (northwest of Bucharest), despite the fact that it was made locally, its inspirations (or an artisan-goldsmith) should be looked for beyond the cultural borders of the region [Palincas 2007]. Interestingly, next to gold artefacts, very rare silver ones have been found here as well. The closest analogies to this sword, it is claimed, are found in Mycenaean shaft grave Delta in Circle B [Gimbutas 1965: 55-56; Bouzek 1985: 33-34, 39, 82].

Further east, certain north-south contacts, in particular in metallurgy, can be seen in the Trialeti culture whose range encompasses Georgia and continues as far as the southern range of the Caucasus. Nine long swords found in a barrow of this culture are compared to type A and claimed to be of Aegean provenance [Hiller 1991: 211; Paschalidis 2007: 441]. In the case of bronze spearheads, too, found in a Trialeti group barrow and at a cemetery in Prosymna, Argolis, likeness is striking

[Gimbutas 1965: 92-93]. There are also analogies in the production technology of gold spherical beads (combination of granulation with filigree and the cloisonné technique) found in the Aegean and in the Trialeti culture, dated to the 15th century BC. In this case, however, a study by E. Konstantinidi-Sybridi [Konstantinidi-Sybridi 2002-2003] showed that the technique had developed in the north. In addition, from Kirovakan in Armenia comes, still unpublished, a very interesting example of a silver vessel of the Vapio type, dated to the 16th-15th century BC [Hiller 1991: 213].

2.3. THE MOUTHS OF THE SOUTHERN BUG AND DNIEPER RIVERS

The Southern Bug and Dnieper lowland is a rather special place within the Northern Pontic Area. For what is clearly seen there (Fig. 3) is the concentration of material culture objects of eastern Mediterranean and Aegean provenance (individual examples are discussed in 2.2 above). In addition, two exceptional sites located in the Southern Bug drainage and in its mouth make the place highly intriguing. These are Hordeevka [cf. Ślusarska..., in this volume] and Dikiy Sad [cf. Gorbenko, Grebennikov..., in this volume]. They testify to broad intercultural links, including Mediterranean civilizations.

The location of the Hordeevka site (cemetery) in the borderland between the steppe and forest-steppe and between the influence of Carpathian-Danube groups and eastern Caucasian, and Volga-Ural ones – of the east and west – exerted a decisive impact on the emergence of this cultural group [Subbotin, Cherniakov 1982: 20-21; Berezanskaya, Kločko 1998]. In the cemetery of Hordeevka's populations, objects of both Mediterranean and central European origin have been found, which is believed [Berezanskaya, Kločko 1998] to stress the significance of multidirectional links for this society.

The graves in the cemetery produced, for instance, knives exhibiting close Aegean and eastern Mediterranean analogies and resembling objects known from Thassos, Sicily, Boghazköy, central Turkey, Mycenae, Pylos and Karphi, central-eastern Crete, as well as Hungary [Berezanskaya, Kločko 1998: 8]. The inventory includes also an interesting bronze knife with an iron handle, which resembles specimens known from Crete (Knossos), Cyprus (Enkomi) and Rhodes (Ialyssos) [Klochko 2001a: 277]. J. Bouzek [Bouzek 1985: 154] believes that they were prototypes of later central European knives, dated to the early period of the Urnfield culture.

Hordeevka's inventory has also included discoid amber beads showing links to ornaments known from central Europe and the Carpathian Basin as well as the eastern Mediterranean, from contexts dated to Late Helladic III A-C [Harding,

Hughes-Brock 1974: 159-170]. The greatest significance, however, is attached to Tiryns and Allimuere beads of northern Italian/Aegean provenance (known from Ialyssos, Encomi, Ugarit, southern Adriatic coast), dated to Late Helladic III C and the Sub-Mycenaean period (12th-11th century BC). They add special significance to the site by showing that it lay on a communication route joining the Mediterranean Sea to the Northern Pontic Area [Klochko 1998: 349; Ślusarska 2007: 373-374]. The Hordeevka group is believed to be an intermediary and controller in a down-the-line exchange of, *inter alia*, amber along the so-called Bug branch of the amber route [Klochko 1996: 131; 1998: 349].

Another significant site is a fortified settlement, Dikiy Sad, situated on a high plateau in the drainage of the Ingul and Southern Bug rivers. The present stronghold covers the area of 3 hectares while in the prehistoric times it must have spread over 4 to 5 hectares [Gorbenko, Grebennikov 2007: 3]. What is significant about Dikiy Sad, which was occupied between the 12th and 11th centuries BC, is the fact that it lay on a communication route joining (via a system of rivers) the Black Sea to the Baltic [Gorbenko, Grebennikov 2007: 2]. Owing to the concentration of objects of eastern Mediterranean and Aegean provenance (e.g. double axes, Tiryns and Allimuere amber beads) in the Southern Bug and Dnieper drainages (see Fig. 3), it seems to be justified to suggest that the route be extended as far as the Mediterranean coast. Hence, the Dikiy Sad fortified settlement is interpreted by its discoverers as a major town-port [Gorbenko, Grebennikov 2007: 2].

Regular investigations at the site, begun by J.S. Grebennikov and K.V. Gorbenko, have continued since the early 1990s. They have yielded many archaeological features such as defensive structures, remains of stone house foundations and cult objects with an altar in the form of a raised platform, which the researchers interpreted to have been early temples [Gorbenko, Grebennikov 2007]. The discoverers believe that the rituals performed in them by the inhabitants were related to the cult of ancestors, the sun, the moon, fire and phallus, and had not been known earlier in the north [Gorbenko, Grebennikov 2007: 3].

To describe the situation in the Southern Bug drainage and mouth, I will use the concept of gateway developed for the purposes of economic geography. The gateway is defined as a point of entry to a given territory and, at the same time, a point of exiting it [Burghardt 1971: 269-285], and, in addition, connecting individual settlements with the world beyond. It has been observed that such gateways are frequently formed in contact zones between areas differing in the intensity of production and in places of special communication significance that are characterized best through long-distance trade relations. Gateway communities, in turn, stand for the societies that developed in places where the movement of goods and people potentially could be controlled. Exercising such control must have provided the communities with sizeable profits. In view of these facts, it seems that both Hordeevka and Dikiy Sad could be taken to be North Pontic gateway communities.

3. CONCLUSIONS

The study of the occurrence of material culture objects of Aegean and eastern Mediterranean provenance on the coast of the Black Sea and North Pontic ones in the Mediterranean basin justifies the tracing of a communication route joining the two areas. The presence of imports, analogies and certain ideas from the Carpathians and the Danube drainage makes the route extend further north.

To the north-south cultural and technological exchange may testify similar rituals and the funerary rite, known from the early Mycenaean culture and the zones of steppe and forest-steppe, as well as the diffusion of such innovations as the chariot, horse harness, and new weapon types as well as drinking vessels found in numerous hoards in the Northern Pontic Area and showing close analogies to the Aegean world. It is worth remembering here that some elements, which were related to trade in the Mediterranean, such as oxhide ingots and stone anchors, were found on the Black Sea coast as well. Thus, it seems that the possibility of eastern Mediterranean and Aegean societies of the Late Bronze Age being interested in the Northern Pontic Area cannot be totally excluded. From the geographical point view, such a penetration of the Northern Pontic Area was possible as the Sea of Marmara did not offer a communication barrier (this belief seems to be borne out by the Sarköy hoard mentioned earlier).

What is also important is the fact that almost all objects mentioned here (and many others left without mention) are very similar, arguing in favour of a certain *koine* with respect to forms, shapes and motifs prevailing in the Bronze Age (in the 2nd millennium BC) over vast areas. The *koine*, being evidence of transcontinental exchange of patterns and ideas, is, alas, very troublesome when it comes to precisely determining the provenance of some objects.

Translated by Piotr T. Żebrowski

Baltic-Pontic Studies
vol. 14: 2009, 176-190
PL ISSN 1231-0344

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GREEK CHOROGRAPHY OF LAND ROUTES IN NORTH-WESTERN PONTIC AREA

As can be gathered from the title, the major purpose of this paper is to acquaint the reader with the way ancient Greeks viewed the world known to them, the knowledge of geography they had and representations they shared of adjacent lands, in particular, areas on the northern coast of the Black Sea. Already since the times of Hecataeus of Miletus (latter half of the 6th century BC) the Earth had been believed to be round and flat, surrounded by the ocean on all sides [Czarnowski 1956: 242], which influenced Greeks' view of the world around them for a long time. The literature on this subject has devoted much space to sea routes, owing to which the inhabitants of the Peloponnesus could colonize or explore distant lands. The present author would like, however, to focus on land routes joining the south of ancient Europe to its northern portion. By the latter I shall mean northern Greece, Macedonia and the western and northern coasts of the Black Sea.

The question of land space of the named countries represents only a fraction of considerations related to mutual contacts between their inhabitants. Even the earliest Greek written records, i.e. the *Iliad* and *Odyssey* by Homer, do not refer directly to the broadly meant Pontic area [Graham 1958: 25]. Slightly more information on the geographical knowledge of ancient Greeks concerning the land space of the Pontic Area is supplied by later records, which shall be discussed in detail below.

Here, I would like to explain that this paper does not attempt to settle the controversies surrounding Greek colonies on the Prepontide[1] and Pontus (dates of foundation of some of them, questions of mythology or their history); instead, its purpose is to recount how ancient Greeks viewed these areas and their inhabitants.

[1] Prepontide or Prepontis is today's Sea of Marmara [Hammer 2005: 634].

The geographical space of the northern frontier of Hellas can be divided into (1) proximate (Macedonia and Thessaly, forming part of the circumpontic route and mentioned in the *Iliad*; see papers by J. Boltryk and W.W. Otroshchenko..., in this volume) and (2) distant, Western and Northern Pontic of which certain information can be found in 2.1. Herodotus' *History*, 2.2. accounts prior to the 7th century BC (e.g. the myth of the Argonauts and accounts by ancient authors from the 8th century BC), 2.3. records of the period of Greek colonization from the 7th to 5th century BC.

1. GEOGRAPHY OF MACEDONIA AND THESSALY IN WORKS BY HOMER

Before I discuss the geography of areas on the Black Sea as viewed by Greeks, I would like to take a closer look at lands lying closer to the Peloponnesus, namely Thessaly and Macedonia, the latter being a country lying north of Thessaly which only since the times of Herodotus had been called thus [Hammer 2005: 628]. Some information on the country is included in Homer's *Iliad* where towards the end of the second chapter the author gave a description of two catalogues of ships. Owing to these descriptions we can learn about the tribes that took part in the Trojan War, we can tell where these tribes lived and by what routes their countries were connected and, above all, we can learn what ancient Greeks knew about their immediate northern neighbours.

Now, the Achaean catalogue closes with two contingents of ships arriving from distant parts of Thessaly inhabited by the Enienes, Peraebi and Magnetes. During the Trojan War, the Enienes held the lands lying on both sides of the Zygos pass that led from Thessaly to Dodona [Hammond 1972: 295]. The Peraebi were a warlike Pelasgian tribe that settled the Thessalian regions of Hestiaeotis and Pelasgiotis [Hammer 2005: 633], or the area of Perrhaebia, and controlled the important passage of Volustan that joined Thessaly and Macedonia [Hammond 1972: 295]. The Magnetes, in turn, inhabited a region of Thessaly located south-east of the Peneius River or a coastal belt running south from the Vale of Tempe[2] [Hammer 2005: 628]. During the Trojan War, they occupied historical Magnesia where they had come from the coastal areas of Pieria [Hammond 1972: 298], belonging to lower Macedonia.

Moving step by step towards Macedonia, we reach areas lying between Olympus-Pieria and the Axius River[3], which were supposedly no man's land. Owing to Hera's journey towards Thrace, described by Homer [*Iliad* 14.225-7], we learn that between

[2] Passage of Tempe on the Pinios River [Hammond 1972: 298], today's Greek Tempi, lying between Olympus in the north and Ossa in the south.

[3] The main river of Macedonia, today's Vardar [Hammer 2005: 613].

Olympus and that country lay Ematia (a sandy place identified with the plains of lower Macedonia) and owing to Strabo, in turn, we know that between Pieria and Ematia there stretched Bottisea [Hammond 1972: 295-296], a country forming a district of Macedonia, lying on the right bank of the lower Axius [Hammer 2005: 616].

In the Trojan catalogue of ships [2.848], in turn, from the lands on the Axius came the Paeonians (Greek αονας), who occupied north-western Macedonia, from the Illyrian border as far as the Strymon River [Hammer 2005: 632]. In the Early Bronze Age, they occupied the eastern portion of central Macedonia, later their influence spread beyond the Axius, across the plain, as far as the River Lydias[4], next to Eordea, then to Linkus, and finally to Pelagonia [Hammond 1972: 298]. Following the information given in the *Iliad*, we can learn that the westernmost regions allied to Troy included Amydon (probably Vardaroftsa), areas on the Axius[5], and Paeonia (a name that had been used to refer to central Macedonia since ca. 1200 BC). It follows that Troy's influence in Europe reached the Axius River and the region of Pelagonia. Trojans conquered these lands already before the Trojan War [*History* 7, 20] and they had penetrated the Balkans through either the Tsangon pass or along a route bypassing Lake Ohrid from the north, later known as Via Egnatia. Other important places on the route joining the Ionian Sea (southern portion of the Adriatic) to Asia Minor included crossings of the Axius and Strymon (today's Struma) rivers. The former was controlled by the Paeonians from Amydon, allies of Troy, while the latter was commanded by a military colony established there by Teukers [Hammond 1972: 296, 297] or Trojans so named after Teukros, the first king of the Troad [Hammer 2005: 639].

It is also known that Pieria and northern Olympus were controlled by Greek-speaking Macedonians while the central part of the Haliakmon valley was occupied by both Macedonians and Dorians-to-be, who had emigrated from north-eastern Thessaly. Up to 1200 BC, the Peraebi controlled the passage between them and Thessaly. Other Greek-speaking tribes occupied Linkus and Pelagonia or today's central Albania and central Epirus [Hammond 1972: 298].

2.1. GEOGRAPHY OF SCYTHIA IN HERODOTUS' WORK

Following Homer's narrative, we have reached Thrace and Scythia, the latter being of particular interest to us. Reading carefully Herodotus' *History*, in particular its Book IV, one can learn what the ancient author and, by implication, his

[4] A river in Macedonia that in ancient times joined the Haliakmon [Hammer 2005: 627] that is today's Aliakmon.

[5] Archaeological evidence shows that the mouth of the river and the coastland as far as Sedhes (vicinity of Vasiliki) were well known to Mycenaean traders at least since the middle of the 14th century BC [Hammond 1972: 296].

contemporaries knew about the Black Sea and adjacent areas. As R. Kapuściński [Kapuściński 2004: 78] noted:

The map of the world that Herodotus has before his eyes or that he imagines, differs from the one we deal with today (...) The centre is occupied by mountainous lands then covered with forests around the Aegean Sea (...) the world is divided, it falls into the East (Persia) and West (Greece).

Owing to Herodotus' passion and his desire to come to know the world and record the knowledge thus accumulated, we are able to study the fruits of his inquiries. He begins his story of Scythia by giving the genealogy of the Scythians [4.5-11]. Next we read that "with regard to the regions which lie above the country whereof this portion of my history treats, there is no one who possesses any exact knowledge[6]". But as the author himself says: "I shall proceed to mention all that I have learnt of these parts by the most exact inquiries which I have been able to make concerning them." [4.16] The lines following these words describe Scythian tribes and are interspersed with information on peoples of different descent [4.17-21]. Beyond the Scythian border, across the Don River, one entered non-Scythian lands, inhabited by the Sauromatae, Budini, Thyssagetae and a Scythian tribe that had revolted from the Royal Scythians [4.21-22]. Furthest north-west and north-east, the Agathyrsuses and Gelonuses[7] supposedly lived [Hammer 2005: 578] who descended from Agathyrsus and Gelonus, brothers of Scythes [4.10]. Beyond the country of Scythians Husbandmen, which ended on the Dnieper (after eleven days' sail), there extended a desert beyond which the lands of the Cannibals[8] stretched [4.18]. Beyond the Royal Scythians, in turn, lived the Melanchaeni[9] [4.20]. Next, "passing over a great extent of this rough country, you come to a people dwelling at the foot of lofty mountains" – the so-called Argippaeans[10] [4.23]. The ancient author lets us know that "Thus far, therefore, the land is known; but beyond the bald-headed men lies a region of which no one can give any exact account. Lofty and precipitous mountains, which are never crossed, bar further progress." East of the bald-headed men (Argippaeans) supposedly lived the Issedonians[11] [4.25]. It follows from accounts given by this tribe that above them lived the Arimaspis (one-eyed), next griffins guarding gold [4.27] and at the very end there dwelled the Hyperboreans (past-northern) whose country extended as far as the sea [4.13] or the Arctic Ocean [Hammer 2005: 578]. However, Herodotus himself had doubts about the actual existence of the last-mentioned people [4.36].

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[6] All quotations from *The History of Herodotus* by Herodotus translated by George Rawlinson. Provided by The Internet Classics Archive. Available online at http://classics.mit.edu//Herodotus/history.html.

[7] A tribe closely related to the Scythians. In Herodotus' times, it lived east of the Don, towards the Volga, next to the Finnish Budini [Hammer 2005: 620].

[8] Populations possibly of Finnish descent living on the upper Dnieper [Hammer 2005: 614].

[9] A people of Finnish descent on the upper Don [Hammer 2005: 629].

[10] They lived at the foot of the Urals and were of Mongolian descent [Hammer 2005: 615].

[11] Beyond the Urals, in Western Siberia [Hammer 2005: 623].

Further in his relation on Scythia, we learn that the country is crossed by many rivers among which "the most famous and [...] navigable to some distance from the sea [...] are, the Ister[12] [today's Danube], which has five mouths; the Tyras [today's Dniester], the Hypanis [today's Boh], the Borysthenes [today's Dnieper], the Panticapes, the Hypacyris, the Gerrhus, and the Tanais [today's Don]" [4.47]. The Panticapes, the Hypacyris, the Gerrhus have not been successfully identified so far. Herodotus' knowledge on Scythia's rivers was quite extensive. Besides the rivers themselves, he knew their tributaries and the course of each of them [4.48-57]. What's more, he knew that a Greek colony[13] was situated at the mouth of each river or close to it [Hind 2002: 42].

Giving account of Darius' expedition against the Scythians, Herodotus described and supplied the dimensions of the Pontus "which is indeed well worthy of consideration" as well as of the Bosphorus, Prepontide and Hellespont[14]. The author mentioned also Lake Maeotis (today's Sea of Azov), the dimensions of which supposedly matched those of the Black Sea [4.86] whose shape, in turn, was as follows: "Now from the mouth of the Pontus to the River Phasis[15], which is the extreme length of this sea, [...] Again, from Sindica[16] to Themiscyra on the River Thermodon[17], where the Pontus is wider than at any other place," [4.86] i.e. from today's Bafra Bay to the Taman Peninsula. Today, it is assumed that the distances given by Herodotus are exaggerated and the lengths of journeys given in days show that he probably did not sail on the Black Sea. The shape of the sea following from his calculations is oval with a small number of narrow places in its central part [Hind 2002: 41].

Continuing his account of Darius' expedition to Scythia, Herodotus provided a description of the lands towards which the Persians marched:

Before you come to Scythia, on the sea coast, lies Thrace. The land here makes a sweep, and then Scythia begins, [...] Starting from the Ister I shall now describe the measurements of the seashore of Scythia. Immediately that the Ister is crossed, Old Scythia begins, and continues as far as the city called Carcinitis[18], fronting towards the south wind and the mid-day. Here upon the same sea, there lies

[12] Other smaller rivers emptied into it as well. These included: the Pyretus (Prut), the Tiarantus (Aluta/Olta), the Ararus (Siret), the Naparis (Jalomita), and the Ordessus (Arges) [4.48]. The Ister supposedly rose in the country of the Celts, who lived the farthest west [4.49].

[13] E.g. Tyr on the Tyres [4.51] and Olbia on the Borysthenes [4.78].

[14] The length of the Black Sea is eleven thousand and one hundred stadia, while its width is three thousand and three hundred stadia. The Bosphorus is one hundred twenty stadia long. The width of the Sea of Marmara is five hundred stadia while its length is one thousand four hundred stadia. The Dardanelles are four hundred stadia long [Herodotus 4.85]. A stadium is equal to about 185 m (or 607 ft.) [Hammer 2005: 641].

[15] Today's Rion, a river in Asia Minor, rising in the Caucasus and emptying into the eastern Black Sea. It was regarded a border river between Europe and Asia or between Asia Minor and Colchis [Hammer 2005: 620].

[16] Sindians, a people inhabiting Asia's Sarmatia on the eastern coast of the Black Sea, at the foot of the Caucasus [Hammer 2005: 636].

[17] Today's Terme in north-eastern Asia Minor [Hammer 2005: 613].

[18] A city in the vicinity of today's Perekop [Hammer 2005: 624], Karkinitskiy Zaliv (Crimea).

a mountainous tract projecting into the Pontus [southern portion of the Crimea], which is inhabited by the Tauri[19], as far as what is called the Rugged Chersonese [Kerch Peninsula], which runs out into the sea upon the east [Sea of Azov]. For the boundaries of Scythia extend on two sides to two different seas, one upon the south, and the other towards the east [...] [4.99].

The description given by Herodotus is to a certain degree consistent with what we know today on the western and northern shores of the Black Sea. Despite the general character of information given by the ancient author, J. Hind [Hind 2002: 41-42] believes that Herodotus knew about the great arch joining the Danube to the northern portion of the Crimea as he did about the neck which constituted that part of Scythia and the land of the Tauri which protruded most into the sea, i.e. the Crimea. Further on

[...] we find the Scythians again in possession of the country above the Tauri and the parts bordering on the eastern sea, as also of the whole district lying west of the Cimmerian Bosphorus [Kerchenskiy Proliv] and the Palus Maeotis, as far as the river Tanais, which empties itself into that lake at its upper end. As for the inland boundaries of Scythia, if we start from the Ister, we find it enclosed by the following tribes, first the Agathyrsi, next the Neuri[20], then the Androphagi, and last of all, the Melanchaeni. [4.100]

Next we read that "Scythia then, which is square in shape, and has two of its sides [eastern and southern] reaching down to the sea, extends inland to the same distance that it stretches along the coast, and is equal every way," i.e. respectively from the southern border to the northern one (western) and from the western border to the eastern one (northern). According to the record, the southern coastal part of Scythia stretched from the Ister to the Borysthenes or from the Danube to the Dnieper and continued from the Borysthenes as far as Lake Maeotis. The eastern border ran from the sea (south-western extremity of the Cimmerian Bosphorus) inland as far as the country of the Melanchaeni [Herodotus 4.101; Hammer 2005: 582].

2.2. JOURNEY OF ARGONAUTS

A certain insight into the geographical knowledge of ancient Greeks is offered to us by mythology and mentions in the writings of ancient authors dated as early as to the 8th century BC (details to be found below). As far as mythology is concerned, a very meaningful example, probably one of the most popular, is the story of the sea

[19] A people living in the Crimea. It was made up of vestigial Cimmerian populations driven away by the Scythians [Hammer 2005: 638].

[20] They lived in Podolia and Volhynia and may have been of Slavic origin [Hammer 2005: 630].

journey of the Argonauts[21]. According to some calculations[22], their journey was to take place in the 14th or 13th century BC. It is certain that it preceded the Trojan War [Kubiak 1997: 475]. The purpose of the expedition was to seize the Golden Fleece kept in a country lying at the foot of the Caucasus, namely in Colchis, north of Mount Ararat, ruled by King Aeëtes [Koromila 2002: 19]. The Argonauts' journey may be divided into three stages: the sail to Colchis for the Golden Fleece, adventures of the sailors while at their destination, and their journey home[23].

The Argonauts' expedition began in Pagaes[24] and followed a route along the western edge of the Aegean Sea [Kubiak 1997: 484]. The first stop on the route was the island of Lemnos and then Samothrace. Next, they negotiated the Hellespont and landed on the southern shores of the Prepontide, at Cyzicus, on the Arkton Peninsula [Hammer 2005: 626], where Cyzikos was king ruling over the country of the Doliones [Grimal 1987: 38]. The journey continued along the southern edge of the Sea of Marmara. Before reaching the Bosphorus[25], the sailors landed on the Thracian coast, in the country of Phineus who helped them pass the Cyanean Rocks (=Bosphorus) also called the Symplegades or the rocks that clashed together. Still before crossing the Pontus, the Argonauts visited also the country of the Maryandini[26]. Finally, they saw the peaks of the Caucasus and sailing up the River Phasis, they reached their destination, namely Colchis [Grimal 1987: 39].

The account of the outward journey of the Argonauts can be considered a guidebook telling sailors what the shores are like, where to look for fresh water and safe havens and how foreigners are greeted by native peoples [Czarnowski 1956: 251].

On Colchis, the destination of the Argonauts' journey, some information was passed to us by Herodotus. In the beginning of the first Book of his *History*, in the third paragraph, we can read of an expedition by the Greeks to fetch the Golden Fleece that was kept at the court of the country's ruler in Aea, on the River Phasis. Also in successive paragraphs and books, there are references to Colchis and the River Phasis [e.g. 1.104; 2.103-104; 3.97; 4.37-38; 4.45, 4.85, 7.193]. However, these references neither facilitate the identification of the distant land nor does Herodotus mention in any of them any Greek colonies in this area. It is for this reason that J. Hind [Hind 2002: 46] believes that there may have not been any Greek colony there in Herodotus' times (5th century BC). On the other hand, archaeological records

[21] The most popular and comprehensive version of the myth was authored by Apollonius of Rhodes, an Alexandrian poet of the 3rd century BC [Czarnowski 1956: 269, footnote 24].

[22] Chronological findings adopted by mythographers on the basis of, *inter alia,* information that some fathers of Trojan War participants took part in the journey [Kubiak 1997: 475, 483].

[23] Because of the area of interest, I shall discuss only the journey of the Argonauts to Colchis and back and leave out the adventures they met with on their way.

[24] A district in Magnesia, Thessaly; ancient Iolkos, the present day seaport of Volos [Koromila 2002: 27].

[25] A strait connecting the Prepontide to the Euxine or the Pontus [Koromila 2002: 25].

[26] A people living in the north-western part of Bithynia [Hammer 2005: 628].

show that the first Greek towns in Colchis emerged in the middle of the 6th century BC [Tsetskchladze 1998: 35].

The homeward journey of the heroes to Thessaly could have followed several different routes described in ancient texts.

(a) First: a route following the northern shores of Europe. After escaping across the Black Sea, the Argonauts supposedly made a landing at the mouth of the Istros, then sailed upstream and when they reached its sources, they dragged the Argos to the Elbe and reached Jutland by water [Graves 1974: 547].

(b) Second: the Argonauts oared up the Don River, reached its sources, whence they dragged the Argo to a river flowing north and emptying into the Gulf of Finland [Graves 1974: 547]. Next, they crossed the Baltic, sailed around Britain, then followed the coast of today's France and Spain and through the Straits of Gibraltar they entered the Mediterranean [Kubiak 1997: 491].

(c) Third: according to a still different version, let's call it a southern one, the Argo sailed on the Danube, Sava and Po (mythical Eridanus) rivers and thus reached the Adriatic[27] [Graves 1974: 547] and then the Mediterranean. After experiencing more adventures, the crew reached Iolcos [Grimal 1987: 40] and ended the expedition.

Needless to say that the routes of the Argo's return voyage outlined above give rise to controversies, the more so as they are an attempt to reconcile different records of the heroes' journey.

(d) Taking into account the development stage of Greeks' knowledge of geography, it seems that the most realistic route of the Argonauts' return voyage to Thessaly is the one given by Diodorus of Sicily. According to this author, the Greeks came back the same way they had travelled to Colchis [Graves 1974: 548]. When one remembers that the Ister is frequently confused with the Istrus, a small river emptying into the Adriatic near Trieste [Graves 1974: 549], it seems quite possible that the adventures of the Argo originally took place in the northern Adriatic. Especially if we consider the possibility that the ancient authors erred in identifying Colchis with Kolikaria, situated on the lower Po River and being a stop on the amber route [Graves 1974: 529]. In turn, according to S. Czarnowski [Czarnowski 1956: 251-253], the westward journey of the Argonauts could have been a result of imprecise information given to Greeks by traders venturing into these areas. The reference to three rivers flowing from one lake can concern Lake Geneva, which was a hub of important trade routes in prehistoric times. A similar undertone can be attributed to the Argonauts' sail on the Danube, which was an important communication and trade route as well. Also, the version of the homeward route involving the escape along the Phasis River, sailing around Asia in the south and coming back to the Mediterranean along

[27] The Sava River does not empty into the Adriatic and the Danube is navigable only as far as the Iron Gate and it is not connected to the Po River [Grimal 1974: 548].

the Nile could have had a trading undertone as well as Colchis was a source of important mineral resources, not only for ancient Greeks. The country was the endpoint of a trade route from India. Therefore, it can be assumed that each homeward route of the Argonauts to Thessaly testified to contacts with other ancient civilizations, set up in the course of time.

3. NORTHERN PONTIC COLONIES AND THEIR ROLE IN TEACHING GREEKS GEOGRAPHY OF EASTERN EUROPE

The lands that have been described above, at least some of them, Greeks had a chance to come to know when they embarked on their colonization. Hence, I would like here to refer to the stages of the Greek penetration of the Pontic Area and to the way colonists perceived its land resources and inhabitants. In the opinion of G.R. Tsetskhladze [Tsetskhladze 1998: 9], some scholars studying the 'colonial' past of the Black Sea simplify the role of Greek towns located in the area. The colonies are considered only in the context of settlements that were set up for the purpose of trading in all kinds of goods and supplying food to the metropolises in the south. For this reason, the relations with the native populations are considered from this point of view as well. The quoted author, meanwhile, believes that Greek colonies on the Pontus were independent entities with their own economies and were not totally subservient to trade with both the Mediterranean world and a local community. Their dependence on the latter was rather cultural and political, and not economic. Trade, in turn, was a consequence of colonization and not its reason [Tsetskhladze 1998: 10].

The first Greek colonies were established on the coast of the Aegean Sea in the late 8th century BC [Fol 2000: 54] along an ancient road following the coast and called *Via Egnatia* by Romans (another name it was referred to was Ismarus), which connected Istanbul with today's Durrës on the Adriatic [Fol 2000: 56]. Along the Strandzha Mountains, there ran another coastal road known as *Apollonia Pontica* [Fol 2000: 58]. In turn, the earliest Greek colonists appeared on the Black Sea, with exception of the east coast (6th century BC), in the second half of the 7th century BC [Tsetskhladze 1998: 19, 36]. Hence, it is assumed that the earliest finds of Greek pottery on Scythian sites (7th century BC) could have been luxurious offerings brought by the first colonists for members of the local elite in order to win their favour [Tsetskhladze 1998: 12].

The first contacts of ancient Greeks (or even Mycenaeans, see Suchowska..., in this volume), both direct and indirect, with the inhabitants of the western coast of the Black Sea (Thracians) must have taken place along water routes such as the

Danube and Maritsa (ancient Hebros) as well as probably along the Mesta, Struma and Vardar rivers. This is evidenced by single finds of imported pottery and metal goods unearthed there [Archibald 2002: 50]. Not surprisingly, the Hellenization of south-western Thrace (between the lower Struma and Vardar rivers), began quite early on. The process was a result of mutual contacts between the local populations and the inhabitants of northern Hellas (Thessaly and Macedonia). The major exchange route ran north from Mount Olympus along the coast of the Gulf of Salonika (Therma) [Fol 2000: 54].

A characteristic feature of Black Sea colonies in the early stage was shelters in the form of dugouts and semidugouts. Only after 25 years of their existence did stone structures appear [Tsetskhladze 1998: 20]. Also from the early stage of Greek colonies, examples of hand-made pottery come, which may show that parts of local populations lived in newly founded towns as well [Tsetskhladze 1998: 44]. In the 6th century BC, colony dwellers began exchanging adjacent plots of land for rural areas and embarked on manufacturing of all kinds of goods [Tsetskhladze 1998: 36]. In some locations, because of local populations [Tsetskhladze 1998: 42], which in most cases occupied forest and steppe areas, this was not possible. In Z. Archibald's opinion [Archibald 2002: 54], the relationships between the urban and rural spheres form a major theme of discussions on Greek colonies in the Northern Pontic Area. Relying on the study of Olbia, it can be assumed that both spheres interpenetrated. It is known that north-south trade was going on both ways. Imports of Attic pottery, especially its contents in the form of wine, were popular in particular among colony dwellers whereas native populations favoured metal vessels and jewellery [Tsetskhladze 1998: 60]. A significant concentration of finds of ancient origin can be found in the forest-steppe area on the right-bank Dnieper [Murzin 1996: 52]. Taking into account the number of Greek artefacts in the Scythian territory and their distribution, it can be concluded that such goods were spread among native populations along river routes and that both Greeks and natives were involved in the activity [Tsetskhladze 1998: 65]. A question remains open whether colonists themselves visited native settlements further inland. From Nemirov, we know of a graffiti on local pottery dated to the middle of the 6th century BC, which is believed to be evidence of Greek presence in the settlement [Grakov 1959: 259-261]. Also G. T. Tsetskhladze [Tsetskhladze 1998: 50], having analyzed a find of Greek artefacts from the settlement of Belskoe (pottery, both local and Greek, a bronze arrowhead, a spindle with a Greek graffiti and two gems), became convinced that Greeks lived in native settlements among local people. They could have been Greek craftsmen who emigrated from coastal emporiums as described by Herodotus [4.108]. A very common view holds that the surplus of cereals grown in northern colonies was sent to Athens; however, it is not known on what scale and in what amounts this was done [Archibald 2002: 55]. What is known, however, is the fact that at least in the early period, reserves came from Greek settlements. Native

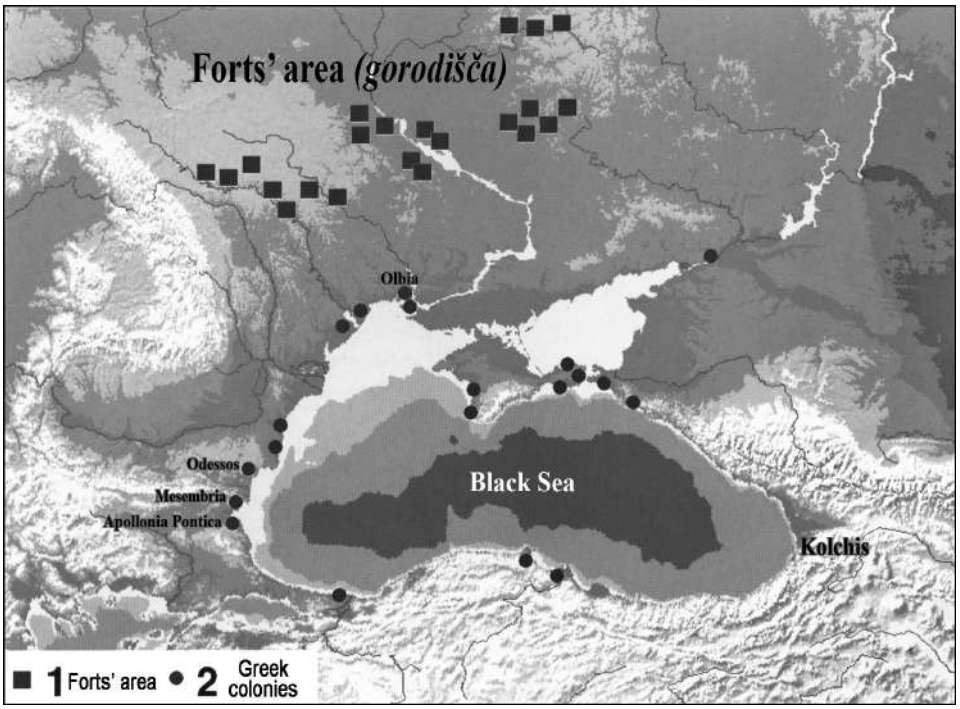

Fig. 1. Overview map of lands adjacent to the Black Sea [foll. Videiko 2008: 153, amended by the author]

populations grew cereals to satisfy their own needs only. The import of cereals from the Pontic Area to Greece gained momentum only in the late 5th century BC [Tsetskhladze 1998: 66].

Considering mutual relations between the Scythians and incomers, a mention should be made of strongholds or *gorodišče*, which appeared on the forest-steppe as early as in the 8th century BC (on both banks of the Dnieper and Boh rivers). Their origins presumably should be traced locally [Videiko 2008: 147]. Archaeological investigations carried out on the strongholds showed the presence of different cultural traditions (Chernoles culture, Thracian Hallstatt, Finno-Ugric and Baltic cultures) that must have influenced their formation [Videiko 2008: 152-153]. The strongholds were large enclosures[28], surrounded by earthen ramparts reinforced with clay (in this respect they differed greatly from Greek citadels). The interior was made up of individual households built along streets crossing the settlement. The inhabitants not only cultivated land but also engaged in all kinds

[28] Their surface area reached hundreds and thousands of hectares [Murzin 1996: 56].

of crafts, for instance, weaving, bone and antler working, metallurgy (iron) and the manufacturing of jewellery, also of gold. Some of it must have been manufactured to be exchanged not only locally but also with Greek colonies on the coast of the Black Sea. The colonies in return offered wine, pottery and objects or ornaments made of metal and glass, and others. Numerous Greek artefacts found at the forest-steppe strongholds, in particular pottery, testify to the intensity of trade and economic relations with Greek *poleis* [Videiko 2008: 144-151]. The strongholds were located at some distance from the Black Sea colonies and were separated from the latter by a broad belt of steppes crossed by trade routes. Of special importance in this connection were the Dnieper and Boh rivers. The strongholds included Bilskoe, Karatulskoe, Velikoe Khodosivskoe and Nemirovskoe [Murzin 1996: 53, 56].

Detailed archaeological investigations carried out on some colonies around the Prepontide and Pontus provided enough data to draw the following conclusions:

(a) Probably all Greek colonies, as for instance Ionian Apollonia Pontica, (today's Sozopol) were centres of mutual cultural and linguistic contacts between native inhabitants and colonists, which is shown by coins, inscriptions and few written records.

(b) It is known that some colonies, as for instance Mesembria (today's Nessebar) took the place of earlier Thracian settlements, which sometimes were fortified and were centres of local royal power [Fol 2000: 51]. Absence of any traces of destruction at such settlements indicates that native inhabitants were integrated into new structures in a peaceful manner. On the other hand, however, as in the case of Colchis, the graves of native populations (7th/6th century BC) contained large amounts of weapons, which, in combination with information gathered from written records, may be evidence of their hostility towards colonists [Tsetskhladze 1998: 47].

(c) In addition, being centres of Hellenic culture, colonies served as intermediaries in contacts with native inhabitants [Fol 2000: 51]. This is confirmed by some epigraphic documents which mention Thracian rulers of the Odrysian dynasty who used their ports [Fol 2000: 52]. For this reason, Greek emporia were often located in such places as to make access to them for native people easier [Archibald 2002: 59].

(d) It is also known that members of Thracian aristocracy had close ties to Greek cities, as in the case of Odessos (today's Varna). This can be seen in archaeological finds, inscriptions and, above all, the presence of the Thracian funerary rite at the cemetery belonging to the city [Fol 2000: 52].

(e) Greeks, while colonizing new lands, brought with them their system of social structures. It must be remembered, however, that its adoption by people of so different descent was rather difficult as the Greek system was based on shared cultural values. In the opinion of Z. Archibald [Archibald 2002: 60], a trans-

plantation of the whole political system was not possible in this case but this did not prevent different communities from cohabiting for several centuries.

(f) It follows from the study of epigraphs that some cities paid tax to communities living around them. Possibly, the purpose of such 'tributes' was to stop attacks on Greek settlements (e.g. in Thrace, they were frequent within the Odrysian kingdom).

(g) The relations between Greek colonists and native populations must have depended on many factors, one of them being the people who held power and to whom the communities were subjected. Taking into account the fact that power held, sooner or later, changed hands, the relations must have changed as well [Archibald 2002: 66].

4. CONCLUSIONS

The above short analysis of the geographical knowledge of ancient Greeks justifies the following conclusions:

(a) It is a well-known fact that the inhabitants of the Peloponnesus rationalized nature and all kinds of knowledge through myths. Hence, their earliest geographical concepts had the form of myths. Their contents must have reflected incomplete information passed by word of mouth by travellers or traders visiting distant lands. This was also the case with the lands on the Prepontide and Pontus [Kolev 1986: 311].

(b) Detailed analyses of Greek spatial concepts relating to the limits of the world known to them suggest that what they had in common was gold. At the northern limits, beyond Scythia, it was guarded by griffins while in the east access to the Golden Fleece was denied by a dragon. In the opinion of M. Vassileva [Vassilieva 1998: 73], gold in the context of myths was an intermediary between the known and unknown, it was also a symbol of the underworld, similarly to the monster that barred access to it. Hence, the mythical meaning of gold should not be taken directly but rather indirectly through its association to the underworld. There, it marked the limit of that which was known and played an important role by giving shape to the Greek notions of that which surrounded them [Vassileva 1998: 74]. Considering the myth of the Argonauts from this point of view, it can be claimed that it not only reflected ancient Greeks' knowledge of the geography of Asia Minor, specifically its northern limits [Vassileva 1998: 76], but also delineated the limits of the known world, similarly to the Phasis River which by tradition marked its eastern frontier [Tsetskhladze 1997: 338]. In the

literature, there are two lines of thought concerning the interpretation of the Argonaut myth. Adherents of the first of them believe that it reflects true events while their opponents claim otherwise. G.T. Tsetskhladze [Tsetskhladze 1997: 339-340], having analyzed Greek art depicting the events mentioned in the myth and relying on the fact that mythical Aea was identified as Colchis only in the 5th century BC, believes that this specific instance of Greek chorography cannot be an account of a real expedition to Colchis in the 13th century BC. What's more, he assumes that mythology in itself is not a reflection of historical events and cannot be a proof of early contacts between the peoples living on the Black Sea and Greeks. Such contacts were established only in the second half of the 7th century BC.

(c) Some of the Greek notions of the Black Sea, including myths, should be taken as views of that which is unknown through the lens of cultural contacts and the transfer of tradition. Therefore, the Greek desire to come to know that which is alien, dated to the times earlier than the 7th century BC, should be considered in the cultural context and not in the historical one [Vassileva 1998: 77].

(d) The penetration of lands lying north of Greece (not only coastlands, but inland areas as well), in the beginning, continued along land routes following major rivers joining individual countries. From written records [e.g. Ksenophon I, 3; III, 2, 5; IV, 1], we know that all expeditions to unknown lands relied on the help of local guides (including prisoners of war). They made travel easier as well as assisted in learning the customs prevailing in strange countries. Later, with the development of sailing, it was possible to reach more distant areas as for instance Colchis. The contacts of Greeks with peoples living on the frontiers of the world known to them, both closer and farther, can be divided into two major stages: a stage preceding colonization and colonization proper divided, in turn, into several phases. As the manifestations of the so-called pre-colonial contacts, with both Scythians and Colchians, may be regarded references to them in writings by ancient authors. And so, Arctinus of Miletus, a poet of the 8th century BC, mentions a white island at the mouth of the Ister. The river was known to Hesiod as well (8th century BC), likewise the Phasis. From the end of the 8th century BC, from a Corinth poet named Eumeleus, we have information on the Borysthenes, Sinope and Colchis. Relying on them and on early Greek finds (e.g. clasps), it can be accepted that certain indirect contacts with the lands of today's Georgia were established as early as in the 8th century BC. They followed a land route running from Mesopotamia to the southern shores of the Pontus and then to Greece [de Boer 2007: 128].

(e) There is no doubt that the appearance of Greek culture and colonies in new lands played an important, formative role which, taking into consideration a new environment and customs prevailing in it, must have changed. Greek emporia in Scythia were more alien to the local milieu than in Colchis. Interestingly eno-

ugh, Scythian forest-steppe *gorodišča* resembled somewhat classic cities. Greek *poleis* could have made native populations organize their settlements into cities. Examples of such an impact are known from Italy [Bouzek 2005: 2]. However, a precise determination of the relations between the dwellers of such strongholds (native populations) and Greek colonists is not fully possible and calls for further research. It is worth remembering that they must not be considered from the trade perspective only. They might have been determined by political circumstances prevailing on different tiers.

Translated by Piotr T. Żebrowski

Baltic-Pontic Studies
vol. 14: 2009, 191-213
PL ISSN 1231-0344

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CENTRAL EUROPEAN LOWLAND SOCIETIES AND THE PONTIC AREA IN THE 4TH-4TH/3RD MILLENNIUM BC

The question of exploration of the biocultural milieu of the Black Sea Plate by Central European Plain societies (Fig. 1) has not been systemically studied yet. Neither do we have any substantial register of settlement by and tradition of cultures originating on the Plain, in particular of the Funnel Beaker culture (FBC) and Globular Amphora culture (GAC), on the Black Sea Plate. Even less is known about their contacts, joint efforts or migrations in the Pontic Area. The present paper is an attempt to preliminarily discuss these questions with respect to the 4th and the early 3rd millennia BC [cf. Kośko 1994; Kośko, Szmyt 2004].

The theme of the paper is the development of the knowledge of geography (chorography) of the Pontic Area taking place among Lowland societies in the period indicated.

1. GENETIC BACKGROUND: LOWLAND SOCIETIES AND THE PONTIC AREA IN THE ERA OF INCIPIENT NEOLITHIZATION – 6TH-5TH MILLENNIUM BC

As a prologue to the development of 'Lowland' chorography of Volhynia, Podolia and Dnieper-Pontic Area can be considered the early agrarian colonization (Fig. 2), taking place in two forms:

- penetration of the Polish Lowland by the Proto-Neolithic societies of the Pontic Area from the Janisławice-Rudoy Ostrov cultural circle as exemplified by site Dęby 29 in Kujawy [Domańska 1990; cf. Czerniak 1994: 11-16];

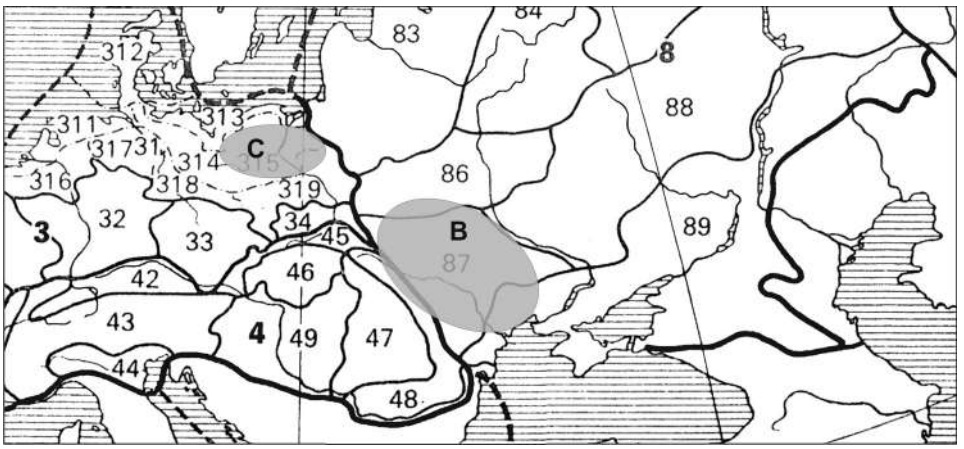

Fig. 1. Central European Plain and Black Sea Plate against the background of physiographical regions of Europe [according to Kondracki 1969, amended by the authors]. Legend: B - Black Sea Plate, C - fragment of Central European Plain discussed in the paper

– the settlement of the Black Sea Plate by the societies of the upper Vistula drainage, from the circle of the Linear Pottery culture [Kozłowski 1985; Zakharuk, Telegin 1985; Kadrow, Zakościelna 2000; Larina, Okhrimenko 2007].

Hence, it can be assumed that from the beginning of the 5th millennium BC, in the disposal of Lowland early agrarian societies, there was some basic chorography of Volhynia and Podolia (more broadly: Volhynia-Podolia Upland). It may have included their environment advantages viewed from the angle of the strategy of future settlement and – to a minor extent – raw material resources.

In turn, in the range of Lowland 'Late Danubian' ('Post-Linear') groups, formed around the middle of the 5th millennium BC, of the Brześć-Kujawski type [cf. a Lowland model of the Late Danubian culture: Czerniak 1980], there are no major manifestations of the reception of Volhynia-Podolia 'patterns'. In the FBC, formed around 4400-4500 BC, 'Pontic elements' appear in its Middle Neolithic phases (I-II/IIIa) only sporadically, either. When they do, they are single artefacts of 'Volhynia' flint, with the attempts to classify them according to raw material being equivocal [Domańska 1995: 40ff.]. There is no evidence either to suggest that Lowland Middle Neolithic societies took part in the colonization of Volhynia, taken up by Post-Linear culture colonists from the Upland (Małopolska) zone [cf. Kadrow, Zakościelna 2000].

Thus, it can be believed that in the period prior to the 4th millennium BC, Lowland early agrarian societies learned about the Pontic Area through their Upland neighbours from the circle of Linear and Post-Linear cultures. Hence, this stage can be called 'Upland' chorography.

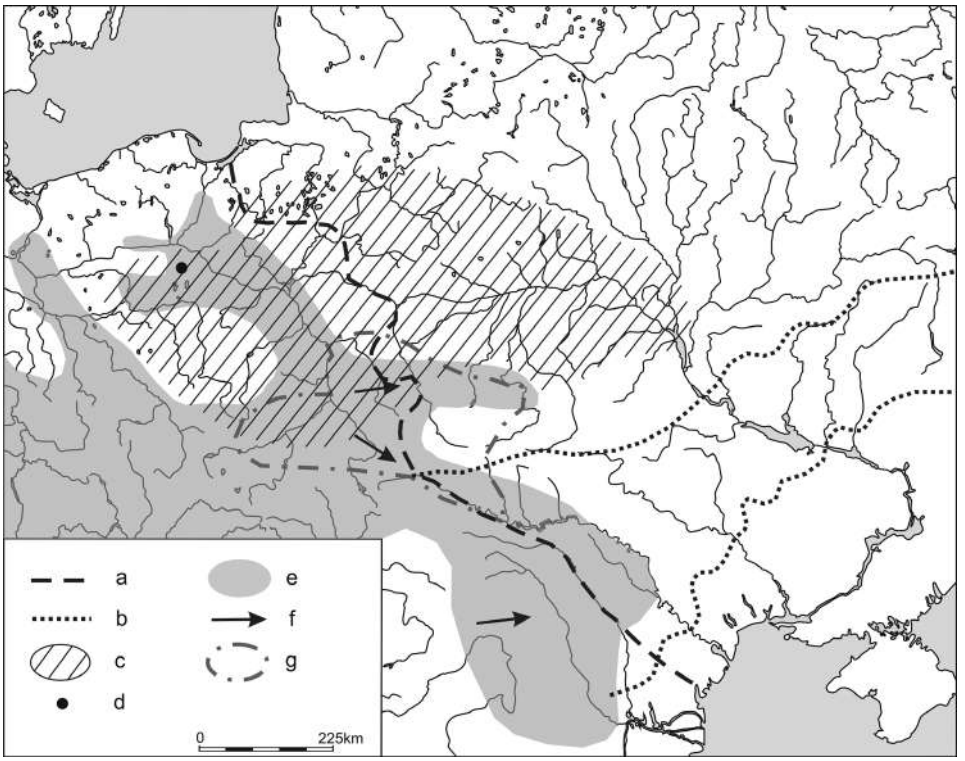

Fig. 2. Early agrarian stage of contacts between central European and Black Sea societies [according to Domańska 1990; Kadrow, Zakościelna 2000; Larina, Okhrimenko 2007, amended by the authors]. Legend: a - Western Bug - Dniester limes; b - borders of east European ecological zones; c - range of Janisławice-Rudoy Ostrov cultural circle; d - site Dęby 29, region of Kujawy-Pomorze; e - range of settlement by LBK populations; f - selected diffusion directions of LBK settlement; g - range of (post-LBK) Lublin-Volhynia culture

2. THE WATERSHED OF THE 4TH MILLENNIUM BC PROLOGUE: A CHOROGRAPHY OF THE PONTIC AREA PREVALENT AMONG THE LOWLAND SOCIETIES OF THE LATE NEOLITHIC FBC

A watershed in the way the Pontic Area was perceived by Lowland societies occurred in the early 4th millennium BC and was connected with the activities of Late Neolithic FBC societies or, more precisely, their eastern Lowland agglomerations [Kośko 1981: Fig. 14]. There are two ways of looking at this process: **(2.1)** assuming the reception of the traits of 'Pontic neighbours' by the Lowland FBC groups (chiefly from the eastern and Mątwy groups and only rarely from Radziejów,

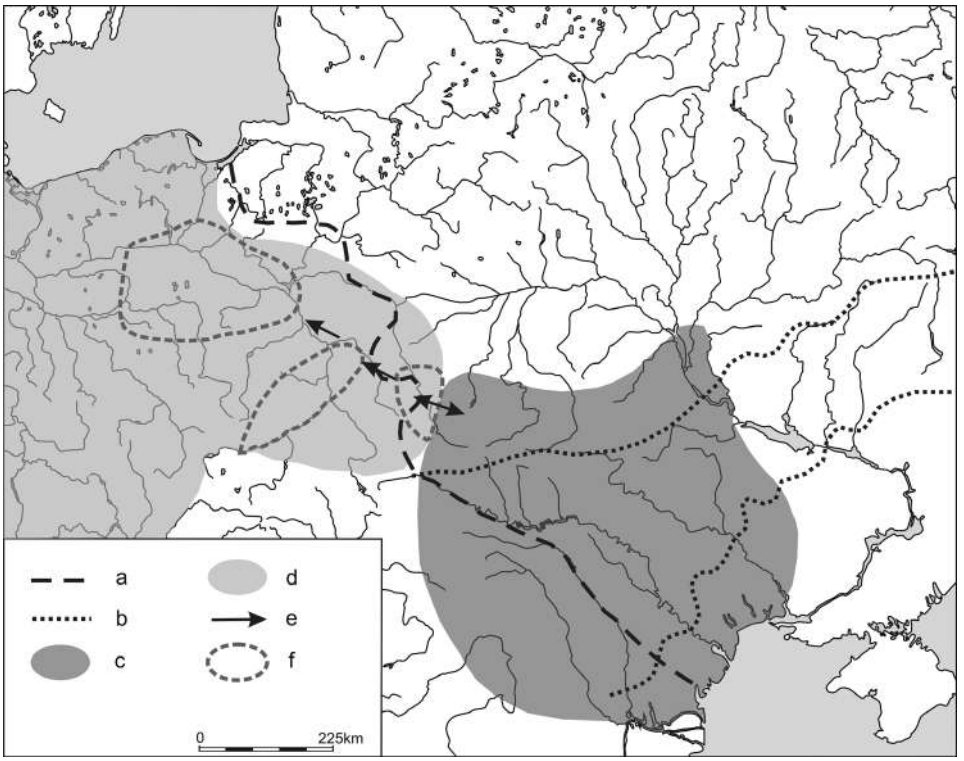

Fig. 3. Zones of intensive reception of 'Black Sea' traits by FBC populations [according to A. Kośko 1981, amended]. Legend: a - Western Bug - Dniester limes; b - borders of east European ecological zones; c - range of Tripolye culture settlement; d - range of FBC settlement; e - directions of cultural impact; f - zones of intensive reception of 'Black Sea' traits by FBC populations

Chełmno and other groups), or **(2.2)** assuming the presence of FBC societies on the Black Sea Plate and their contacts with local Late Neolithic populations representing primarily the Tripolye culture, stage C (phases CI and CII) and, possibly, pre-Yamnaya societies as well (to be precise: of the Sredni Stog culture).

2.1. THE RECEPTION OF 'PONTIC' TRAITS BY LOWLAND FBC GROUPS

Attempts to develop a comprehensive register of 'Pontic' traits available to Lowland FBC groups were made in the late 1970s and early 1980s. They spawned the

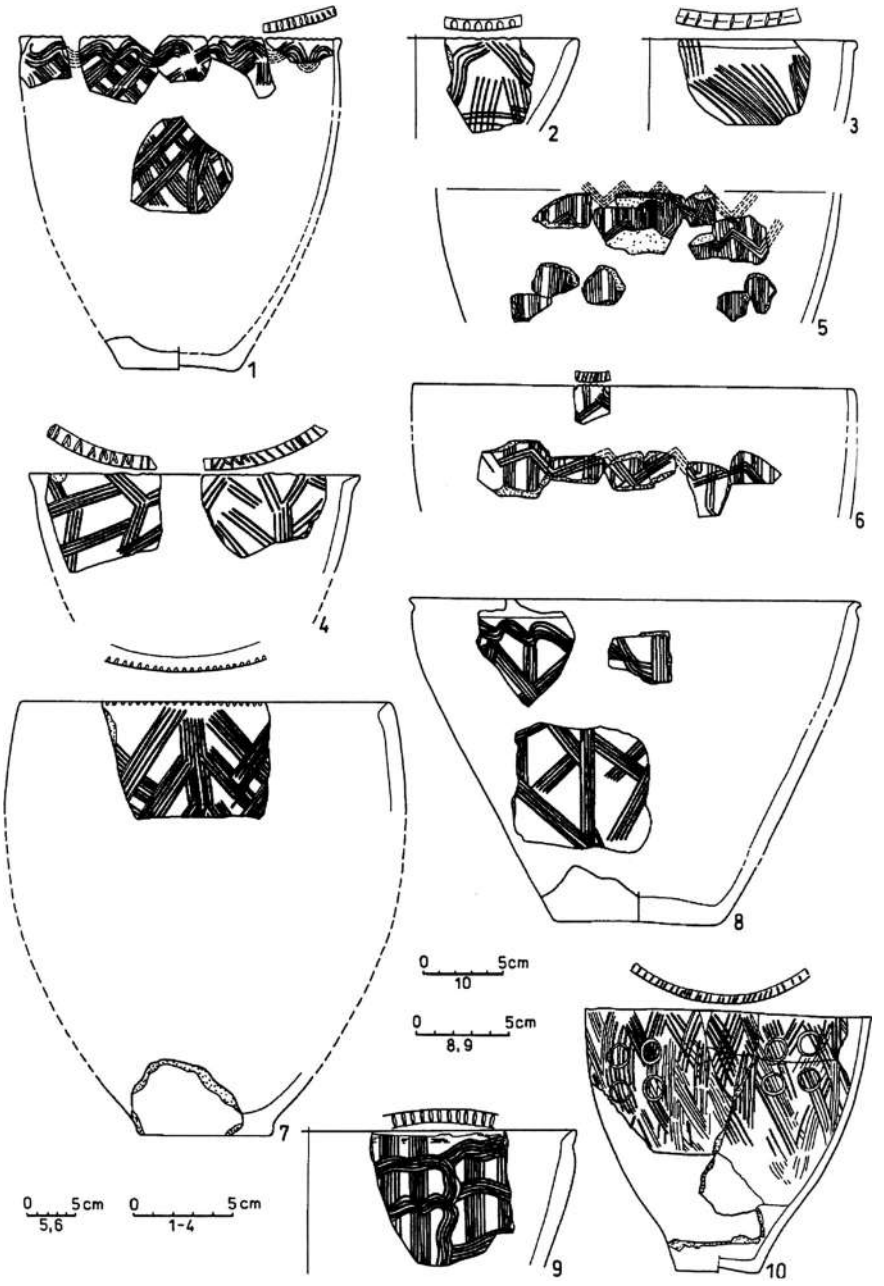

Fig. 4. Examples of reception of 'Black Sea' traits in pottery production by FBC populations in Kujawy [according to Daszkiewicz, Prinke 2001; Kośko 2003]. 1-6 - Tarkowo, site 23, 7 - Piecki, site 1, 8-9 - Inowrocław-Mątwy, site 1, 10 - Inowrocław-Mątwy, site 5; all sites are located in region of Kujawy-Pomorze

concept of Mątwy cultural component (MCC – named after sites Inowrocław-Mątwy 1 and 5, of diagnostic value for these studies) [Kośko 1981; 1988a]. The concept involved the presence of traits originating with various cultures of Black Sea Plate provenance, not leaving out the area's Polissya frontier, in the cycle of FBC groups (Fig. 3). The traits represented the following cultures: late Tripolye culture (stage C), 'pre-Yamnaya' structures and the Yamnaya culture [Kośko 1985], the FBC on Bug River [Nowak 2001; Bronicki *et al.* 2003] and the cultures of Volhynia-Polissya frontier between the forest-steppe and forest zones in the Pripet drainage, identified with the cycle of comb-like and stroked pottery cultures [Kośko 1981; 1988a: 106-109; 1988b]. An outline was made of a three-phase division of MCC identification (by analogy to the Kujawy periodization of the FBC [cf. Kośko 1988a]), which now looks as follows:

- early phase (1) = FBC phases IIIA-IIIB;
- classic phase (2) = FBC phases IIIB-C—IIIC-IVA;
- late phase (3) = FBC phases IIIC-IVA/IVB—IVB/VB.

In the currently adopted absolute chronology, the division corresponds to the following years: 4000–3500–3200–2750? BC [Czebreszuk *et al.* 2000; Kośko, Przybył 2004].

In the early phase (4000-3500 BC), the Lowland FBC takes over certain elements of pottery-making from the societies of the Black Sea Plate. One of these elements is the use of shells as temper in the ceramic body; another one – to a debatable extent – is certain customs of decorating vessel surfaces (Fig. 4). The decorations included chiefly band-comb patterns and – possibly towards the end of the phase (ca. 3600/3500 BC) – also corded ones [Kośko 1988a: 94n.; 2003]. A controversy is aroused by the scope in which 'Volhynia' flint artefacts were received by the Lowland FBC [cf. Papiernik, Rybicka 2002; Rybicka 2004; Domańska 2005 – the chronology of 'imports' discussed in these papers is not unequivocal: FBC phase IIIB + dominating phases IIIB-C]. The list is supplemented by the reception of more complex technologies of destructive distillation of wood[1] and clay processing to make it into a composite building material [Kośko 1988a: 106 and later modifications: Kośko, Przybył 2004; Kośko, Szmyt 2006]. A key significance for the assessment of the scope and dynamics of the transfers is held, as it seems, by the temper of shells [cf. Daszkiewicz, Prinke 2001; Videiko 2001; Kośko 2003a].

In the classic phase (3500-3200 BC), the spectrum of 'Pontic' traits is considerably broadened, with pottery being affected most, which is seen in band-comb, corded and, to a lesser degree, zoomorphic ornaments becoming more popular. Likewise on the rise, the imports of both Dniester-Volhynia flints and Volhynia basalts [Chachlikowski 1996: 140-141] are among the minerals that may include also copper

[1] A suggestion following from comparative analyses carried out by the team headed by Prof. Jerzy J. Langer. The analyses involved Tripolye ceramics (mainly from a settlement in Talyanki) and FBC pottery from Kujawy. We would like to thank Prof. J.J. Langer for the information supplied.

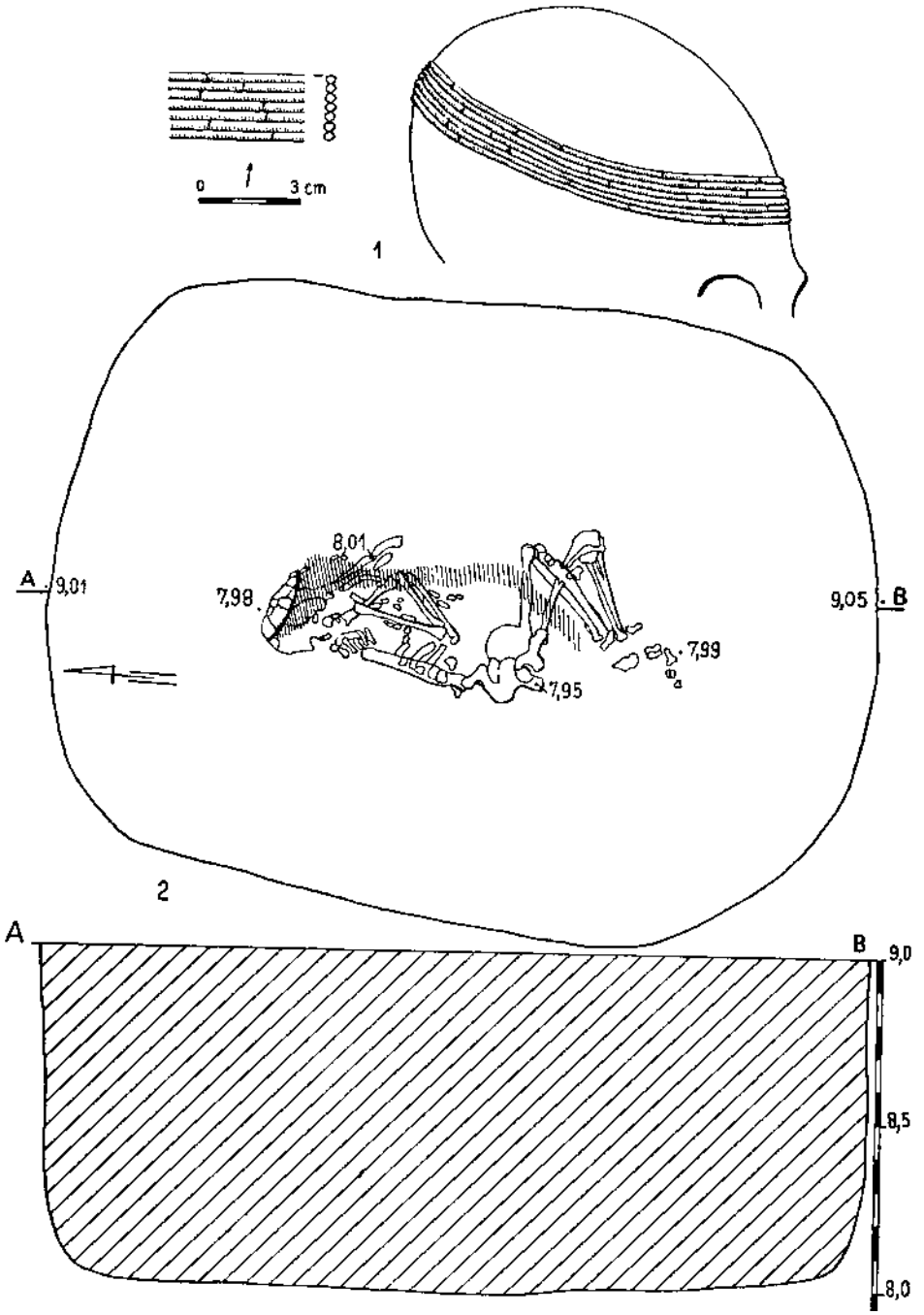

Fig. 5. Bożejewice, region of Kujawy-Pomorze, site 8. A grave displaying 'Pontic' traits in the funerary rite [according to Kośko, Kločko 1991]

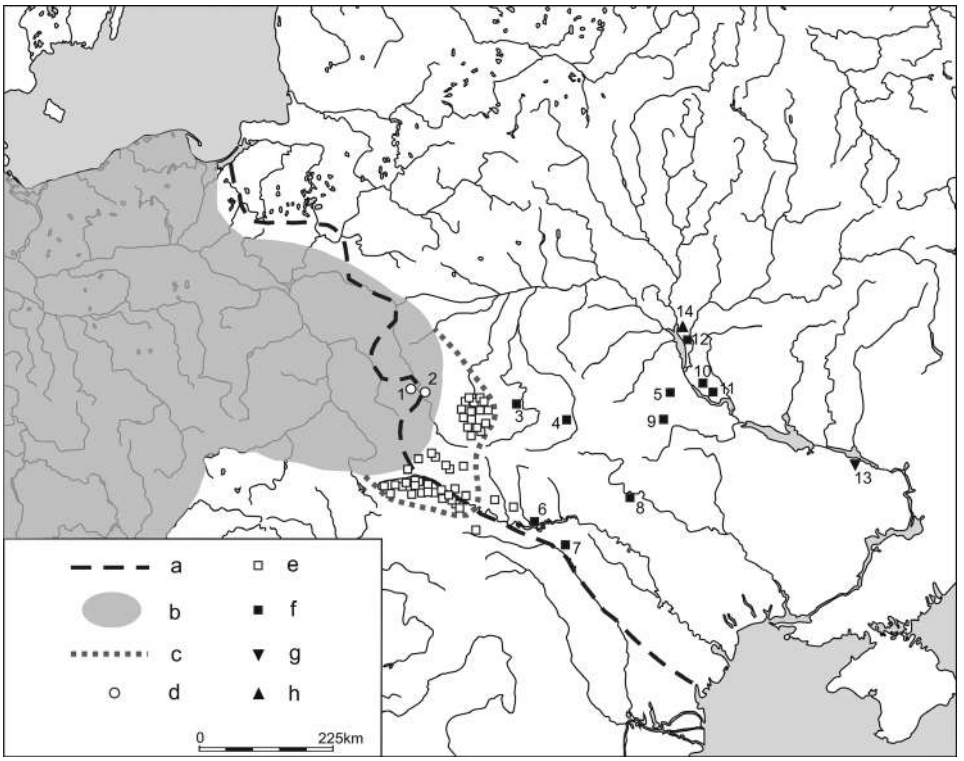

Fig. 6. Volhynia-Podolia impact of FBC populations [based on Jastrzębski 1989; Kruts, Ryzhov 2000; Videiko 2000; Okhrimenko 2001; Telegin *et al.* 2001, amended by the authors]. Legend: a - Western Bug - Dniester limes; b - range of FBC settlement; c - range of Volhynian and Podolian settlement of FBC; d - upland sites of the FBC on the Western Bug River; e - FBC sites on Volhynia and Podolia; f - Tripolye culture sites with FBC traits; g - Sredni Stog culture site; h - Pit-Comb Pottery culture site; 1 - Gródek, 2 - Zimne, 3 - Khoriv, 4 - Nova Chartorya, 5 - Gorodsk, 6 - Zhvanets, 7 - Brinzeni, 8 - Pechera, 9 - Troyaniv, 10 - Sofievka, 11 - Krasny Khutor, 12 - Zavalovka, 13 - Dereivka, 14 - Mnevo

from the drainages of the Horyn and Dniester[2] rivers in later times [cf. Klochko *et al.* 2000; 2003].

In the late phase (3200-2750? BC), the spectrum of 'Pontic' traits does not broaden much while in terms of numbers a decline can be observed.

Generally, in 4000-2750? BC (mainly however after 3500 BC), FBC Lowland societies – mainly in Kujawy and to a smaller, selective extent in neighbouring regions – took up various cultural patterns from the Black Sea Plate. The adoption of such patterns was taking place despite the fact that no 'Pontic' populations

[2] Studies by an international team comprising the faculty members of the Institute of Geology, National Academy of Sciences of Ukraine, Kiev, and the Dept. of Polish Prehistory, Institute of Prehistory, Adam Mickiewicz University in Poznań, Poland.

(either Tripolyan or 'pre-Yamnaya') were coming then onto the Lowlands, as far as we can tell. A prologue of such an influx can be dated only to ca. 2700 BC (cf. a 'Yamnaya'-like burial under a barrow in Bożejewice, site 8. Kujawy; Fig. 5).

Thus, it may be concluded that the process was a result of activities by Lowland colonizers of the Pontic Area, deriving primarily from FBC 'Kujawy' groups [Gajewski 1949; Kośko 1981; 1991: Fig.4]. Arguably, within the 'Kujawy-western Pontic' substructure of the FBC, there may have been periodic ritual contacts, bringing about long-distance transfers of diverse cultural novelties from the Pontic Area or, more broadly, from the circumpontic cultural circle.

2.2. FBC SOCIETIES ON THE BLACK SEA PLATE

The colonization of the Black Sea Plate by FBC societies seems to mark the prologue of the establishment of a Lowland ('Beaker') representation (image) of the area in question. The image covered such issues as the limits of the area, internal community and cultural divisions, including rules of landscape mythologization. The image was used, judging by what is clear to an archaeologist's eye, to make the best use of local routes and raw material resources. The resultant knowledge was disseminated in the Vistula drainage and partially in that of the Oder.

One can distinguish three areas of documenting FBC presence on the Black Sea Plate (Fig. 6): (**a**) Volhynia, (**b**) Podolia-Dniester, and – however with lesser credibility – (**c**) Dnieper/Black Sea. In the first two cases, the main partners of the 'migrants' were Tripolye culture societies [Jastrzębski 1989; Ścibior 1994; Pelisiak 2005; 2007], while in the possible third – 'pre-Yamnaya' groups [Kotova 2000].

a. The rudiments of what we know about the 'Pontic' FBC come from the Volhynia Upland [Jastrzębski 1989; Ścibior 1994; Pelisiak 2005; 2007]. Of key importance here is the exploration of the 'large settlements' of its south-eastern ('Lesser Poland'-'Małopolska') group on the Bug River: in Gródek Nadbużny [Gumiński 1989; Jastrzębski 1989] and Zimne [Bronicki 1997]. This applies to both available sources and series of their radiocarbon measurements [Bronicki *et al.* 2003; Kadrow 2005]. In light of these data, the upper Bug drainage was settled by FBC societies coming mainly from Uplands (Lesser Poland) ca. 4000 BC. The question of direct participation of Lowland populations in the colonization is not clear.

The Lesser Poland FBC is characterized by many development trends ('upland--loess', 'lowland-quasi-lowland', 'Carpathian') [cf. Nowak 2001] which can be seen in the diversity of development dependencies on Lowland Neolithic societies, i.e. on the FBC Lowland (great-valley) zone or rather – continuatively – on its eastern group [Kośko 1981]. Such topogenetic links are strongly emphasized in respect of

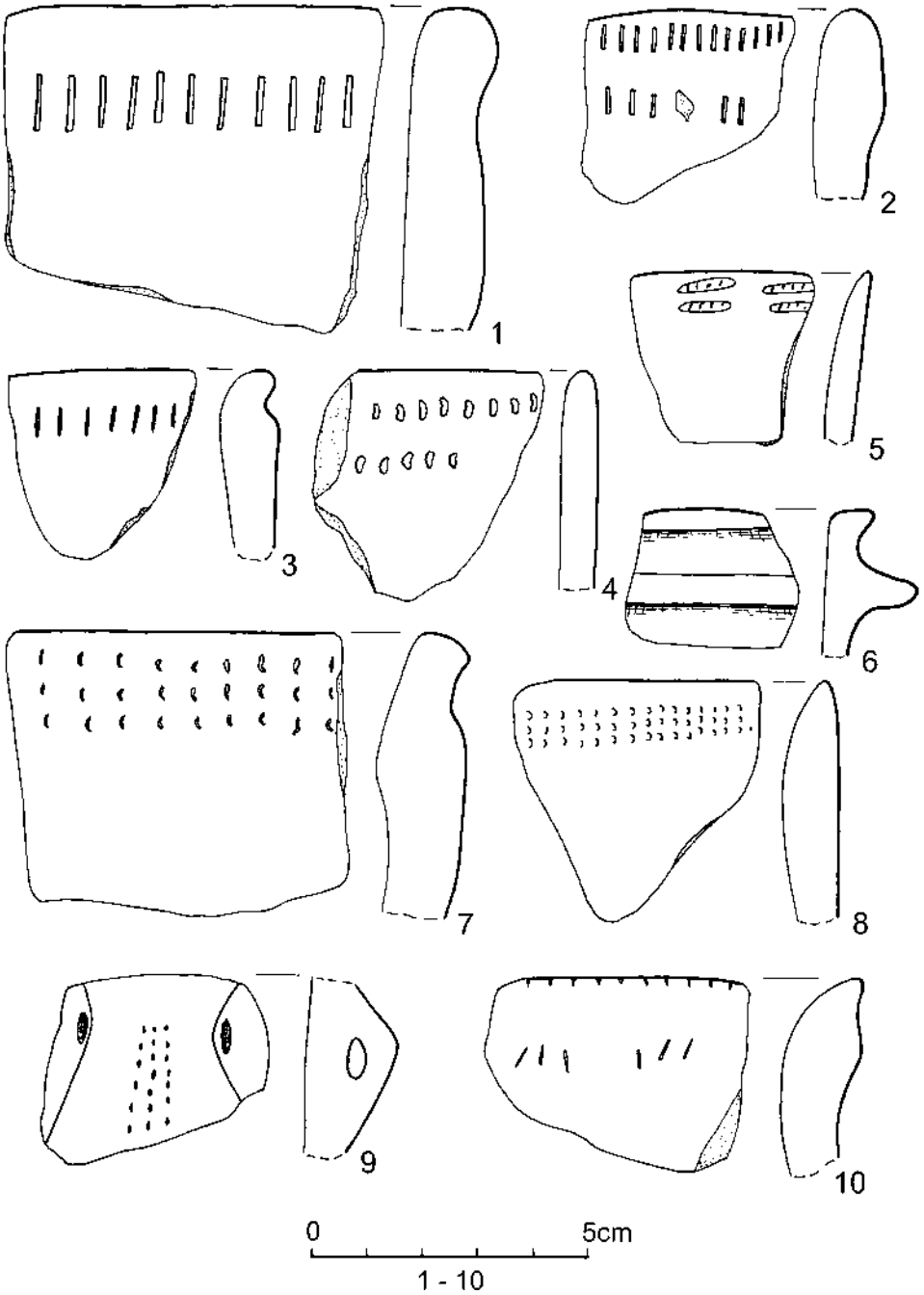

Fig. 7. Buzhanka-Cherchirichi, Lutsk district. A selection of FBC pottery [according to Okhrimenko's archives]

the quasi-lowland trend. It is identified also in the upper Bug drainage, on both its left (e.g. settlement at Majdan Nowy, Poland) [Bronicki, Kadrow 1987] and right (investigations by Dr. Grigoriy Okhrimenko: e.g. settlement at Buzhanka-Zhuritin or Cherchichi, Ukraine; Fig. 7) banks. The FBC quasi-lowland oecumene is made up of "small settlements of typically several hundred square metres (...) periodically inhabited and abandoned" [Nowak 2001: 135; see also Zych 2007a]. The system finds close analogies on the Lowlands where microregional continuativeness is observed as a rule in zones settled by the FBC [Kośko, Szmyt 2006; cf. a sequential model: Kruk, Milisauskas 1999: 122]. Lowland analogies are also clear in the taxonomic dimension of 'quasi-lowland' pottery in the Lesser Poland. This can be seen in the context of the following 'Kujawy' styles: early Wiórek-Łojewo (phase IIIA) and especially Wiórek-Pikutkowo (phases IIIB–IIIB-C), currently dated to 4000-3200 BC [Kośko, Szmyt 2006]. For the time being, no data is available for any direct assessments of the absolute chronology of 'quasi-lowland' sites. The styles of 'quasi-lowland' pottery known to us display unequivocal typochronological clues combining 'early' traits in terms of style development. However, they can be interpreted – from the Lowland topogenetic perspective – as 'peripheral archaisms' [Gajewski 1949; Kośko 1981; Bronicki 1997; Bronicki *et al.* 2003; Rzepecki 2003: 285-286; Zych 2007a, b; cf. polemic comments: Nowak 2004]. The set is quite typical of subphase IIIB-C that can be identified with the genetic nucleus of 'stamped-stanchion styles' in the drainages of the middle and upper Vistula (Mazovia, Lesser Poland) and the Warta (central Poland). One of their distinguishing characteristics is a frequent substitution of stanchion impressions (A-1) with comb-stanchion ones (G- ... [1]), which is also recorded on the Black Sea Plate (Fig. 7). The last-mentioned characteristic is found also on the Volhynia Upland and in Transnistria (see section **b** above). It must be said, however, that our collections of sources are rather small and the methods of obtaining and presenting them give rise to many reservations.

Focusing on the lowland and quasi-lowland trends does not pre-empt the assessment of the topogenesis (or rather cultural-historical significance) of the so-called 'imports' from the FBC eastern group ('Wiórek' and 'Luboń' phases) that have been recorded at the large settlement in Gródek Nadbużny, i.e. within the upland trend [Jastrzębski 1983: Fig. 3:3; Gumiński 1989: Fig. 90]. What is necessary, however, is a closer analysis of the techno-stylistic context of these traits. This is not possible though with the available publication of the Gródek site.

The limitations considerably reduce the insight into the 'Pontic' FBC offered by the 'Volhynia key'. Hence, it is justified to request that a programme be launched to expand the records concerning the 'quasi-lowland oecumene', which, in light of currently prevailing opinions, stretches as far as the upper Styr River[3].

[3] A recommended methodological procedure would be one similar to the Polish Archaeological Record (AZP);

Similar conclusions can be drawn in respect of the list of 'imports' ('influences') generally believed to come from the FBC circle (i.e. whose provenance is currently hard to determine: it is either 'lowland', 'quasi-lowland' or 'upland') and identified within the range of the Tripolye Gorodsk-Volhynia group [Zakharuk 1959; Shmagliy 1966; Movsha 1985; Ścibior 1994; cf. Kruts, Ryzhov 2000; Videiko 2000]. Their full and taxonomically satisfactory – which is equally important – record should include direct analytical experience of investigators studying the FBC.

b. The area of Podolia, chiefly on the Dniester, penetrated by FBC settlements (Fig. 6), has until recently stayed outside of planned field surveys. This state of research stagnation has made K. Jażdżewski's interpretation current for a long time [Jażdżewski 1936: Tab. LXXIII; cf. Peleshchishin 1985: Map 7]. The Podolian FBC was identified chiefly in the upper Dniester drainage (according to the latest assessments – as far as the Zbruch drainage) [Pelisiak 2005: 34-36], where both FBC settlement points and 'beaker imports' within Tripolye culture settlements were found [Movsha 1985: Map 1, Fig. 2-4; Pelisiak 2005; 2007]. Far less clear, the manifestations of 'Beaker' penetration of the upper Southern Bug (Boh) drainage come from an area that is, admittedly, poorly explored. FBC 'imports' on Tripolyan settlements are known also from areas located east of Vinnitsa (e.g. an axe with a button-like butt from the area of Pechera on the Southern Bug River[4]). A typochronological assessment of available (published) sources shows that they are taxonomically consistent with Volhynia materials. Hence, it can be suggested that they fit into Kujawy phase IIIB-C. There is no sufficient evidence to determine their geographical origins unequivocally [cf. Burchard 1991: Fig. 1, 96]. Two routes are feasible along which FBC settlers may have poured into the drainages of the Dniester and Southern Bug rivers: a lowland/quasi-lowland-Volhynian one and quasi-lowland-Carpathian Foothills one [Valde-Nowak 1988; Zych 2007a; 2007b].

Of key importance for the analytical study of the questions raised above is the Kraków/Rzeszów-Lviv programme for the study of Transnistria [cf. Machnik 2001: 130; Pelisiak 2005; 2007].

c. The reception of FBC 'influences' in the areas on the Dnieper and the Black Sea is not corroborated by any manifestations of settlement by the culture's populations (Fig. 6). The same is true for supposed routes along which the FBC was to reach these areas, namely, Volhynia and Podolia ones, following the Dniester and Southern Bug rivers. A mention must be made of a possible third route along the Pripet River [Kryvaltsevich 2004b: Map 1]. A major argument in this case is stylistic 'influence' visible in macromorphology, micromorphology and, less clearly,

such surveys were planned already at a Polish-Ukrainian symposium held in Lutsk in the early 1990s. See also recommendations made by A. Pelisiak [Pelisiak 2005: 36].

[4] An artefact identified during the recording of museum and extra-museum collections in the district of Vinnitsa (within a broader Western Bug – Southern Bug Project) carried out by an international team of researchers from the Institute of Prehistory, Adam Mickiewicz Univ. in Poznań and the Institute for the Study and Conservation of National Heritage, Ukraine's Ministry of Culture, with the Vinnitsa Conservator of Archaeological Antiquities participating.

in the ornamentation of pottery of cultures located on the Dnieper (Neolithic and Eneolithic) – generally their 'eastern zone' [according to the terminology of D.J. Telegin 1999]. From the Polish point of view, in the development of the research trend, three perspectives of analysis and assessment can be distinguished:

(1) from the position of single taxa, with observations being spatially limited (e.g. the Pit-Comb culture: Mnevo settlement [Neprina 1976]; Tripolye culture – Sofievka group: cemeteries [Kadrow *et al.* 1995]);

(2) from the position of a macrospatial concept of 'Beaker' transformation of the 'Dnieper-Donets Neolithic' [Doluchanov, Tretjakov 1979; cf. Isayenko 1976] or a 'trans-European block of Funnel Beaker cultures' extending as far as the foothills of the northern Caucasus [Rezepkin 1996], and

(3) in the context of macrosynthetic interpretations of the Dnieper 'as a frontier of western European (Balkan-central European) and eastern European ethno-cultural communities' [Telegin 1999].

An attempt to review and verify the sources underpinning the concept of 'Funnel Beaker traditions on the Dnieper' (against the background 'perspectives 2 and 3') was made by N. Kotova [Kotova 2000] who relied on the pottery of the Sredni Stog culture from Dereivka. She has found that stylistic links to the FBC are shown by considerable part of Dereivka vessels. Among FBC sites lying behind the list of 'beaker early stylistic patterns', N. Kotova mentions: Gródek Nadbużny, Bronocice, phases I and II, and Podgaj 6, i.e. the sites from the Lesser Poland and the Kujawy that should be generally linked to Kujawy phases IIIA-IIIB = 4000-3600/3500 BC. The Dereivka site, however, whose radiocarbon chronology is controversial, is referred to phases BII and CI of the Tripolye culture, in particular to Chapaevka type of stage BII [Videiko 2003: 7], i.e. it can be dated to ca. 4000-3700 BC.

The 'Funnel Beaker – Sredni Stog cohabitation', mentioned by N. Kotova, may be chronologically, and possibly developmentally too, linked to the early phase (1) of the MCC, i.e. to the threshold of reception of Black Sea patterns by FBC societies on the Polish Lowland. It is worth noting here the insightful context of S. Rzepecki's [Rzepecki 2004] hypothesis about the rise of an interregional 'Beaker' cultural trend in the 5th millennium BC, encompassing 'post-linear' communities living in the Paris Basin → German Lowland → Polish Lowland. The trend supposedly contributed to the emergence of the Middle Neolithic (early) FBC. The settlement Podgaj 6, cited by N. Kotova, would provide evidence – according to this concept – for the final section of its 'Kujawy link' (i.e. a significant centre of FBC development). Can then eastern late (4th millennium BC) reflexes of this 'trans-European' phenomenon be recognized on the Dnieper (Kotova) or even in the Ciscaucasia (Rezepkin)?

Of key importance for a preliminary source-material corroboration of the hypothesis about a 'Pontic continuation of the beaker cultural trend' would be the study of occidental components in the styles of pottery representing the middle stage (stage B) of the Tripolye culture, i.e. from the period of 4500-3600/3500 BC

[cf. Klochko *et al.* 2003: 411ff.], corresponding to the prologue of the FBC on the Polish Lowland.

Inspiring leaven for such analyses could be an observation that the macromorphology of Tripolye culture vessels [cf. Kruts 1977: 33ff – Chapaevka type pottery] contains counterparts of the forms of early FBC beakers – proto-beakers of type IA [Domańska, Kośko 1983: 32n.], known from Kujawy, Germany or Denmark.

2.3. CONCLUSIONS: LOWLAND ('FUNNEL BEAKER') VERSION OF PONTIC AREA CHOROGRAPHY IN THE 4TH MILLENNIUM BC

The review of archaeological materials and attempts to put some interpretations on them – chiefly of a cultural-historical character – yield two conclusions, reflecting the state of research into the Lowland ('Beaker') reconnaissance of biocultural environments in the Pontic Area in the 4th millennium BC:

- Lowland experience referred to the state of 'Upland' chorography in the 5th millennium BC and covered the Bug drainage, northern Volhynia, the Dniester drainage, and – although unequivocally – that of the Southern Bug;
- the first half of the 4th millennium BC was dominated by the process of expansion of the 'quasi-lowland' FBC oecumene; on the margin of the process – *via* neighbourly contacts – FBC societies received many 'Pontic' cultural patterns, albeit the degree of reception varied in individual cases;
- what was received was above all the knowledge of the raw material economy, i.e. where resources where located and how to reach them in Volhynia [cf. Petrougne 1995: Fig. 1]; this flow of information got broader in the second half of the 4th millennium BC.

The presented approach cannot be related now to the hypothesis about a supposed 'trans-European Funnel Beaker trend'.

3. THE WATERSHED OF THE LATE 4TH AND EARLY 3RD MILLENNIA BC. PONTIC AREA CHOROGRAPHY PREVAILING AMONG GAC SOCIETIES.

The turn of the 4th millennium BC introduces a new quality into the building of the mental map of the Pontic Area cherished by Polish Lowland societies. This time, the picture building is related to multi-faceted and wide-ranging activities by GAC populations, engulfing the vast expanses of eastern Europe [Szmyt 1999a; 2001], with the Black Sea Plate being especially strongly affected (Fig. 8). The GAC

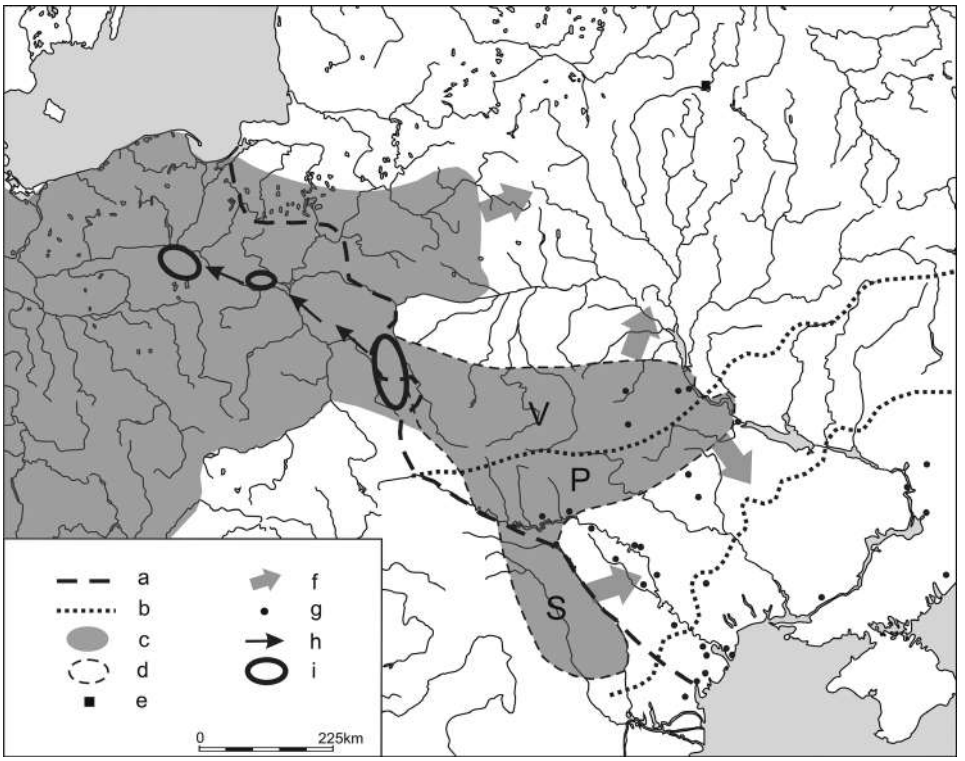

Fig. 8. 'Black Sea' impact of the GAC [according to Szmyt 1999a, amended by the authors]. Legend: a - Western Bug - Dniester limes; b - borders of east European ecological zones; c - range of GAC settlement, d - range of GAC eastern group; e - isolated site of GAC (Turinshchina, Smolensk district); f - directions of GAC impact towards the east and south-east; g - GAC elements on the sites of the Tripolye, pre-Yamnaya and Yamnaya cultures; h - directions of back transmission of eastern GAC group; i - reception zone of eastern group traits and hypothetically of 'Pontic' ones by the societies of the GAC central group; V, P, S - substructures within GAC eastern group (V = Volhynia subgroup, P = Podolia subgroup, S = Seret subgroup)

settlement spread above all across Volhynia, Podolia and the Moldavian Upland, forming agglomerations making up the eastern group of the GAC and extending east as far as the middle section of the Dnieper [Sveshnikov 1983; Szmyt 1999a]. Influences radiating from these lands travelled far, reaching the steppe zone as well.

The chronology of the eastern group is known as to general facts, although many details are still controversial. Towards the end of the 4th millennium BC (in its final century?), GAC settlers must have arrived in Volhynia, travelling from the Lublin Upland [Szmyt 1999a; 2001]. Their movement towards Podolia and the Moldavian Upland was rather quick as shown by the dates attributed to grave assemblages in Romania [Mihăilescu-Bîrliba, Szmyt 2003] (Fig. 9).

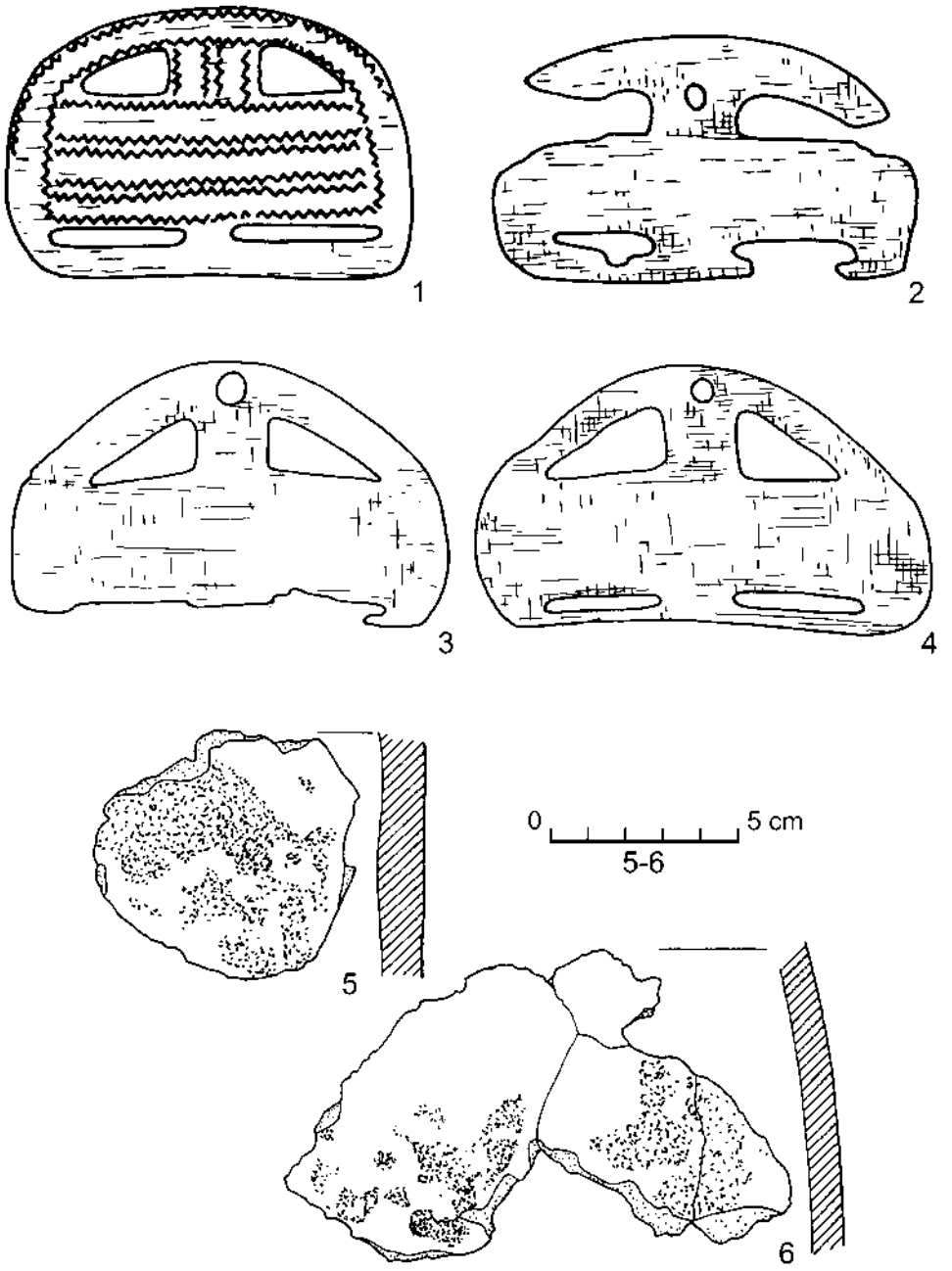

Fig. 9. Examples of reception of eastern group traits and hypothetically of 'Pontic' ones by the societies of the GAC on Polish Lowland: 1-4 - Kosewo, region of Mazowsze, 5-6 - Żegotki site 2, region of Kujawy-Pomorze (painted ware – dotted vessel zones) [according to Szmyt 1999a]

As the state of research into the GAC eastern group is discussed in detail elsewhere [cf. paper of Szmyt, in this volume], we shall focus now on the exploration of the Pontic Area by GAC societies. We shall take three perspectives: (**3.1**) referring to older experience, in particular to the stage completed by FBC populations (see section 2 above) and (**3.2**) starting new directions and forms of taking advantage of Black Sea environments, and (**3.3.**) transmitting back eastern group traits to the Lowlands.

3.1. 'PONTIC COLONIZATION' BY GAC SOCIETIES AGAINST THE BACKGROUND OF OLDER EXPLORATION STAGES OF THE BLACK SEA PLATE

In the context of the FBC population experience related earlier, spatial links to it are partially traceable in two areas where GAC settlement is documented: (**a**) Volhynia and (**b**) Podolia. In both cases, however, their territorial range considerably expanded. A possible participation of population groups from the Lowland in the colonization of Volhynia and Podolia has not been studied in depth yet, but the analyses carried out so far show that the original but indirect point of departure for the GAC expansion, both in terms of population movements and the transfer of ideas, was the Lowland.

a. In Volhynia, GAC settlement concentrated along the right-bank tributaries of the Pripet River, specifically in the drainages of their middle and upper courses (Fig. 8). In the northern portion of this area, i.e. on the upper Bug and on the middle courses of the Styr, Horyn and Sluch rivers, the settlement coincided with the much older range of the Linear Pottery culture. On the Bug, it re-used in part FBC settlement places, which is illustrated by a GAC grave on a large FBC settlement in Zimne [Szmyt 1999a, Cat. IA: 68]. However, GAC populations took advantage of Volhynia lands in a more sweeping and intensive manner than their central European predecessors. For GAC settlers included in their oecumene the drainages of the upper courses of the Styr, Horyn and Sluch rivers, as well as eastern Volhynia, namely the drainages of the Teterev and Uzh rivers, hence they must have arrived on the middle Dnieper (cf. section 3.2).

The spatial range, considered in the context of absolute chronology data [Klochko *et al.* 1999; Szmyt 1999a; Bronicki *et al.* 2003], means that in Volhynia we deal with a situation where GAC societies penetrated not only the margins of settlement by the FBC and the Tripolye culture but also entered deep into the oecumene of the latter, i.e. into territories where its settlement had existed in its stage CII (Gorodsk-Volhynian group, stage of Troyaniv and Gorodsk settlements) [Kruts, Ryzhov 1999].

Radiocarbon dates referring to the FBC settlement in Zimne indicate that its second phase (Zimne II) lasted as late as to 2600 BC, i.e. it coincided with the growing GAC settlement. Also both Tripolye groups mentioned earlier still continued in the early 3rd millennium BC [Klochko *et al.* 1999: 266-268]. Hence, a conclusion can be drawn that GAC population groups pouring into Volhynia were met by people representing two different cultural traditions: the FBC in the west of the country and the Tripolye culture in its central and eastern parts. Judging the situation on a macrospatial level, it can be reasonably claimed that both spatial contacts and direct encounters took place between GAC, FBC and Tripolye culture settlers, although the effects of such contacts are not very clear to us. Unfortunately, with the current state of knowledge of the problem, it is not possible to carry out necessary analyses on a microspatial scale, the results of which would be considerably more credible.

b. The Podolia subgroup encompassed sites concentrated mainly in the drainages of the northern tributaries of the middle Dniester (the Strypa, Seret, Zbruch and Smotrych rivers) and less densely on both banks of the middle Dniester, too (Fig. 8). What we notice here is coincidence with settlement traces by both Linear Pottery populations, concentrated rather narrowly on the middle Dniester, and those of the FBC. The frontier between the FBC and GAC ran between the Zolota Lypa and Strypa rivers and continued along this line south of the Dniester [see Pelisiak 2007: 27-34]. Later on, another frontier – in that case between the GAC and the Corded Ware culture - is located slightly more to the west (between the Gnila Lipa and Zolota Lipa rivers) [see Machnik 1998a]. In both cases, GAC populations occupied territories lying east of the frontiers. The territories were earlier and in part simultaneously, no doubt, exploited by Tripolye culture societies of the decline segment of stage CII (Zhvanets group and then Kasperovtsy group) and only sporadically (FBC) or later (Corded Ware culture) were they penetrated by the western neighbours of GAC populations. As in Volhynia, in Podolia too, GAC settlers made deep inroads into the Tripolye oecumene, moving around the drainages of the middle Dniester and upper Southern Bug rivers. Again, we are faced with a complex picture of settlement, representing diverse cultural traditions that partially overlapped. What is clear is the macrospatial separation of GAC, FBC and Corded Ware culture settlement ranges; however, any microscale studies of this question are lacking.

The movements of GAC populations east copied initially earlier shifts by FBC groups and, to a lesser degree, those by Linear pottery culture populations. Does this indicate the use of the predecessors' 'mental map'? By no means can this hypothesis be ruled out especially in respect of the FBC and relocations from the Lublin Upland towards Volhynia. But Podolia must have been reached by a different route, namely from Volhynia only since the Carpathian Foothills route stayed outside of the GAC oecumene. Likewise, it surpassed the experience of older settlers to settle the lands lying east of the Sluch and Zbruch rivers.

3.2. NEW DIRECTIONS AND FORMS OF EXPLORATION OF THE PONTIC AREA

Entirely autonomous of older experience, new activity directions brought about (**a**) a considerable expansion of areas settled by GAC populations (to include the Moldavian Upland and lands on the middle Dnieper), and (**b**) a broad dissemination of some GAC cultural patterns across lands not covered by the culture's settlement (partially in forest-steppe and steppe zones).

a. The appearance of GAC societies on the Moldavian Upland, or to be more precise, in the drainage of the Seret River and between the Seret and Prut rivers (Fig. 8), meant making inroads into the territories that had not been penetrated earlier by settlers coming from the Vistula drainage (the origins of the local Linear Pottery culture are traced to the Carpathian Basin [cf. Larina, Okhrimenko 2007]). In the late 4th and early 3rd millennia BC, there could have lived groups of populations representing the decline stage of the Tripolye culture (Gordineşti group). With the cultural relations in this area being poorly explored, it is not possible, however, to make any broader comments on the context in which GAC settlement structures appeared.

Also on the middle Dnieper, specifically on its right, western bank, the presence of GAC populations was a significant new development that interrupted the sequence of local cultural transformations. With radiocarbon measurements lacking, we can only presume that GAC settlement appeared there towards the end of stage CII of the Tripolye culture and after some time it adjoined areas used by the societies of the Yamnaya culture.

What else merits attention is the penetration by GAC populations of forest-steppe areas valued for raw-material deposits. Next to the deposits of fine quality flint in Volhynia, Podolia and central Transnistria, as well as basalts in Volhynia, a mention must be made of the resources found in eastern Volhynia and lands on the central Dnieper, namely, flint-bearing areas on the Uzh River and on the Dnieper at the confluence with the Ros River [Petrougne 1995: Fig. 1; Szmyt 1999a: Fig. 6].

b. A major watershed in the exploration of the Black Sea Plate and formation of Pontic chorography took place as a consequence of GAC societies taking part in broad-space structures of cultural contacts, encompassing populations of the forest-steppe and steppe dated to the pre-Yamnaya stage and the Yamnaya culture [Szmyt 1999a; 2000; 2002b; 2004a]. The contacts must have certainly taken various forms (direct ones as for instance neighbourly contacts, marital exchange, conflicts as well as indirect ones as for instance diffusion of ideas) [cf. Szmyt 2003]. Material evidence of such contacts was recorded outside of territories permanently settled by GAC populations both in the borderland between the forest-steppe and steppe, and deep into the steppe zones (Fig. 8).

The diffusion of the evidence is extensive and practically covers the whole western expanse of Black Sea steppes, from the Dnieper as far as the Prut River. However, its dates are not clear and relying on typology only, they can be linked to generally the first half of the 3rd millennium BC. It is difficult to assess its impact now as well, either short- or long-term one. Paradoxically, such assessments have already been formulated in the literature despite the lack of even rudimentary records of source materials. In this context, two opposing approaches can be named authored by V. Safronov [Nikolaeva, Safronov 1974] and M. Gimbutas [e.g. Gimbutas 1997a; 1997b]. The former author maintained that some steppe groups (Mikhailovka I) and dolmen cultures of the Caucasus originated with the impact of the GAC. Whereas M. Gimbutas looked for a stimulus giving rise to the GAC in the effects of the second wave of the 'kurgan culture invasion' (represented, *inter alia*, by Mikhailovka I group, which she considered an early link of the Maikop culture) from the steppes into central Europe. The latest data on absolute chronology [Klochko *et al.* 2003; Kotova, Spitsyna 2003] remove this controversy, because of the much older origins of Mikhailovka I, which corresponds to the current dating of the Maikop culture as well [Korenevskij 2004].

Regardless of the questions concerning the role of GAC populations in the cultural transformations of steppe societies calling for an answer (as for instance their relationships with the so-called Kemi-Oba culture) [cf. Szmyt 1999a: 170-171], there is no doubt that the GAC was instrumental in the process of exploration of steppe environments by societies from the Vistula drainage.

3.3. BACK TRANSMISSION OF EASTERN GROUP TRAITS TO THE POLISH LOWLAND

When describing the relationships between two neighbouring GAC groups, namely the central and eastern groups, scholars emphasize two issues. First, a genetic dependence of the eastern group on the central one [Wiślański 1966; Sveshnikov 1983; Szmyt 1999a], and, second, the presence of the traces of the eastern group deep inside the territory occupied by the central group (Fig. 8) [Szmyt 1999a]. The latter phenomenon is believed to be either a symptom of a back transmission of traits or even evidence of the back migration (exodus) of the representatives of the eastern group to the Vistula drainage [Kośko 1991]. The 'eastern' traits so transmitted include specific ornamentation patterns on pottery (mainly using the so-called fish-scale motifs, and mineral and organic colorants) and certain types of ceramic forms (especially so-called lids), bone buckles, certain kinds of stone grave structures and partially (however equivocally) also some artefacts of Volhynia flint and other materials (chiefly basalt) found in that area.

The greatest accumulation of such traits is found in the so-called mingling zone of eastern and central groups located on the Bug River [Sveshnikov 1983: 13-14; Ścibior 1991: 55-56] and on the Lublin Upland [Szmyt 1999a: 49-50]. However, spectacular sets of 'eastern' traits were discovered on the Polish Lowland, specifically in northern Mazovia (Płońsk Upland) and in Kujawy. In the former case, very clear 'eastern' analogies can be recognized in some areas of manufacturing (especially in the making and using of the so-called bone buckles – Kosewo (Fig. 9:1-4) and surely Nowy Dwór Mazowiecki) and in funerary rites (stone cists made of regular slabs – e.g. Kucice Nowe, Szeromin) [cf. Nosek 1967, see here for older literature]. In addition, what is still left unexplained is possible 'eastern' loose ends in the case of the ritual feature with deposits of horses in Potyry [Sawicki 1920; see Kośko, Szmyt 2004: 110ff]. However, there is no data on the absolute chronology of the sites.

In Kujawy, 'eastern' traits can be seen in a short series of artefacts made of Volhynia basalt [Chachlikowski 1997: 174] and in pottery making, specifically in covering outer surfaces of vessels with mineral and organic colorants (Fig. 9: 5-6). The last was recorded in several assemblages representing phases IIb and IIIa, dated to 3020-2550 BC [Kośko *et al.* 2000].

In sum, the territorial range of 'eastern' patterns in the Vistula drainage confirms that intensive ties existed, possibly in the form of a stable structure of contacts, between the societies of the eastern group and Lowland populations.

3.4. CONCLUSIONS: THE LATE 4TH AND EARLY 3RD MILLENNIA BC AS A WATERSHED IN THE DEVELOPMENT OF THE PONTIC AREA CHOROGRAPHY BY LOWLAND SOCIETIES

The material evidence outlined above and proposals how to interpret it make us conclude that the exploration and 'taming' of the Pontic Area by GAC societies had an unparalleled range when compared to the experiences of Linear Pottery culture and FBC populations described earlier. This applies to both spatial dimension of the settlement and its forms as well as to becoming part of various 'Pontic' networks of cultural contacts. The contacts had not only a neighbourly character but also a long-distance one as well [cf. Szmyt 1999a; 2003; 2004a].

The "Pontic" translocations of GAC populations started with communities who had complex versions of Pontic Area chorography that relied on both Linear Pottery culture experiences and, above all, those of the FBC. This is true, however, only of the first link in the process, i.e. western Volhynia. Initiated from there, a series of other relocations (south, south-east and east) relied on autonomous reconnaissance and one's own 'mental map'. This knowledge was transmitted back to GAC societies on the Polish Lowland, owing to a stabilized structure of intercultural ties.

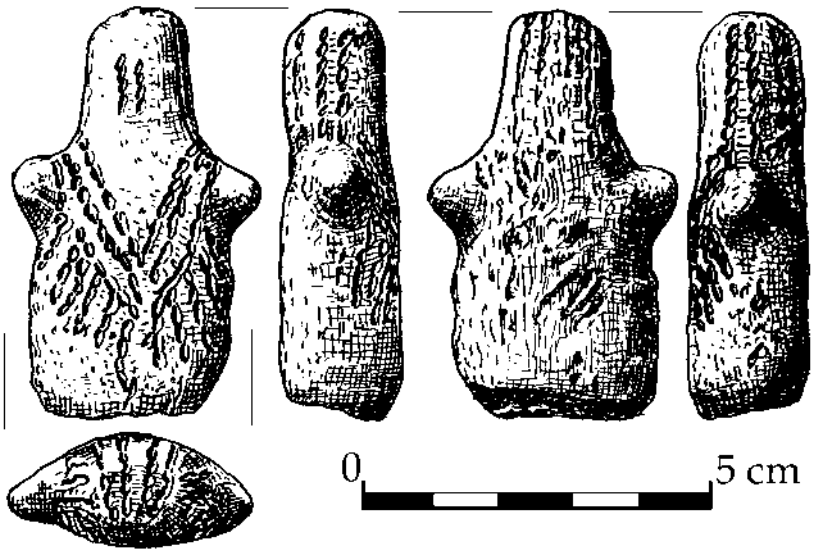

Fig. 10. Example of Pontic traits on Polish Lowland: Łasin, region of Kujawy-Pomorze [according to Kirkowski 1984]

4. SUMMARY

Discussed in this paper, the period in the history of exploration of Black Sea Plate biocultural environments by the societies of the Central European Plain can be called the stage of *tactics of contact*s. The contacts were neighbourly in the case of the FBC and the Tripolye culture, and neighbourly and transboundary in the case of the GAC, the Tripolye culture and the Yamnaya culture by continuation. The effect of these long-term and varied contacts, the development of a certain chorography of the Pontic Area in the minds of Lowland societies gave them knowledge on the natural conditions prevailing and raw material resources available there, and above all on the special character of people inhabiting this vast area.

Inspiring as it seems, the current programme of studying development relationships of the Late Neolithic *tactics of contacts* and Early Bronze ('Middle Bronze' from the Black Sea perspective) hypothetical *strategy of long-distance routes* relies on varied source material. The early signs of the latter strategy are traces of visits by population groups of the 'Pontic' provenance on the Lowland (e.g. 'Yamnaya' burials from Bożejewice 8 – Fig. 5 – or Krusza Zamkowa 3 or a ritual feature (?) with a Yamnaya/Tripolye ['Serezliyevka type'] figurine from Łasin, Fig. 10) [cf. Klochko, Kośko..., in this volume]. Against this background, a very important qu-

estion is whether the chorography of the Pontic Area of the 4th and 3rd millennia BC had any impact on the strategy of routes of the prologue of the Bronze Age in the second half of the 3rd millennium BC, and if so, then to what degree. This is particularly relevant for the routes following the rivers of the Black Sea basin and associated with the Corded Ware culture and the Catacomb culture. The routes are documented by the dispersion of the so-called fluted maces [Kośko 2002]:

- Boh (Southern Bug) → Bug (Western Bug) and
- Dnieper (Ingul-Dnieper) → Pripet →Bug (Western Bug).

Finally, it is worth observing that while GAC groups were exploring the cultural environments of the Pontic Area across borders in the 3rd millennium BC, a significant re-orientation took place in the 'Pontic' chorography of the Lowland in the Vistula drainage. The re-orientation was triggered by, *inter alia,* the then growth in importance of amber as a crucial medium in ritual behaviour and ideological practice [see Czebreszuk..., in this volume]. The increasing role of amber will culminate on the successive stages of getting to know each other by the societies of central Europe and the Pontic Area.

Translated by Piotr T. Żebrowski

Baltic-Pontic Studies
vol. 14: 2009, 214-222
PL ISSN 1231-0344

Jan Machnik

SHORT AND LONG-DISTANCE PASTORAL JOURNEYS ALONG ANCIENT UPLAND ROUTES IN EUROPE IN THE 3RD MILLENNIUM BC

The issues in the title above, to be raised in this study, shall begin with the Sokal Ridge, the south-west of the Volhynia upland, a mezoregion covered in a thick layer of loess featuring a geomorphology of oblong elevations and watersheds running east-west. On its southern elevations in Poland, thanks to the only relatively recent deforestation (latter half of the 19th century), several dozen kurgans have survived, creating a long 30 kilometre chain. These were built on the peaks of elevations in local groupings of small hillocks numbering usually 2 or 3 mounds (rarely more) separated 100-500 metres from one another [Machnik 2003: 213, Fig. 1; Machnik *et al.* 2009, map 1].

When systematic research of these barrows began in 1988, the majority were already in an appalling state. Their mounds, originally reaching about three metres or more, were already by the end of the 20th century, practically levelled. Nonetheless, it was possible to excavate 28 of these where more than 60 human graves where systematically analysed up to 2006, the majority belonging to the Corded Ware Culture (CWC). Moreover, in many cases it was also possible to observe their stratigraphic relations, and analyse barrow construction, as well as burial rites. Consequently, a copious amount of materials was gained, including a large number of clay vessels that were part of the burial rite [Machnik *et al.* 2009].

On the basis of a multi-faceted chronological analysis (stratigraphy, radiocarbon dating and spatial-typological relationships) we know now that almost all the analysed kurgans were created between 2800 and 2550 BC. They cover graves placed in the middle of the tumulus, which was often encircled by small ditches that marked the kurgan diameter. These are single pit graves (sometimes with both an adult and a child), containing male skeletons laid on their right side, often east-west or close to, facing the light.

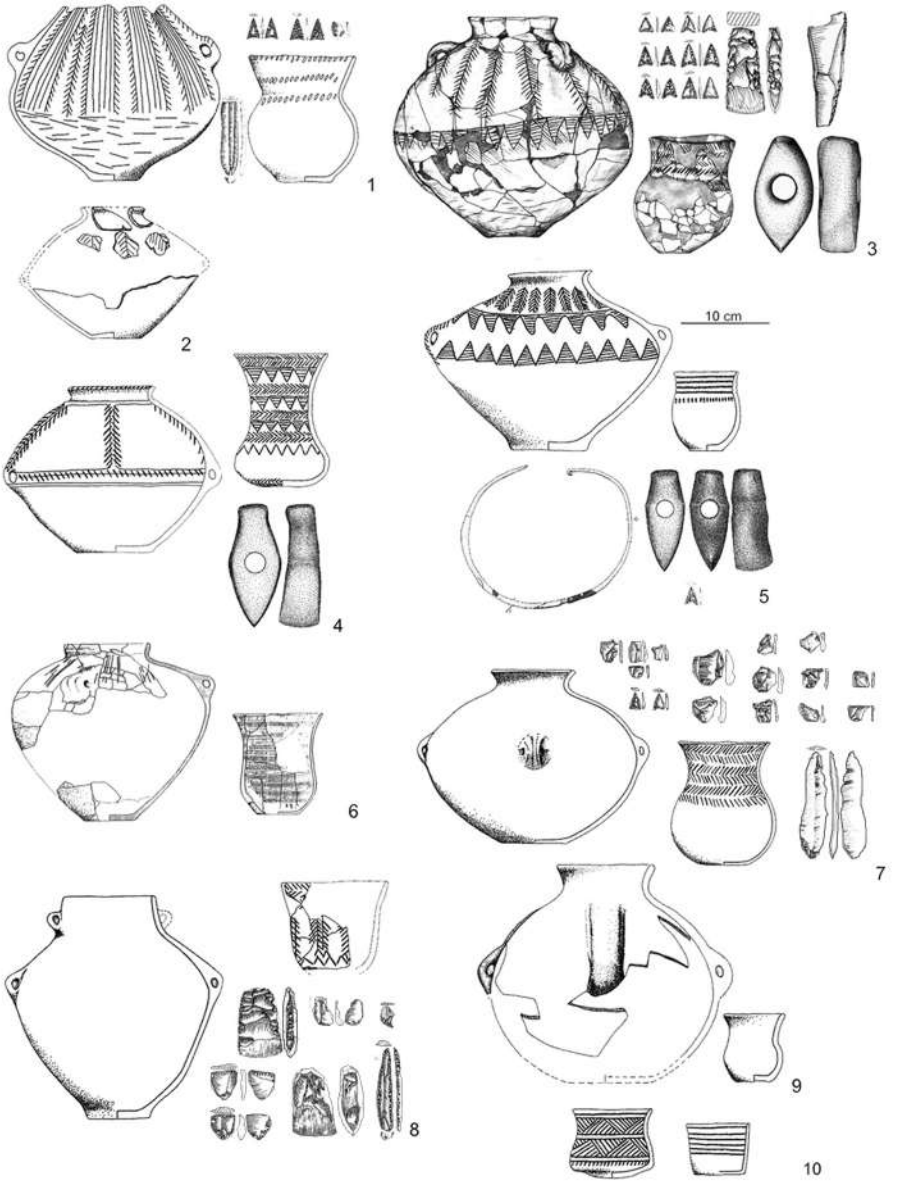

Fig. 1. Select CWC grave complexes on the Sokal Ridge and its environs with analogies to other ancient Central European uplands as well as those in the middle and upper Dnieper basin: 1 – Wierszczyca, Tomaszów Lubelski district, site 29, barrow 1, grave 1; 2 – Łubcze, Tomaszów Lubelski district, site 26, barrow I; 3 – Ulów, Tomaszów Lubelski district, site 3, barrow I; 4 – Wierszcyca, Tomaszów Lubelski district, site 1, barrow 1, grave 2; 5 – Klekacz, Tomaszów Lubelski district, site 10, barrow 1, grave 1; 6 – Białka, Krasnystaw district, site 3, barrow 6; 7 – Łubcze, Tomaszów Lubelski district, site 25, barrow 2, grave 2; 8 – Nedeżów, Tomaszów Lubelski district, site 22, barrow 2, grave 2; 9 – Łubcze, Tomaszów Lubelski district, site 26, barrow II; 10 – Wierszczyca, Tomaszów Lubelski district, site 31, barrow 1, grave 6

The barrows were decorated with vessels (amphorae and goblets) that in general are characteristic of older phases of the CWC, small stone axe-hammers also of this period and other bone or flint artefacts. These types of graves were already assigned previously to category A in the Sokal Ridge [Machnik 2003; Machnik *et al.* 2009]. Apart from these tumuli (where these barrows were built), both pit and niche graves of the CWC were also found on their periphery (sometimes placed inside the tumulus) though from a later period, from the latter half of the 3rd millennium BC, as well as Mierzanowice culture (MiC) graves from the start of the Bronze Age.

The first of these (greatly varied in vessel design) was categorised into several types from B to F. Thus group C signifies vessels of Middle Dnieper culture (MiDC) pottery, D that of CWC (earlier phase) and MiDC, E and F that of CWC and vessels that are only derivatives of the latter and group G containing those of the MiC [Machnik 2003].

Groups C to F therefore exemplify the syncretic nature of cultures referred to, which in the light of ^{14}C occurred in a relatively short time between 2500 and 2460 BC, though some influence of this process might have lasted longer, at least to 2350 BC [Machnik *et al.* 2009].

The variety of vessel forms and their design is expressed not only in the materials of the above mentioned groups but also within the categories themselves. In several dozen vessels subjected to detailed typological-stylistic analysis, only in two or three cases there were shared traits of a secondary nature. This startling lack of commonality of forms and ornamentation in vessels applies to all the groups of each category – though most to category A, representing as we know, the oldest graves where kurgans were created on the Sokal Ridge. In every case, the vessels from these tumuli are patterned with different motifs and their respective combinations[1] (Fig 1.)

This scenario clearly contrasts that of the local CWC in the Małopolska Upland Kraków-Sandomierz groups [Machnik 1966; Włodarczak 2006], in the Mansfeld group in central Germany [Hein 1990], or in group III in the Czech Republic [Buchvaldek, Koutecký 1970], where the majority not only in the cemetery concerned but in larger areas covering a micro-region, contain vessels with the same, often almost identical forms and ornamentation, and with the same motifs, most often occurring in similar or even the same combinations in many vessels of these groups (Figs. 2, 3).

The question then arises why there are such differences between what can be observed in the Sokal Ridge and that of the above mentioned local groups of the CWC? Before we attempt to find an answer to this question, first it is necessary to consider what role, beyond a purely decorative or aesthetic one, could the ornamentation of funary vessels played in the CWC. Ethnography for example, provides

[1] In large measure this also concerns vessels from groups belonging to the remaining categories where such, apart from pottery with MDC traits, are significantly less lavish in their decorative elements than the vessels from groups in category A.

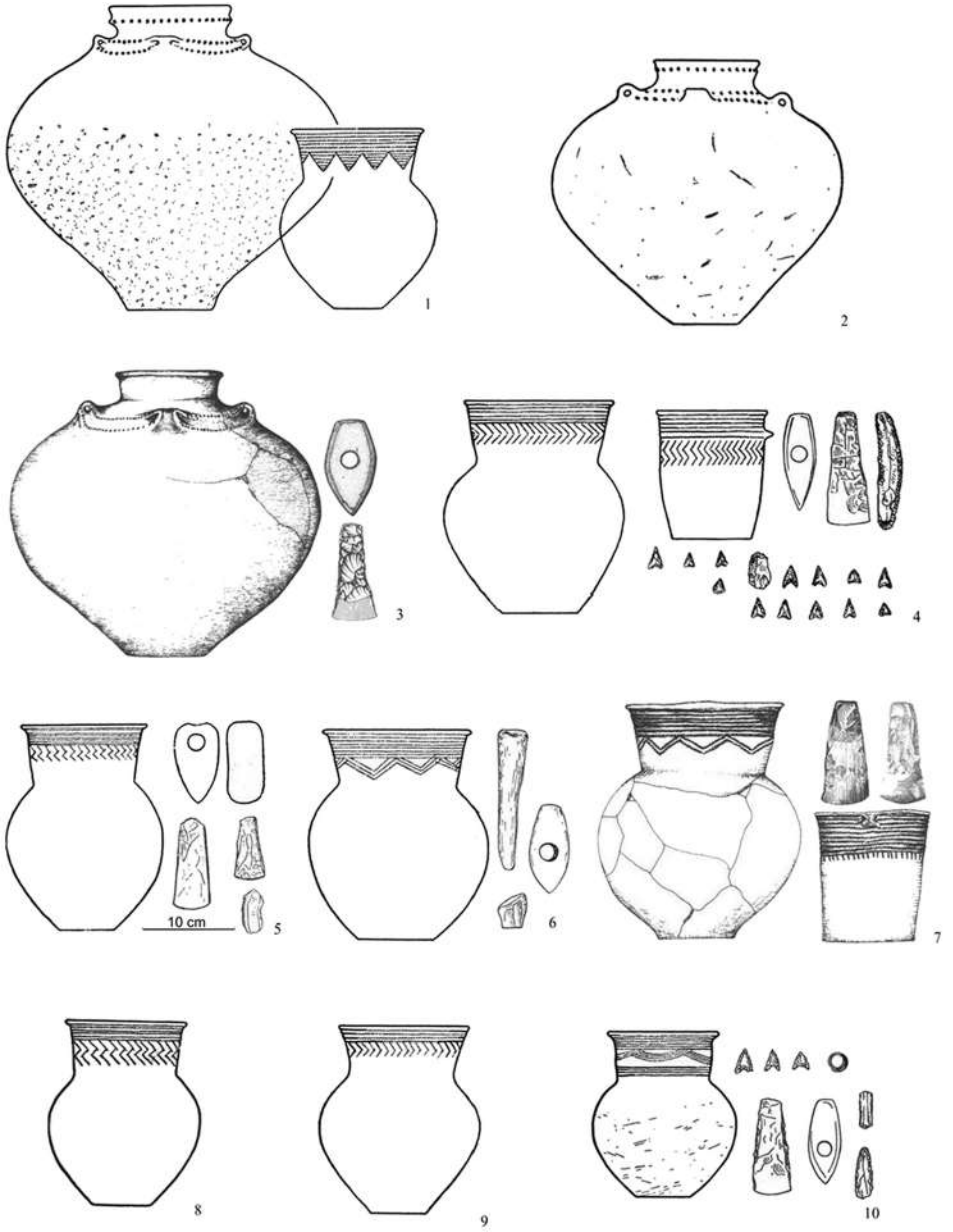

Fig. 2. Select grave complexes of the local CWC Kraków-Sandomierz group in the south-west loess of the Małopolska upland: 1 – Kraków-Zesławice, Kraków district, grave 7; 2 – Smroków, Miechów district; 3 – Smroków, Miechów district, site 17, grave 1; 4 – Rosiejów, Kazimierza Wielka district, grave 35; 5 – Kraków-NowaHuta, Kraków district; 6 – Sulechów Kraków district; 7 – Żerniki Górne, Busko Zdrój district, grave 128; 8 – Batowice, Kraków district, grave 3; 9 – Jurków, Busko Zdrój district; 10 – Bosutów, Kraków district, grave 3

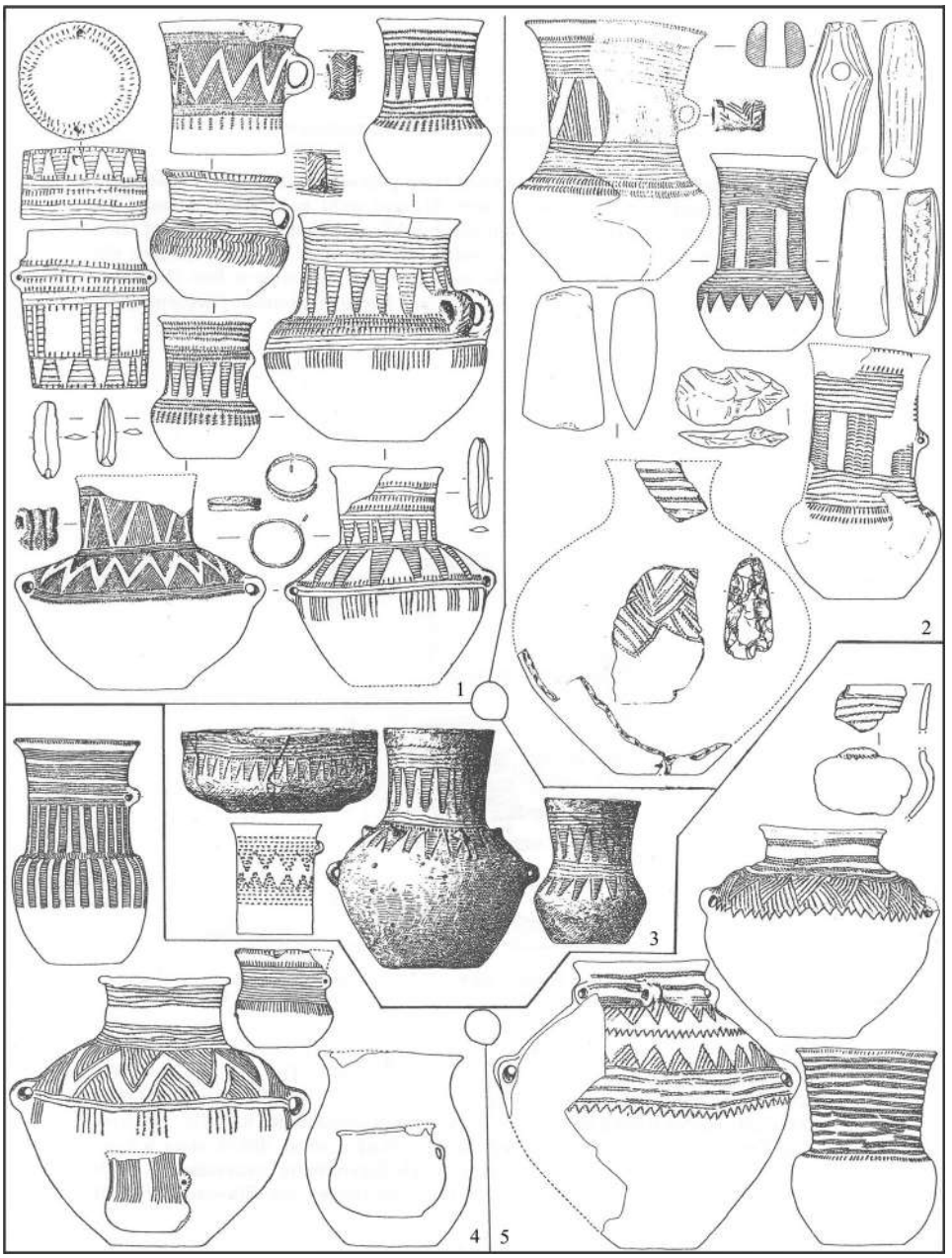

Fig. 3. Select grave complexes of the Mansfeld CWC group in Central Germany [Buchvaldek 1986]: 1 – Halle-Dölauer Heide; 2 – Mittelhausen; 3 – Neudorf; 4 – Braunsdorf; 5 – Rothenschirmbach

answers to the question of regional differentiation in many fields of material and spiritual culture, in particular in traditional folk costumes [Bogatyriew 1979; Kantor 1983; Karwicka 1995].

Such a differentiation occurs not only between ethnographic regions but also in the respective region itself, often between particular districts or even hamlets and is expressed in so called secondary decorative elements such as pattern details, choice of colour, as well as the appropriate composition of dress detail. These have the function of a distinguishing mark, identification of inhabitants of a particular region or village, and in turn, various groups in it depending on status associated with age or in the case of women, their marital status (single or married), wealth or what is in our time understood as profession [Bogatyriew 1979]. In contemporary Poland it is possible to observe the above in the example of Mountain Folk (*górale*) dress both in the west Carpathian ranges in the differentiation of characteristic design such as 'parzenica' embroidery on Podhale regional trousers [Seweryn 1930], and in Ukraine for the Hutsuls for example, in the embroidery of shirts for men as well as women [Szuchiewicz 1902].

Regional differentiation does not affect to such a degree for example construction, interior design and ornamentation of various everyday objects made out of wood, bone or metal. It is common knowledge that these very same 'trade mark', identifiers, are carried over to life after death, in principle only in folk costumes together with their place of burial. In Christian communities therefore other objects, possibly marked in such fashion, are not officially given to accompany the dead.

In prehistoric times, to be exact in the CWC, where to this very day burial rite objects have been preserved, clay vessels as a raw material were best suited to carrying distinguishing marks (not only tectonic details but foremost design) of a given community. The repetition therefore in many graves in a given cemetery or cemetery complex for a particular micro-region (not only these same types and varieties of vessels but also the same or very similar decorative motifs as can be seen in the example of these local CWC groups) (Fig. 2, 3), may testify to particularly close relations of those interred to whom such vessels were entrusted into the afterworld, as distinguishing marks for that location where pottery was shaped and designed according to the respective cultural rules of a given society (possessing appropriate sets of so called cultural templates).

This notable replication of forms and decorative motifs in a given area, for example in the Kraków-Nowa Huta district [Włodarczak 2006] or Vikletice in the Czech Republic [Buchvaldek, Koutecký 1970], would have had to have taken place in conditions of relative stability (migration limited to a small area) for this community, where particular relations and enduring communication forms arose within its environs.

What does the above mentioned form of pottery and its decoration, startling in its diversity, in the Sokal Ridge tell us? This diversity of designs, where in nearly

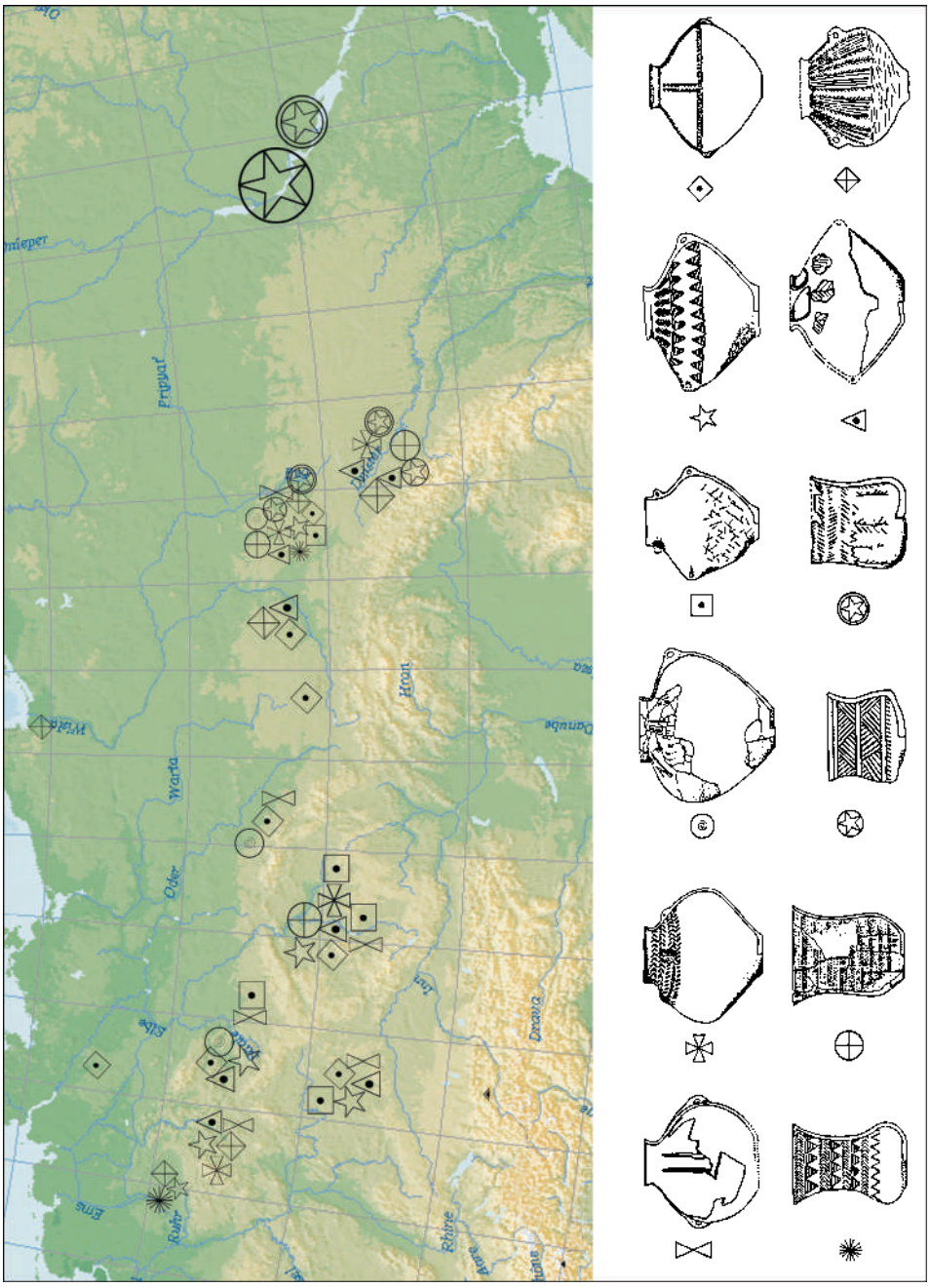

Fig. 4. Dispersion of some types of vessels and ornamental motifs in the Central Europe ancient uplands as well as middle and upper Dnieper basin, represented in CWC barrows in the Sokal Ridge and its environs [Machnik *et al.* 2009]

every case the vessels found and their form of decoration has at the same time very close analogies in grave complexes, especially those from older phases of the CWC [Buchvaldek 1986; 1998; Furdholt 2003; Machnik *et al.* 2009], appears in other areas from Harz north-west to Thuringia, Saxony, Czech Republic, Silesia and the Małopolska upland as far as the upper Dniester basin in south-east Europe (for MiDC vessels and also in the upper and middle Dnieper basin) (Fig. 4).

It is therefore not difficult to observe that all these areas constitute an ancient upland range, an important Neolithic settlement region, probably in the 3rd millennium BC (for southern Polish loess uplands and the Sokal Ridge) covered to a large extent in anthropogenetic steppe flora, a so called cultural steppe [Kruk 2008a; Makohonienko..., in this volume].

Vessels analogous to the pottery from kurgan graves on the Sokal Ridge do not represent local traits anywhere, though are 'scattered' in various places in the areas under discussion where there might appear (and often do so) also local CWC groups such as the aforementioned Mansfeld or Kraków-Sandomierz, thereby representing a completely different stream of development in relation to the latter, in part (at a certain period) even contemporaneous to them.

The similarities arising between the pottery of the older branch to which no doubt the vessels of barrow graves also belong in the Sokal Ridge, are difficult to explain through the spreading of cultural vogues (in particular their decorative motifs) when these very artefacts appear in a 'pepper and salt' fashion, often in places great distances away, where as in the case of the Sokal Ridge in so called neighbouring barrows from older phases of the CWC, they are marked by various ornamental motifs and decorative themes (Fig. 4).

Taking into account the above discussion in respect to the likely marking (distinguishing) function of CWC vessel design, we ought to accept on the one hand that such 'dispersion' of markings over huge areas and on the other that the great variety in a small area that is the south part of the Sokal Ridge, would seem to indicate that these were circulated (as marking patterns) by those who made and used them when stopping by in a given location in an *ad hoc* form only for funerary purposes. Subsequently other inhabitants arrived in this area, also with their own distinguishing 'trademarks'. The effect of this rotation, in terms of archaeology, is in fact the above mentioned variety of pottery found in the Sokal Ridge barrows.

This rotation can only be accounted for if we accept a pastoral type of economy and nomadic or semi-nomadic lifestyle of peoples burying their dead in tumuli. Such a view would seem to be all the more justified now at the beginning of the 21st century, both in the light of research into the development of such economies at the turn of the 3rd millennium BC [Kruk 1980; 2008a; Kruk, Milisauskas 1999], as well as palaeo-botanic research [Makohonienko..., in this volume].

In the second half of the 3rd millennium BC the situation in the Sokal Ridge changes in as much as exogenous peoples arrived, mainly from closer afield (in-

terring their dead often in niche graves on the barrow periphery or dugging into the mound) who passed on vessels (as well as stone small axe-hammers) corresponding in form to those already known from the Kraków-Sandomierz CWC group. We know therefore that this community begins to spread in this period after the territorial decline of the Globular Amphora (GAC) and Złota cultures (ZłC) [Włodarczak 2006] and that sporadic graves of these may be encountered even in the environs of Lublin.

Some of the so called representatives of the GAC and ZłC in the meantime having become nomadic pastors, could have also made their way to the Sokal Ridge, though it cannot be excluded that this is also due to the cultural impact of the relatively close in proximity Sandomierz upland district. In similar circumstances (after the demise of the GAC in Volhynia) there was no doubt that an 'intrusion' of culture in the Sokal Ridge and its immediate environs took place, this time from a great deal further afield, namely the middle and upper Dnieper basin where small groups of the MDC came [Machnik, Pilch 1997; Machnik 2003].

In the Sokal Ridge therefore there occurred not only a direct contact of these migrants from the local CWC, making use of kurgans for interring their dead, but also some form of cohabitation, which resulted in the appearance of a syncretisation of culture, producing archaeological sources in this area in respect to the furnishing of tumuli where side by side there appear vessels characteristic for each of the above cultures, as well as those that are only derivatives of MDC ceramic ware and a local version of vessels from the CWC [Machnik 2003; Machnik *et al.* 2009].

This process, if we have interpreted it correctly in archaeological sources, would seem to be the product of a certain social stabilisation in this regard, one continuing it would seem (in the light of radiocarbon dating of graves) for a relatively short time, for two or three generations that made use of the Sokal Ridge for their subsistence, and in so doing (during this stabilisation) created local ties that were sufficiently enduring that there arose shortly thereafter a certain 'homogeneity' of traits fulfilling marking functions (distinguishing) of the community concerned – in the archaeological taxonomy known as the Sokal Group of the CWC [Bagińska, Machnik 2003].

Translated by Ryszard J. Reisner

Baltic-Pontic Studies
vol. 14: 2009, 223-231
PL ISSN 1231-0344

Jerzy Libera, Jarosław Sobieraj, Vitaliy Konopla

SOME LATE NEOLITHIC STONE AXES AS POTENTIAL MARKERS OF CULTURAL EXCHANGE IN BALTIC-PONTIC INTER-REGIONAL ROUTES

One of the direct stimuli for examining the above issues, figuring in the title, was the recent study [Libera, Sobieraj 2008] on stone axes in the 3rd Millennium BC, which were characterised by a 'spade-like' blade. These goods have traits that allow to link them to the Corded Ware Culture (CWC) in its older phases, though there are no strict analogies in the context of commonly applied Central and Western European classification of similar objects. These materials are to some extent dispersed over a large continent and represent casual finds, although it ought to be borne in mind that for the population under discussion, it is axes in fact that create a reference framework and make up the majority of the corpus of artefacts concerned. Examples of circulation of some of their types, in so far as these are considered prestige items of weaponry, allow in turn to observe in them good markers of contact for particular communities or indeed, as an indicator of communication channels.

The axes under discussion in their traditional 'Type 1' form [Libera, Sobieraj 2008], are 'boat-shaped' with a flattened body, lightly turned crest and a clearly asymmetrical side contour. They are distinguished from other old CWC materials by a markedly drooping and very prominent blade that is shaped bottom-up like a spade. In addition, these axes have a clearly distinguishable, lightly concave and drooping horse-shoe shaped head and socket a third of the way up along the body for affixing the handle[1].

[1] For the morphology of these particular objects, a catalogue of finds and a relevant bibliography, see: Libera, Sobieraj 2008.

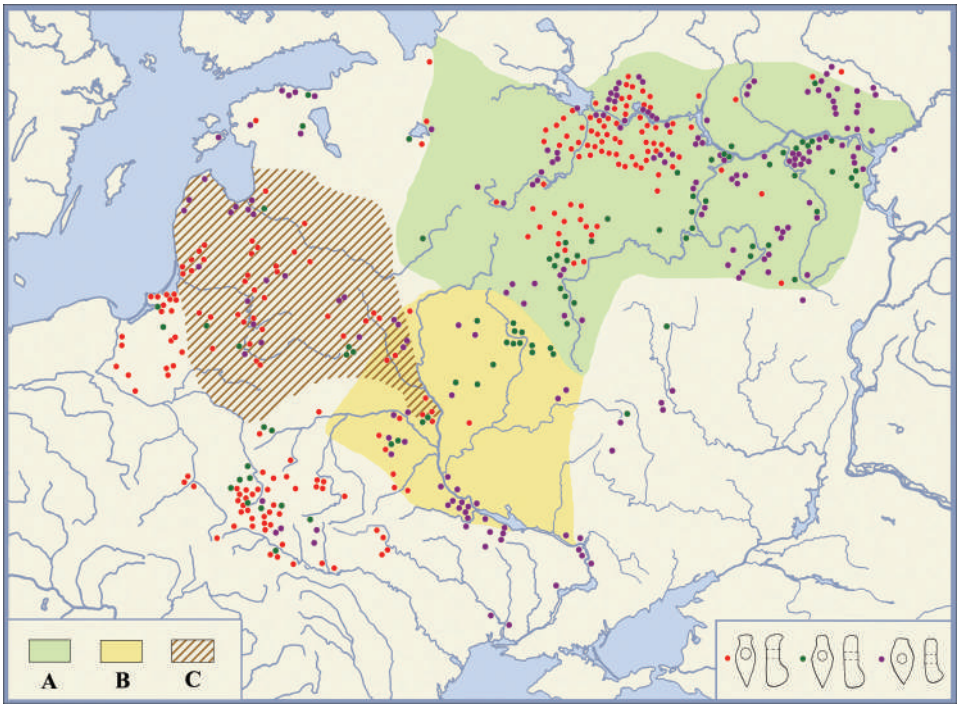

Fig. 1. Dispersion of 'spade-like' axes of referenced types in Central East Europe [after Bagušienė, Rimantienė 1974; Kraynov 1987; with appendices]. Geographic demarcation of cultures: (A) Fatianovo, (B) Middle Dnieper and (C) the 'proto-Fatianovo' range [after Kraynov 1987]

1. DISPERSION OF 'SPADE-LIKE' AXES

The above described artefacts are not often found in Poland. According to current research there are only 25 finds known (including derivative objects, qualifying only on the basis of the prominent 'spade' [Libera, Sobieraj 2008])[2]. These have been found, in principle, only on the right bank of the Vistula Valley (Fig. 1), mainly it clearly seems, in two enclaves – in north-east and south-east Poland.

The first area where the above are concentrated is the narrow belt of the Roztocze borderland and northern part of the Sandomierz Valley, impinging somewhat west in the direction that the Vistula river takes near Złota and Opatów. There is

[2] This catalogue ought to include an example of the material in question, most likely produced from basalt, originating from Czarnia, Ostrołęka district in the Mazowsze region [Korsak 1990: 155, ryc. 1:b].

also one find in the eastern Beskid Mountains ranges as well as a yet-to-be definitively identified object from the Polesie of Lublin district. In the north, however, these materials are concentrated in the general area of the Masurian Lake region, extending eastwards to the lake districts of Iława, Chełmno and Dobrzyń, as well as the odd find in the northern Plain of Mazowsze. The above described enclaves where these axes with spade-like blades occur in Poland, only mark the western boundary of the factual area of their dispersion, which, significantly, on this part of the route cover the axis of the direction of the Baltic-Pontic route embracing the valleys of the Vistula and Wieprz rivers [Kośko 2002: 68-72, Fig. 22]. The clear majority of analogies of this type originates, however, from areas east of Polish borders, which has been already noted by L. Kozłowski [Kozłowski 1924: 214, 218; Table XXII: 6, XXVI: 7, 8] and T. Sulimirski [Sulimirski 1955: 156] who recorded 'Fatianovo' axes in the eastern borderlands of Poland in the 1930's.

Without a doubt the majority of known artefacts of this analysed type originates in fact from the area of the Fatianovo Culture (FaC) [Ebert 1925; Krivcova-Grakova 1947; Smirnov 1947; Foss 1952; Ozols 1962; Gadzjackaja 1963; 1964; 1976; Kraynov 1963; 1964a; 1964b; 1987; Artemenko 1964b; Bader 1970; Kirjanova 1973; Halikov 1974; Kraynov, Gadzjackaja 1987; Sidarovich 2005], where such materials have been found mainly as furnishing elements of graves in an area ranging from the basin of the upper and middle Volga and Oka rivers in the east as far as the upper reaches of the Dnieper and Dvina in the west (see Fig. 1A). Discoveries of these objects are not limited, however, only to the above mentioned regions, as A. Ja. Brjusov and P. Zimina [Brjusov, Zimina 1966], among others, have noted, there has been a relatively broad dispersion of similar finds in the former Soviet Union countries.

Axes described as лопастные have been recorded (with a high degree of dispersion and mainly as sporadic finds) over a greatly larger area than would appear from the extent of FaC settlements. In the north of Europe they have been noted in the region of lake Ladoga and Novgorod Velikij [Gurina 1961, Table 176:3], in eastern Estonia, Lithuania (the oldest such type according to the model of V. L. Lakiza [Lakiza 2007, Fig. 8]), the interfluvial area of the lower Niemen and Dvina (data courtesy of M.M. Kryvaltsevich)[3] as well as Kaliningrad [Kilian 1955; Kulikauskas *et al.* 1961, pav. 32:2, 3; Bagušienė, Rimantienė 1974, map 15; Rimantienė 1996: 309, pav. 194; Libera, Sobieraj 2008].

In Belarus the above finds are also known from the environs of the Berezina and Pripet rivers [Jakimowicz 1924: Fig. 115; Charniauski, Lakiza 1995, illustration 6:64, 65, 68; Lakiza 2008, Table 76:1; 77:1; 78:3] as well as the upper and middle Dnieper basin (between the Sluch and Pripet rivers). These materials also extend to the south-west Ukraine (Fig. 2), upper Dnieper basin [Kozłowski 1924, Table XXVI:7, 8; 1939, Table XII:25; Sulimirski 1957-1959: Fig. 56; Sveshnikov 1974: Fig. 18:9;

[3] The authors would like to sincerely thank Dr. M. Kryvaltsevich for making available the catalogue of these axes and for permission to use it for this study.

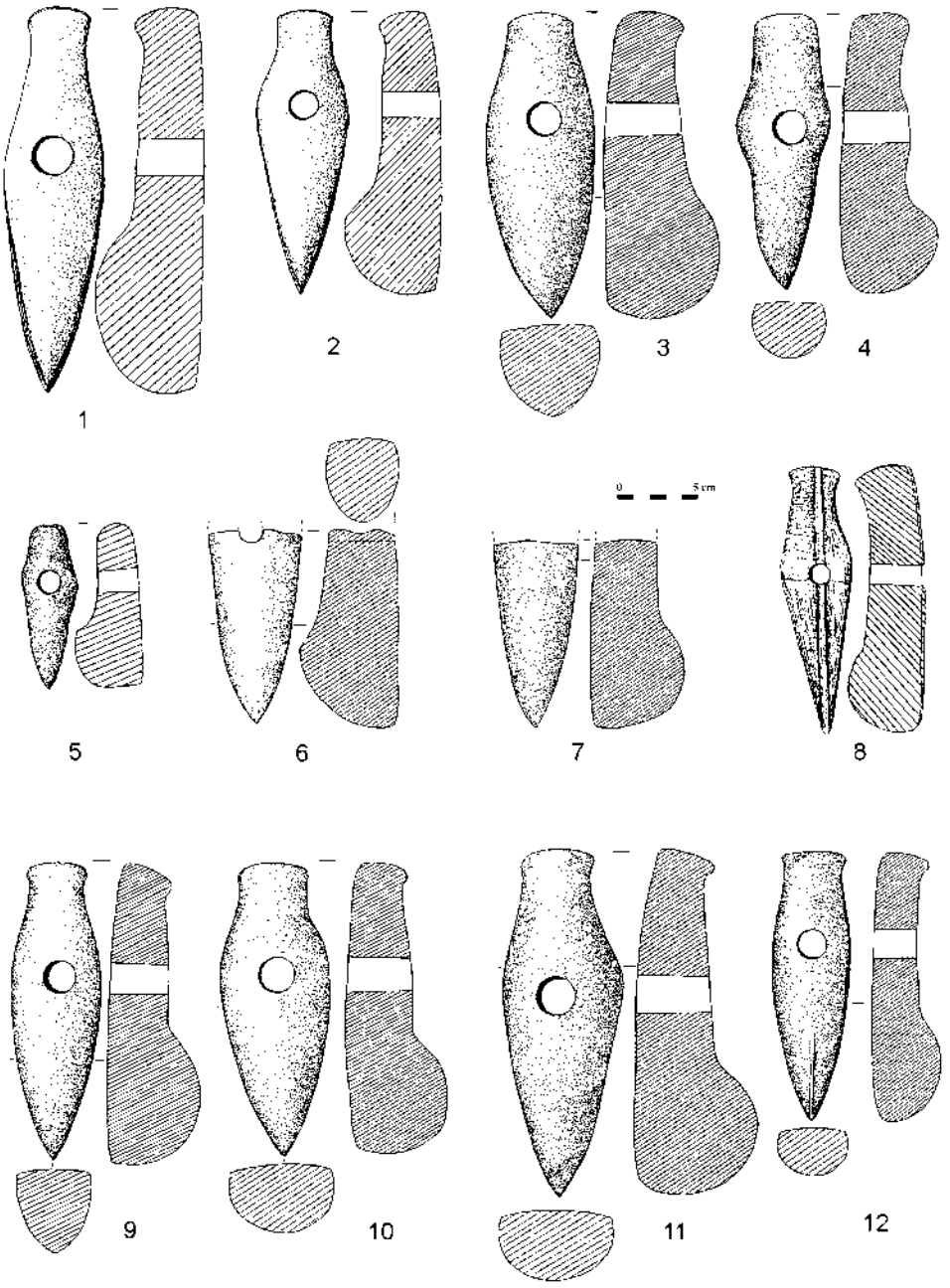

Fig. 2. Examples of 'spade-like' axes of west Volhynia and Podolia: 1. Narodyš, 2. Kornič, 3. Dašava, 4. Zabučia, 5. Targovica. 6, 7. Demidovka, 8. Dzvinogrod, 9. Griadki, 10. Halič, 11. Černylava. 12. Bohorodčany (sketches by V. Konopla)

Machnik 1998: Fig. 1:3; Michalčišin *et al.* 2005: Fig. 11; also data from the A. Kośko[4] and V. Konopla archive].

The broad distribution of axes under discussion would seem to allow a clear 'archaeological' reading (as well as chronological) of the dissemination of a particular cultural concept over the huge expanse of Eastern Europe both in genetic terms as well as that of a clearly marked 'route', clear enough to reveal where the byways of such channels reached in particular regions. It seems this would, allow to formulate a thesis in respect of readable traces of 'major junctions' that served as communication hubs for the communities in this part of Europe in the 3rd Millennium BC. Even more clearly, the 'channel' nature of such dispersion allows to observe the framework of 'spade-like' axe 'Type 1' distribution in Poland in respect to the former Soviet Union countries [Brjusov, Zimina 1966] with other derivative forms such as those with drooping and clearly raised blades (thus also of 'CWC' origin)[5].

2. ORIGIN OF 'SPADE-LIKE' AXES

Both the morphology of 'spade-like' axes as well as the tradition of their characteristic blade shape have a general 'old CWC' and 'western', it would seem, origin. The separation of these axe types into a 'new' category should have therefore already occurred during the period when 'boat-like' Type A axes were in use (in a rather clearly defined period, most likely at the turn of the first quarter of the 3rd Millennium BC). It is necessary therefore also to assume that the appearance of models for reproduction and subsequently the creation of derivative forms should occur in the environs of a CWC centre where axe Type A were also deployed (and those with oval bases) as well as 'spade-like' ones, as the research suggests in the Niemen basin.

The existence of a similar distribution field was observed by D.A. Kraynov [Kraynov 1987: map 11; 1992: 325, Fig. 3] as genetically 'proto-Fatianovo' in fact, in the east and north-east of present Polish borders, between the middle reaches of the Bug and the upper Dnieper towards the basins of the Niemen and Dvina (see Fig. 1C). Most likely, by means of the above discussed distribution, axes with spade-like blades came to find their way where the FaC was forming, as one of the elements of an 'old CWC system' that tied this community with the remaining populations of the CWC. Their further continuation in the inter-regions of the Volga and Oka marks the growth of a group that adapted this so called template, as documented in particular by a huge number of similar items deposited as grave furnishings.

[4] The authors would like to sincerely thank Professor A. Kośko for making available the catalogue of these axes and for permission to use it for this study.

[5] Please note differences in current state of research and sources for particular comparable areas.

Another clearly observable centre of these axe types is the upper and middle Dnieper basin, reaching to the middle Pripet in the west and the basin of the upper Boh, almost in the very area of the Middle Dnieper Culture (MDC) (see Fig. 1B) [Artemenko 1985: Fig. 3; Machnik *et al.* 2001: Fig. 5]. Although such material types in this area usually represent sporadic finds, similar categories have been noted as characteristic for the middle phase of the above discussed culture [Artemenko 1985: Fig. 99:40]. In comparing the documented ritual context of finds in the FaC and the greatly higher number of these axes found there with a spade-like blade (as well as a greater variety of forms), it is difficult not to propose their 'far-east' origin in the MDC circle.

Due to the recent finds in central-east Poland in respect to grave complexes containing 'Middle Dnieper' elements, 'spade-like' axes recorded in the western extreme of the west Volhynia upland take on new research significance (in the Sokal Ridge environs as well as the northern part of the Sandomierz Valley). On the basis of such complexes bearing typical MDC and the earliest CWC traits, the syncretic Sokal group was created and can be placed in the period of 2400-2200 BC [Machnik 1999; Machnik *et al.* 2001; Bagińska, Machnik 2003]. The dispersion of 'spade-like' axes in the north-east foreland of the Volhynia Upland overlaps to a vast extent in fact with 'Middle Dnieper' ceramic wear finds in the upper basins of the Vistula, Bug and Dniester[6]. This would appear at the same time to indicate unambiguously, it might be argued, the direction of their penetration into Polish territories (in the southern enclave). Thus, this might represent the final stage of so called re-transmission of the model under discussion where this was adopted by settlers of the Sokal group whose activity needs to be identified in the context of the Małopolska-Volhynia-Podolia cultural centre.

3. 'SPADE-LIKE' AXES AND THEIR DERIVATIVES

Among the large variety of axe forms encountered in CWC circles in Eastern Europe, those with spade-like blades 'Type 1' appear to represent the oldest model in genetic and typological terms, not including of course direct references to other such

[6] Another element indicative of a great similarity in morphology is the flat flint quadrangle-axe, ones associated with mainly the Globular Amphora Culture but also figuring in tightly knit grave complexes of the CWC [Libera 2009]. Their presence in the upper Bug basin does not necessarily have to be tied to the settlement of these two taxonomic units. Analogous artefacts have been identified in MDC graves [Artemenko 1967]. Axes of the 'boat-like' category represent a different issue in respect to imports and cultural impact from the east (or their false derivatives that feature a cross-like emblem placed on the extension of the opening at the bottom of the corpus – found in barrow K in Łukawica, near Lubaczów [Machnik 1966: 249, Table XXIV:2]).

artefacts from the oldest CWC phase, which are sometimes found in the area of the FaC [Gadzjackaja 1976: 119, Fig. XX:11d]. As expected, these 'spade' axes, 'Type 1', gave birth also to related forms with a 'boat' shape as well as certain morphological traits (ornamentation?) inherited through subsequent, less well defined types. In support one could mention for example the 'reduction' where horse-shoe shaped handles (entirely flat, not drooping) as well as boat-shaped blades (more recessed and greatly shortened) as clearly younger forms, both in the FaC as in the MDC. Here mention ought to be made also of those materials with various types of 'boat' blade, though with a different morphology (perhaps though of a eastern origin)[7].

To the former it is necessary to classify foremost the most derivative forms, traditional 'Type 1' of spade axes that accompany in their immediate vicinity (see Fig. 1B). These tools of similar dimensions, though somewhat simplified style (without a horseshoe handle with a rather straight unturned corpus) certainly represent the younger chronological variant, referring though to the boat forms with a broadened cutting edge. Their distribution over eastern Europe, foremost covers the right bank of the upper Volga basin (together with the basins of the Sur, Oka and Moskva), subsequently in a south-west direction to the basins of the Desna and middle Dnieper up to the evident concentration overlapping its dispersion with that of the Małopolska-Volhynia-Podolia centre of 'Type 1' axes. Towards the north some scattered and sporadic finds of simplified 'spade' forms correspond exactly to the above mentioned dispersion 'archetypes', in a clear concentration within the Prussian enclave.

The third of the analysed axe types from the eastern populations of the CWC can be included to the 'spade' type, though significantly changed in relation to the previous design. These are much smaller in size, with a slightly raised handle and clearly broadened in the middle of the corpus, though asymmetrical (boat-like) in design and with a drooping 'spade' blade. In general (not counting the blade) of the tool of this type, they are reminiscent of the B3 form in the Małopolska Upland [Włodarczak 2006], known from the grave in Słupcza in the Sandomierz district [Włodarczak 2006: 33]. These axe types are characterised by a distribution similar to those already referred to, though a great number of known artefacts is concentrated in the middle and lower reaches of the Dnieper (see Fig. 1C). Perhaps this breakthrough in culture exchange for 'previous' CWC circle forms of axes in the southern area of the hitherto hermetic and unpenetrated borderlands of the Yamnaya-Catacomb culture in the lower reaches of this river is proof of their chronology[8].

[7] These differences might also be related to their modfied forms – perhaps numerous times, for example in Klesztów, Susiec [Libera, Sobieraj 2008], or with their application. Also in respect to 'replication' and application of damaged axes, see: Bronicki, Kadrow 1998.

[8] In as much there has occurred a false picture in relation to the types of artefacts identified by A.Ja. Brjusov and M.P. Zimina [Brjusov, Zimina 1966], for example by inclusion to 'CWC' forms that are similar vertically – for example finds by Sofijevka, though different in side contour [Klochko 2001a].

4. TRANSMISSION CHANNELS OF 'SPADE-LIKE' AXES

Apart from the routes joining the FaC area with that of the Baltic-Pontic, the distribution of such axes also allows for a description of other potential channels of contacts in these inter-regions in the 3rd Millennium BC. This would be in respect to the routes linking both seas not only along the 'Bug-Boh' route but also in the use of other communication arteries, especially those resulting from the reaches of the Dnieper and its basin.

This type of exchange takes into consideration for example, the synthesis of historically documented contacts along long-distance routes [Sujkowski 1918] as 'the great Norman road towards Greece' (mouth of the Dvina-Dnieper-Black Sea channel) with a branch in the form of 'the Vilnius-Kiev route' (along the right bank of the lower Pripet in the Mozyr district and subsequently along the valleys of the Ptich and Vilia) as well as the section relating to 'the route from Królewiec (presently Kaliningrad) through Kaunas, Vilnius, Vitebsk, Orsha up to Smolensk' (along the Niemen Valley near the Baltic in the Królewiec district), running along the east and south-east shores of the Baltic (Fig. 3). The variability ('regionalisation') of these connections and directions of relations in the CWC populations is primarily a result of routes being a part of the area of influence particular to its given community (circle). In this instance, the populations of the eastern CWC found themselves outside the traditionally understood 'zones' of models and information as marked out by the Circum-Baltic and Circum-Carpathian culture areas.

5. RAW MATERIALS

An important indicator in considerations of the distribution channels of the axes under discussion could be said to be their source materials. The data for over a dozen examples described from the Małopolska-Volhynia-Podolya centre point to the use of basalt, diabase and andesite. In as much as basalt (and diabase) occurs in post-glacial materials of the Polish Plain in the form of small scattered boulder stones [Chachlikowski 1997: 257-260], in many instances, it source could have been the outcrops of the Volhynian Plate [Chachlikowski 1997: 174-175].

In the case of basalt, the relevant areas are near the Styr (Rafałówka district) or Horyn rivers (Berestowiec, Janowa Dolina – presently Bazaltovoe) and for diabase, the Klesov, Tomaszgród, Moczulanki and Korec areas, east and south of the Sluch

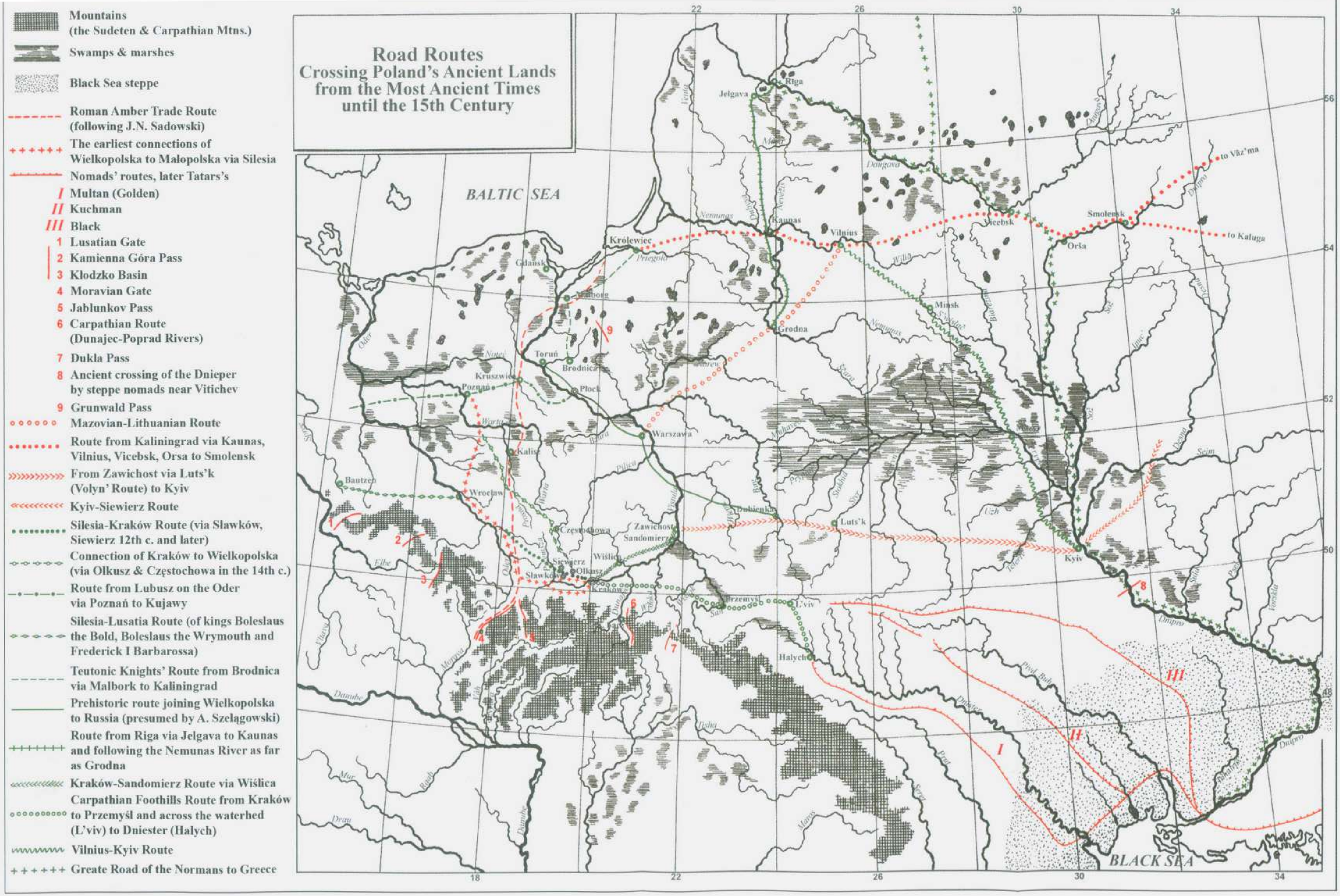

Fig. 3. Ancient communication routes [after Sujkowski 1918]

river[9]. The next raw material worthy of note from this region is the 'green rock' (Ovruch material that occurs in the Zhytomyr environs), recorded by Sulimirski [1955: 156; 1957-1959: 243]. One important and timely consideration to add in respect to ancient communication routes (at least those based on stone products) is that there is an urgent need to conduct petro-graphic research on the already analysed forms of the artefacts in question.

Translated by Ryszard J. Reisner

[9] The outcrops of this magma rock cover an expanse close to 1,600 kilometres. Data provided courtesy of Dr. L. Gazda, Lublin Technical University.

Baltic-Pontic Studies
vol. 14: 2009, 232-251
PL ISSN 1231-0344

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EASTERN EUROPEAN DESTINATIONS OF CENTRAL EUROPEAN CULTURAL PATTERNS. THE CASE OF GLOBULAR AMPHORA CULTURE (END OF THE 4TH – MIDDLE OF THE 3RD MILLENNIUM BC)

The Globular Amphora culture (GAC) had got its deepest roots at the Central European Plain, but in the course of time it became the phenomenon that bound societies settling different regions of the borderland between western and eastern Europe. On the basis of material evidence the GAC can be described as a supraregional structure of certain mutual elements of material culture and social behaviour (especially ritual and economic ones). Thus that is the structure of common traits that defines the GAC on a general level, but on the other hand its wide spread resulted in its multiregional character. From the last point of view it is possible to explore not only various regional backgrounds of origins of the GAC, but also its different position and directions of evolution in each region. An occurence of the GAC in Eastern Europe may serve as a very good example for the question [see Szmyt 1999a].

Taking a historical view, it can be claimed that GAC societies (i.e. societies that used elements of the GAC structure) marked a successive stage in the exploration of ecological and cultural milieus located along the borderland between western and eastern Europe (after Danubian cultures and the Funnel Beaker culture) [see a paper of Kośko, Szmyt..., in this volume], a stage of a far greater range and diversification as regards the use of the area in question.

The data base is abundant and varied in this case as traits linked to the GAC have been found across the western expanse of eastern Europe: from the Baltic in the north to the Black Sea in the south while in the east they are discovered as far as the Western Dvina (Daugava)–Dnieper line. I described the sources in detail 10 years ago [Szmyt 1999a]. Here, I shall recapitulate the findings reported in the cited book, giving prominence, however, to the areas located south of the Pripet River (Fig. 1), i.e. in the southern forest zone, on the forest-steppe and steppe. Against this background, supplemented by references to the information accreted

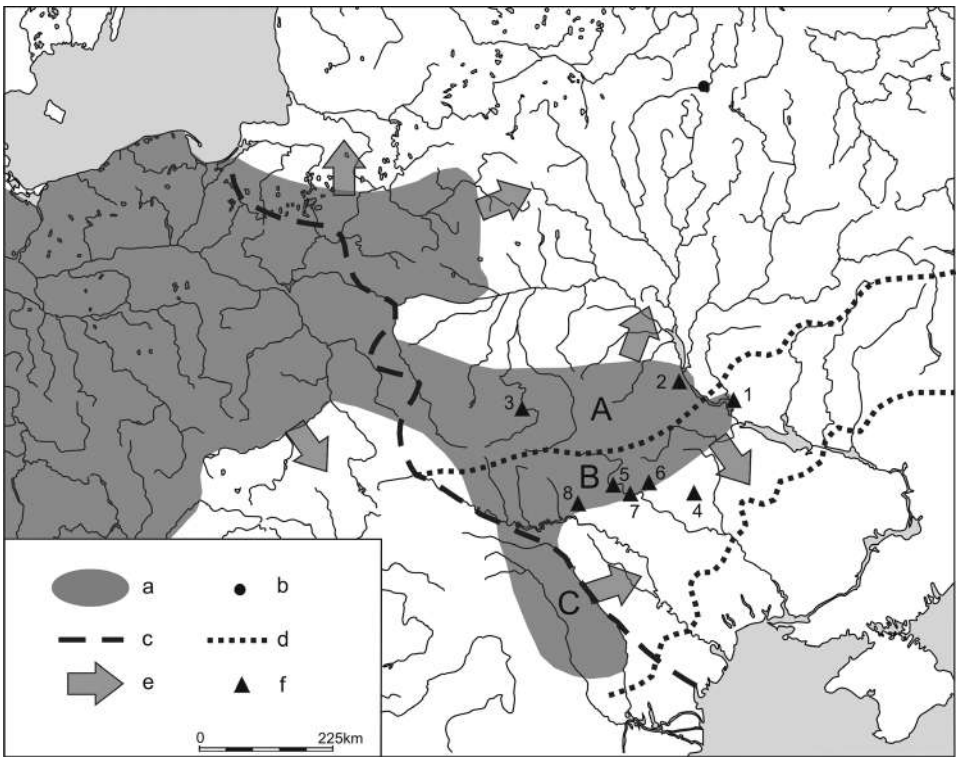

Fig. 1. Range of the GAC eastern group and its subgroups: A - Volhynian, B - Podolian, C - Seret (Moldavian). Key: a - areas occupied by GAC groups; b - isolated site of the GAC (Turinshchina, district Smolensk); c - Bug-Dniester limes; d - borders of Eastern European ecological zones; e - directions of influences of the GAC; f - sites mentioned in the text (1 - Bile Ozero site 1; 2 - Chodosovka; 3 - Ostrog-Zeman; 4 - Kochubeivka; 5 - Bushchinka; 6 - Meleshiv; 7 - Orlivka; 8 - Yaroshinka)

in 1999-2009, I shall shed light on the role of GAC populations in the exploration of the Pontic Area by central European societies.

1. ARCHAEOLOGICAL RECORD

The sources indirectly or directly related to the GAC in the area in question are made up of (**a**) functionally defined complexes (cemeteries, campsites, animal deposits), (**b**) single artefacts (vessels, flint axes), and (**c**) single traits of pottery.

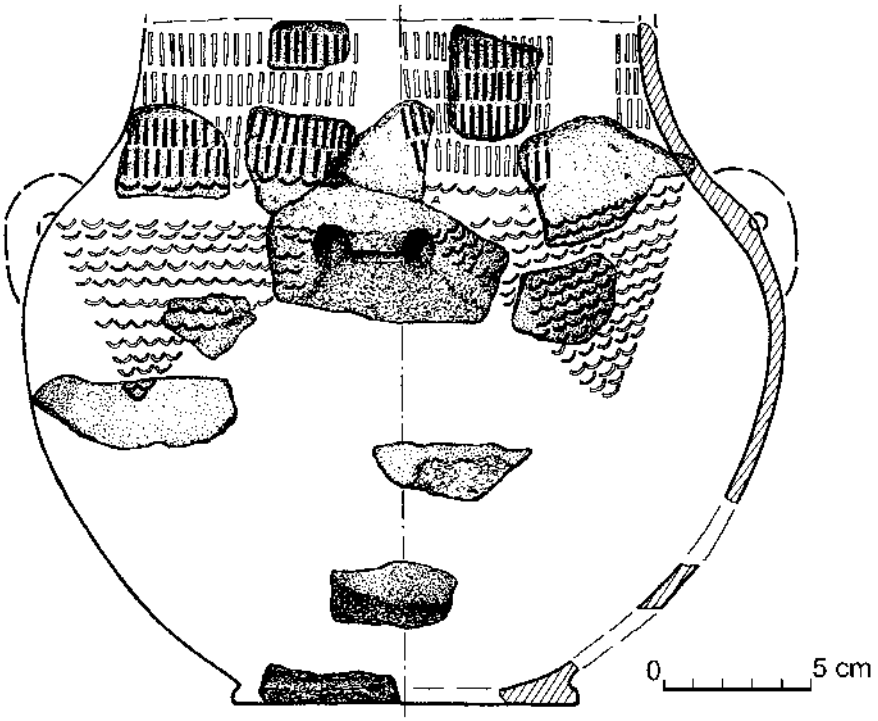

Fig. 2. Chodosovka, Kiev district. Selected pottery of the GAC [following Lysenko, Szmyt 2010]

(a) Complexes of GAC are recorded mainly as cemeteries consisting of a single grave or several graves built of stones or having a stone-earthen structure (in the form of stone cists or built of rubble, or having single stones in their fills). They are sometimes accompanied by other ritual features, typical of the GAC tradition, namely deposits of domestic animal carcasses. In addition, we know of remains of short-lived campsites. The site types are fully consistent in terms of cultural characteristics with GAC rules, with ties to the eastern European cultural milieu being either very poorly marked or nonexistent. The range of GAC complexes south of the Pripet covers Volhynia, Podolia and the Moldavian Upland, reaching as far as the middle Dnieper between the confluences with the Desna and Ros rivers.

(b) Single artefacts (e.g. vessels or flint axes) are for the most part unattached finds, often random ones, as a rule deprived of any information on the context of their occurrence. Their distribution in part coincides with the location of GAC complexes but also in part goes beyond the areas where they occur (e.g. in the Pripet drainage).

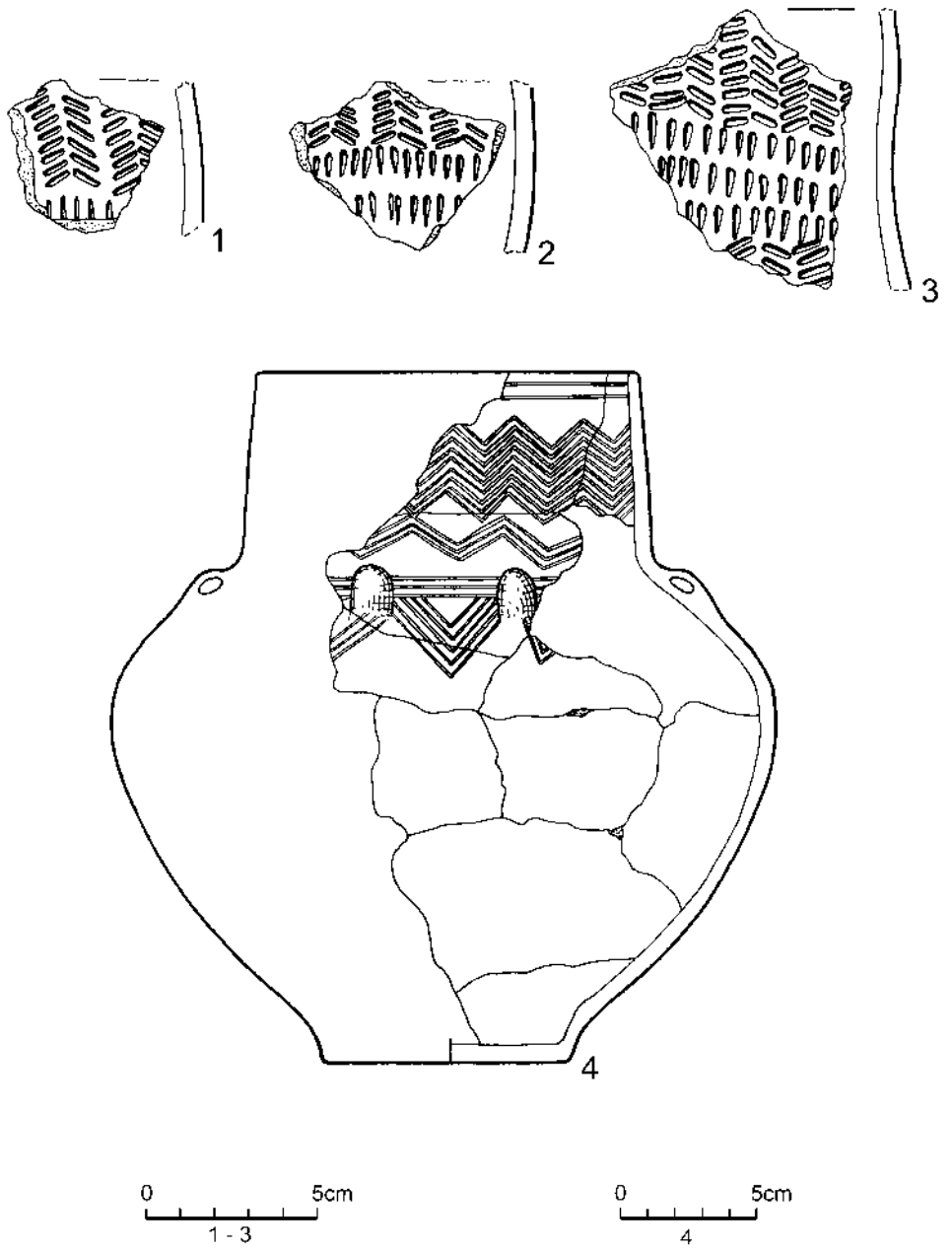

Fig. 3. Bile Ozero 1, Kiev district. GAC pottery [following Rozdobudko, Yurchenko 2005]

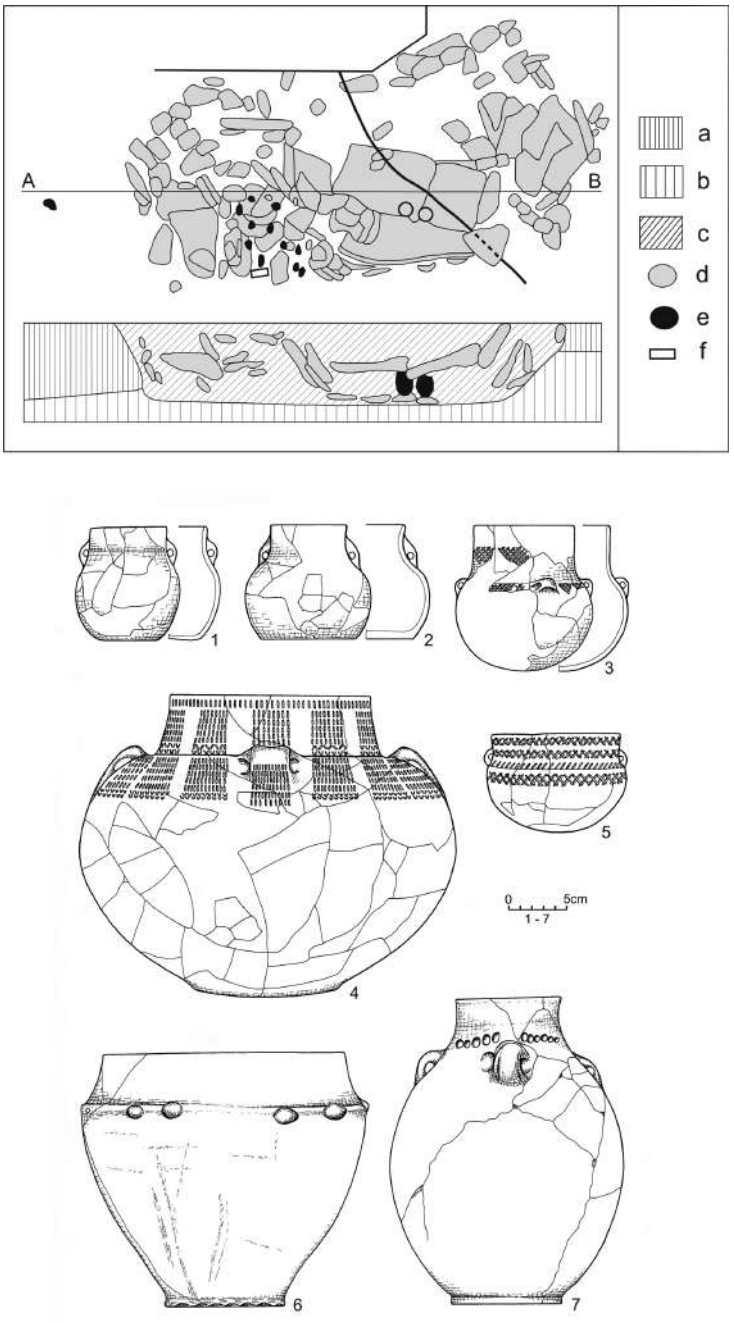

Fig. 4. Ostrog-Zeman, Rivne district, grave no. I. Plan and cross-section of the grave and vessels from the grave-pit [following Pozikhovskiy, Samolyuk 2007]. Key: a - subsoil; b - rock-bed; c - filling of the grave-pit; d - stones; e - ceramics; f - bones

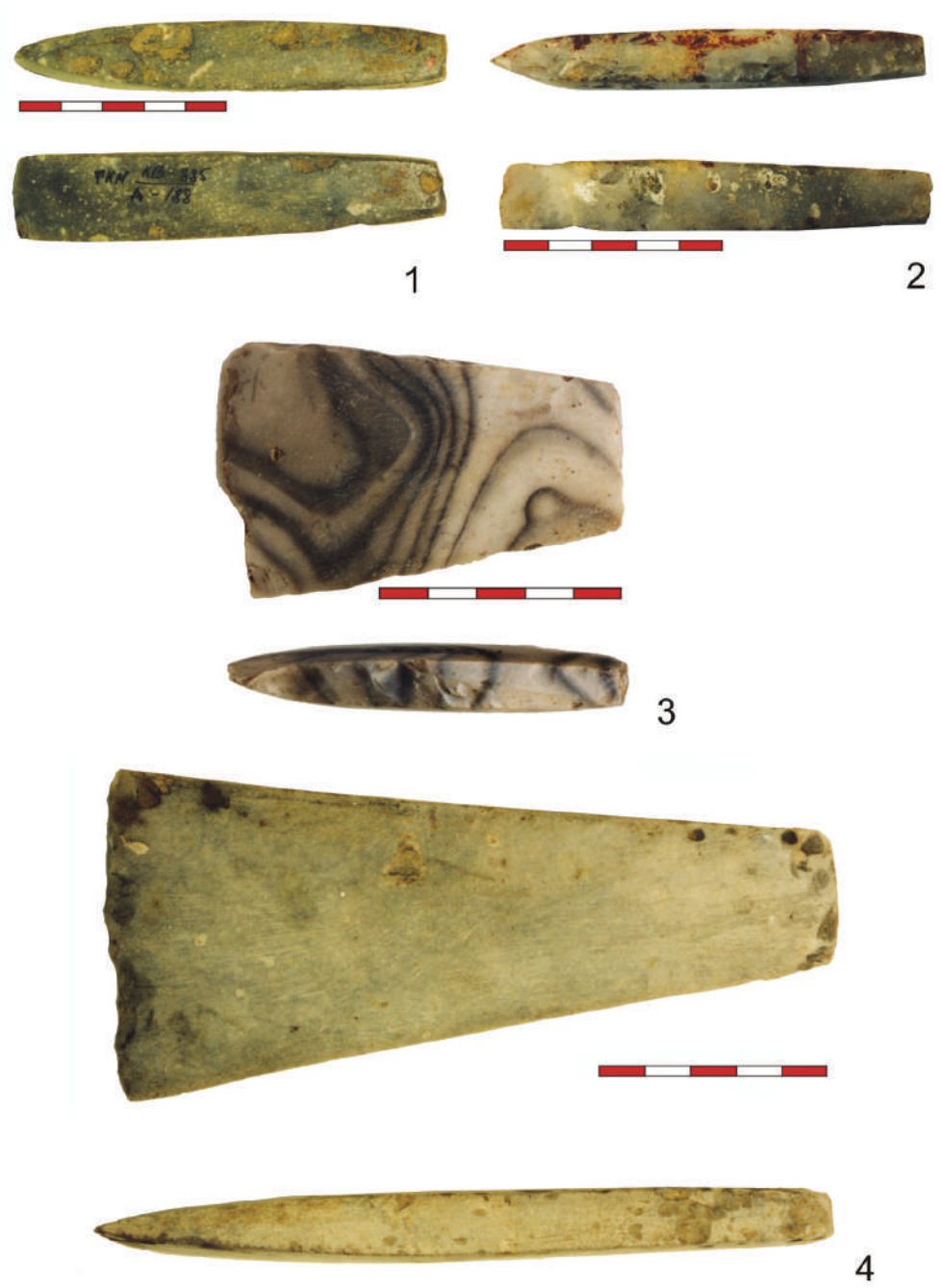

Fig. 5. Examples of flint axes and chisels linked to the GAC: 1 - Orlivka, Vinnitsa district; 2 - Bushinka, Vinnitsa district; 3 - Yaroshinka, Vinnitsa district; 4 - Meleshiv, Vinnitsa district. Collections of museums in: Tulchin (1, 3), Tyvriv (2), Vinnitsa (4). Photo by M. Ignaczak (Bug – Boh Project)

(c) Single elements that can be traced to the GAC such as specific ways of making ceramic body, types of ornaments or forms of vessels are recognizable in the pottery of many eastern European groups. They are recorded in both forest (e.g. Middle Dnieper culture) and forest-steppe zones (certain Tripolye groups of stage CII) as well as the steppe zone (pre-Yamnaya groups, Yamnaya culture, and Catacomb culture).

The size of all the above source categories grows slowly but steadily. With respect to the numbers identified in the late 1990s [Szmyt 1999a], each category has witnessed expansion of our knowledge in the last decade.

Specifically, the GAC complexes published earlier can be supplemented by a small series of sources from the middle Dnieper, possibly of a settlement nature, from site Chodosovka, Kiev district (Fig. 2) [see Lysenko, Szmyt 2010], as well as a possibly grave from a left bank of Dnieper, from site Bile Ozero 1, Kiev district (Fig. 3) [Rozdobudko, Yurchenko 2005], and another grave from Ostrog-Zeman, Rivne district (Fig. 4) [Pozikhovskiy, Samolyuk 2007]. New grave monographs have been published as well, concerning graves known so far from preliminary publications: Ozdiv, Lutsk district [Malejew *et al.* 2004] and Mastacăn, Neamţ district [Mihăilescu-Bîrliba 2001; 2005]. Moreover, sources from the Moldavian Upland served as a basis for another two publications summing up our knowledge [Dumitroaia 2000: 68-81; Burtănescu 2002]. However, it was expanded yet again to include a series of radiocarbon dates sometime later [Mihăilescu-Bîrliba, Szmyt 2003].

A growth has been noted in the number of the finds of flint axes (with tetrahedral cross-sections and well-worked face and lateral surfaces; Fig. 5), of which some may be related to the GAC. New sites have been recorded in both Volhynia [e.g. Okhrimenko *et al.* 2005] and Podolia (the results of the Polish-Ukrainian *Bug - Boh* project), and on the Moldavian Upland as well [Dumitroaia 2000: 84-100].

Highly significant, the continuing expansion of information concerns also groups in the context of which – sporadically or regularly – traits originating with the GAC appear. As examples in point may serve studies of the western range of the Tripolye culture [cf. Videiko 2000 and other papers in: Kośko (Ed.) 2000], western (between the Dnieper and Prut rivers) portion of the Catacomb culture oecumene [cf. Kaiser 2003] and the so-called pre-Yamnaya (Eneolithic) steppe societies [cf. Rassamakin 2004]. Systematically expanded, chronometric data resources comprise chiefly radiocarbon dates for the forest-steppe and steppe groups of the 4th and 3rd millennia BC [cf. Kośko (Ed.) 2003b]. A new quality is introduced by monographs on assemblages displaying characteristics of the Middle Dnieper culture from graves on Grzęda Sokalska [Machnik 2003; Machnik *et al.* 2009], a series of materials from the settlement features of the Funnel Beaker culture from an upland settlement at Zimne, Lutsk district [Bronicki *et al.* 2003] and a cemetery of the Middle Dnieper culture at Prorva, Homel district [Krywalcewicz 2007], located, admittedly, in the upper Dnieper drainage but having great significance for the whole cultural unit.

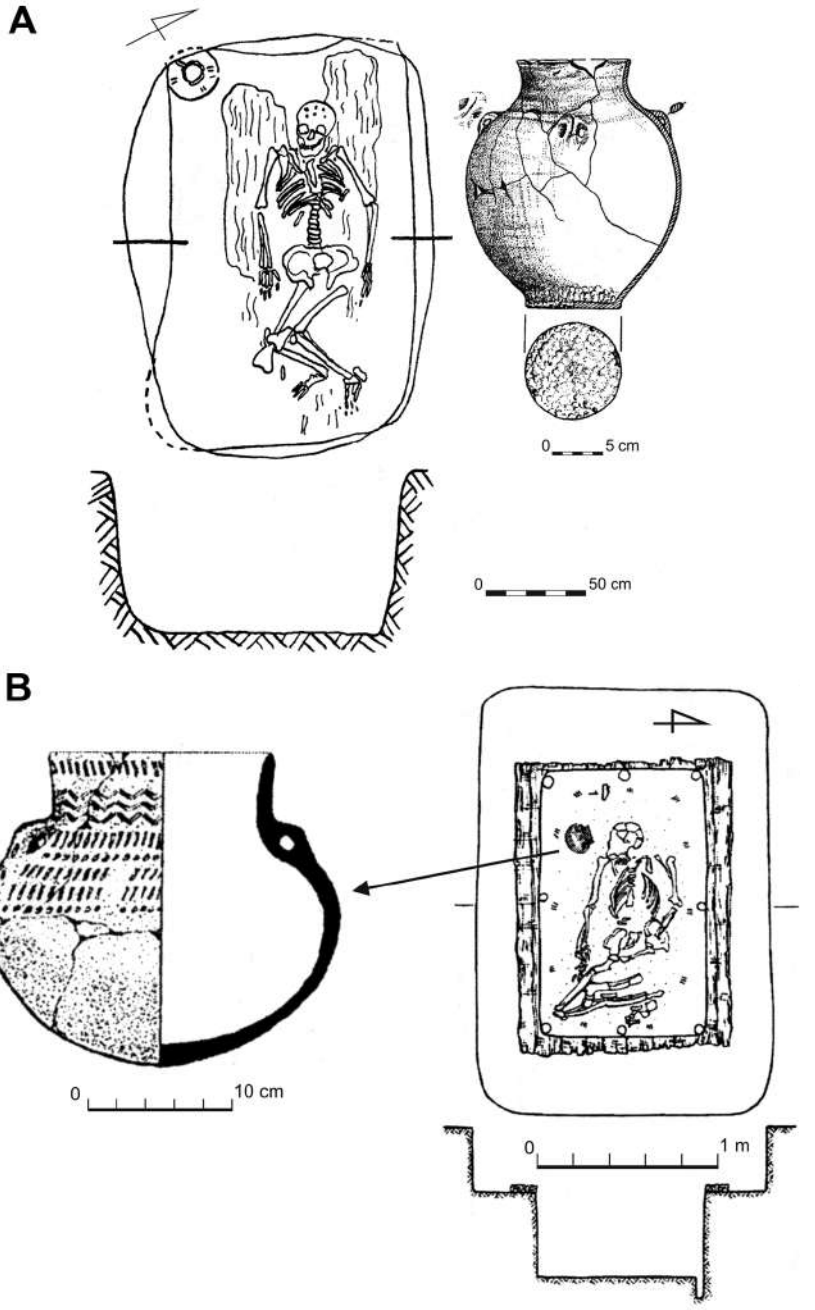

Fig. 6 Examples of Yamnaya culture graves with GAC vessels:A - Kochubeivka, Cherkassy district (Ukraine); B - Mokra, Rîbniţa district (Moldavia) [following Bidzilya *et al.* 2005; Kashuba *et al.* 2002]

In addition, implementation continues of long-term international (Polish-Ukrainian) research programmes, covering the upper Dniester drainage [Machnik 2001; Pelisiak 2007] and the upper and middle Boh (Southern Bug) drainage (*Bug - Boh* project)[1]. The results of these programmes supply detailed observations of settlement-cultural transformations on a mezo scale.

A valuable piece of information is the discovery of another grave assemblage of the Yamnaya culture, comprising pottery showing affinities to the GAC [cf. Szmyt 2000] in the forest-steppe between the Southern Bug and Siniucha rivers at Kochubeivka, Cherkassy district (Fig. 6) [Bidzilya *et al.* 2005].

The publications cited above allow researchers to make some corrections in the description of GAC settlement range in eastern Europe, its chronology, spreading and impact on local cultural milieus. However, they do not change the main elements of the approach presented in 1999 [Szmyt 1999a; see also Szmyt 2003; 2004b].

2. FORMS OF OCCURRENCE

A conclusion resulting from the studies carried out so far of the question referred to in the title holds that sources associated with the GAC were present in and spread across eastern Europe in several different ways [Szmyt 1999a]. The finding relies on the following crucial facts: the presence of the three categories of sources (**a** –**c**) and their varied descriptions as well as their characteristics in the context of other eastern European sources of a concurrent or similar chronology and GAC materials from the drainages of the Vistula, Oder and Elbe rivers.

(a) Grave and settlement (camps) complexes, identified in Volhynia, Podolia and the Moldavian Upland, are by and large consistent with GAC assemblages in the Vistula drainage and, to a certain degree, with those from the other regions where the culture is identified. The consistency is visible in both manufacturing traits (e.g. of pottery, flint, amber, etc.) and ground feature types as well as settlement forms (cemeteries and still few campsites). Emerging dissimilarities, in turn, which concern for the most part the ornamentation style of pottery and, quite obviously, the use of local raw materials, may be interpreted as effects of growing differences following from the development of a new network of circulation of cultural information. The latter is identified as a special cultural structure known as the eastern group of the GAC [Sveshnikov 1983; Szmyt 1999a]. Its range covers Volhynia, Podolia

[1] The project is carried out by an international team of researchers from the Institute of Prehistory, Adam Mickiewicz Univerity in Poznań and the Institute for the Study and Conservation of National Heritage, Ukraine's Ministry of Culture, with the Vinnitsa Conservator of Archaeological Antiquities participating.

and the Moldavian Upland, reaching the middle section of the Dnieper in the east (Fig. 1). The eastern group had its social dimension, visible in characteristic settlement patterns, alien to eastern European traditions, while identical with those which dominated in the Vistula oecumene of the GAC [Szmyt 2004b]. Here also settlements/camps were organized around the division of space among kin groups. The division was sanctioned by symbolic rules that assigned special importance to funeral places, marked by the presence of stone cist graves where ancestors had been interred [Szmyt 2002a; 2008]. This peculiar settlement pattern was transmitted to these parts of the Pontic Area that earlier, but also at the time when GAC societies appeared there, had been settled by Tripolye culture populations (forest-steppe groups of phase CII), whose social and settlement characteristics differed radically. Only in respect of the eastern group, it is justified to speak of 'GAC populations', i.e. of societies included in the network of circulation of information and cultural patterns, and cultivating and developing the central European traditions of the GAC. To their strong ties with GAC societies in the Vistula drainage testifies clearly a back transmission of eastern group traits onto the Polish Lowland [more on the issue in a paper of Kośko, Szmyt..., in this volume].

(b) The second category of sources, namely single artefacts (mainly vessels and flint axes) can be treated as remains of damaged GAC sites (either grave or settlement ones); some of them, however, may reveal genetic relationships and/or cultural contacts of varied eastern European cultural environments with the GAC.

(c) The least homogeneous, the third of the distinguished categories encompasses single traits of more or less clear affinities with the GAC but occurring in alien cultural contexts. Generally speaking, the distribution of the traits can be sorted according to three criteria: spatial, temporal and quantitative (in the sense of intensity of GAC traits). And so, in terms of space, it is necessary to distinguish areas covered by GAC population settlement (including relatively short stays) from regions deprived of any independent GAC settlement structures. With respect to the former, a logical explanation of the appearance of the traits in other cultural units is accepting the possibility of direct contacts between GAC societies and populations representing eastern European traditions. In turn, taking into account temporal parameters, one can distinguish such eastern European cultural units that were contemporaneous with the GAC and genetically independent of it (e.g. Tripolye culture, Yamnaya culture) and others in the origins of which a GAC impact played a certain role (e.g. Middle Dnieper culture). Finally, as regards the intensity of GAC traits, one can name such units in which the traits make up a stable segment of the whole cultural structure (i.e. they are numerous and frequent as, for instance, in the Middle Dnieper culture) and others in which their intensity varies strongly from region to region (e.g. Yamnaya culture). Hence, any interpretation of the significance of the traits depends on a specific context in which they have been recorded. Consequently, possibilities are many [cf. e.g. Szmyt 2003].

Table 1

^{14}C dating of samples from sites of the Volhynian and Podolian subgroups of the Globular Amphora culture. Calibration after OxCal v.3.5.

Site	Feature	Lab. no.	Sample	δ^{13}C (‰)	BP	BC – 1 sigma (68,2%)	BC – 2 sigma (95,4%)	References
Volhynia sub-grou								
Tovpyzhyn	Grave	Ki-5011	human bones		4310±45	3020-2980 (17.4%) 2960-2950 (1.6%) 2930-2880 (49.2%)	3090-3060 (2.5%) 3040-2870 (92.9%)	Maleyev, Pryshchepa 1996; Szmyt 1999a
Tovpyzhyn	Grave	Ki-5010	human bones		4270±50	2930-2860 (50.6%) 2810-2780 (10.9%) 2770-2760 (3.3%) 2720-2700 (3.4%)	3030-2850 (66.6%) 2820-2670 (28.8%)	Maleyev, Pryshchepa 1996; Szmyt 1999a
Tovpyzhyn	Grave	Combine	human bones		4292±33	29140-2884 (68.2%)	3020-2870 (95.4%)	Maleyev, Pryshchepa 1996; Szmyt 1999a
Ozdiv	Grave	Ki-5919	human bones		4150±50	2880-2830 (13.6%) 2820-2800 (8.4%) 2790-2660 (40.5%) 2650-2620 (8.7%)	2880-2580 (95.4%)	Mazurik, Panyshko 1998; Szmyt 1999a
Ivanye	Grave	Le-5021	human bones		4090±70	2860-2810 (14.4%) 2750-2720 (6.7%) 2700-2560 (41.2%) 2520-2490 (5.9%)	2880-2470 (95.4%)	Sveshnikov 1983; Maleyev 1996; Szmyt 1999a
Ivanye	Grave	Ki-5141	human bones		4030±50	2620-2470 (68.2%)	2860-2810 (5.7%) 2750-2720 (1.1%) 2700-2450 (88.6%)	Sveshnikov 1983; Maleyev 1996; Szmyt 1999a
Ivanye	Grave	Combine (Le-5021 + Ki-5141)	human bones		4050±41	2660-2650 (1.6%) 2630-2490 (66.6%)	2860-2810 (7.6%) 2700-2460 (87.8%)	Sveshnikov 1983; Maleyev 1996; Szmyt 1999a
Suyemtsy 2	Grave	Ki-6930	human bones		3935±45	2550-2540 (2.1%) 2490-2340 (66.1%)	2570-2510 (10.2%) 2500-2290 (85.2%)	Sveshnikov 1983; Szmyt 1999a
Peresopnitsa 3	Pit	Ki-5075	animal bones		3910±50	2470-2300 (68.2%)	2560-2520 (3.2%) 2500-2270 (86.8%) 2260-2200 (5.5%)	Shelomentsev-Terskiy 1996; Szmyt 1999a

Site	Feature	Lab. no.	Sample	$\delta^{13}C$ (‰)	BP	BC – 1 sigma (68,2%)	BC – 2 sigma (95,4%)	References
Podolia sub-group								
Vorvulintsy	Grave	Ki-5008	human bones		4220±70	2910-2850 (18.4%) 2820-2670 (49.8%)	3010-2980 (1.2%) 2930-2570 (94.2%)	Sveshnikov 1983; Maleyev 1996; Szmyt 1999a
Loshniv	Grave	Ki-5006	human bones		4150±55	2880-2830 (13.7%) 2820-2800 (5.6%) 2790-2660 (40.2%) 2650-2620 (8.8%)	2890-2570 (95.4%)	Sveshnikov 1983; Maleyev 1996; Szmyt 1999a
Khartonivtsy 2	Grave	Ki-5586	human bones		4130±70	2870-2800 (18.5%) 2780-2770 (2.6%) 2760-2580 (47.1%)	2890-2550 (90.8%) 2540-2490 (4.6%)	Sveshnikov 1983; Szmyt 1999a
Khartonivtsy 2	Grave	Ki-5587	human bones		4060±60	2840-2810 (6.6%) 2670-2470 (61.6%)	2870-2800 (13.3%) 2790-2460 (82.1%)	Sveshnikov 1983; Szmyt 1999a
Khartonivtsy 2	Grave	Combine (Ki-5586 + Ki-5587)	human bones		4090±46	2860-2810 (16.0%) 2700-2570 (47.3%) 2520-2500 (4.9%)	2870-2800 (19.2%) 2790-2490 (76.2%)	Sveshnikov 1983; Szmyt 1999a
Dovge	Grave	Ki-5009	human bones		4040±60	2830-2820 (2.4%) 2660-2650 (2.7%) 2630-2460 (63.1%)	2900-2350 (95.4%)	Sveshnikov 1983; Maleyev 1996; Szmyt 1999a
Siret (Moldavian) sub-group								
Dolheştii Mari	Grave 2/ skeleton 1	Ki-10658	human bones	-19.20±0.2	4590±60	3510-3430 (22.6%) 3380-3320 (21.1%) 3220-3170 (12.9%) 3160-3110 (11.6%)	3520-3090 (95.4%)	Mihăilescu-Bîrliba, Szmyt 2003
Dolheştii Mari	Grave 2/ skeleton 1	Ki-10652	human bones	-19.00±0.2	4560±60	3490-3470 (4.0%) 3380-3300 (21.9%) 3240-3100 (42.3%)	3510-3420 (10.6%) 3380-3080 (82.8%) 3070-3030 (2.0%)	Mihăilescu-Bîrliba, Szmyt 2003

Site	Feature	Lab. no.	Sample	$\delta^{13}C$ ($^{0}/_{00}$)	BP	BC – 1 sigma (68,2%)	BC – 2 sigma (95,4%)	References
Dolheştii Mari	Grave 2/ skeleton 1	Combine (Ki-10652 + Ki-10658)	human bones		4575±42	3500-3460 (9.5%) 3380-3330 (27.8%) 3220-3180 (14.5%) 3160-3120 (16.3%)	3500-3430 (13.6%) 3380-3260 (37.5%) 3240-3090 (44.3%)	Mihăilescu-Bîrliba, Szmyt 2003
Basarabi		Ki-10651	human bones	-19.30±0.2	4370±60	3090-3060 (8.4%) 3040-2900 (59.8%)	3330-3220 (9.4%) 3180-3150 (1.3%) 3120-2880 (84.6%)	Mihăilescu-Bîrliba, Szmyt 2003
Bârgauani		Ki-10654	human bones	-19.90±0.2	4320±60	3020-2880 (68.2%)	3100-2700 (95.4%)	Mihăilescu-Bîrliba, Szmyt 2003
Piatra Neam		Ki-10653	human bones	-18.90±0.2	4140±60	2870-2800 (20.4%) 2790-2620 46.7%) 2610-2600 (1.1%)	2890-2570 (94.0%) 2520-2500 (1.4%)	Mihăilescu-Bîrliba, Szmyt 2003

3. THE SPREADING OF POPULATIONS OF THE GAC EASTERN GROUP. DIRECTIONS, CHRONOLOGY AND DYNAMICS

Below, I shall focus first on questions related to the eastern group of the GAC. The sites related to this group can be divided into three subgroups (Fig. 1): Volhynia, Podolia and Seret (Moldavian). They were located on the southern frontier of the forest zone and on the forest-steppe. Owing to a research project carried out since the late 1990s in cooperation with colleagues from Ukraine (above all with the Late Yuriy Maleyev) and Romania (with Virgil Mihăilescu-Bîrliba), we have data on absolute chronology for all the subgroups (Table 1). These are radiocarbon age measurements of bone samples that contained chiefly human remains from graves; only in a few cases they contained animal bones from settlement features or ritual deposits.

An analysis of the whole set of radiocarbon dates (Table 1) and typochronological assessments (Table 2), made with regard to the knowledge of cultural and historical transformations taking place between the Vistula and the Dnieper in the second half of the 4th and in the 3rd millennium BC, allows to determine the basic temporal and spatial parameters of the GAC eastern group. Curiously enough, it looks as if population movements had different dynamics depending on their direction: north-south or west-east.

Considering first the north-south direction, it must be observed that the earliest known GAC assemblages east of the Bug River, representing Volhynian phase A (=VA), come from the western part of Volhynia likewise the oldest ^{14}C dates that we have now (Tovpyzhyn). Hence, a plausible hypothesis is that it was there that GAC settlers appeared in the late 4th millennium BC (ca. 3100 BC), coming from the west, specifically from the Lublin Upland [Szmyt 1999a]. Their movement further south was very dynamic and could have taken place in the course of fewer than 100 years or even – which should be considered – in a period corresponding to the lifetime of a single human generation. As indicated by dates referring to grave assemblages from Romania [Mihăilescu-Bîrliba, Szmyt 2003], the beginning of GAC settlement on the Moldavian Upland did not have to be much delayed with respect to Volhynia and could have occurred even ca. 3100-3000 BC. The dates for Podolia are slightly younger (the oldest of the measurements indicates ca. 3000-2900 BC). Did, therefore, the spreading of GAC settlement follow the shortest geographical route: first to Volhynia, thence to Podolia and next to areas located between the Prut and Seret rivers? This remains an open question.

By contrast, in the west-east direction, GAC populations' entering onto the lands lying further east, in the drainages of the Horyn, Sluch and Teterev rivers, could have differed greatly in dynamics. In this case – due to too few radiocarbon dates – arguments for a hypothesis are supplied by typochronological analyses. What they show is the absence of any assemblages of phase VA in the lands in-

Table 2

Globular Amphora culture, eastern group. Typochronological assessments for sub-groups and regions

Sub-group	Region	Typochronological assessments [phases after Szmyt 1999a]
Volhynia	Lutsk	VB, VC
	Lviv	VA, VB
	Rivne	VA, VB, VC
	Zhitomir	VB, VC, VD
Podolia	Ternopil	PA, PB
	Khmielnitskiy	PA, PC
	Vinnitsa	?
Seret (Moldavian)	Suceava	?
	Neamt	?

dicated; only assemblages of successive, second Volhynia phase (VB) are found. On the scale of absolute chronology this may mean a delay of about 200-250 years [Szmyt 1999a: Fig. 17].

A number of questions arise here: What factors made GAC societies spread at different rates? What stimulated a higher rate along the north-south axis and what was the reason for a lower rate along the west-east one? Indeed, in both cases, GAC population groups appeared in areas having a long tradition of Tripolye settlement, where it still continued or could have continued: in Podolia it was a decline Kasperivtsy group, in Volhynia – Troyaniv and Gorodsk groups (?) and on the Moldavian Upland – Horodiştea-Erbiceni groups (cultures) [cf. Kośko (Ed.) 1999; 2003b; Dumitroaia 2000]. A partial answer to the posed questions depends certainly on the condition of the representatives of the named Tripolye groups. Although research into the final section of stage CII of the Tripolye culture has been actively pursued in the recent years [cf. Kośko (Ed.) 1999; 2000; 2003b], the problem, however, is still not investigated well enough to formulate any hypotheses.

4. THE GAC EASTERN GROUP AND STEPPE GROUPS

The subject of relationships of GAC eastern group populations with steppe societies has been discussed in the literature already on several occasions [cf. Szmyt 1999a; 2000; 2002b; 2003]. Here, I shall indicate certain debatable issues that arose,

owing to the results of more recent research into the cultural and historical transformations in the steppe zone and its borderland with the forest-steppe. Chronologically, the presentation shall be divided into (**a**) 'pre-Yamnaya' stage (Eneolithic in eastern European periodization), (**b**) 'Yamnaya' stage and (**c**) Catacomb stage.

(a) The record that may serve the purpose of investigating the relationships holding between the societies of the GAC eastern group and those of the pre-Yamnaya stage is still very limited [Szmyt 1999a: 148-152]. Symptomatic enough, a rich set of Eneolithic grave assemblages published by J. Rassamakin [Rassamakin 2004] has not supplied any new data in this respect. Our knowledge still relies basically on two grave assemblages from the drainage of the lower Dnieper: Boguslav, Dnipropetrovsk district, kurgan group I, kurgan 23/grave 12 [Androsov *et al.* 1991; Rassamakin 2004: 150-151] and Baratovka, Mykolaiv district, kurgan 1/grave 6 [Rassamakin 1996; 2004: 152-153], included by J. Rassamakin in the fourth burial tradition on the steppes represented by the Zhivotilovka-Volchansk group [Rassamakin 2004: 208-209]. In both cases we deal only with single elements of funerary rituals, the origins of which may be linked to the GAC. These are: vessel form (small amphorae) in Boguslav and a collective character of the grave (six burials in a stone cist[2]) in Baratovka. Hence, the status of the sources remains debatable, although – considering the spatial, typochronological and structural similarity to elements originating with the Late Tripolye Kasperivtsy/Gordineşti group – it is most plausible to discuss them against the background of a broader network of contacts between the societies of the forest-steppe and steppe zones. From this angle, GAC traits can be viewed as an element in a set of heterogeneous cultural patterns characteristic of small mobile groups of changeable ethno-cultural make-up from the decline stage of the steppe Eneolithic [Szmyt 1999a: 185]. Out of the premises of the hypothesis, relatively the easiest one to invalidate is that of typochronological similarity. However, to do that it is necessary to implement a programme of radiocarbon age measurements of bone samples from graves representing the group in question.

(b) Much better looks the set of data for analyzing the relationships between GAC populations and the Yamnaya culture. This time, however, a majority of sources come from the forest-steppe zone, where 'Yamnaya' societies appear only in their late development stage. Relying on a series of measurements from the western drainage of the Dnieper [Bidzilya *et al.* 2005: Table 1], it can be estimated that the beginning of the Yamnaya culture in the forest-steppe zone very likely falls on ca. 2900-2600 BC, i.e. synchronously with the GAC. For the question discussed here, the most significant sources are a series of graves included in the Yamnaya culture but containing objects alien to the steppe tradition. For the most part these are clay vessels more or less faithfully imitating the GAC style; much less frequently

[2] The links do not have to be necessarily revealed by the stone cist alone as in the Eneolithic of the steppe zone such structures are sporadically encountered in different burial traditions [foll. the proposal by Y. Rassamakin 2004: 152-153].

these are flint axes. So far, such objects have been recorded in three areas of the forest-steppe, namely between the Prut and Dniester rivers (e.g. Corpaci kurgan 2, grave 7; Ocniţa kurgan 1, grave 3 [Szmyt 2000]), on the middle Dnieper (Łosiatyn [Szmyt 2000]) and between the middle Boh (=Southern Bug) and Siniucha rivers (Kochubeivka kurgan 1, grave 9; see Fig. 11) [Bidzilya *et al.* 2005]. These are areas where both societies must have come into direct contact with one another, taking even the form of migrations of individual people (matrimonial exchange). Thanks to a relatively good exploration of the area, on the Prut it is practically possible to draw a line separating the ranges of synchronous settlement, with the GAC occupying territories west of the river (i.e. between the Prut and Seret rivers), while the Yamnaya culture settling its eastern bank [Szmyt 2003: 412-415].

In the steppe zone, we lack any similarly clear-cut records of mutual contacts. Artefacts (vessels and axes), representing hypothetical GAC traits, have undergone more transformations here, i.e. they are less clear cut [Szmyt 2001: 460]. They were identified in several graves of the Yamnaya culture on the lower Dniester and Dnieper [Szmyt 1999a: Fig. 27]. In turn, the origins of graves taking the form of stone cists, sporadically encountered in the steppe zone [e.g. Shaposhnikova *et al.* 1986], are not known but they do not have at all to refer to a single source[3]. Inspirations could have come from different sources: older traditions of the steppe Eneolithic [Rassamakin 2004] or the Caucasus [Teslenko 2007] or finally the GAC. With the last-mentioned source one can tentatively associate only several features from the lower Dniester (Sanzheyka, Tatarbunary [Szmyt 2000: 451-453]) and possibly a single grave on the Molochna river (Akkermen [Szmyt 2000: 453]). Due to the ambiguities, the interpretation of 'steppe' locations of the hypothetical GAC patterns should refer to the situation in the forest-steppe zone as it must been there that their reception took place.

(c) Characteristically enough, in the grave features of the Catacomb culture only few traits showing affinities to the GAC have been identified (certain types of bone goods and ornaments of clay vessels); however, they have been identified in the Dnieper drainage [Szmyt 1999a: 164-165] while they are absent from the areas lying more to the west, between the Boh and Prut rivers [cf. Kaiser 2003, *passim*]. In this case also one can admit of several routes of transferring 'amphora' patterns: direct contacts or – which is more likely – *via* the Yamnaya or Middle Dnieper cultures. In the latter, there is sufficient evidence to confirm, on the one hand, patterns drawn from the GAC and, on the other hand, ties to the Catacomb culture [cf. recently Krywalcewicz 2007: 92-97], with the latter being particularly clear in the forest-steppe assemblages of the Iskovshchina type on the Dnieper [Serdyukova 1996].

[3] Many doubts related to the so-called Kemi Oba culture [see e.g. Toshchev 2007] additionally increase troubles in the given question.

5. THE GAC AND THE EXPLORATION OF THE PONTIC AREA BY CENTRAL EUROPEAN SOCIETIES

Elsewhere in this volume [cf. a paper of Kośko, Szmyt], a historical perspective was taken on the place of GAC societies in the exploration of the Pontic Area by populations arriving from central Europe. It must be stressed that in the case of the GAC we deal with **(a)** a broadening of the range of the process with its **(b)** simultaneous deepening and stabilizing.

(a) In the first of the two aspects, of key importance are, on the one hand, references to the experience gained at earlier stages of Pontic Area exploration by Linear Pottery culture societies and especially by the populations of the Funnel Beaker culture and, on the other, a considerable expansion of the ranges that were at least partially subjected to the control of GAC societies. Hypothetically, one could distinguish here areas relatively permanently settled and others that were only sporadically penetrated. In reality, this is not at all simple because the supply of source data continues to grow (see section 1 above). At present, with some caution, the eastern frontier of lands settled by GAC populations can be marked along a line drawn from the Teterev river to the upper drainage of the Boh (Southern Bug) river since it is more or less there that the last concentrations of GAC sites end. Further east (as far as the middle course of the Dnieper), we deal with dispersed finds although quite spectacular at times (e.g. a possibly grave in Kanev). Likewise, the northern frontier can be delineated along the Uzh river and further west across the middle courses of Pripet tributaries (Sluch, Horyn and Styr rivers). The southern frontier is far more complex because it covers the interfluvial area between the middle sections of the Seret and Prut rivers. In turn, in the west, the range can be bounded by the Carpathians and a line drawn across the drainage of the upper Dniester (between the Gnila Lipa and Zolota Lipa rivers) as far as the upper Bug river. Thus, generally speaking, the area from the Bug to the Boh river was covered by the settlement and economic activities of GAC population groups, belonging to the culture's regional structures (Volhynia and Podolia ones). Whereas lands lying immediately north, east and south of the indicated frontiers may have been occasionally penetrated by GAC societies: on their own (e.g. area between the upper Boh and Dnieper rivers) or in co-operation (of different kinds) with other cultural groups. The varied formulas of the co-operation are perceived today as evidence of GAC societies' participation, from the decline of the 4th millennium BC to the middle of the 3rd, in both neighbourly and broad-space networks of cultural contacts. The latter covered the southern portion of the forest-steppe and the steppes from the Ciscaucasia to the Danube delta [e.g. Rassamakin 2004]. Clear relics of these processes are recorded in the drainages of the middle and lower courses of the Dniester and Dnieper rivers. So far, no such traces have been discovered in the lands on the middle and lower Boh river.

(b) Characteristically enough, the presence of GAC populations in the areas settled by them took on signs of stability visible in a relatively permanent division of space among constituent kin groups [Szmyt 2008: 520-521]. As evidence may serve the structure of settlement organization in Volhynia, Podolia and on the Moldavian Upland, where a major role was played by stone tombs with two or more burials [cf. Szmyt 2002a: 222-223]. Thus, the space bounded by (symbolically) the Bug and Boh rivers became a 'tamed' and 'domesticated' area, regardless of any complications following from either confirmed (e.g. the case of Zimne) or hypothetical presence in it of societies, having a different material culture and, most probably too, a different cultural and socio-economic structure (decline stages of the Funnel Beaker and Tripolye cultures) [cf. Szmyt 1999b; Videiko 1999; Bronicki *et al.* 2003]. In this context, it should come as no surprise that some elements of GAC rituals were revitalized in the groups of the Early Bronze Age (e.g. Strzyżów culture [e.g. Machnik 1978: 79]).

6. CONCLUSIONS AND RECOMMENDATIONS

The above review of current data justifies distinguishing several different forms of the presence or impact of GAC societies in the area bounded by the Pripet and Dnieper rivers, Black Sea coast and the Western Bug River.

Well evidenced, the traces of the physical presence (settlement) of autonomous population groups, representing (i.e. cultivating and developing) central European GAC traditions, testify to the groups' large capacity to adapt to the varied natural environments (mainly in the forest[4] and forest-steppe zones) of eastern Europe. An explanatory mechanism, fitting this case, involves multidirectional movements of population groups aware of their origins as seen in their maintenance of ties with their native lands in the Vistula drainage [see Kośko, Szmyt..., in this volume]. The migrations and consequent development of the socio-economic structures of the GAC eastern group must have been accompanied by the processes of cultural change in local cultural environments. Co-optations of individuals or groups, descending from other cultural traditions, could have followed.

Apart from the GAC settlement, in the forest, forest-steppe and steppe zones equally, the effects of varied forms of cultural contacts have been identified, including contacts that could have resulted in migrations of individuals (e.g. related to

[4] This assertion takes into account the presence of GAC complexes deep inside the forest zone (on the upper Dnieper and on the Neman rivers). Cf. Szmyt 1999a; 2004b.

matrimonial exchange) and cultural changes involving, for instance, adaptation of GAC patterns by different steppe traditions.

While the presence of GAC populations in the areas settled by them, bounded by the Western Bug, Teterev and upper Boh rivers and located between the Seret and Prut rivers, took on characteristics of stabilization in the course of the 3rd millennium BC, outside of these areas, in particular on vast areas of the steppe, we can identify evidence of varied formulas of co-operation between the populations and other cultural groups. It must be stressed that, in principle, neither phenomenon finds any analogy in the earlier stages of Pontic Area exploration and as such is an autonomous experience of GAC populations – in a sense, a top achievement of the stage of *tactics of contacts*, anchored in neighbourly and superneighbourly (transborder) networks of cultural contacts.

*

The hypotheses formulated above are based on the results of multifaceted analyses of archaeological sources. Further attempts to confirm or invalidate them should concentrate on at least four areas:

(1) expansion of typological analyses of source assemblages (including physicochemical methods applied to the study of pottery technology);

(2) expansion of the database for the study of absolute chronology;

(3) implementation of a programme of study of ancient DNA, taken from human and animal remains;

(4) isotope analyses (to determine the content of strontium and other relevant elements in human remains).

Only the use of DNA and isotope analyses will allow archaeologists to confirm or invalidate the hypothesis about population changes induced by migrations. The eastern European settlement of GAC populations provides excellent input data for such analyses. Hence, it can be expected that their results will have a momentous significance for investigations of a much greater, pan-European range.

Translated by Piotr T. Żebrowski

Baltic-Pontic Studies
vol. 14: 2009, 252-268
PL ISSN 1231-0344

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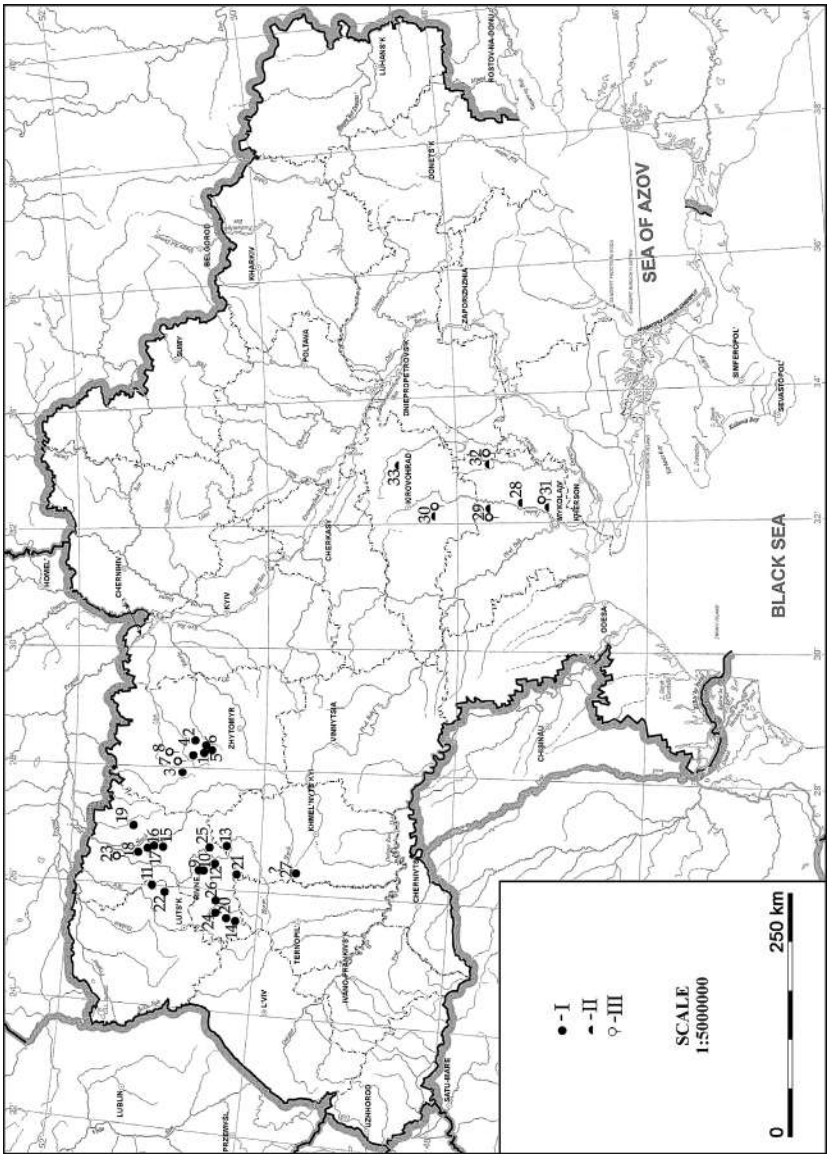
MANIFESTATIONS OF MIDDLE DNIEPER CULTURE IN THE VOLHYNIA TERRITORY AND THE ISSUE OF ANCIENT ROUTES

For a long while, materials of the Middle Dnieper Culture (MDC), widespread primarily in the Upper and Middle Dnieper areas, have been recorded sporadically by researchers in other, in particular, more western territories. The significance of those facts became obvious with the study of barrow mounds on the Sokal mountain ridge (south-western edge of the Volhynia upland). A series of interments found there, contained MDC pottery (or close to it), which enabled J. Machnik to express an opinion about the MDC population's west-bound migration. This phenomenon became possible after the decay of the Globular Amphorae culture (GAC) in the Volhynia and the Podolia areas, which opened the way to the migrations from about mid 3000 cal BC [Machnik 1999]. In fact this prompted us to take a closer look at the territory between the Middle Dnieper area and Eastern Małopolska in order to record traces of MDC in the region. As it usually happens, addressing a particular theme touches upon a whole number of issues.

1. MDC TRACES IN THE VOLHYNIA

Researchers of ancient artefacts in the Western Volhynia note the occurrence of MDC materials there. The first one to note that was I.K. Sveshnikov; a MDC vessel brim was found in dwelling III in a well-known eponymic settlement, Gorodok of the Gorodok–Zdovbytsya Culture (the Kurhany natural boundary (ravine) near the city of Rivne) [Sveshnikov 1964: 131, Fig. 45:4]. While the situation with the dwelling



Map 1. Map of locations containing MDC ceramics. Eastern Volhynia (Zhytomyr region): 1 – Fasova; 2 – Isakivka; 3 – Rudnya Ozeryanska; 4 – mouth of the Lemnya river; 5 – Horbuliv; 6 – Zhadky; 7 – Bovsuny; 8 – Ignatpol. Western Volhynia (Rivne region, except point 22 of the Volhynia region): 9 – Gorodok; 10 – Rivne-beach; 11 – Osova; 12 – Rozvazh; 13 – Netishyn; 14 – Bushcha; 15 – Berezne; 16, 17 – Gorodyshche; 18 – Bohushi; 19 – Blazhove; 20 – Tarakaniv; 21 – Vilia; 22 – Maidan Lypnensky; 23 – Rudnya; 24 – Dubno; 25 – Symoniv; 26 – Myrohoshcha Persha. Podolia (Khmelnytskyi region); 27 – Yukhymivtsi. Steppe belt (Kirovohrad and Mykolaiv regions); 28 – Starohorozhene; 29 – Mayorivka; 30 – Sofiivka; 31 – Vynohradivka; 32 – Zelenyi Hai; 33 – Golovkivka. Legend: I – MDC traces in the Volhynia area; II – barrow graves; III – finds of maces

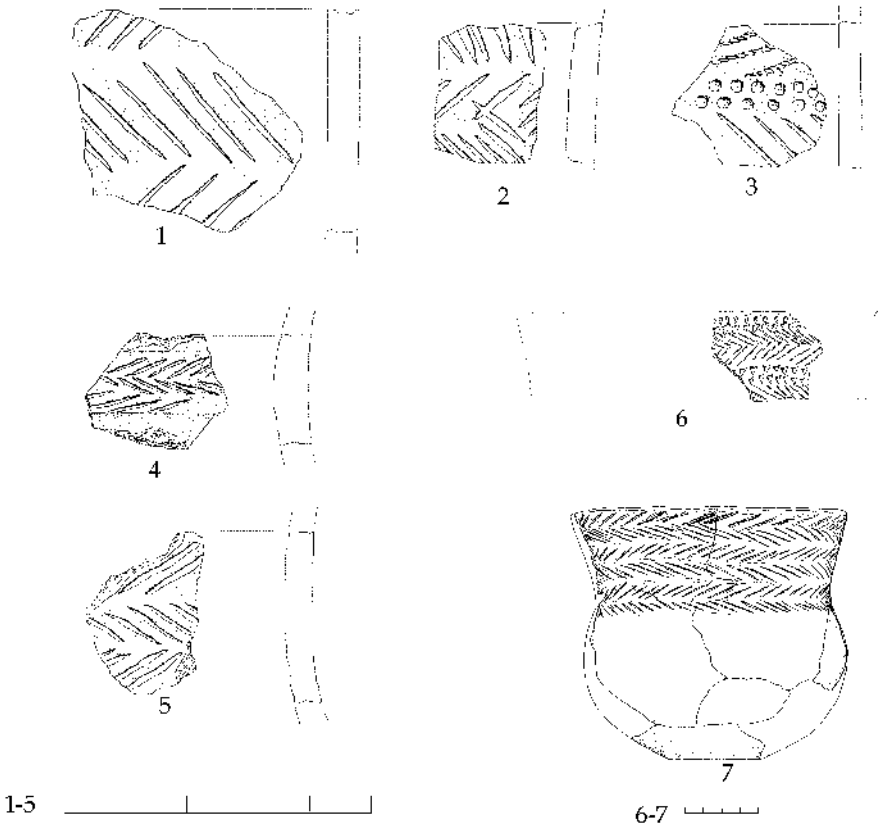


Fig. 2. MDC ceramics from the Western Volhynia territory. 1 – Myrohoshcha 1 (Pole Votruby); 2 – Tarakaniv 5; 3 – Dubno-Volytsia; 4 – Rivne–beach; 5 – Symoniv; 6 – Gorodok (Kurhany ravine); 7 – Rozvazh (Koshary ravine)

remains very uncertain, the fact of the find made there remains (Fig. 2:6). Later on, the researcher pointed to two MDC pots from the village of Osova (Nakoty ravine) of the Kostopil district, the Rivne region, found by H.V. Okhrimenko [Sveshnikov, Nikolchenko 1982: 68]. Some idea about that pottery is given by publications by H.V. Okhrimenko, in which the goblets are listed as found either in the village of Maidan – Lypnensky of the Manevytsi district, Volhynia region [Kuchinko, Okhrimenko 1991: 95, Table 7: 1, 2], or in Osova [Okhrimenko 2005: Fig. 25].

To date there has been significant growth in the number of localities where fragments of the MDC pottery has been found (Fig. 1). They were found, primarily, in the process of exploration and more seldom, while studying poly-cultural monu-

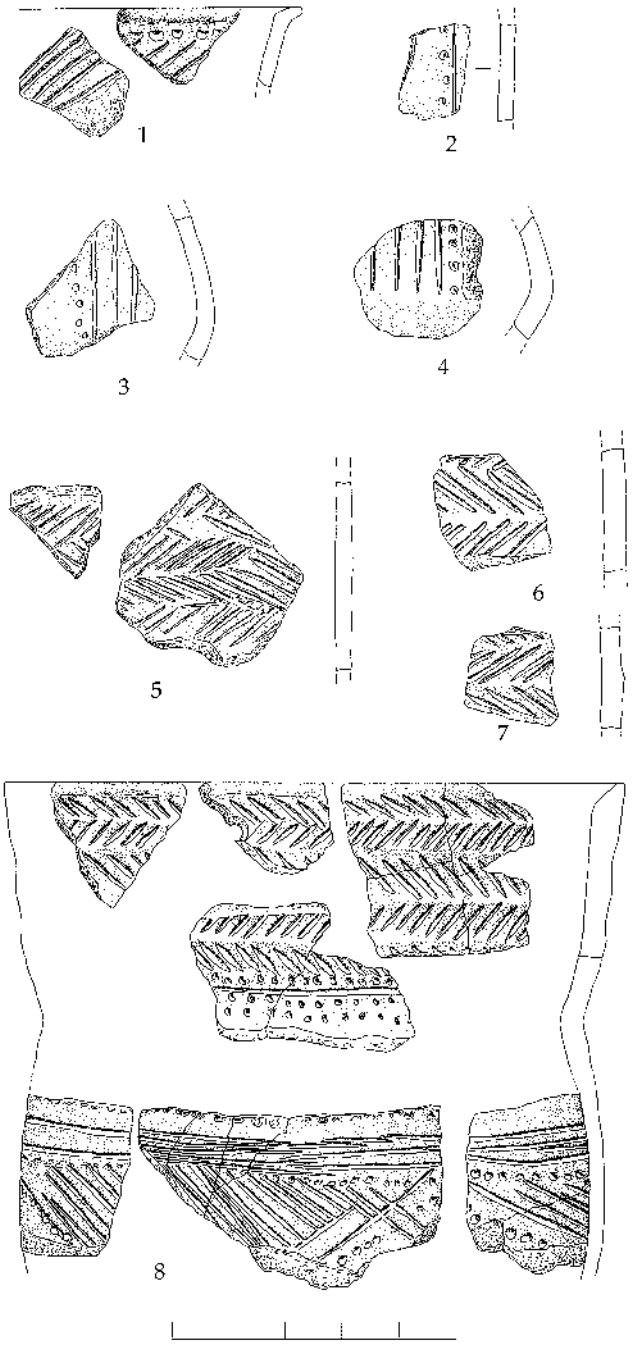


Fig. 3. MDC ceramics from the Western Volhynia territory. 1-8 – Netishyn (Kozatski Mohyly ravine)

ments. They are usually represented by individual small fragments that can be easily identified but are rarely suitable for reproduction of the shape. Let us add some more facts to the list of already known locations [Romanchuk 2005; Tkach 2007]. Fragments of an MDC goblet were found by O.L. Pozickowski[1] in the multi-layer anthropogenically ruined settlement near the village of Rozvazh (the Koshara ravine) near Ostrog town (Fig. 2:7). Fragments of several goblets also were found in a minor bore pit made in the vicinity of Netishyn (the Kozatski Mohyly ravine) of the Khmelnytsky region (explorations by S.S. Berezanskaya and V.O. Samoliuk; Fig. 3). According to local residents, there was reportedly a burial mound in that place. This assumption is confirmed to some extent, by the absence of MDC materials on the neighbouring patches. A substantial number of finds were collected in the vicinity of the village of Bushcha (the Tartak ravine) between the towns of Dubno and Kremenets (explorations by T. Bytkovska and, particularly, partially published multi-annual collections of V. Tkach [Tkach 2007: Fig. 2:28, 32-34]). In addition to traditional fragments (Figs. 4, 5), the site contained others, decorated by corded impresses (Figs. 6, 7). Technologically they do not match the canons of pottery of the Volhynia cultures: the GAC, the Gorodok-Zdovbytsya and the Strzyżów – and probably, also belong to the MDC as assumed by V. Tkach. Individual fragments with a herring-boned pattern were found near Rivne (location Rivne–beach) and other locations (collections by V.O. Samolyuk and V.K. Piasetsky) (Fig. 2:1-5).

Far fewer studies have been done in the Eastern Volhynia area (the Zhytomyr district). V.K. Piasetsky's efforts resulted in the collection of individual small fragments of MDC pottery in several locations. Minor excavations were undertaken only in one of these [Berezanskaya *et al.* 1987].

Outside of the Volhynia region, the MDC ceramics were reportedly found in the course of excavations in the Podolia at the Southern Bug source, in two closely located sites near the village of Yukhymivtsi of the Volochysk district, the Khmelnytsky region [Mykhalchyshyn 2005: 223; 2006: 284]. Only one of the fragments was ornamented with a sketched herring-bone pattern. Since so far we have had no chance to become acquainted with that material, we are leaving this item with a question mark.

Further, the western boundaries of the dissemination of the MDC pottery in the territory of Ukraine are marked by the known finds in the Dniester area. No doubt, a goblet from the village of Kolokolyn of the Rohatyn district of the Ivano-Frankivsk region – found in the north-western periphery of the kurgan burial mound 2 – belongs to the MDC [Sulimirski 1968: Plate 7:7]. Other finds from that region only to a certain extent correspond with "classic samples" of the MDC pottery. An echo of those migrations is probably, the ancient artefacts of the so-called Kavsko-Kolpets group in the Upper Dniester area, the bowl-shaped pottery which demonstrates

[1] We are sincerely grateful to O.L. Pozickowski, V. Tkach and V.K. Piasetsky for the provided materials.

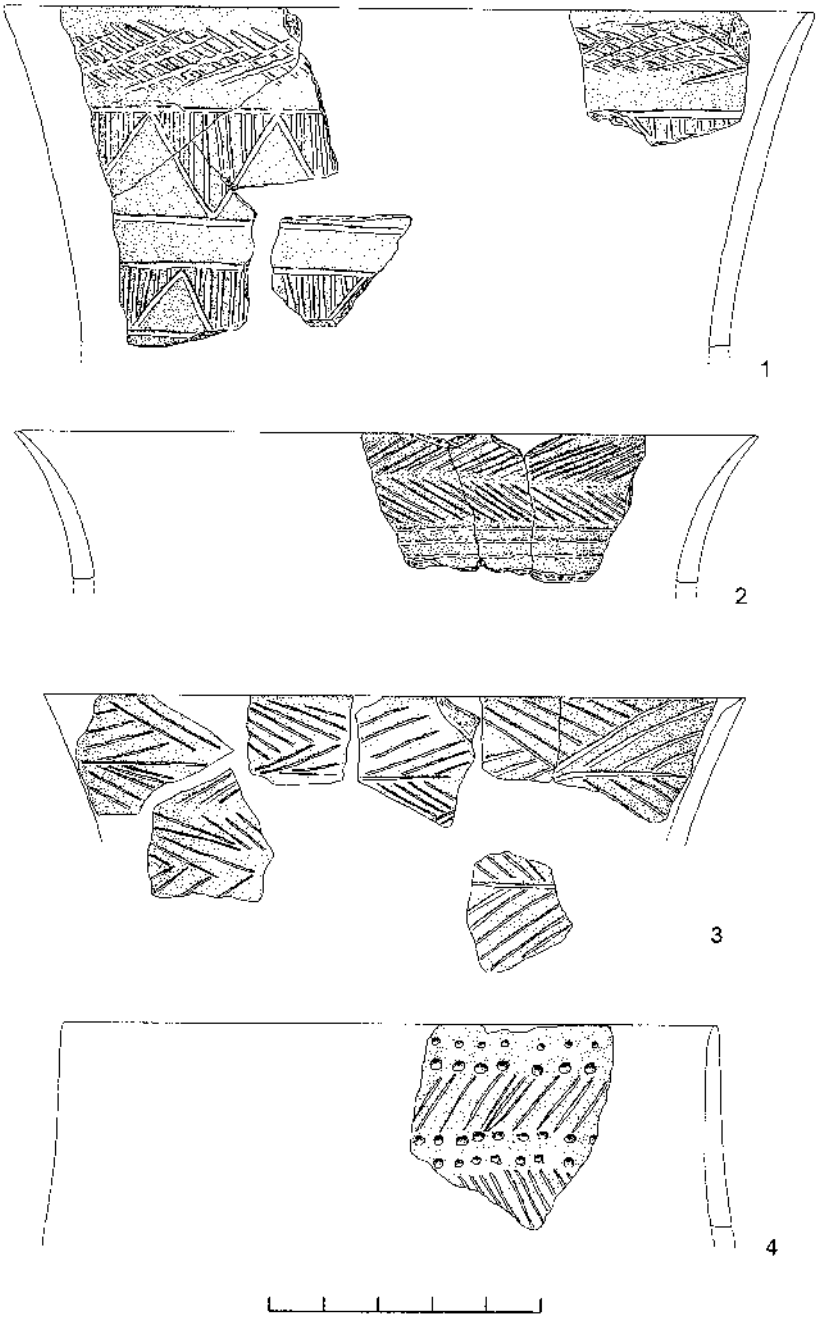


Fig. 4. MDC ceramics from the Western Volhynia territory. 1-4 – Bushcha, Tartak ravine

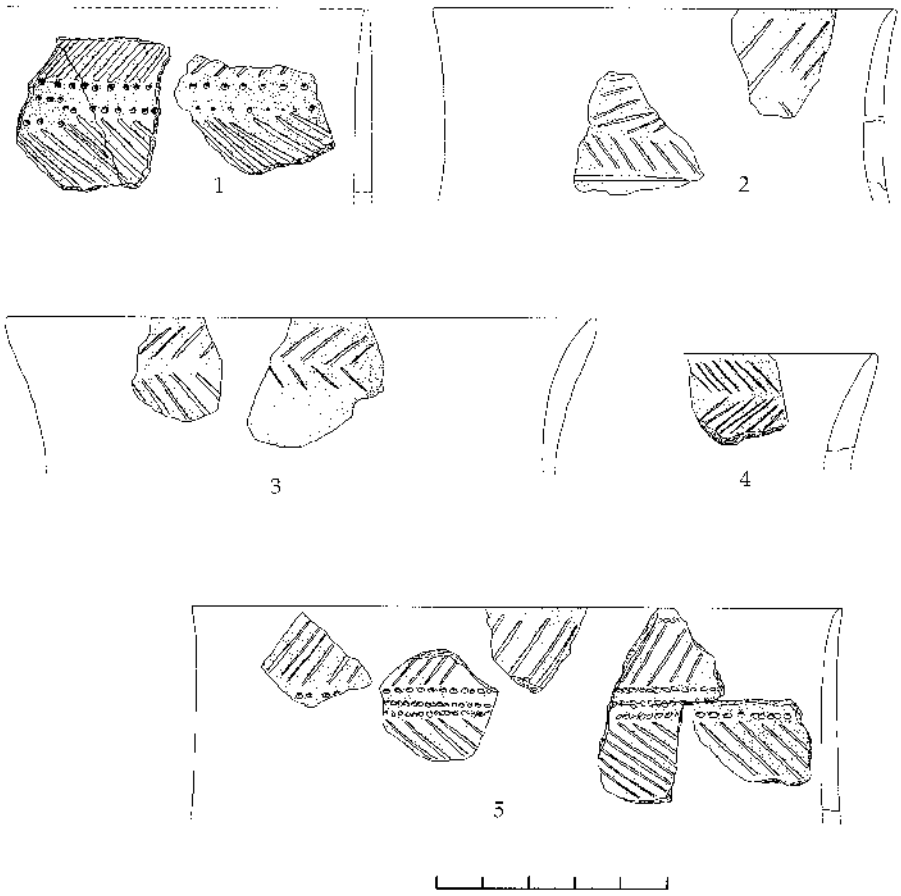


Fig. 5. MDC ceramics from the Western Volhynia territory. 1-5 – Bushcha, Tartak ravine

a certain resemblance to that of the Middle Dnieper area. I.K. Sveshnikov, based on I.I. Artemenko's periodisation of the MDC, mistakenly dated that group to a very early time and regarded it as a source point of the development of the Circum-Carpathian Corded Ware Culture [Sveshnikov 1974: 33-35, Fig. 4]. J. Machnik [Machnik 1979a], based on typological peculiarities of the finds, placed it on the edge between the Corded Ware and the epi-Corded Ware horizons. However, most probably, the group demonstrated one of the versons of the epi-Corded Ware horizon of the monuments.

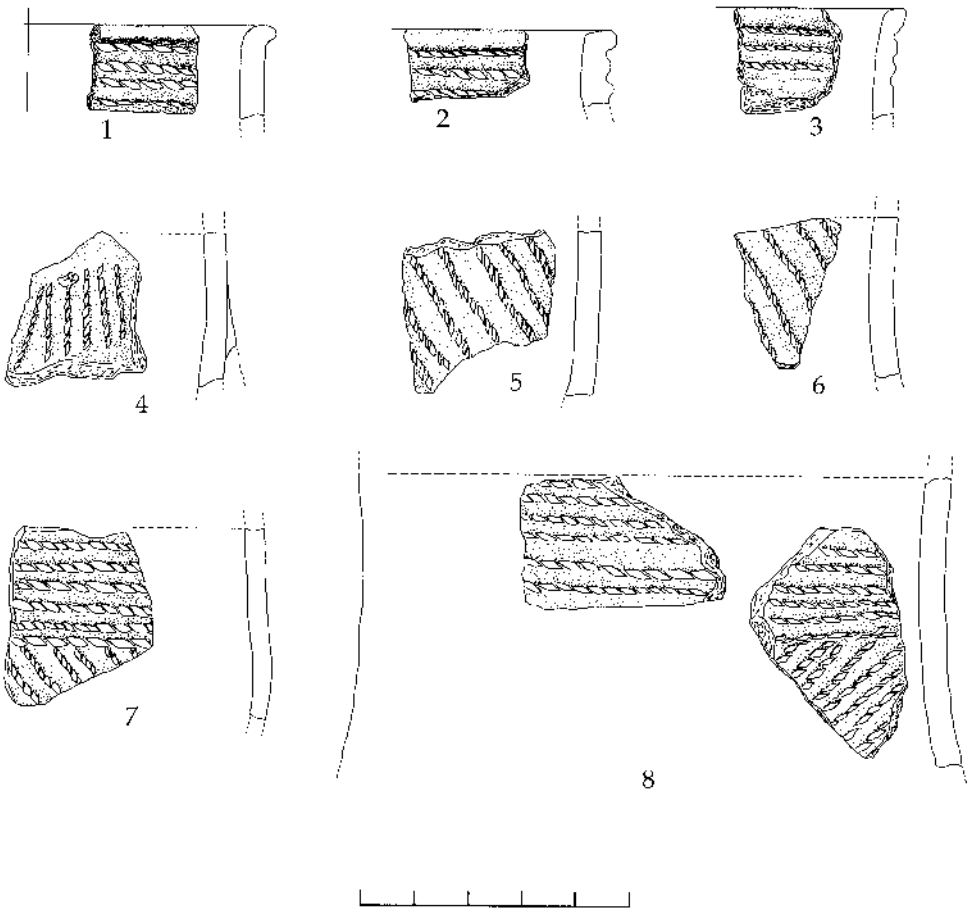


Fig. 6. MDC ceramics from the Western Volhynia territory. 1-8 – Bushcha, Tartak ravine

2. THE TIME AND REASONS FOR MIGRATION OF THE MDC POPULATION

So far there has been no direct reasons – except stratigraphical – to date the MDC materials from Western Volhynia; therefore, they can be generally referred to the second half of 3000 cal. BC. However, if one focuses on typological features of selected samples of pottery, it can be argued that the process started before

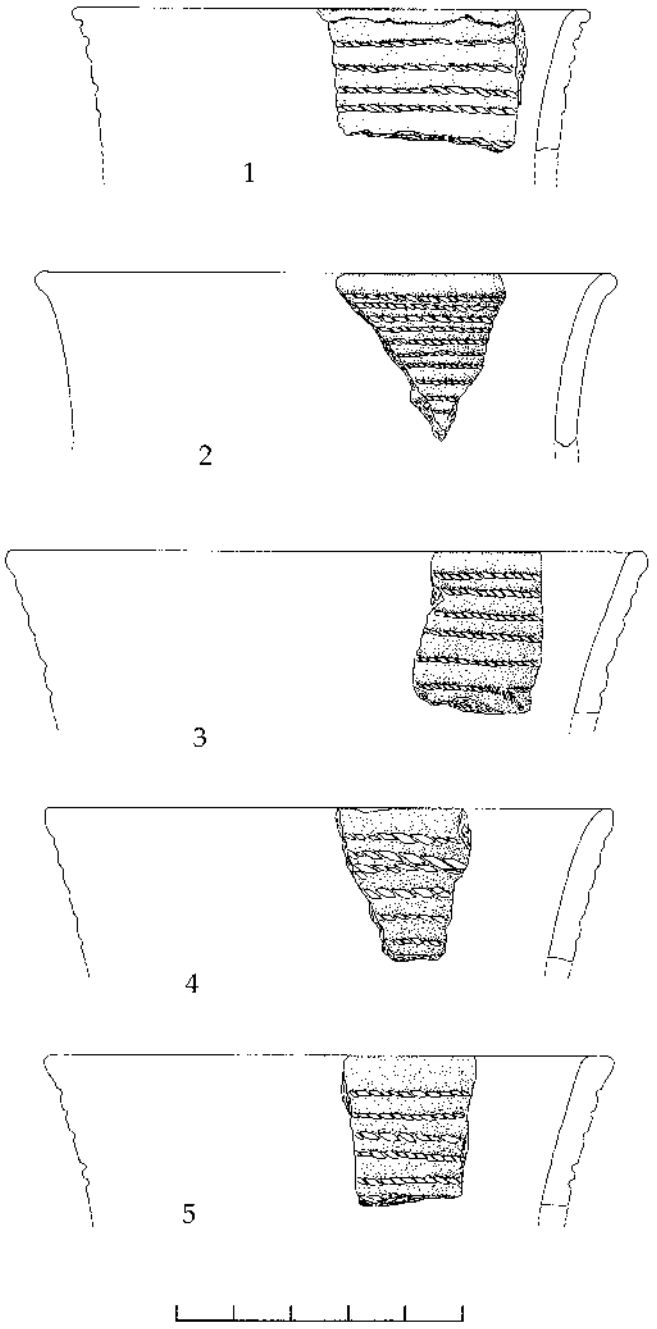


Fig. 7. MDC ceramics from the Western Volhynia territory. 1-5 – Bushcha, Tartak ravine

mid 3000 cal. BC. Here we are referring to the Rozvazh goblets (Fig. 2:7) and particularly the Bushcha find (Fig. 4:1; [compare, e.g., Machnik 1999, Fig. 6:1]), that tend to have prehistoric CWC pottery shapes, while technologically belonging to the MDC. This assumption is not challenged by the dates of some of the MDC interments in the Sokal Mountain ridge [Machnik 1999: Table 1].

At the same time, the most important issue is what made the MDC population migrate westwards? Searching for an answer, let us consider the following. In the Early Bronze Age (based on the Eastern European periodisation system) the Lower Dnieper dwellers were not culturally homogeneous in terms of culture; this trend can be also seen for other epochs. The MDC population shared that territory from the very start with the Yamnaya culture, whose tombs are almost some dozen times more numerous than those of the former. Meanwhile, the Globular Amphorae Culture (GAC) population also sought that territory: the GAC people reached the vicinity of Kiev and crossed the Dnieper [see: Rozdobudko, Yurchenko 2005; Lysenko 2006: 94, Fig. 12-14]. Its legacy, represented by rectangular stamp ornaments on the pottery, became quite noticeable with time, as mentioned briefly by I.L. Serdyukova [Serdyukowa 1996], although we not all of her assumptions are fully shared by these authors. Evidence of the visits of strangers from the western "Corded Ware world" can be seen in individual graves containing the pottery that is not typical for the territory in question [Bunyatyan 2007]. Finally, the Catacomb culture (CC) population makes its way to the Middle Dnieper area. The change was proven first and foremost by the materials found in the settlements.

M.M. Bondar and subsequently I.I. Artemenko, classed them among the MDC. However the issue is not that simple, and it is not surprising that from the very moment of discovery archeologists are divided on their cultural identify, reason being the ceramics.

Actually, the second (following the classification by M.M. Bondar) group of ceramics from those settlements, pieces of goblets and amphorae, could be clearly identified as the MDC. At the (reportedly) fully studied Iskivshchyna settlement they comprised about 10% [Bondar 1974: 34-39, Fig. 12]. Generally, however, in various monuments known mainly due to explorations and occurrence of materials in multiple-time deposits, this indicator fluctuates from a total absence of that group or, on the contrary, its domination. However, the first group represented by fragments of pots and usually more common, is a mixed one. Its major part clearly belongs to the Catacomb culture and tends to be similar to the pottery of the late Catacomb – the Ingul, the Kharkiv – Voronezh and the late Donets – cultures. This fact was recognized by M.M. Bondar [Bondar 1974: 32-33, 38, 46, 169; 1990: 48], although he never made an attempt to provide any explanation. Therefore, his principle argument was confined to the observation that "so far there are no other settlements in the Middle Dnieper area except the Iskivshchyna type that could be linked to the Middle Dnieper Culture" [Bondar 1974: 155]. The simplicity of that

reasoning, inspired by the "one territory – one culture" formula, actually allowed M.M. Bondar to ignore the diversity of the ceramic complex, which on the one hand, clearly displayed samples of pottery of the above cultures, and on the other hand, contained a number of those resulting from interaction of different population groups as well as evolution of the craft of ceramics-making.

We will not go deeply into the complex issue that requires special attention, i.e., a new and complete investigation of the ceramics complex of the settlements and its more careful typologisation in order to identify proper MDC as well as other (Catacomb) cultures' samples and their importance in the "kitchenware" (the first group), as well as building a chronological scheme of changes in the ceramics complex. At some point, this issue had been radically approached by I.L. Serdiukova [Serdyukova 1994]; however, later on she left archaeology. Let us confine ourselves to the fact that proliferation of the CC population to the Middle Dnieper area and, apparently, from various territories (from the south and the east) has been clearly proven. Recently, this fact has been also confirmed by the discovery of Catacomb graves [Klochko, Rychkov 1989; Heyko *et al.* 1999], although they were really scarce compared to the number of domestic objects[2].

It should be noted also that the situation in the Middle Dnieper area changed dramatically at some point, with barrow construction declining, as the Catacomb people were more inclined to bury their dead in the existing (older) barrows, usually in their periphery. This, partially, can explain the small number of catacomb graves in the Middle Dnieper area. Most of the barrows there were studied in the late 19th – early 20th century, when the general practice was to dig the central part of the mound only. In any case, the territory was covered with a rather dense network of settlements, most of which appear to have been (nomad) camps. Therefore, the arrival of the Catacomb people to the Middle Dnieper area coincided with the development of some new economic patterns. This can be clearly seen from traces of the settlements, the density of which can compete with that of the late Trypillia settlements, though the latter were located predominantly in the Right-bank Middle Dnieper (a substantial number of Catacomb settlements have been also known in other territories of the forest-steppe and steppe belts), which was partly noted in descriptions of general rhythms of development of the steppe populations [see Bunyatyan 2003]. The Polissya belt also contained ruined soil-built cremation MDC graves [Telegin, Kruts 1970; Telegin 1972]. Individual soil-based cremation burials with late MDC pottery have been found also further to the east by the Desna River. The result of interaction of two cultural groupings was probably the emergence of graves with the dead buried in the stretched position in pits,

[2] Catacomb tombs were studied in the Cherkasy region (the village of Adamivka), but information about them is quite limited. Their inclusion by M.M. Bondar to the MDC is not based on any grounds, since their pottery is typically Catacomb. In addition, we believe there is no reason to expand the MDC space to the Kirovohrad region inclusive [see: Bondar 1974: 167].

which I.I. Artemenko mistakenly referred to as the initial stage of the MDC, and which were often accompanied with Catacomb-type pottery [Bunyatyan 2005].

Secondly, the areas where the MDC materials are registered to occur with more or less addition of the Catacomb objects, they expand eastwards of the Dnieper where a substantial number of settlements were found along the Trubizh River, and most contained fragments of MDC pottery [Serdyukova 1993; Rozdobudko 2002]. Let us keep in mind that further on, in the Poltava district, late sub-barrow MDC burials were also known [Rudynsky 1928: 40, Table III: 3, 4, 5-7; Suprunenko 1994: 15-17, Fig. 6]. The number of settlements "of the Iskivshchyna type" (i.e. containing mixed materials) grew based on taking into account those included by M.M. Bondar in the Desna River area (most have not been published) There is though a small sketch on this matter [Kurylenko, Bunyatyan 2006]. To the west of the Dnieper they were registered in the Eastern Volhynia, previously occupied by the GAC population.

Most of the MDC tombs in the Middle Dnieper area belong to this period, which is chronologically correlated with the epi-Corded Ware horizon in other territories, for instance with the Gorodok – Zdovbytsya in Western Volhynia (at least with its older period). Similarly, we observe rapid growth in number of settlements compared to the previous period. In other words, the MDC drops out of the circle of other cultures not only because of its original pottery, but also due to its pace of development. In any case, its oldest and individual graves in the territory of Ukraine can be only hypothetically synchronized with general European and classic horizons of the Corded Ware culture (CWC), generally synchronous to the Yamnaya culture. Further on, keeping its face (kurgan burials, clepsydra-like goblets), and undergoing changes (the emergence of settlements, earth graves and different kinds of kitchenware: round-bottomed goblets and cups, bowls, pots, original amphorae), in the new environment it had smoothly flown into the "epi-Corded Ware horizon", which was synchronous to late Catacomb cultures (CC) [Bunyatyan 2005; 2008].

3. IDENTIFICATION OF ANCIENT ROUTES

The east-west direction on the segment between the Middle Dnieper and the upper currents of the Dniester, the Vistula and the Western Bug in the early Bronze Age can be determined by the movements, in different directions, of the GAC and late "Corded Ware" populations to the East, and the MDC population to the West. Taking into account small occurrences of the MDC ceramics in the Volhynia

settlements' layers and in the on-surface collections[3], on the one hand, and the possible broad range of its dating on the other, there seems to be no reason to talk about massive westward migration of the MDC population. It does not appear to be a one-time planned or forced action, but rather as spontaneous movements of individual groups that travelled westwards from time to time in the search for a "better destiny". In the light of those migrations Western Volhynia appears today to be a transit territory, which is indirectly confirmed by the lack of influence of MDC traditions on the GAC and the Gorodok–Zdovbytsia culture.

Apparently, the movement took place about the southern zone of the Polissya. However, somewhere beyond the Horyn' or the Ikva, it had to break into branches, which is visible by the final points of finds of the MDC pottery: the Middle Dniester area (there, in addition to the Kolokolyn and the Komariv barrows one should mention the find of a goblet in the late Trypillya settlement near the village of Koshylivtsi [Sveshnikov 1974: 59, Fig. 14: 6] and the upper currents of the Dniester, Vistula and the Western Bug rivers.

It is hard to say whether that direction of movements coincided with the exchange routes. Let us only remind of a bronze adornment treasure from Kiev [Movsha 1957] and point to two maces found to the north of the town of Korosten [Mykhalchyshyn 1993: 23, Fig. 3:22-23].

At the same time, our attention has been caught by the northward – outreaching points grouped together along the Horyn' and the Sluch rivers, i.e., in the meridional direction. While taking note of this, we are unable to answer the question of what is marked by these points: a branch of already indicated direction of movements from the Middle Dnieper area, which turned to the left, or the movement of a totally different MDC population, in particular, from the vast Upper Dnieper area, which turned to Volhynia at this point. What is noteworthy in this respect? Like the latitudal direction of movement (the Bovsuny and Ignatpol maces), this one is also marked with a mace from the village of Rudnya of the Volodymyrets district, the Rivne region. Its was noticed under the scoop of a power-shovel in the sand extraction process by the village dwellers, together with bones and other objects, including a stone axe and a flint spear (Fig. 8). However, we would not dare argue that the complex was a monolithic one – both because of the circumstances of the finding and because of the nature of the monument. It is in fact a dune, on which settlements and burial sites had been made from the Neolithic Age to the late Bronze Age and further onwards. The mace was decorated with a very delicate (barely visible) herring-bone pattern, which resembles ornamentation of the MDC ceramics. Therefore, there is a temptation to regard it as belonging to that culture. On the other bank of the Prypiat river (the territory of Belarus) "ornamented" maces (B3 type) were identified by A. Kośko [Kośko 2002: Fig. 4.2; 10.2; 13]. The

[3] H.V. Okhrimenko mentioned briefly that MDC burial and hut were found in Osova (the Nakoty and Krynychka II ravines); however, we do not have proven information about that.

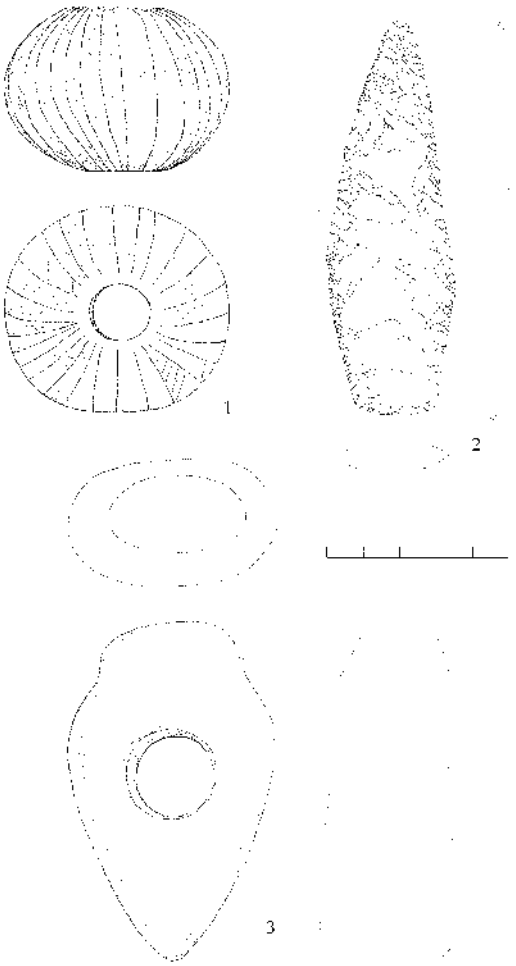


Fig. 8. Finds from the village of Rudnya (1, 3 – stone, 2 – flint)

maces, found in the "migration ways", probably had been the insignia of individuals that had lead the movement of their communities, which does not exclude their involvement in control over the exchange.

Another direction of connections, which united totally different worlds, became rather significant for that period. The direction of interests of the steppe population to the forest-steppe space and interaction of the two communities, the MDC and the CC ones, was reflected also in the monuments of the steppe belt. The MDC goblets

were found in graves of the Ingul CC with stretched skeletons in barrows along the Ingul River (the left tributary of the Southern Bug, the Mykolayiv region). Here we refer to grave 24 in barrow 2 near the village of Starohorozhene [Shaposhnikova *et al.* 1977: 133-134, Fig. 18]. A more representative goblet comes from grave 15 in barrow 3 near the village of Mayorovka (excavations by I.M. Sharafutdinova). In both cases the MDC minor vessels had been placed inside the CC pots. Typologically they are late; therefore, indirectly they work against the researchers who are inclined to limit the MDC only to the CC (i.e., the "epi-Corded Ware") period.

It is rather strange to find MDC pottery in areas so distant and alien environmentally and culturally, given the low prestige and significance of this category of objects. However, nevertheless, they fully fit one of the "exchange routes", the Ingul one, marked by A. Kośko, based on the mapping of stone maces, the route that had led to the Middle Dnieper [Kośko 2002: Fig. 22][4]. A mace was also present in a rather "rich" burial set in Mayorivka. Another mace was found also in an Ingul CC grave up the Ingul flow in the Kirovohrad region in the village of Sofiivka (excavations by M.P. Tupchiyenko). Given the above, the emergence of the MDC goblets in the Ingul area can hardly be seen as accidental. Possibly, they in fact symbolized a role of certain individuals in long-distance exchanges.

Importantly, further to the north east, towards the Dnieper, the Ingul route was marked with a double grave of the Ingul CC in a barrow near the village of Golovkivka (upper flow of the Ingulets river, the Kirovohrad region). It did not contain a mace but was marked with other signs of prestige: three vessels (two of them wooden), a bronze knife and which is particularly important, the head of one of the dead was crowned with a diadem made of bronze wire, with its ends wound in spirals – a unique object for the territory of Ukraine [Polin *et al.* 1992: 21-22, Fig. 22-23].

The barrows near Holovkivka and neighbouring villages at the Right-bank Dnieper area are the most northern major groups of CC graves: 90 graves in 30 barrows. Eight of them (about 9%) contained stone axes, which is a high proportion compared to other regions (for example, only two out of 132 CC graves in the vicinity of Ordzhonikidze town of the Dnipropetrovsk region contained axes) [Bunyatyan *et al.* 2006: 38]. The hafts of two of the axes, at the eye level, were "inlayed" with bronze radially positioned wedge-shaped plates [Polin *et al.* 1994: 28-29, 33-34, Fig. 43; 51:1], which gives them a certain "parade" look. The same details in the form of small bronze nails or radially positioned plates were also discovered on some maces in CC graves [Androsov *et al.* 1990: Fig. 5:5; Sorokina 2004: 161, Table 3:7, 8]. Furthermore, a grave of the Ingul CC, also containing a mace, was found lower down the Ingul flow, in the village of Zeleny Hay of the Dnipropetrovsk region [Kovaleva et. al. 2003: 60-62, Fig. 21:6-8].

[4] Meanwhile, let us add that a mace rare for Ukraine, cross-shaped and decorated with grooves, was found in the Ingul area (the village of Vynohradivka) in a grave of the Yamnaya culture, which is not typically rich in finds of maces [Fomenko *et al.* 1987]. However, it may mark a different direction of exchange relations.

Therefore, CC graves in the vicinity of Holovkivka and the neighbouring villages, often also marked with other indications of prestige, appear to lock up the Ingul way. Probably, they were left by a population group that controlled the crossroads of the exchange routes, including those between the two worlds – the southern, purely Catacomb one, and the northern, mixed MDC/Catacomb one.

Further northwards, as mentioned above, there are few known Catacomb culture graves, which possibly is a result of the excavation methodology applied. However, a certain social priority of "the Catacomb people" here is demonstrated by a rather significant proliferation of maces [Sorokina 2004]. Although the finds were made at random and their cultural attribution met certain difficulties, their connection primarily with the CC is obvious, for it is the interments of that culture that contain maces, most frequently on the background of a previous or a successor culture. Let us quote some statistics. A mace was found in only one out of more than 1,800 graves of the Yamnaya culture of the North-Western Black Sea area [Ivanova 2001: 80, Fig. 16:7]; one mace was found in about 1,500 graves in the area between the Southern Bug and Ingul rivers – in the aforementioned village of Vynohradivka [Shaposhnikova *et al.* 1986: 11, 47]. Moreover, in both of the regions they were found in the CC graves. In the North-Eastern Azov area no maces were found in the Yamnaya graves (108 all in all), while three maces were found in three out of 166 graves of the Catacomb culture [Sanzharov 2001: Fig. 35:12, 43: 5, 6]. The same phenomenon can be observed in the northern part of the Left-Bank steppe (the area between the Oril and Samara rivers): none of the 493 graves of the Yamnaya culture contained maces [Kovaleva 1984], while five out of 404 graves of the Catacomb culture had them [Kovaleva 1983: 42, Fig. 10]. Such finds become very rare again in the subsequent period. Maces were found only in four out of the whole range of graves (3708) of the Babyno culture, i.e., the Mnogovalikovoy Pottery Culture, according to P.O. Lytvynenko (manuscript of doctoral thesis).

4. CONCLUSIONS

The communities dwelling in the territory of Ukraine in the 2nd half of 3000 BC demonstrated notable dynamism in their efforts to go beyond their principle spaces and explore new ones. The reasons for that were probably the desire to break away from the traditional and rather one-sided cattle-breeding model of economy and move on to a more harmonious complex one. That focused attention on the Middle Dnieper area, the most suitable regions for implementation of such ambitions in those times. This occurred probably by the time the territory, once devastated by the

Tripolye people who had burnt down its forests, naturally restored its capacity. After about 400-500 years of domination of cattle-breeding tribes, that "barrow country" was covered once again with a dense network of settlements.

The main (and not completely understood) activity in the area was demonstrated at that time by the CC population. Its certain level of aggressiveness is reflected in the weaponry cult represented in the burial rite. However, there is an interesting detail; those strangers (which appears to be the CC place in the Upper Black Sea region) managed to assimilate the numerous populations of the Yamnaya culture. Instead, the MDC population of the Middle Dnieper area, which the Catacomb population could possibly have overpowered, still managed to keep their certain distinctiveness. The secret of that lay possibly in the fact that they belonged to absolutely different ethnic, linguistic and ritual worlds. Each of those groups, being a periphery of its own world, seem to have fed on it; the MDC population from its "brothers" from the Polissya belt, and the CC people from the groups of its vast community.

Possibly the differences in language and ideological systems, given the domination of the Catacomb people, had forced groups of the MDC population to leave once they gained their motherland and disperse in various vast areas, for instance, in Volhynia and beyond. Latitudal migrations in that direction were caused not only by the usual natural conditions but also by the fact that the southward way was practically closed.

The western direction of movements of the MDC population from the Middle – and possibly, also the Upper – Dnieper area was identified by the locations containing finds of ceramics in the territory of Volhynia. It is not unlikely that in such a case the directions of migrations partly coincided with the exchange routes by means of which information about the world around them has been passed across since long before. As to other long-distance exchange routes outlined by researchers, at least one of them, the Ingul route, has been apparently confirmed. However, this issue requires more thorough work on the sources. The hope to find such ways is inspired, among other things, by a certain coincidence in the localization of "special" finds belonging to cultures of different times but on the same territories.

Translated by Inna Pidluska

Baltic-Pontic Studies
vol. 14: 2009, 269-301
PL ISSN 1231-0344

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THE SOCIETIES OF CORDED WARE CULTURES AND THOSE OF BLACK SEA STEPPES (YAMNAYA AND CATACOMB GRAVE CULTURES) IN THE ROUTE NETWORK BETWEEN THE BALTIC AND BLACK SEAS

Suggested in the title, the hypothetical 'Corded-Yamnaya/Catacomb' route community should be taken to be a stage in the sequence of broader early agrarian developments in the chorography of lands stretching between the Seas. What is important is the context of a mental map (mental chorography), i.e. a mental image of neighbouring territories, specifically their natural and optimal network of routes and diversified adaptive potentials.

1. THE BEGINNINGS OF MENTAL CHOROGRAPHY OF LANDS BETWEEN THE BALTIC AND BLACK SEAS

From the point of view of Neolithic culture societies settling the central European plains, early forays into adjacent territories belonging to the Black Sea drainage basin must have taken place in the early second half of the 6th millennium BC. Reconnaissance parties set out from the settlement centres of the Linear Pottery culture located in the borderland between the Lublin and Volhynia uplands. Linear colonization covered then the border between the forest-steppe and taiga, reaching as far as the Dnieper valley (Vita-Poshtova 2), and – slightly later – encompassed the lands on the Dniester or perhaps even the drainage basin of the upper Boh (Southern Bug) River, i.e. areas that had been densely settled by the Boh-Dniester culture [Kozłowski J.K. 1985; Kadrow, Zakościelna 2000; Gaskevich 2001: Fig. 1] (Fig. 1). The process was continued by the societies of post-linear cultures: the Malice culture (after 4800 BC) and Lublin-Volhynia culture (after 4200 BC). In connection with the process, another intrusion can be observed: that

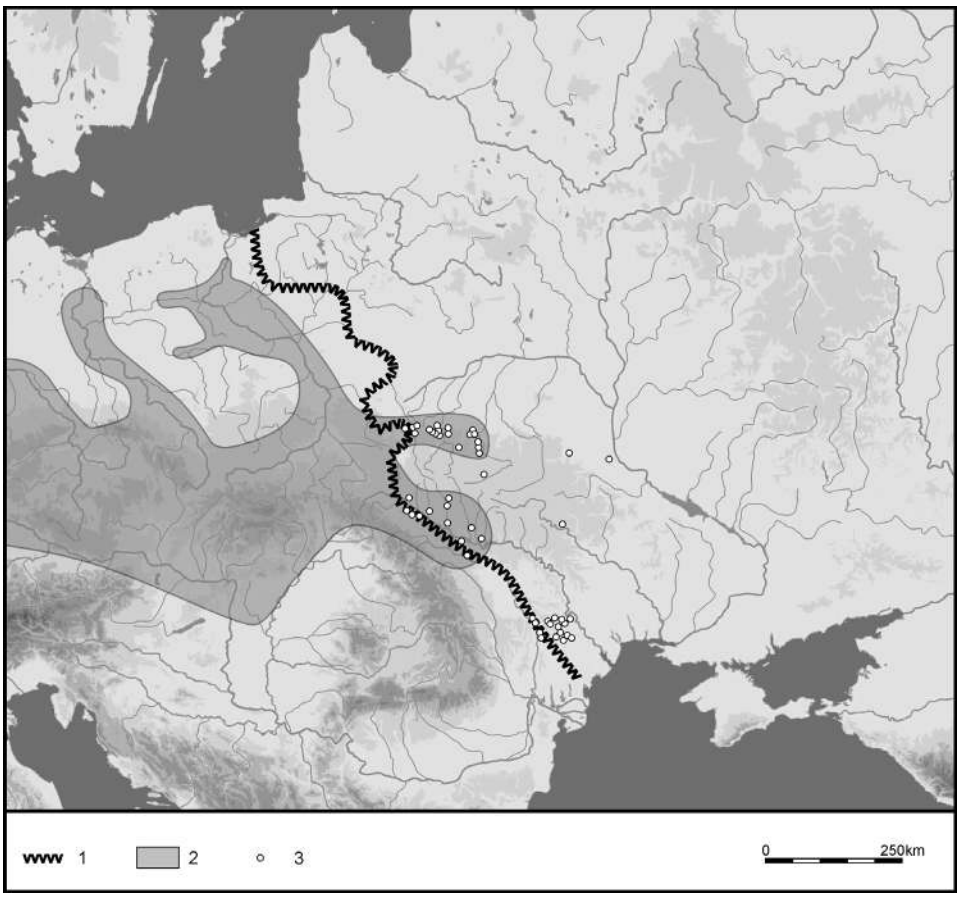

Fig. 1. 'Pontic' routes of migrations by Linear-Pottery culture societies. Legend: 1 – physiographic frontier between the West and East of Europe; 2 – oecumene of the Linear-Incised Pottery culture; 3 – 'Linear' settlement points in the eastern European portion of the Black Sea drainage basin

by the groups of the Funnel Beaker culture (FBC) [Pelisiak 2007: Fig. 2; Kośko, Szmyt..., in this volume]. What was novel about it was the colonizers' point of departure. They initiated a new perspective – a 'Lowland' one – in the development of the chorography of lands between the Seas. It was there that 'funnel' colonizers of the western frontier of the Black Sea basin came from (from 3600/3500 BC) (Fig. 2).

Analogous forays into the Baltic drainage basin by eastern European early-agra--rian societies precede the processes mentioned above. An interesting mental map of the Vistula drainage was developed by Pontic settlers, who had limited knowledge of animal breeding, of the Late Mesolithic Janisławice-Rudoy Ostrov cultural circle

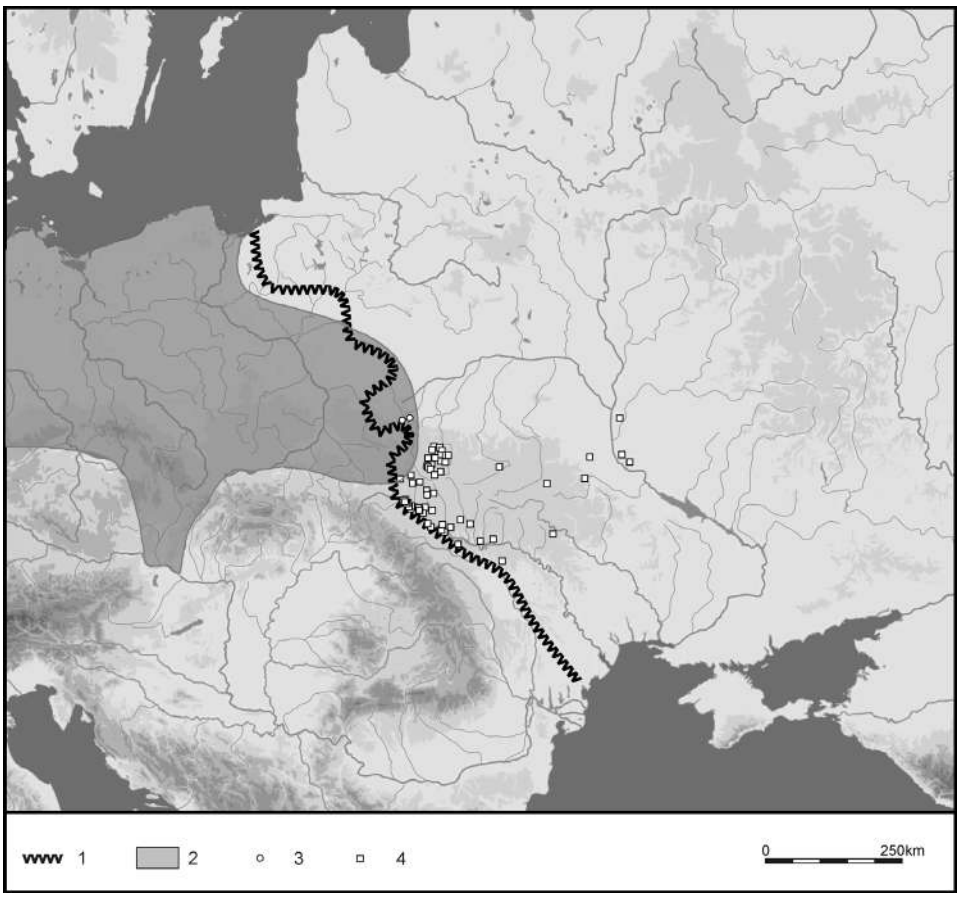

Fig. 2. 'Pontic' routes of migrations/influences by Funnel Beaker culture societies. 1 – physiographic frontier between the West and East of Europe; 2 – Funnel Beaker culture oecumene; 3 – 'upland settlements' in Gródek Nadbużny and Zimne; 4 – 'Beaker' settlement points (or 'impact/imports') in the eastern European portion of the Black Sea drainage basin [Pelisiak 2007; Kośko, Szmyt. . . , in this volume]

towards the end of the 7th millennium BC [Kozłowski S.K. 1985; Domańska 1990] (Fig. 3). However, the process was not continued in the 6th and 5th millennia BC. Neither is it possible to precisely assess its generative significance for the development of Linear colonization routes of the Dniester or Boh drainages. However, we adopt a hypothesis here that such a relationship is very likely [cf. Czerniak 1994: 11ff]. The experience of 'Janisławice' chorography was taken up only by Late Neolithic settlers in the middle of the 4th millennium BC. Specifically, they belonged to phase C of the Tripolye culture (TC) and reached the upper Bug drainage (Slavuta) [Kruts, Ryzhov 2000: Fig.1] (Fig. 4).

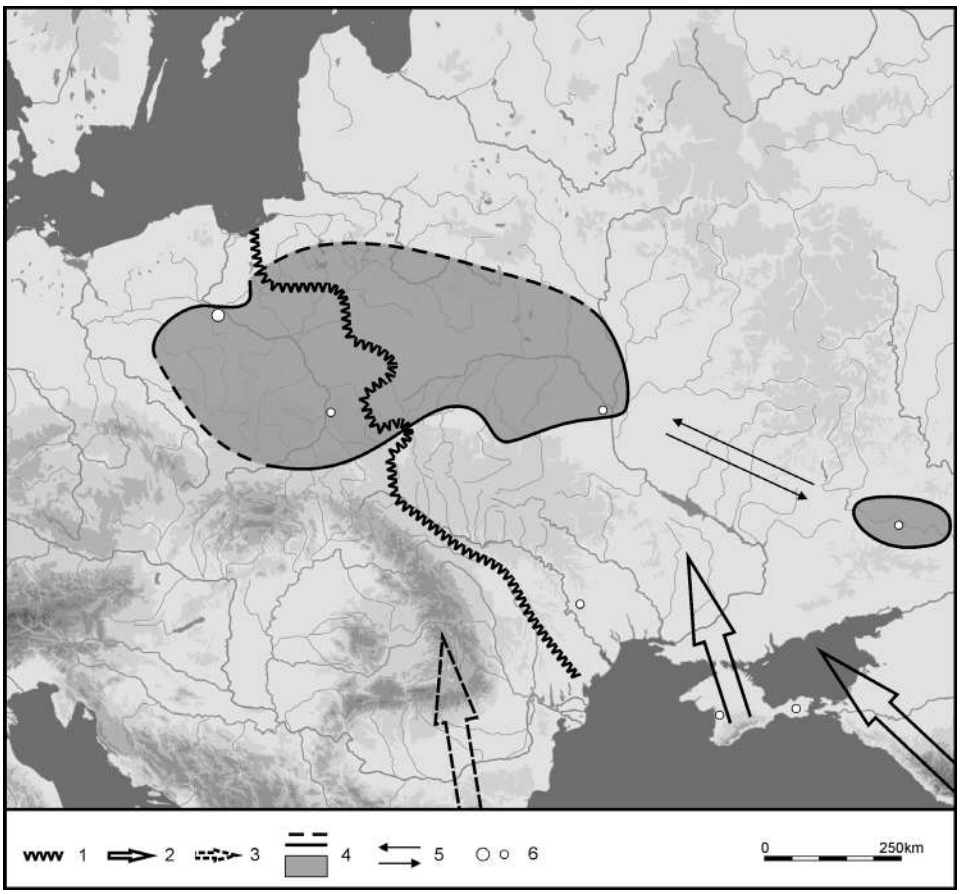

Fig. 3. Distribution map of Late Mesolithic societies of the Janisławice-Rudoy Ostrov circle. Legend: 1 – physiographic frontier between the West and East of Europe; 2 – directions of Caucasus-Black Sea Neolithization; 3 – direction of Anatolia-Balkans Neolithization; 4 – range of Janisławice-Rudoy Ostrov circle; 5 – direction of cultural information circulation within the Janisławice-Rudoy Ostrov circle; 6 – Dęby type inserts [Domańska 1990]

When compared, in the reconnaissance actions prior to the 3rd millennium BC, the societies inhabiting the Baltic drainage basin were more active. They had then extensive knowledge of natural routes in the Black Sea basin and – especially in the 4th millennium BC – of Pontic raw material deposits.

The reasons why early agrarian societies mapped out colonization routes should be looked for above all in an effort to satisfy their economic needs: to expand traditional central European zones/enclaves of adaptation to the environment.

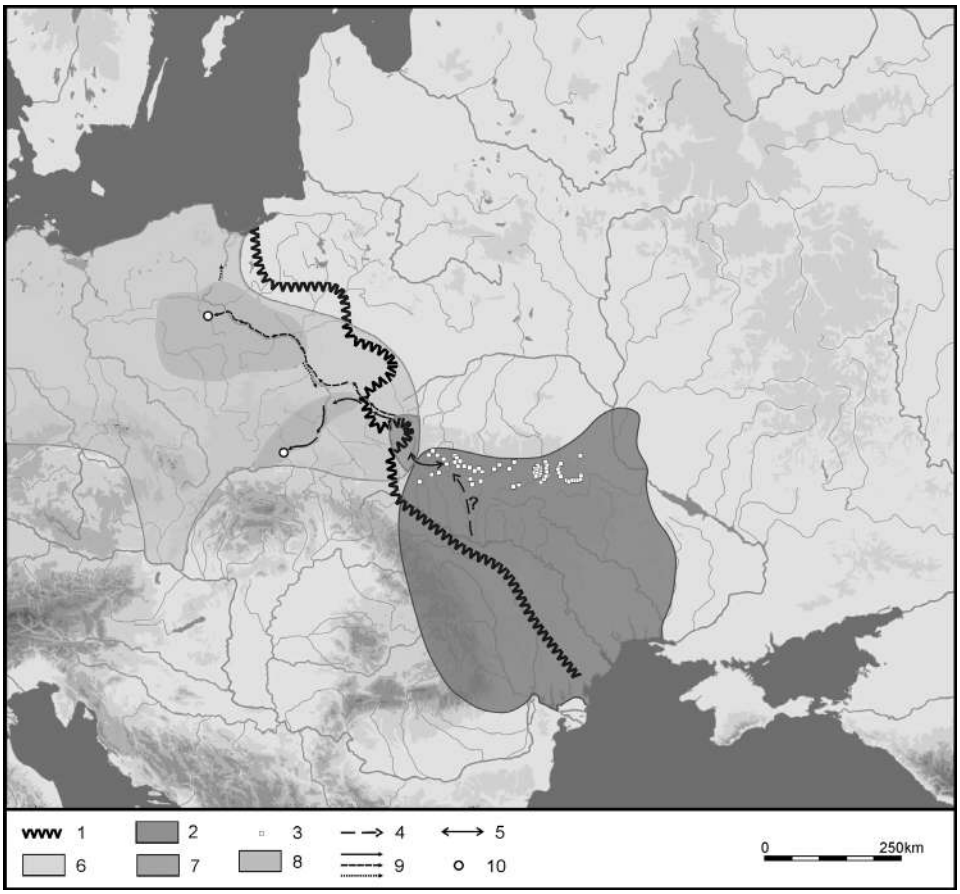

Fig. 4. Routes of influence by Tripolye culture societies on the Baltic. Legend: 1 – physiographic frontier between the West and East of Europe; 2 – Tripolye culture oecumene; 3 – settlement points of Gorodsk-Volhynia group; 4-5 – western migration routes of 'Tripolye' societies; 6 – Funnel Beaker culture oecumene; 7-8 – areas of Tripolye impact on the cultural environments of the Vistula and Oder drainages (showing intensity degrees); 9 – routes of Tripolye influences; 10 – reception centres of Tripolye culture influences [Kośko 1981; Kruts, Ryzhov 2000]

2. A WATERSHED: EXODUS BY THE SOCIETIES OF THE GLOBULAR AMPHORA CULTURE

The appearance of Globular Amphora culture (GAC) societies on Black Sea steppes in the early 3rd millennium BC is a watershed between reconnaissance missions, launched as part of an egalitarian colonization strategy (by early agrarian

societies), and organized long-distance migration programmes, being an expression of the needs of elites. The latter were formed on an inter-regional scale generally in the period of transition between the Neolithic/Eneolithic and the Bronze Age. One of such programmes could have been the participation of GAC populations in the distribution of raw materials or prestige objects: banded flint or amber and perhaps glass products, too [Żuławka 1 on the middle Noteć River, ca. 2550-2450 BC: Rola 2006: 114, footnote 14]. Additional factors, on which the expanded range of such programmes depended, were technical transportation innovations closely connected to the 3rd millennium BC, namely the wagon (with a team of oxen), roads [Rola 2006: 112ff] and the horse.

GAC settlers on the Black Sea (identified as the culture's eastern group) formed a vigorous long-distance structure for the circulation of cultural patterns in which three subsystems or route foundations can be distinguished. These are Volhynia, Podolia and Siret (Moldavian) subsystems (Fig. 5). The structure was used for about 500 years from the 30th to 25/24th century BC [Szmyt 1999a; 2001; 2004b; Mihăilescu-Bîrliba, Szmyt 2003] and left in its wake Pontic elements assimilated by societies inhabiting the Lowlands on the Vistula River. Among these elements are adaptations of the funerary rite of the horse [Kośko, Szmyt 2004b: 110ff]. Some inspiration can be drawn as well from the hypothesis about an early reception of niche grave structures by the Złota culture mediated by GAC settlers from Black Sea steppes [Włodarczak 2006: 159]; however, there is no convincing evidence of their contacts with Black Sea communities applying a given type of funerary rite, e.g. the Ingul group of the Catacomb culture (CC) (see section 3).

3. THE RANGE OF CHRONOLOGICAL AND SPATIAL COHABITATION OF POPULATIONS OF THE GLOBULAR AMPHORA, CORDED WARE, YAMNAYA AND CATACOMB CULTURES BETWEEN THE BALTIC AND BLACK SEAS

In what follows we rely on the conception of parallel development – in the 3rd millennium BC – of all the cultural communities named in the title of this section. A joint consideration of the Yamnaya culture (YC) and the CC is exclusively motivated by the current state of exploration of these 'Pontic traditions' in the Baltic drainage basin.

* The relationships between the GAC and Corded Ware culture (CWC) vary greatly from region to region; nonetheless, it is possible to devise a general simplified division into the Lowlands manifestations of cohabitation and Old Uplands evidence of development in opposition to one another [Szmyt 1999a]. Because of the

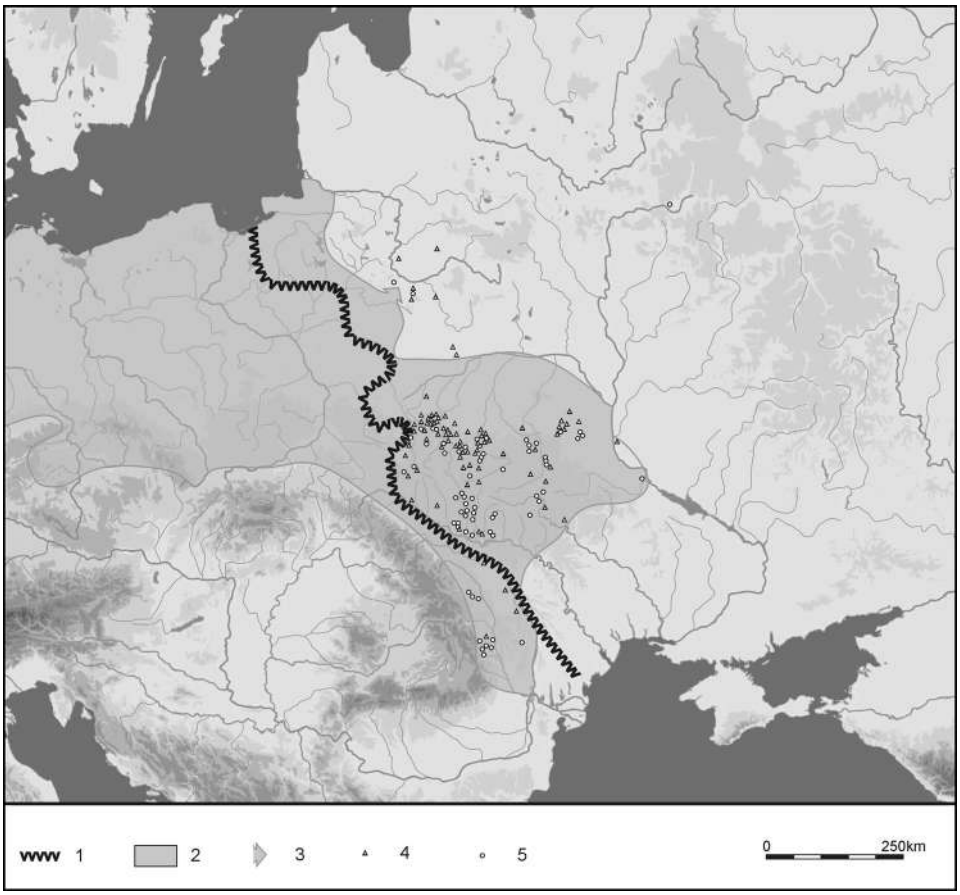

Fig. 5. Routes of 'Pontic' exodus of Globular Amphora culture societies. Legend: 1 – physiographic frontier between the West and East of Europe; 2 – Globular Amphora culture oecumene; 3 – route leading to the taiga; 4-5 – settlement points (graves, settlements, loose finds) in forest-steppe and steppe zones [Szmyt 1999a; 2001; 2004b]

problems discussed here, we focus on the latter model of relationships. In J. Machnik's approach [Machnik 2004: 139], observations made on Małopolska loess soils justify a conclusion about an initial sharp distinction between the oecumenes of the GAC and CWC whose communities developed contemporaneously (GAC, eastern group: 3000-2500/2300 BC – see section 1; CWC: 2800-2300/2200 BC [Włodarczak 2006: 127]). On western Małopolska loess uplands, their cohabitation can be seen first in the vicinity of Sandomierz ('Złota phenomenon') and in a macrospatial version, after ca. 2700 BC, as part of the processes leading to the formation of the

Kraków-Sandomierz group of the CWC (phase II) [Włodarczak 2006: 159]. In his latest approach to the problem – considered against the background of migration barriers – J. Machnik presents a view that CWC migrations across the frontier between the west and east of Europe were made possible by the weakening of settlement and undermining of the GAC social structures [Machnik 2006: 35]. It should be remembered, keeping in mind earlier findings, that in this approach the prologue of penetration of the Małopolska CWC by Black Sea populations should be associated with the time around the middle of the 3rd millennium BC (phase IIIA: 2550-2450 BC) [Włodarczak 2006: 126-127; cf. Szmyt..., in this volume].

* The studies of development of the relationships of the GAC and the cultures of Black Sea steppes – YC and CC – favour the former 'steppe' taxon [Szmyt 1999a: 142ff; 2001: 192], whereas the evidence of contacts between the GAC and CC (2800-2100/1900 BC) [Telegin *et al.* 2003; Ślusarska 2006] is debatable and may refer to the effects of contacts mediated by the YC or MDC [Serdyukova 1996; Szmyt 1999a: 164-165; Krywalcewicz 2007: 95-97]. 'Globular amphora' traditions are present within the loess (Kiev) group of the CC, known by the name of the Iskovshchina type, where they could come along the Volhynia route. More specifically, this concept concerns syncretic settlement materials from the middle Dniester area, identified also – in an earlier version – with the MDC [Serdyukova 1996: 149ff]. Unavailability of detailed analyses makes is hard to be more specific about the time of the hypothetical contact; it can be claimed, however, that what we see here might be recessive forms of the Pontic exodus of the GAC, taking place ca. 2500/2300 BC. No clear manifestations of the cohabitation between the GAC and the Ingul group of the CC (Ingul culture) have been recorded (we ignore here the evidence of the presence of GAC traditions on the Sea of Azov, reaching the area possibly along the Dnieper route [Szmyt 1999a: Fig. 27]). No evidence of cohabitation of the GAC with the communities of the western reaches of the latter culture have been found, either [see Toschev 1991].

* In the relationships of the CWC with the YC/CC [Pustovalov 1994 – YC/CC cohabitation; Telegin *et al.* 2003], the routes of 'globular amphora' societies are continued, however – at least so far – they are hard to identify archaeologically [see Machnik 2003; Bunyatyan 2007]. This applies specifically to the Volhynia and Podolia (Dniester) routes; there is no evidence, however, of the continuation of the Siret route. Here, we shall focus in particular on its Volhynia-Podolia variant, seen as part of a broader structure: Baltic – Bug – Boh (Southern Bug) – Black Sea.

The approach taken here attempts to indicate a spatial framework for a two-way circulation of Corded and Yamnaya/Catacomb patterns (see sections 4 and 6). So far, source evidence of such contacts has been searched for among exogenous artefacts – imports – being chiefly single finds or grave-goods. Only rarely has any such evidence been found in settlement assemblages [see 'Caucasus' pins: Machnik 1979b: 366]. Far more evidence of this kind has been provided by funerary rites: in Yamnaya

[Kośko, Kločko 1991: 129ff; Kośko 1991; 1992; see Włodarczak 2006: 50ff] and Catacomb/niche designs of grave chambers [Włodarczak 2006: 50ff, 59; Ślusarska 2006: 133-135], and circular barrow mounds [recently Włodarczak 2006: 157].

4. MARKERS OF A HYPOTHETICAL ROUTE COMMUNITY OF CORDED WARE, YAMNAYA AND CATACOMB CULTURES

Referring to the earlier discussions of cohabitation, it is possible to distinguish two groups of source evidence seen as markers of migration or routes followed by migrants: **(a)** occasional objects, chiefly of an insignia type, and **(b)** traits of funerary rites. In the present assessment of the extent of borrowings – due to the state of research – we limit the discussion of reception of the stylistic characteristics of pottery (for an exception see CC 'ornamental baroque'). The analysis covers areas believed to have diagnostic characteristics with respect to long-distance contacts along the routes studied here:

- Lowland (Lower Vistula) and Old Upland (Małopolska, Volhynia) CWC ones, and
- Ingul (Podolia, Zaporozhye region, Black Sea steppes) and, selectively, Donets--Don CC ones.

More importantly, the quality of recording of relevant sources varies greatly on the individual segments of a hypothetical route (e.g. excellent specification and taxonomic processing of group 'a' markers on the upper Bug River, in the former Chełm region [Bronicki 1991]). Keeping this in mind, in 2003 and 2007, a project was completed whereby museums located on selected fragments of a route were searched for relevant evidence. The project covered, on the Polish side of the border, the Pomerania, Łódź and Mazovia regions as well as parts of the Cuiavia-Pomerania region. On the Ukrainian side, the project covered both museums and para-museum collections (remembrance halls, school collections) as well as private holdings from the regions of Vinnytsia and Volhynia (Fig. 6).

An effort was made to explore two-way circulation of 'imports' or, more broadly, cultural patterns:

(a) YC/CC markers ('Yamnaya and Catacomb traditions') in the Vistula zone of the CWC (routes/regions in the drainages of the Bug, Wieprz and middle and lower Vistula rivers), and

(b) CWC markers (corded and post-corded traditions), more broadly, Late Neolithic and Circum-Baltic ones, in the zone of Ingul and Donets-Don groups of the CC (with extending the search to include not only the Ingul area but also the whole Boh drainage).

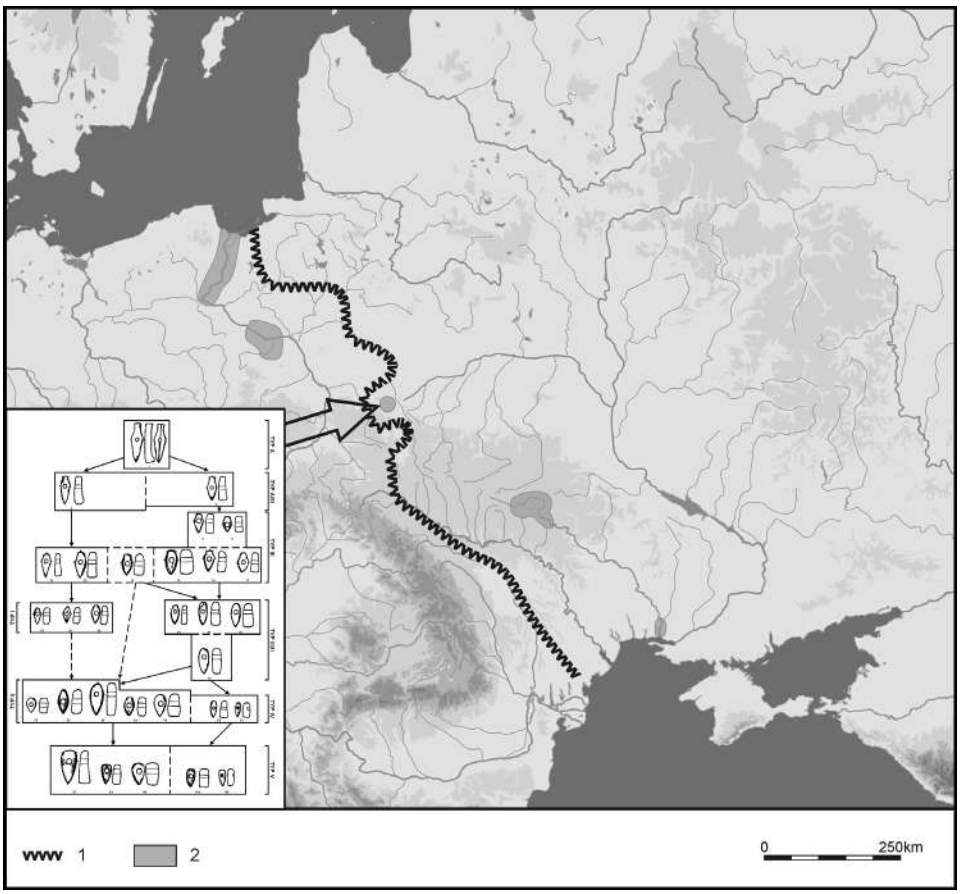

Fig. 6. Areas of museum searches and a list of types from the former Chełm region [foll. Bronicki 1991]. Legend: 1 – physiographic frontier between the West and East of Europe; 2 – areas covered by museum searches

The list of markers presented below must be treated as highly preliminary and purposefully restricted as far as comparative analysis of pottery is concerned (making up for this deficiency should be regarded as an urgent task for the future). **(a)** The basic list of 'Yamnaya-Catacomb' traits in the Baltic drainage basin is made up of **(aa)** pit- and catacomb/niche-graves or 'Pontic' traits of funerary structures; **(ab)** highly controversial, topogenetically 'Strzyżów' complex of reception signs of production patterns typical of the Donets Basin and Caucasus centres of metallurgy and glass-making, and single finds of insignia-type forms; the latter include **(ac)** 'Catacomb' axes (or their local imitations), mainly stone, but also metal ones, or **(ad)** fluted maces.

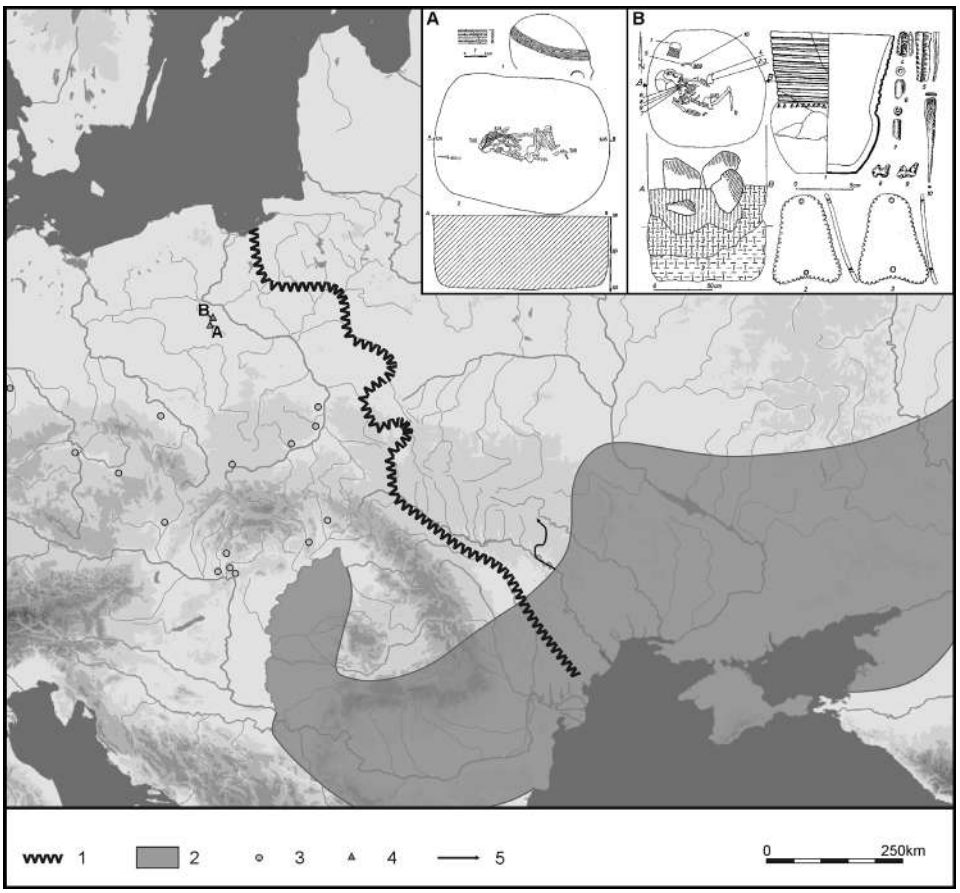

Fig. 7. Routes of Baltic influences of Yamnaya culture societies. Legend: 1 – physiographic frontier between the West and East of Europe; 2 – Yamnaya culture oecumene; 3 – graves with the so-called 'frog-like' skeleton arrangement; 4 – Late Neolithic graves on the Polish Lowlands showing 'Yamanya' ritual characteristics (A – Bożejewice 8; B – Krusza Zamkowa 3); 5 – hypothetical route following Dniester – Boh – Bug. . . ? [Batora 2006: Fig. 134, as amended by authors; Kośko, Kločko 1991; Kośko 1992]

The list is supplemented by occasional finds: Black Sea traits/artefacts unearthed within ritual, settlement (**ae** – Łasin) and funerary (**af** – Bożejewice 8; **ag** – Biskupiec, Gromowo) features.

aa. In the Neolithic of the Vistula drainage, there are no prototypes (genetic inspirations) of 'Yamnaya' designs of grave chambers or single burials underneath barrows that appear in the early stages of CWC development. On the Lowlands these are deep, straight-walled excavations 0.85-1.0 m deep, dated to 2850-2700 BC

[Bożejewice 8: Kośko, Kločko 1991: 123ff; Krusza Zamkowa 3: Kośko 1992: 86ff]. On Małopolska Old Uplands – where niche chambers dominate – our attention is attracted by a particularly 'original', distinctly 'Yamnaya' chamber from a feature located underneath a barrow at Koniusza 1. Its pit is slightly trapezoidal, 1.75 m deep and dated to ca. 2500 BC [Włodarczak 2006: 50ff]. These structures may be deemed an element of an exogenous funerary tradition, genetically related to the YC. Its spreading towards the Vistula drainage could have followed the left-bank tributaries of the Dniester towards the Boh drainage (perhaps this took place at Murava) – see YC barrows in the district of Yampil [cf. Yarovoy 1985: 27ff; *Archiwum* no. 11] (Fig. 7). To assess how far the tradition was observed in the Baltic drainage, it is necessary to conduct detailed studies taking into account 'Yamnaya' features of unclear functional and cultural identity (cf. modest grave goods in the YC funerary tradition [Yarovoy 1985: 27ff]).

Leaving out – mentioned already earlier – the problem of Black Sea funerary patterns found in the syncretic Złota culture (next to niche chambers also the use of ochre and the custom of deforming – artificially elongating – of skulls), it can be said that catacomb structures occur on Małopolska 'classic' CWC territories in two clusters: Kraków-Sandomierz and Grzęda Sokalska (Roztocze, near of Lubaczów). The first cluster can be dated to phases II-III (after 2700/2600 BC), while the other to phase III (after 2600 BC), especially IIIB [Włodarczak 2006: 130ff] (Fig. 8). A comparative analysis of detailed characteristics of both clusters of niche structures reveals closer affinities between features from Grzęda Sokalska and forms known from Black Sea steppes [Ślusarska 2006: 133-135; Włodarczak 2006: 135, footnote 74]. Nothing is known of such structures so far in the CWC on the Dniester [Włodarczak 2006: 135]. Hence, it can be concluded that the 'Grzęda Sokalska' observations testify to a direct contact between CWC societies in the region of Roztocze and the Ingul group, i.e. the Boh drainage (Fig. 9). An important clue to the tracing of the course of the assumed route may be a high share of Middle Dnieper culture (MDC) patterns in the style of Grzęda Sokalska pottery; they are recorded also on both the Boh and lower Vistula rivers [Machnik 1999; 2003; see 'Middle Dnieper' pottery in the graves of the 'Ingul' CC on the lower Boh – studies by O.G. Shaposhnikova's team –oral communication by K. Bunyatyan; also Gzin near Chełmno – *Archiwum* no. 19].

ab. Strzyżów culture (SC) occupied the eastern portion of the Lublin Upland, from the upper Wieprz River as far the Bug and south-western Volhynia as far as the Horyń River. In the south, the SC was bounded by Grzęda Sokalska and in the north by Poles'ye Marshes. Chronometric documentation of the SC is unsatisfactory; at present its preliminary – 'rough' – chronology should be located towards the end of the 3rd millennium BC. The centre of the SC must have been somewhere between the Styr and Horyń rivers and was related to the Volhynia deposits of basalt and flint, and especially of copper (possibly also of inland amber). It is hard

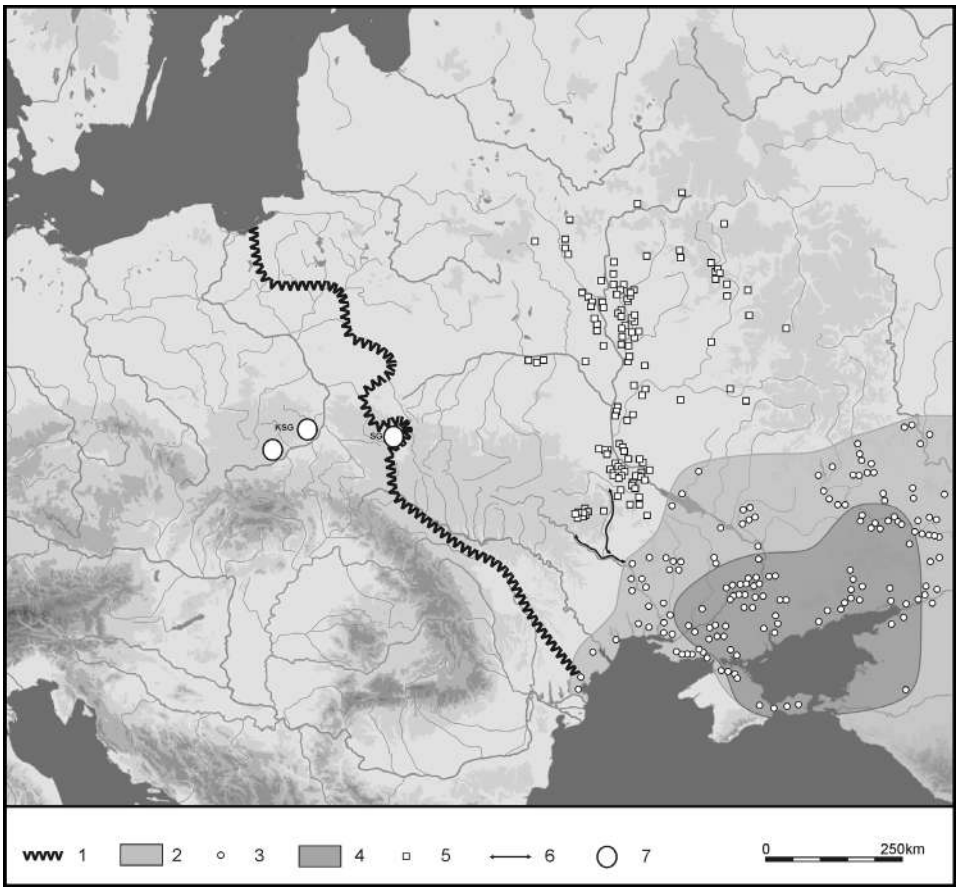

Fig. 8. Funerary evidence of influence by Catacomb culture societies on the Baltic. Legend: 1 – physiographic frontier between the West and East of Europe; 2 – Catacomb culture oecumene; 3 – 'Catacomb' settlement points; 4 – range of metallurgists' graves; 5 – Middle Dnieper culture settlement points; 6 – Boh – Bug ? – and Boh – Sinyukha routes; 7 – concentrations of niche (catacomb) graves within the circle of CWC groups in the Vistula drainage (KSG – Kraków-Sandomierz group; SK – Sokalska group) [Artemenko 1967: Fig. 42; Bratchenko, Shaposhnikova 1985: Map 9; Batora 2006: Fig. 134]

to assess the range of penetration of the Vistula drainage by SC communities. In the south, a discovery of a 'Strzyżów' vessel around Kraków/Nowa Huta merits attention [Godłowska 1984]. Insufficiency of data prevents us from assessing the impact of the SC in the north; a certain clue, however, is offered here by J. Libera's idea of zone A in the distribution of bifacial forms of daggers [Libera 2001: 124ff].

In the SC distribution area, including also SC assemblages, there were discovered collections of copper and faience artefacts standing in a marked contrast, in

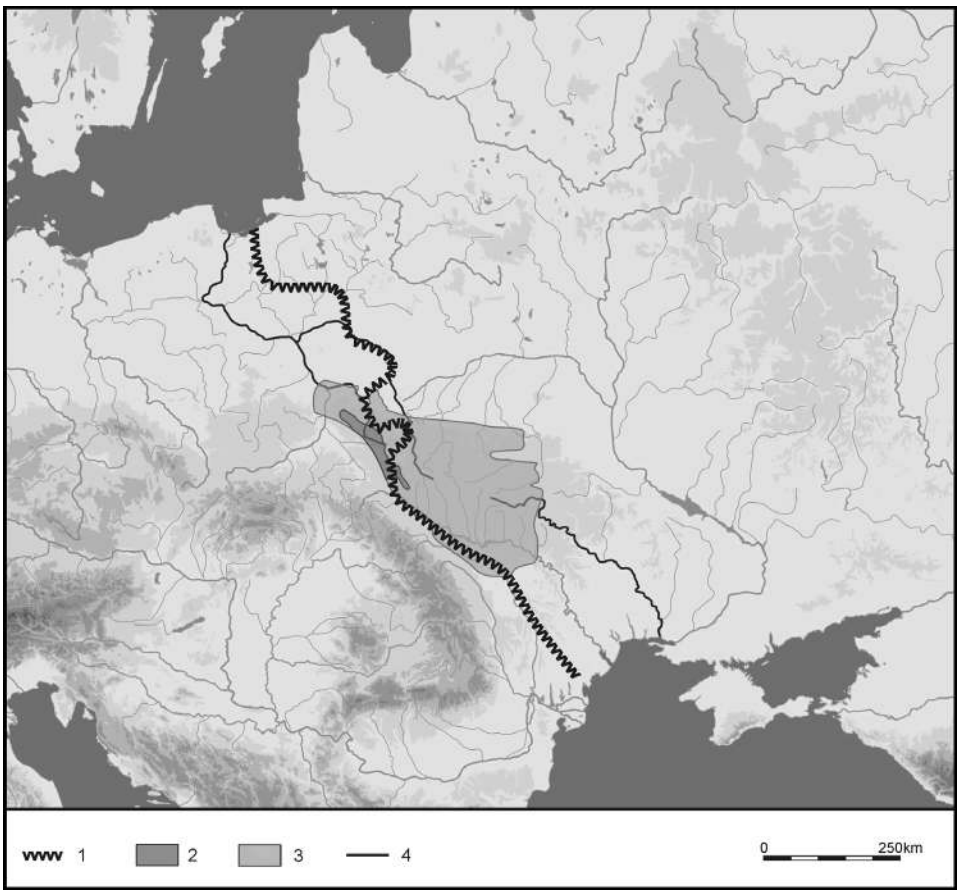

Fig. 9. Frontier of Bug and Boh drainages: Meta-Carpathian Uplands (Roztocze route hub is marked). Legend: 1 – physiographic frontier between the West and East of Europe; 2 – Roztocze; 3 – Meta-Carpathian Uplands; 4 – route: Boh – Bug-Wieprz – Lower Vistula [physiographic presentation: Maruszczak 2002]

terms of their technological, formal and functional complexity, to the inventories of other cultures from the Carpathian epi-Corded circle [Kadrow 2001]. General analogies (in terms of manufacturing and formal aspects) to these collections can be found in the cultural environment of the Dnieper (MDC) and Don (CC) drainages, and – which has been done far more often so far – in Caucasus foothills. However, such analogies are also to be found in the Carpathian Basin or more broadly in the zone of central Europe where the impact of the said civilization centre was felt. These observations primarily concern the inventories of 'hoards' from Stebliwka (Stułbno), Horodysko and Lipa [Majek 2003] (Fig. 10).

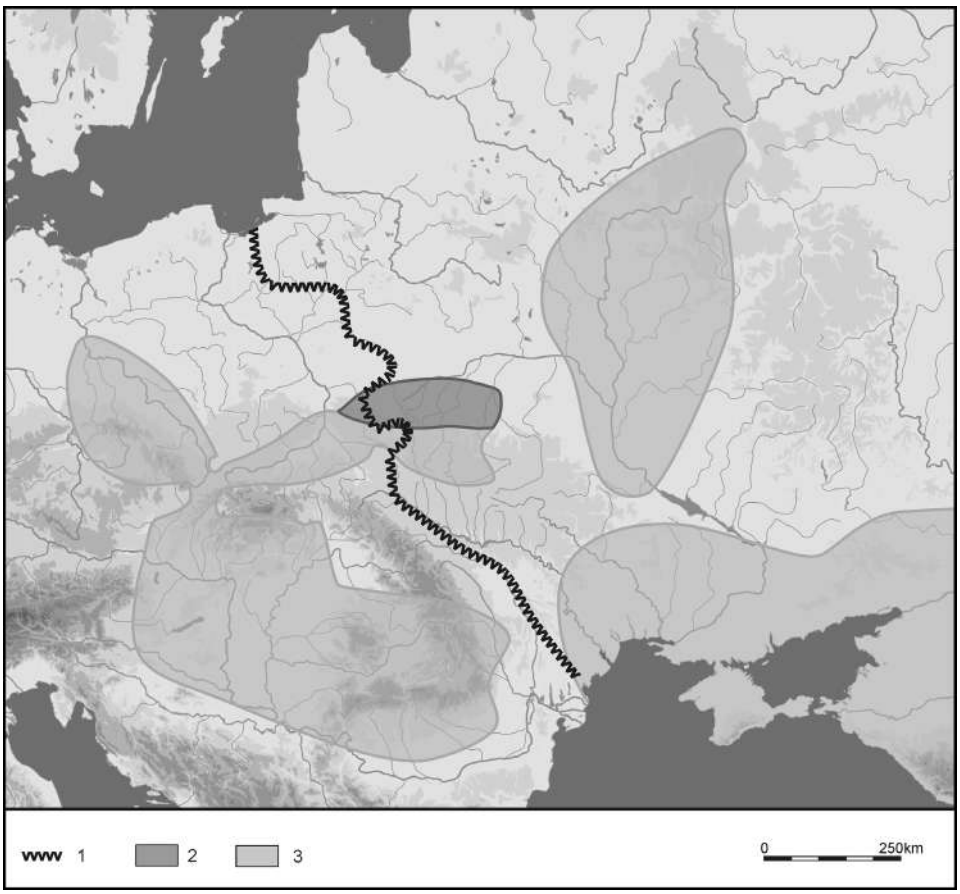

Fig. 10. Strzyżów culture oecumene and areas of hypothetical formal analogies mentioned in the discussions of 'Strzyżów hoard' origins. Legend: 1 – physiographic frontier between the West and East of Europe; 2 – Strzyżów culture range showing the chief direction of contacts; 3 – areas of hypothetical analogies [Majek 2003]

ac. In battle-axe classifications used in the analyses of sources from the Oder and Vistula drainages (in general from central Europe), there are no attempts to identify 'Catacomb' ('Ingul' and 'Donets Basin') battle-axes. This is also true for areas where 'Black Sea traits' have been noticed on many occasions (e.g. areas with niche graves – see earlier comments). A thorough examination of axes believed to be 'corded' or still better 'Late Neolithic' from areas on the Vistula, Volhynia and from upper and middle Boh justifies – in our opinion – a hypothesis about a possibility of identifying a category of 'Ingul' forms, i.e. also outside the CC. They functioned here as 'imports' or possibly as local imitations of their Black Sea preforms. Among

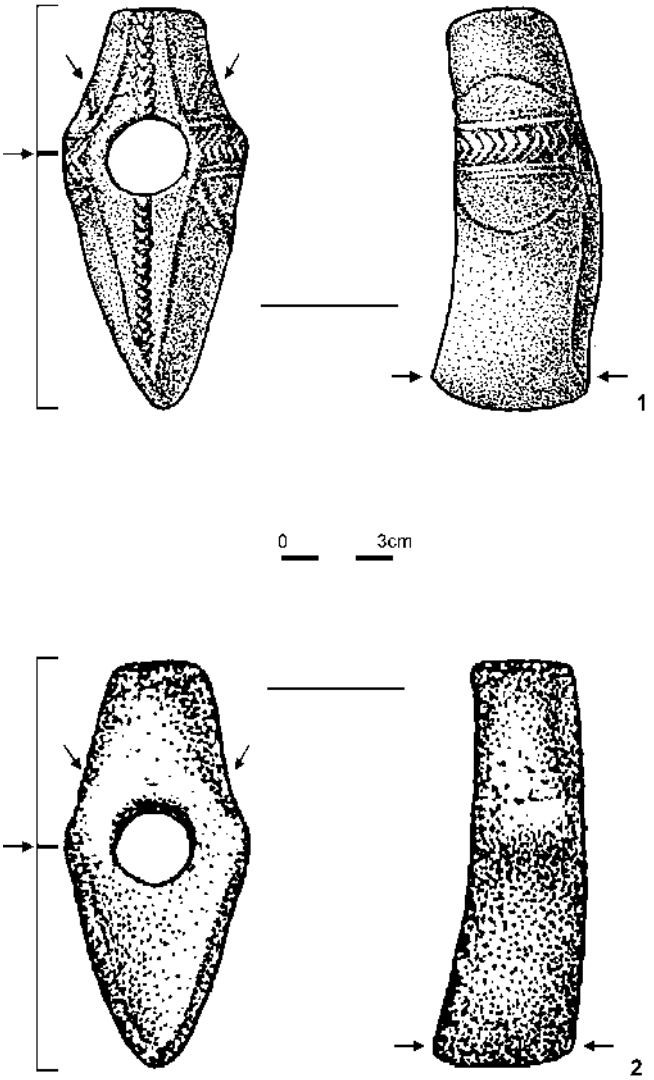

Fig. 11. A module of an Ingul type axe [see Klochko 2001a]

the diagnostic characteristics are:

- a curved profile in side view with a slight broadening, one- or two-sided, next to the cutting edge, and
- a short butt with concave walls when viewed from above (Fig. 11).

Battle-axes fitting into this morphological module were recorded in the drainages/valleys of the upper Boh (Vinnytsia region) and upper Bug (Lutsk region; former Chełm region) as well as on the middle (around Płock) and lower (between Gdańsk and Bydgoszcz) Vistula.

- In the Vinnytsia region at least five axes have been recorded (Fig. 12A) analogous to the 'Ingul' forms [see Klochko 2001a: Fig. 44-46; 2006: Fig. 41-43] (Fig. 12B). They have been recorded in museum collections (Pyatkivka, Bershad district; Kapustyani, Trostianets district; Strilniki, Tyvriv district; Tulchyn district and Vinnytsa region) and in the PLATAR collection [see Platar 2004] (Fig. 12A). From the Vinnytsia region there come a large number of axes typical of the CWC (Fig. 12C). It is obvious that in this area relatively intensive contacts of both cultural circles took place, with the southernmost finds of 'Corded' axes coming from the Bershad district. Hence, they were discovered close to CC cemeteries investigated by O.G. Shaposhnikova and G.T. Kovpanenko's expedition to the Boh valley.
- In the Lutsk region (Volhynia) – right-bank Bug drainage – at least six axes have been recorded (Fig. 13) showing connections to both 'Ingul' forms [Klochko 2001a: Fig. 44; 2006: Fig. 41] and 'Donets' ones [Klochko 2001a: Fig. 36; 2006: 33]. They were found in the holdings of the following institutions: the Regional Museum and the Museum of the Lesya Ukrainka Volhynia State University in Lutsk as well as the District Museum in Lyuboml' (Nesvizh & Peski, Horokiv district; Stariy Zagoriv, Lokachi district; Ludin Volodimir, Volodymyr Volhyniaski district; Liuboml' district x 2).
- While investigating the area lying opposite, i.e. the left-bank Bug drainage, covering the former Chełm region, we encountered an exceptional situation where axe finds (Fig. 14) included in museum collections had been fully recorded on file. After a systematic review of all the collections, the files showed 16 forms that could be identified as 'Catacomb' or as imitating CC axes ([Bronicki 1991]: Okszów, Chełm commune – no. 5; Horeszkowice, Białopole commune – no. 9; Kopina, Cyców commune – no. 10; Rejowiec, Rejowiec commune – no. 13; Bachus Kolonia, Sawin commune – no. 15; Chełmiec, Kraśniczyn commune– no. 16; Husynne, Dorohusk commune – no. 17; Chełm, Chełmno commune – no. 20; Siedliszcze, Siedliszcze commune – no. 25; Klesztów, Żmudź commune – no. 29; Dobryłów, Ruda Huta commune – no. 30; Graniak, Urszulin commune – no.32; Zakręcie, Krasnystaw commune – no. 36; Chutcze, Sawin commune – no. 38; Stupin Duży, Chełm commune – no. 39; Majdan Ostrowski, Wojsławice commune – no. 96). The data for the Chełm area should serve as a valuable clue as to the critical assessment of current research possibilities when source records are highly deficient along the studied 'route' [see also source records from Roztocze – the upper Wieprz valley in Balcer *et al.* 2002: Fig. 23, 42, 44, 45, 51, 52, 57, 59, 61].

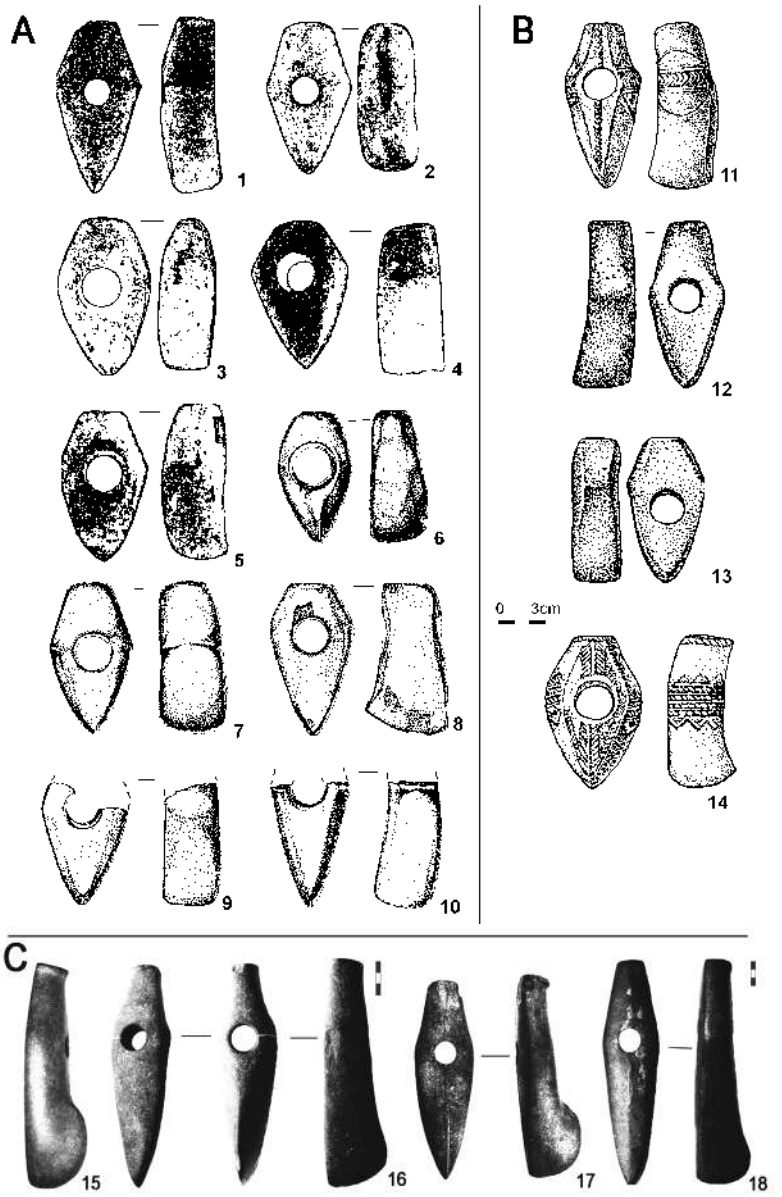

Fig. 12. Ingul type axes from the Vinnytsia region or hypothetically linked to this area – PLATAR collection (A). Analogies from the circle of the Catacomb culture (B) and neighbourhood forms from the circle of Corded Ware cultures (C) are included. A: 1- Kapustyani, Trostianets district; 2 – Pyatkivka, Bershad district; 3 – Tulchyn district; 4-5 Vynnytsia region; 6-10 – Strilniki, Tyvriv district. B: 11 – Shiroke 3.6, Kherson region; 12 – Holovkovka 6.6, Kirovohrad region; 13 – Holovkovka 3.4, Kirovohrad region; 14 – Zamozhne 5.2, Zaporizhzhia region. C: 15 – Vinnytsia region; 16 – Medzhybizh, Letychiv district; 17 – Zhmerynka, Zhmerynka district; 18 – Hnivan, Tyvriv district

- In central Powiśle or, more precisely, in the drainage of the Bzura River, a left-bank tributary of the Vistula, in museum collections (as a result of programme museum search), a single axe has been recorded (Łowicz, Łowicz commune; Fig. 15A) displaying hypothetical 'Catacomb' analogies (Fig. 15B).
- Far more analogies to CC forms are shown by axes yielded by the programme search of museums located along the Vistula valley, in lower Powiśle. At least five forms have been recorded (Toruń-Rozgarty, Toruń-Rozgarty commune; Bydgoszcz, Bydgoszcz commune; Kałdus, Chełmno commune; Komórsk, Warlubie commune; Gdańsk–Orunia, Gdańsk-Orunia commune; Fig. 16A), showing connections to both 'Ingul' [Klochko 2001a: Fig. 44; 2006: Fig. 41] and Donets [Klochko 2001a: Fig. 36; 2006; 33] forms (Fig. 16B).

Along the 'route' no 'ceremonial items' have been recorded – a form of axes known from the closest – 'Ingul' – variety of the CC. Their surface bore fluted and incised ornaments [Sharafutdinova 1980; Kośko 2001: 60ff]. The functional position of all discussed objects fits roughly into an inter-regional module of battle-axes – in broad terms, markers of the rise of elites and chiefdoms (see section 4). It can be assumed that at least some of alleged 'imports' or imitations of 'Ingul' or 'Donets' battle-axes should mark the routes along which – in the territory of the central European CWC – traditions of Black Sea, specifically CC, elites spread. To verify this hypothesis, it is necessary, above all, to conduct specialist analyses (e.g. petro-archaeological ones) (Figs. 12-16).

In addition, to the societies of the YC/CC are linked two finds of metal battle-axes of the Pidlissya type, unearthed in the drainage of the San River at Rudna Mała and Munina, Sub-Carpathian region [Klochko 2001a: 124, Fig. 53:1, 3; 2006: Fig. 50:1, 3] (Fig. 10). It can be assumed that they are a reflection of an alternative Baltic-Pontic connection: the "San-Dniester".

ad. Maces, or more specifically a special type of them with a fluted surface (type B), were recently (in 2002) thoroughly analyzed [Kośko 2002]. The analysis revealed that these forms, inspired by power symbols originating with Near East civilizations, were first made – about the middle of the 3rd millennium BC – in the circle of the CC as prestige markers. They may have served a similar purpose to that of the 'ceremonial' examples of 'Ingul' axes. No direct confirmation is available still of the chronology of the beginning of their use in areas neighbouring on the CC, specifically in CWC environments (i.e. discoveries within assemblages) – certainly in the second half and at the end of the 3rd and in the early 2nd millennia BC. However, there have been significant amendments made to the list of fluted mace finds after 2002 (Fig. 17:6). When reanalyzed, it bears out a view that we have a significant and highly credible record of the course of early routes between the Baltic and Black seas. The communities of fluted mace users could have travelled from the circle of the CC to the agglomerations of the CWC circle along the following routes:

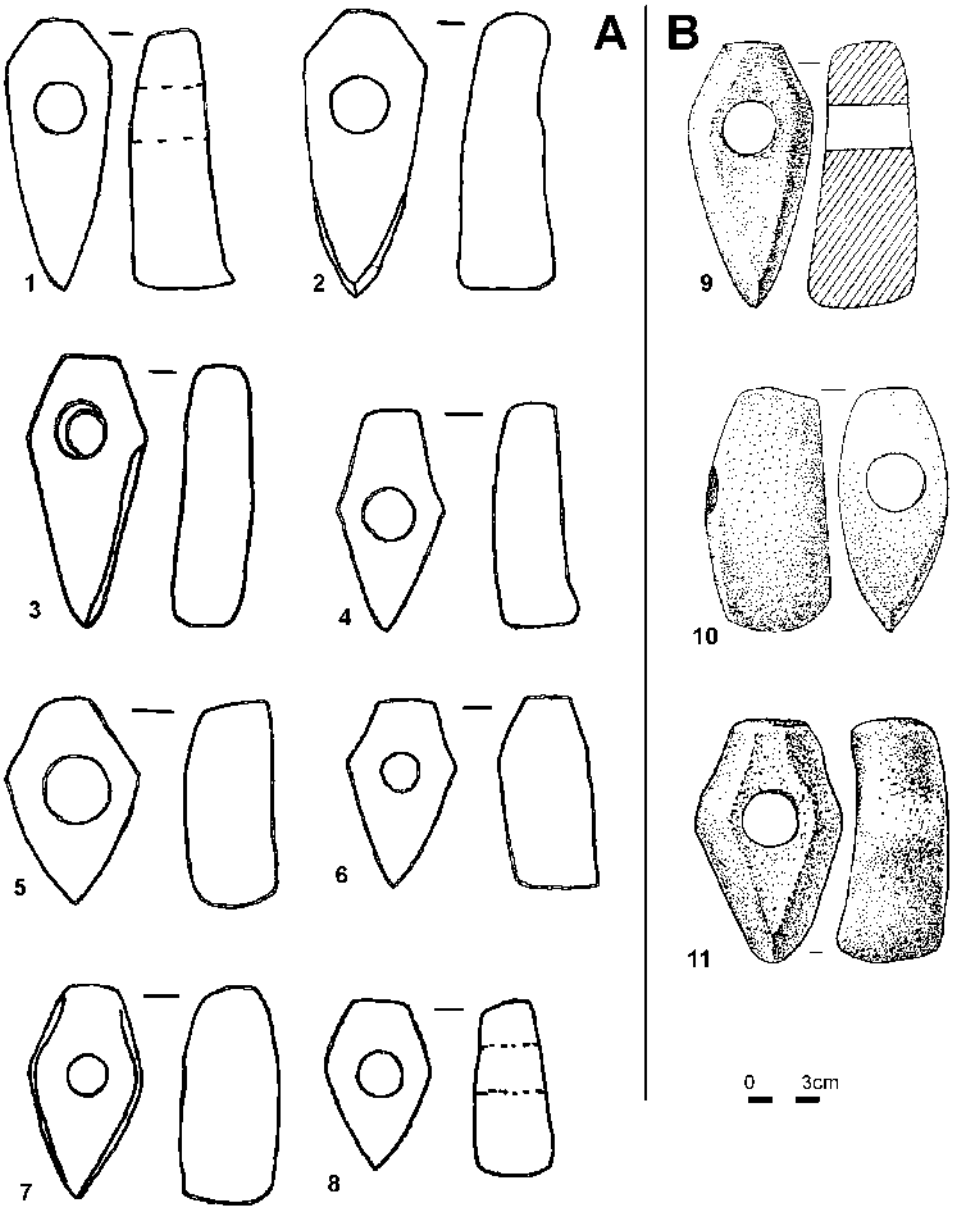

Fig. 13. Ingul- and Donets-type axes from the Lutsk /Volhynia/ region (A). Analogies from the circle of the Catacomb culture (B). A: 1-2 – Lutsk Regional Museum; 3 – Peski, Horokhiv district; 4 – Liuboml district; 5 – Liuboml Regional Museum; 6 – Nesvizh, Horokhiv district; 7 – Ludin, Volodymyr Volhyniaskyi district; 8 – Staryi Zahoriv, Lokachi district. B: 9 – Bubnova Slobidka 8.2, Cherkasy region; 10 – Donskiy 5.29, Rostov region; 11 – Vinogradne 32.10, Zaporizhzhia region

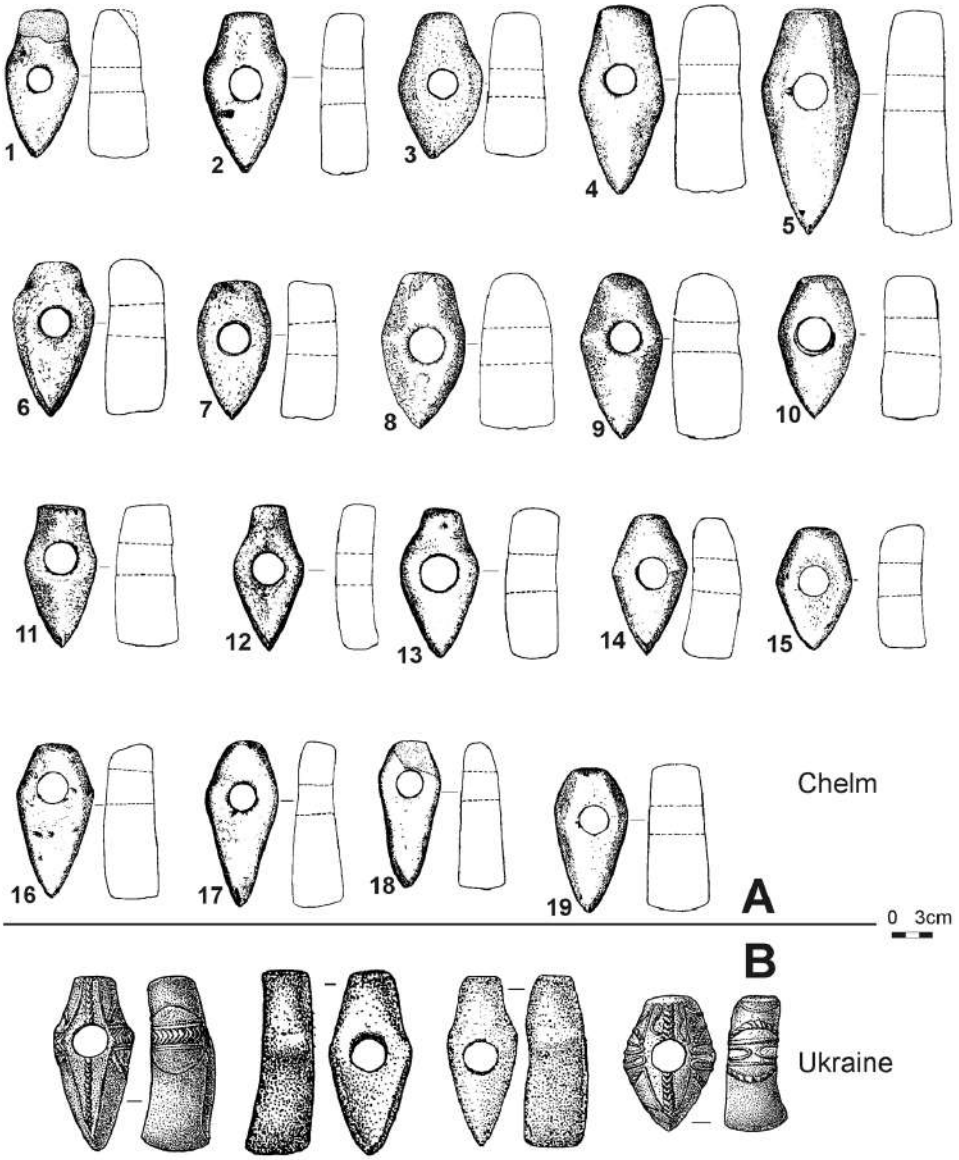

Fig. 14. Ingul type axes from the former Chełm region (A). Analogies fromthe circle of the Catacomb culture (B). A: 1 – Okszów commune Chełm; 2 – Rejowiec, Rejowiec commune; 3 – Husynne, Dorohusk commune; 4-5 – district Krasnystaw; 6 – Chełm; 7 – Bachus Kolonia, Sawin commune; 8 – Chełmie, Kraśniczyn commune; 9 – Zakręcie, Krasnystaw commune; 10 – Majdan Ostrowski, Wojsławice commune; 11 – Siedliszcze, Siedliszcze commune; 12 – Horoszkowice, Białopole commune; 13 – Kopina, Cyców commune; 14 – Chutcze, Sawin commune; 15 – Strupie Duży, Chełm commune; 16 – Klesztów, Żmudź commune; 17 – Dobryłów, Ruda Huta commune; 18 – Grabniak, Urszulin commune; 19 – Krasnystaw, Krasnystaw commune B: See 12B

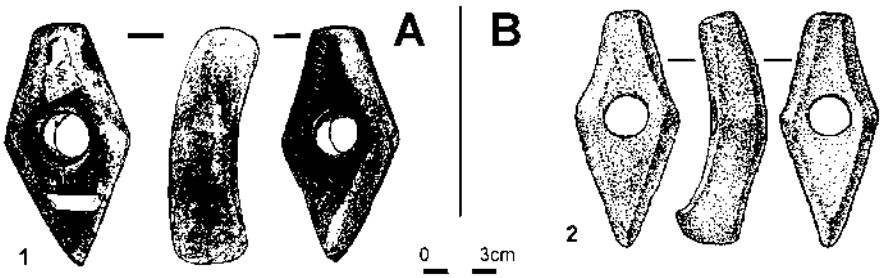

Fig. 15. Ingul type axes from central Powiśle: the Bzura drainage (A). Analogies from the circle of the Catacomb culture (B). A: 1 – Łowicz, Łowicz commune. B: 2 – Zamozhne 8.1, Zaporizhzhia region

* Boh — Bug — Wieprz — Vistula (upper and lower);
* Dnieper (Ingul — Dnieper) — Pripet — Bug — Vistula;
* Dnieper (Ingul — Dnieper) — Bjarezina — Neman [Kośko 2002: 71].

Fluted maces acquired a new dimension and new applications in the drainages of the Vistula, Oder and Morava rivers as well as on the middle Danube. They began to be used as position markers of local communities – of the Western Trzciniec and Tumulus cultures – participating in exchange programmes along north-south routes joining the Baltic drainage to the middle Danube; one of the goods so distributed was amber [cf. the background of finds of amber ornaments in Bukowski 2002: Map 1]. This annexation of a Pontic insignia began with ca. 17th century BC and proceeded rather dynamically, which can be seen in the most recent discoveries made in central Poland. However, there are no satisfactory analytical mechanisms to pinpoint the differences in its use in both route systems: Baltic-Pontic and Baltic-Danube [cf. division of type B into subtypes B1-B4: Kośko 2002: Fig. 2] (Fig. 17:2-5). Also, one should not ignore a hypothesis that both systems were interconnected, if only partially.

ae-ag. The assemblages defined earlier as occasional are, in this approach, seeds of broader micro-spatial phenomena – hypothetical taxa ('site types'), a more detailed description of which is not possible at present (Fig. 18).

ae. Łasin 2. (Chełmno Land). On one of the islands on Lake Łasin – presumably in a post-ritual arrangement – ceramic objects exhibiting traits 'alien' to the local environment of the Chełmno Land were recorded, namely, a female figurine and fragments of two vessels bearing 'corded' ornaments [Kirkowski 1984]. The figurine – relying on formal analogies – was related to the simplification trend in the figurative art of the Tripolye culture (Serezliyevkia type), suggesting a connection to a rather indeterminate, syncretic population of 'Tripolye-steppe'. If one accepts the hypothesis that it was made in 'the final period of the Tripolye culture's lifetime' then its origins will have to be placed in the first half of the 3rd millennium BC.

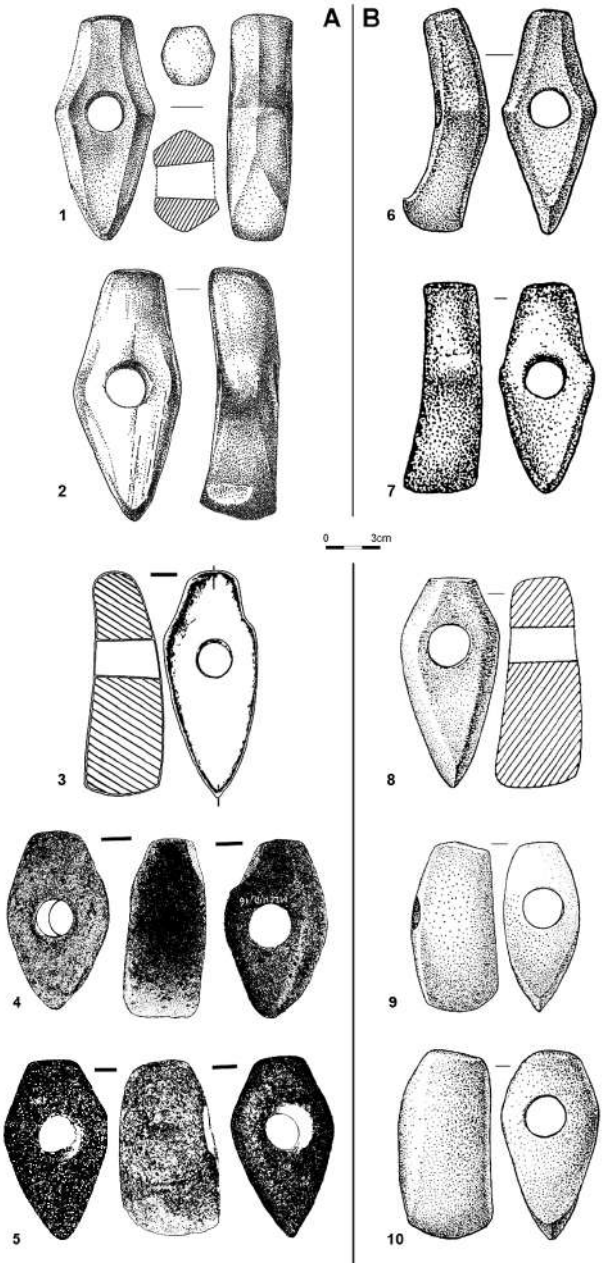

Fig. 16. Ingul type axes from the lower Powiśle (A). Analogies from the circle of the Catacomb culture (B). A: 1 – Gdańsk-Orunia, Gdańsk-Orunia commune; 2 – Toruń-Rozgarty, Toruń-Rozgarty commune; 3 – Bydgoszcz, Bydgoszcz commune; 4 – Kałdus, Chełmno commune; 5 – Komorsk, Warlubie commune; B: 6 – Zamozhne 8.1, Zaporizhzhia region; 7 – Golovkovka 6.6, Kirovohrad region; 8 – Bubnova Slobidka 8.2, Cherkassy region; 9 – Donskiy 5.29, Rostov region; 10 – Zlatopol 25.15, Zaporizhzhia region

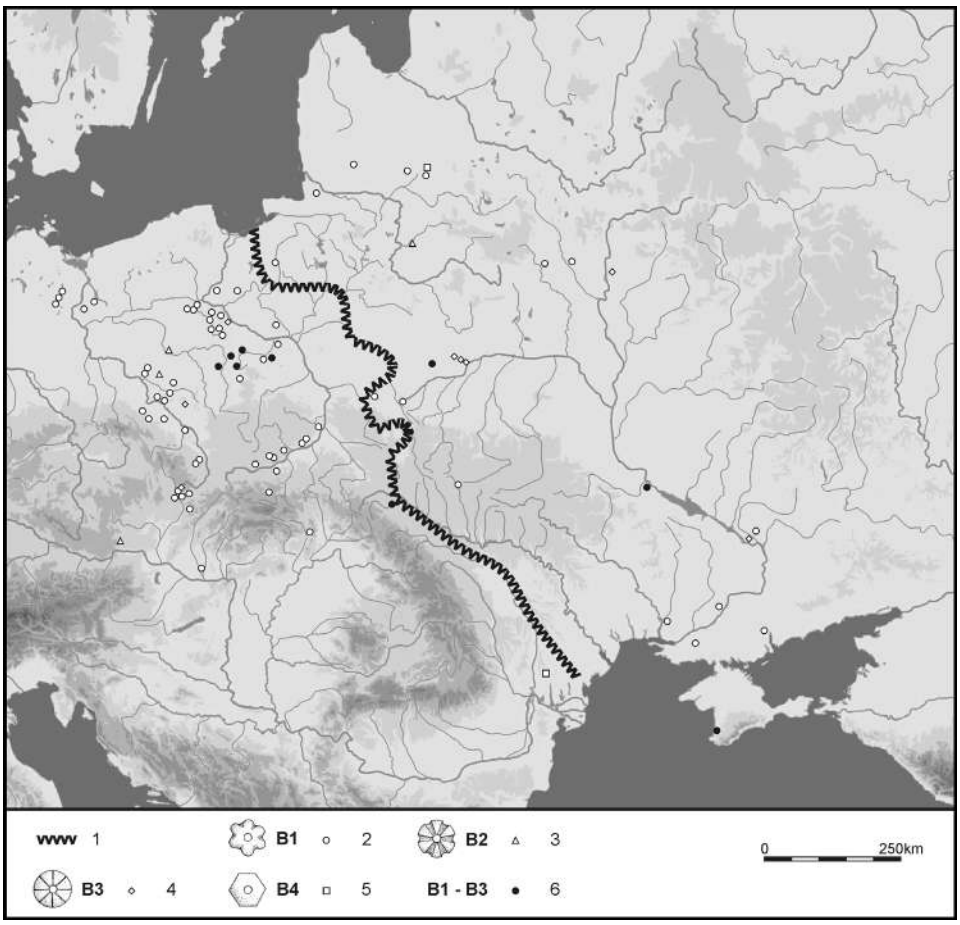

Fig. 17. Distribution of stone fluted maces. Legend: 1 – physiographic frontier between the West and East of Europe; 2-5 – localities where specific types of fluted maces were found [Kośko 2002]; 6 – localities of the latest finds of fluted maces (museum identifications; published after Kośko 2002)

In the case of vessels, 'both technology and the type of cord used for making ornaments' pointed to the CWC (of its late stage). Specific vessel forms, however, bore no analogy to any materials from the Chełmno Land or adjacent areas. Nevertheless, the similarity of their technology with that of the figurine made R. Kirkowski 'look for analogies among Ukrainian groups of the CWC or the decline Tripolye culture' (this was particularly true for the so-called northern group in T.G. Movsha's approach).

Suggestive analogies to the object from Łasin seem to be supplied by more recent investigations of a settlement at Pribierezhnoe on the Vislinskiy Zaliv, Sambia,

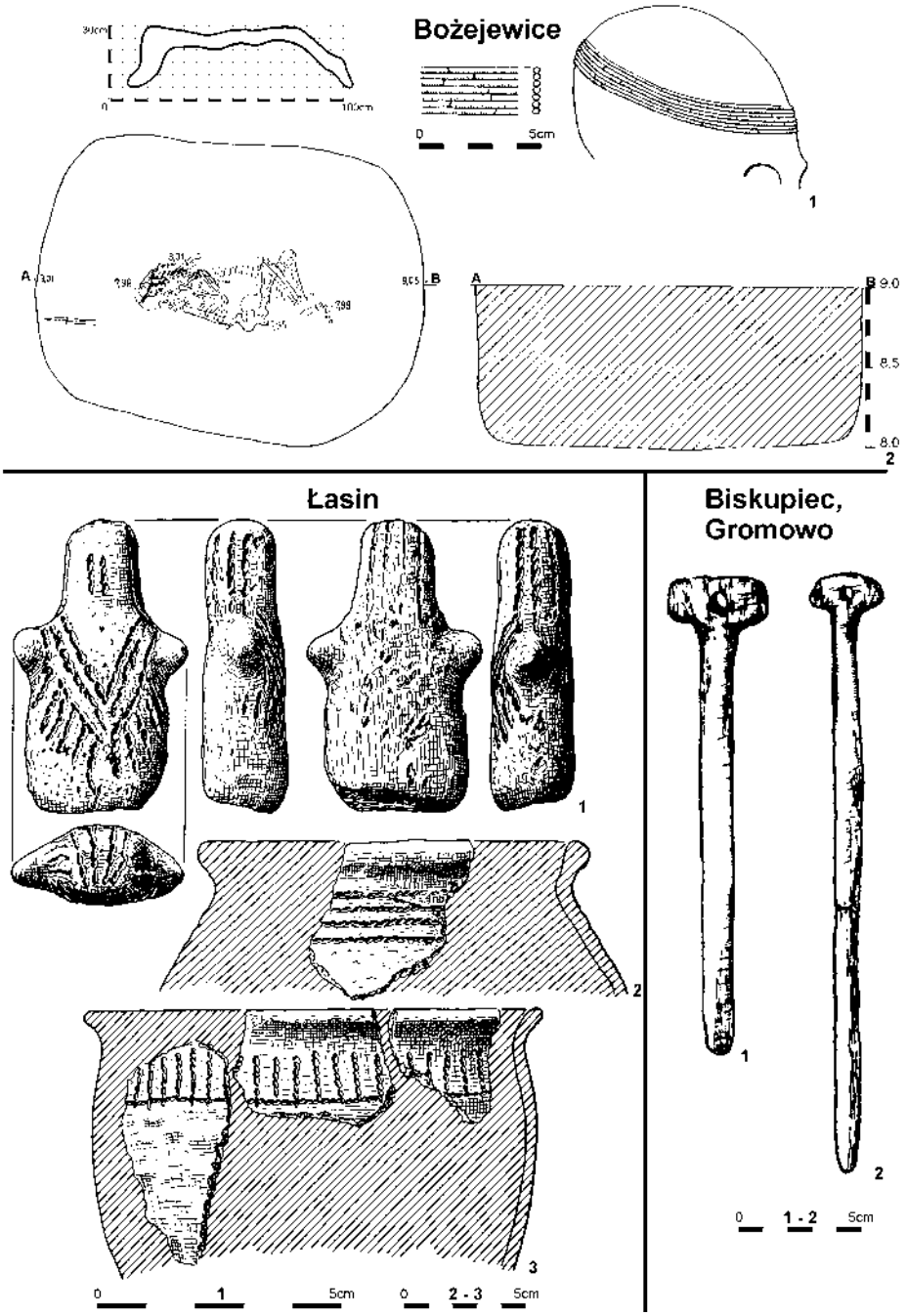

Fig. 18. 'Pontic' traits at Late Neolithic sites in the Baltic drainage basin ('incidental sites'/'site types'): Bożejewice, Łasin, Biskupiec, Gromowo [Okulicz 1973; Kośko, Kločko 1991; Kośko 1992]

carried out by E. Zalcman. A new pottery style has been identified there, characterized by complex cord patterns, closely resembling – in our opinion – the ornament convention of the 'northern group' of the decline Tripolye culture [Zalcman 2004: Fig. 117-118]. However, making the chronology and topogenesis of the 'Pribierezhnoe type' more specific calls for broader, interregional studies concentrated on the frontier between the drainages of the Baltic and Black seas.

af. Bożejewice 8 (Kujawy). On a chernozem plain of the Kujawy Upland, a circular barrow was discovered over a grave of a woman 25-30 years old [Kośko, Kločko 1991]. The grave pit is unusual because of its Yamnaya form: it is rectangular when viewed from above, measuring 245×185 cm and 100 cm deep. The body had been placed along the north-south axis in a 'slightly flexed' position – in type C position according to A. Häusler. The grave goods included a copper diadem (made up of seven cords-tubes 2.7-3.0 mm in diameter) and a wooden object identified as a composite bow. The wood of the bow was subjected to a ^{14}C analysis, which yielded a result of ca. 2700-2600 BC. The feature has no close analogies. The structure of the grave chamber and mound could point to – in the closest range – a group of Małopolska CWC mounds, while a broader, Pontic-steppe context of these traits was mentioned earlier in item aa. The copper diadem of a 'band-cord' type was made of 'Balkan-Carpathian' copper (i.e. without a significant content of arsenic). From the formal perspective, prototypes of such artefacts should be looked for among ornaments using copper tubes recorded among the pre-Yamnaya groups of the Northern Pontic Area. The closest analogy – in terms of design and chronology – to the diadem may be a band from Strelica – of the 'band-cord' type as well – associated with the late phase of the MDC (from ca. 2100 BC). Also in the case of the hypothetical composite bow, the range of genetic suggestions covers analogies from the Pontic area (for Pontic specimens of hypothetical prototypes of the Bożejewice composite bow see Natalivka – Lower Mikhailovka culture or Zvanec – TC [Kośko, Kločko 1991: 127ff]).

ag. Biskupiec-Gromowo and Machovoje (the area between the Vistula and Neman rivers). In the CWC culture settlement concentration on the south-eastern shores of the Baltic, known as the Masurian group, a synthesis of patterns coming from diverse regions was observed. This applies to both corded circle traits – both central and eastern European – and taxa associated with the circle of comb-impressed cultures [Okulicz 1973: 108ff; Machnik 1979b: 364ff]. The beginnings of the complex are currently dated to the 4th/3rd-3rd millennium BC, most certainly to the period from 2800 to 2200 BC [cf. Matuszewska 2007]. It must be observed that the state of exploration of the 'Masurian group' is highly unsatisfactory, which must affect presented opinions [cf. lately Sobieraj 2004; Zalcman 2004]. In the set of exogenous traits, our attention is drawn to objects coming from graves and associated primarily with the Middle Dnieper culture and secondarily with 'steppe-Caucasian' cultures. These are: bone hammerhead pins (Biskupiec, Varmia-Masuria region; Gromowo,

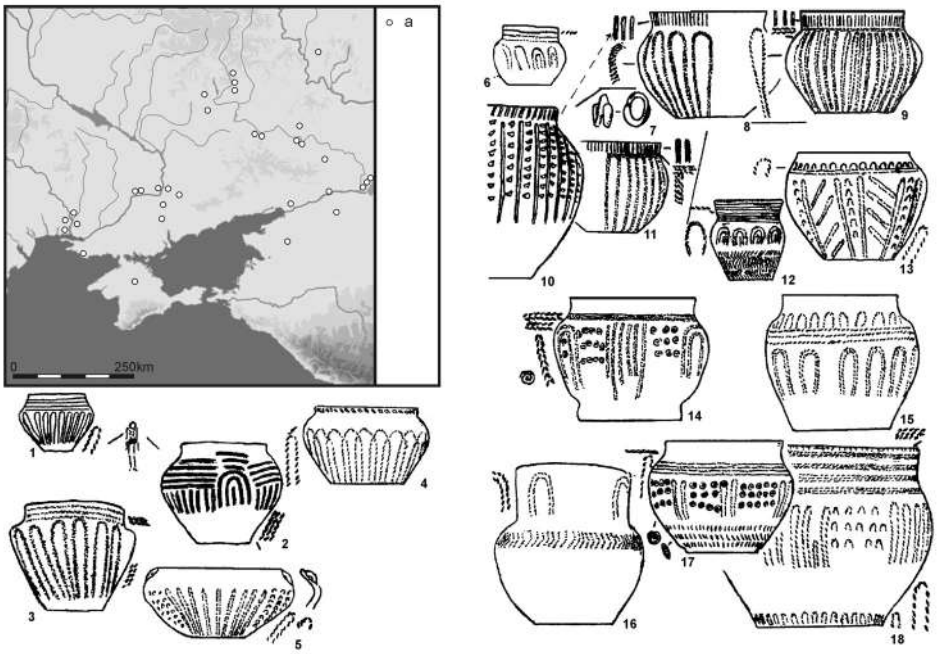

Fig. 19. Catacomb culture sites with pottery identified as 'ornamentation baroque' (a) [Bratchenko 2007]

Sovietsk district) and a pot decorated with a broad band of horizontal lines of chevron impressions (Mochovoye, Primorsk district). The list is being continually expanded (communication from J. Sobieraj – a paper delivered at the seminar organized by Prof. J. Machnik in Igołomia in 2002). There are two versions of the route along which the traits could have reached Sambia:

* Dnieper – Pripet – drainages of the Vistula or Neman [cf. Lakiza 2004: 183 – Podgornaya group] and

* Boh – Bug – Wieprz (Sokalska group) – lower Vistula (see Gzin near Chełmno).

b. The list of cord traits in the drainages of the Boh – Dnieper – Donets is made up of **(ba)** stylistic traits of pottery **(bb)** axes and **(bc)** amber artefacts.

ba. Of particular interest is the style of CC grave pottery, defined as baroque, recorded primarily in the area occupied by the Donets-Don group but encountered also in the drainage of the Boh, i.e. within the range of the Ingul group. In total, 39 sites have been recorded with pottery bearing baroque ornament patterns and dated to the decline of the middle phase of the CC. They are considered an exogenous phenomenon linked, in general, to the Caucasus [Bratchenko 2007: 103ff]. One of

the markers of the style is a segmented pattern of vertical lines, ending in loops and made using cord impressions (Fig. 19). Looking for the origins of this pattern, S.N. Bratchenko [Bratchenko 2007: 104, 109] notices analogies to the central European CWC and epi-Corded Mierzanowice culture. Taking up the suggestion, it must be said that in central Europe belly ornaments of vertical cord lines, ending in loops, are a continuation of crescent ornaments. The former appeared first in the middle Elbe drainage in the CWC and on the Oder in the GAC (phase IIIa) in the late first half of the 3rd millennium BC [Czebreszuk, Szmyt 1992: 113]. However, they developed rapidly outside of the Lowlands, in the drainage of the upper and middle Vistula, precisely in the area occupied by the Carpathian Cultural Circle, after 2300/2200 BC [Kadrow 1991: 43ff, Tab. I-VI; Kadrow, Machnik 1997].

bb. CWC axes were recorded in the Boh drainage, in the whole Vinnytsia region, from the localities of Zhmerynka in the north-west to Bershad in the south, on the border with the Mykolaiv region, i.e. not far from CC cemeteries, investigated by the expedition of O.G. Shaposhnikova and G.T. Kovpanenko (Fig. 12 C). What's interesting is the fact that relatively many CWC axes were recorded – as loose finds – also in the Donetsk region (Amvrosiivka; Mariupol; Mikolayivka; Stepanivka; Temryuk; Volodarsk district; Museum in Mariopol) [see Catalogue 1993: no. 61, 62, 63, 64, 78, 79, 81, 113]. The area produced also 'corded' axes found in the graves of the 'Donets' CC (Donsiy 5.29; Kamyanka 4.2.9; Kamyanka-Dniprovska; Noviy Aksay [Klochko 2001a: Fig. 35-36; 2006: Fig. 32-33]). The forms mentioned here have close analogies at the eastern frontier of the CWC circle (e.g. Dashava; Khmilova; Klimkivci; Kolokolins; Krilos – "Nastina Mogila"; Zdovbtsya [see Klochko 2001a: Fig. 50-51; 2006: 47-48]).

bc. Amber artefacts were found in the drainage of the Donets River, on the Krasnaya River [Novonikolskoye by Krasnorechensk, grave 1/6; Bratchenko, Shvecov 1991: Figs. 9, 6]. The axe-like beads that have been recorded here show close affinities with Proto-Bronze and Early Bronze forms known from Kujawy (class 1CV – 'in the shape of a pentagonal axe' according to R.F. Mazurowski), i.e. dated to the period after 2300/2200 BC [Dobre, Wąsosz; Mazurowski 1983: 30; Bukowski 2002: Figs. 20, 21] (Fig. 20).

5. THE SOCIETIES OF THE ROUTE COMMUNITY OF CORDED WARE, YAMNAYA AND CATACOMB CULTURES

Generally speaking, CWC and YC/CC societies must be regarded as quasi- or early pastoralist [for the most recent treatments of the subject see: Pustovalov 1994; 2005; Kruk, Milisauskas 1999; Kruk 2004; Machnik 2004; Włodarczak 2006]. Both

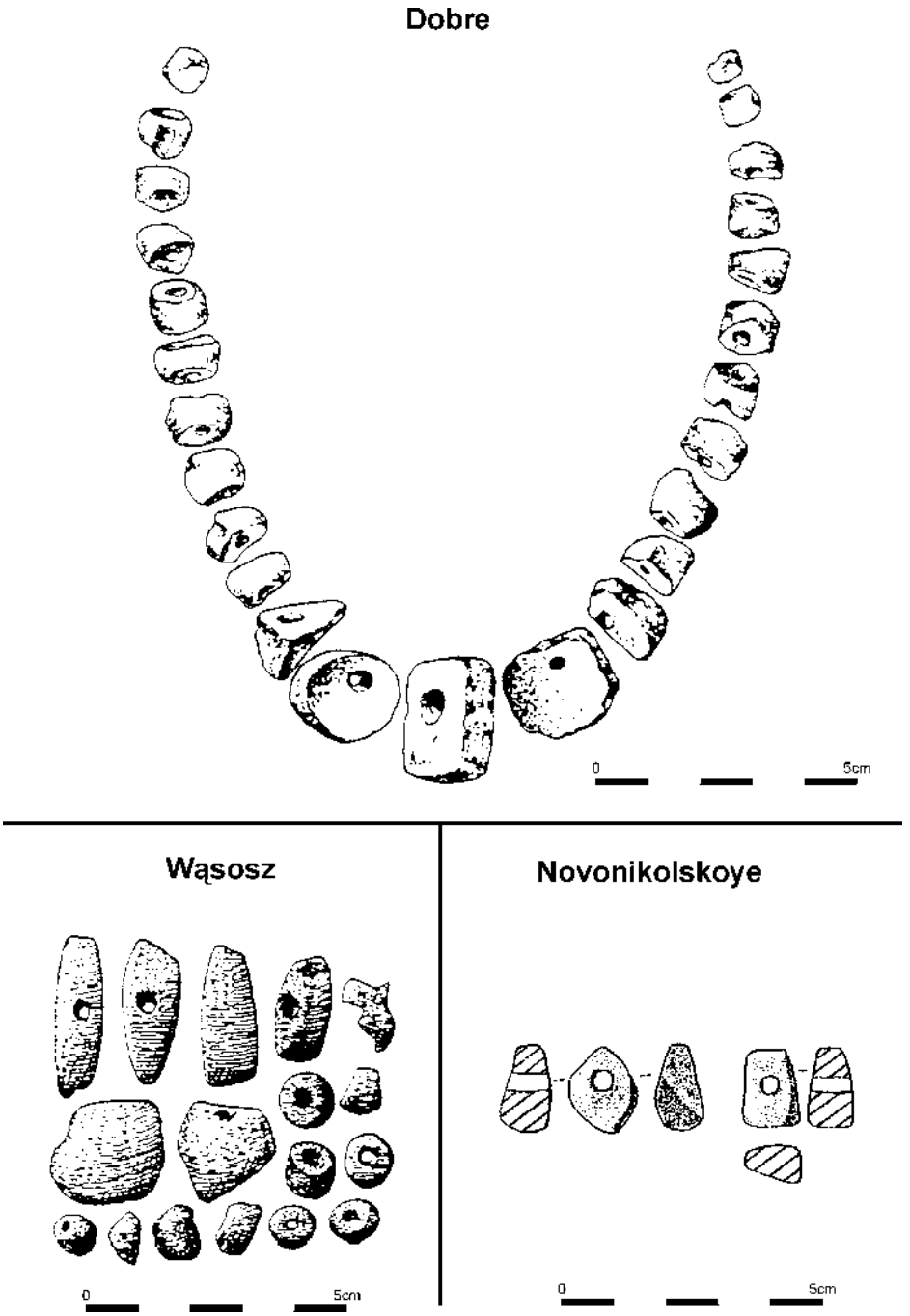

Fig. 20. Axe-shaped amber beads from the Baltic drainage basin (Dobre, Wąsosz) and from the CC steppe zone in the Donets drainage (Novonikolskoye) [foll. Bratchenko, Shvecov 1991; Bukowski 2002]

taxa, identified as grave cultures, supply little information that could help in a detailed reconstruction of their economies [this is particularly true for CWC: Kruk, Milisauskas 1999: 249ff]. This fact imposes certain limitations on their socio-organizational interpretation as well. Keeping in mind a broader context of observations made across Europe, one should associate the times of CWC and YC/CC development (3rd millennium BC) with the prologue of the rise of permanently stratified societies [Czebreszuk 2001a: 37ff; Włodarczak 2006: 152].

There were two major processes that contributed then to hierarchy building. First, exchange of goods became professionalized and, second, conflicts over the protection of goods and herds became more frequent, leading to the rise of a new social category: elites of warriors. In the case of quasi- and early pastoralist societies special attention is drawn to chiefdoms.

* However, no traces of their presence are found in Corded groups in the Vistula drainage. In respect of the Old Upland CWC – or rather its Małopolska groups – P. Włodarczak says that 'there are absolutely no archaeological data that would testify to the existence of such a system' [Włodarczak 2006: 153]. A similar opinion can be found with respect to the societies of the Lowland CWC (in the area remaining under the influence of the Single Grave culture) in J. Czebreszuk [Czbreszuk 2001a: 187]: 'they can be called the most simple variety of ranked communities'. A comparative analysis of grave-good inventories from the areas in question does not yield, in principle, any chieftain burials; a constant package of grave-goods dominates. In the case of few departures from the norm, as for instance in the case of prestige markers found among the grave-goods of a child burial (*Infans* I) from Krusza Zamkowa 3, Inowrocław district, Kujawy, (2850-2700 BC), attention is drawn to its exogenous traits, namely, Pontic linked to the YC funerary traditions (Yamnaya grave chamber, arrangement of the body [Kośko 1992]). Similar topogenetic observations (suggesting CC funerary traditions) are induced by a barrow grave from Pałecznica on the Miechów Upland. A catacomb explored there was a large room (3 × 4 m) about 3 m high, fitted with posts supporting the ceiling. It contained a body (with no traces of permanent offerings) of an elderly man (60-70 years). The grave had been covered with a mound surrounded by a palisade of oak posts 30-40 cm in diameter. Relying on the identification, J. Kruk and S. Milisauskas [Kruk, Milisauskas 1999: 258] draw a conclusion that 'the dimensions of the structure and the effort that must have been put in to build it testify to the high status of the individual buried in it, possibly exceeding the kin group'.

The cited cases seem to corroborate the hypothesis that Pontic, steppe societies (YC-CC) could have inspired not only radical changes in the funerary rite (barrows with circular mounds, grave chambers both pit and catacomb ones, some grave-goods; section 4) but also a remodelling of social structures [Włodarczak 2006: 157].

* The Pontic centres located along the Bug-Boh route are characterized by a different, considerably more advanced, state of social stratification [Pustovalov 1994; 2005; Krywalcewicz 2007: 92ff]. This can be seen in both the clear category of shepherds-warriors (see scale of weapons production, hypothesis about 'unstable politico-military structures') and economic specialization (cf. graves of metallurgists – Fig. 8:4) in both western (Ingul) and eastern (Donets) CC and the late YC, defined jointly as a broader 'North-Pontic, ethnopolitical community' [Pustovalov 1992].

6. GENERATORS AND MECHANISMS OF ROUTE OPERATION. AN ATTEMPT AT CONCLUSIONS.

Beginning with ca. 2900/2800 BC and especially with the second half of the 3rd millennium BC, when the societies of the 'eastern European' CWC were replacing the GAC (2500-2300 BC) in contacts with the civilization centres of the Northern Pontic Area, we see a rapid development of a bilateral system of migration initiatives or cooperative relationships commence between the societies of the west and east, with the letter being clearly more active. Direct observations concern the increase in the bilateral reception of objects or ritual norms. It can be assumed that we also see then the rudiments of the route from the Baltic through the Bug and Boh rivers to the Black Sea. Its development rested on long-distance migration programmes manifesting the ideological ('occasional') needs of rudimentary, narrow elites. In the Vistula drainage, they took shape in the first half of the 3rd millennium BC being related to an earlier influx of exogenous communities from the Black Sea (cf. Bożejewice type) into the area. The 'occasional' needs must have concerned different values. Relying solely on material sources (i.e. archaeologically identifiable), it is difficult to reconstruct clearly a system of their application (preferences, equivalents). This is true for a wide gamut of artefacts made of flint, stone, amber, copper and glass-faience [see Balcer 1981; 1983; Mazurowski 1983; Klochko, Stolpiak 1995; Petrougne 1995; Chachlikowski 1996; Rola 2006: 114, footnote 14; Czebreszuk 2007]. A separate issue is the question of 'material evidence' of salt import [see salt deposits around the neck of the Crimea known as 'Syvash salt' – Kośko 2002: 70, or at the mouth of the Boh – cf. J. Boltryk ..., in this volume]. What we lack is relevant (interdisciplinary) studies how to identify 'raw material-object' imports; it does not seem, however, that this was the principal object of their bilateral interests. We need to work on the assumption that along the frontier such 'imports' were an addition to archaeologically discreet values understood within the kinship system and taking into account the cycle following a ritual calendar. What's more, a syntactic assessment of recognizable source inspirations is not possible, which would be helpful in

the process of necessary selection of an anthropological module – a framework for the interpretation of archaeological data referred to earlier. As a helpful hint may possibly serve a female motif found in settlement rituals (Łasin – a ritual place on an island) and the funerary rite (Bożejewice – grave under a barrow).

* CWC settlers reached the middle Dnieper along the Volhynia route (along the northern limit of the forest-steppe), later taking part in the development of the northern frontier of the YC on the Dnieper (Volodarka type, Kiev region). It is hard to tell now how far the process corresponds, in terms of its course and final culture-making structure, with, contemporaneous and much better explored, the southern module of the CWC-YC synthesis. The module was based on the Dniester route, known as the syncretic Budzhak group (Odessa region). The third of the Pontic 'corded' routes interesting us here, the Volhynia-Podolia one, with the Boh valley tentatively assumed to be a direction marker, led to the communities of the CC Ingul group. There is no taxonomic evidence for a possible 'synthesis' of the CWC-CC. An important hint for tracing its course is MDC traits recorded on the Boh River. This may indicate a need to include in the picture the mediation of the said societies in the building of ties between the central European CWC and Ingul CC, and the creative role of the Sokalska group (CWC/MDC) as a stage coupler. From the upper Wieprz drainage, patterns could have radiated that were successively transmitted to the south-east, towards the Dnieper and Boh rivers, and to the north-east, towards the lower Vistula (e.g. a 'middle Dnieper' beaker from Gzin by Chełmno).

* Reciprocating western migrations of YC and CC populations can be especially easily identified in the region of Roztocze (Sokalska Group where apart from 'Middle Dniester' patterns, we encounter 'Pontic' traits of catacomb chambers) and in the settlement centres of the middle and lower Vistula drainage: Sandomierz Upland (Złota phenomenon), Kujawy (Bożejewice type – possibly evidence of a syncretic CWC/YC society?), Chełmno Land (Łasin type), Masuria Lake District and Sambia (Biskupiec type: Gromowo, Makovoye or Gzin by Chełmno already cited a few times earlier). This set of areas can be considered as evidence of continuation – the use of a mental map of the Baltic drainage basin from the 4th millennium BC [see Mątwy group of the FBC – Kośko 2003a: Fig. 8].

A share in the piecing together of the Bug-Boh route could have belonged, on the part of the Vistula basin CWC, to barely emerging elites, undoubtedly forming under the inspiration of Pontic patterns (settlers?) (after ca. 2900/2800 BC – Bożejewice type). With no signs of status inheritance and relative demographic paucity of the society, which had a network-like structure, its operative elements could not have numbered more than 25 people. From the perspective of the Northern Pontic Area, the seeds of Baltic migrations could have been sowed by the culturally syncretic societies (CWC/YC) mentioned earlier that had long experience in the cultivation of bilateral – Baltic-Pontic – contacts. All the typochronological

data point to the second half – mainly the final part – of the 3rd millennium BC as the time span for the phenomenon.

Still, the use of experience of the 3rd millennium BC in the 'Early Bronze' cultures of the 2nd millennium BC remains an issue in controversy. In the structure of the societies of the Trzciniec Cultural Circle there are no signs of clear elites. Hence, it is difficult to identify the mechanisms of handing down the 'route experience'. One should note, however, that the clearest manifestations of the route ought to be dated to the middle of the 2nd – early 1st millennium BC, i.e. to the period documented by the elite cemetery at Hordeevka [Berezanskaya, Kločko 1998; Ślusarska..., in this volume]. This opinion is elaborated on in the latest – still unpublished – results of investigations held in the Vinnytsia region.

Translated by Piotr T. Żebrowski

Baltic-Pontic Studies
vol. 14: 2009, 302-337
PL ISSN 1231-0344

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BALTIC-PONTIC INTERREGIONAL ROUTES AT THE START OF THE BRONZE AGE

INTRODUCTION

The question of long-distance exchange has seen many publications in recent years related to the function of routes in human migration, goods and raw materials, transfer of knowledge and technology, as well as the circulation of cultural behaviour patterns at the start of the Bronze Age in the temperate zone of Europe [Kristiansen 1998; Harding 2000; Kristiansen, Larsson 2005; 2007]. The eastern region of Europe has had important research in earlier work by M. Gimbutas [Gimbutas 1965], which proposed an outline of the most significant trans-European routes from the Rhine and the Rhone to the Urals and the Caspian Sea, as well as from the Baltic to the Mediterranean (Fig. 1)

Further discussion on the archaeometric identification of routes leading from the Baltic regions towards the Black Sea in the Bronze Age has been initiated by A. Kośko's [Kośko 2001; 2002] argument on the existence of a 'Crimea-Jutland' route where the spatial distribution of stone heads of fluted (melon-like) maces found in the Baltic watershed was linked to the transmission of so called cultural templates from Pontic regions. The concept of maces in this context therefore, interpreted as prestigious objects (insignias of power) came by way of exchange from the genetic center in the Near East. Pontic societies, mainly the Catacomb

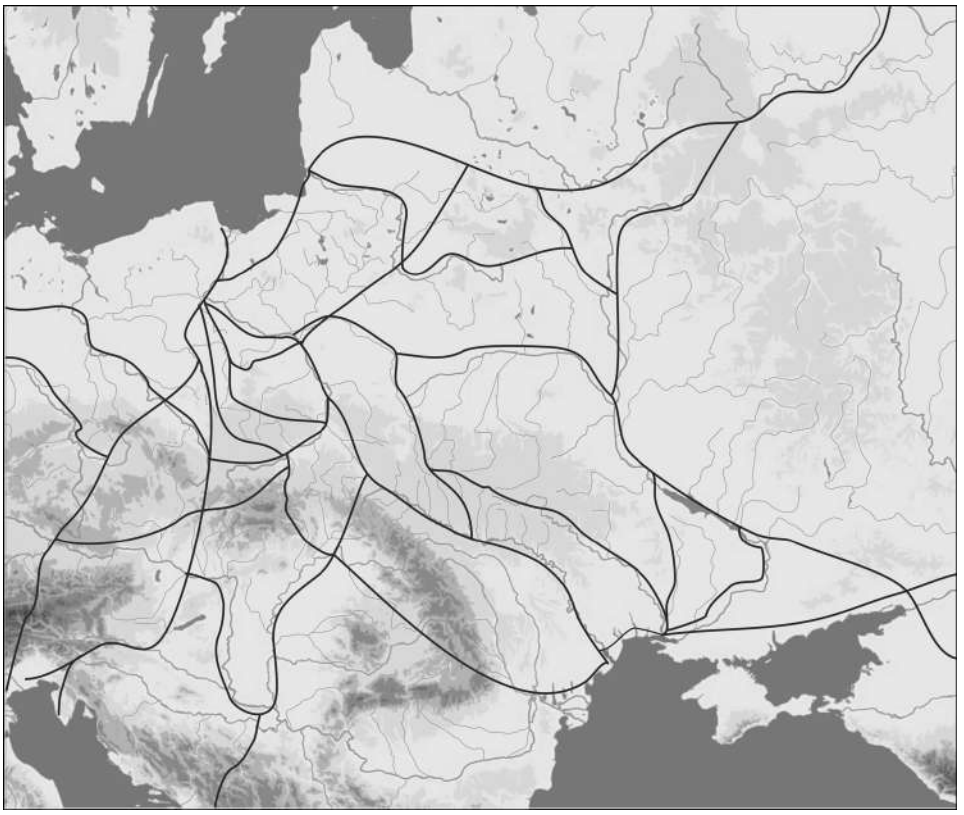

Fig. 1. A long-distance exchange routes in the 2nd millennium BC [according to Gimbutas 1965; Kośko 2001, 2002]

culture, were to adapt and subsequently pass on to the north-west this Near East model of trade, first organised by specialised family enterprises.

The distribution of maces between the Volga and Elbe rivers in the aforementioned thesis was therefore related to the transmission of community and organisational models of Near East civilisation. In the north Pontic region, trade could have been stimulated by the exploitation of salt reserves from the shallow bays at the base of the Crimea (salt lakes of the Sivash) as well as possibly deposits of copper in what is now known as the Donbas district. The Pontic-Baltic route was established therefore, according to the preceding, by related communities using the route, specialising in long-distance trade. Further dissemination of the Mesopotamian-Pontic model towards the Baltic was possible due to the addition of the local community into this interactive system, one with clear hierarchies and the presence of higher ranks such as metallurgists from the Únětice culture, principals behind far-reaching

exchange on the north-south axis bronze and amber and their trade partners to the north from the Iwno culture.

In the above conception, five variations based on the valleys of the main rivers between the Baltic and the Black Seas of the Pontic-Baltic route are proposed [Kośko 2002]. One of these ran from the Baltic shore through the valleys of the Vistula, Bug and Boh rivers towards the Black Sea. On account of the considerable concentration of maces, Kujawy had the main importance as a 'communication stop' region, where according to the above, its societies were the first to adopt the Mesopotamian-Pontic long-distance exchange model. The cultural traditions of Kujawy went on to spread to the Odra basin (later Morava and Danube), as well as the middle and upper Vistula, then through the Raba, Poprad and Wisłok rivers in the direction of the Váh and Danube.

The societies of the Trzciniec cultural circle, late Únětice culture as well as Iwno, Mad'arovce, Otomani/Füzesabony and Tumulus cultures, added maces into the existing system of meridional exchange, which linked the communities of the Aegean, Adriatic and Baltic seas. After the disintegration of the Únětice culture, maces were to in fact take on the role of metal products and become symbols of power and high rank in the majority of the kinship-based societies of the above mentioned cultures [Kośko 2001; 2002].

H. Taras [Taras 2007] on the other hand, has raised doubts as to the possibility of including the Bug basin in the context of a wider, extra-regional system of disseminating cultural patterns. In respect to inter-cultural contacts in the Lublin district (taking in an important part of one of the potential branches of the Baltic-Pontic route) she does not see any clear indications of long-distance interactions. In analysing the distribution of various types of prestige objects (among others, fluted maces), it is proposed that this area was not included in long-distance exchange, understood as an organised and regular channel of products between regions (for other markets) where trade, barter and specialised services were on offer.

Further, the author argues that the main communication routes did not bisect the region in question, nor were there many potential so called clients for luxury goods [Taras 2007]. In fact, it is argued that production was based on an internal market though the custom of replication played a part with imitations of some imported objects where local exchange dominated between the respective settlements in the form of a down-the-line, prestige chain. Patterns of culture exogenous to these communities reached as a result of various factors such as familial and community ties (marriage, alliances, wandering craftsmen). Their presence could have been a result of occasional exchange or even robbery. The former can be understood as barter or an exchange of goods for a service. The distribution of luxury goods did not necessarily have to be tied to an organised long-distance exchange for the main form of contact, it may be argued, was local or regional. These qualifications aside,

the author [Taras 2007] recognises that because of the Lublin district's geography, it is possible to maintain that also in this context we can speak of central European, east European and Pontic cultural models. In addition, objects and patterns from the regions of Carpathia-Transylvania, Silesia and the Pontic at times made their mark here. Not many such (for example a bracelet from Puławy-Włostowice made according to the 'Únětice' stylistic), however, travelled from the Baltic where the Únětice culture and its exchange partners were to be found [Taras 2007]. The diversity of views on the possible identification of inter-regional byways and mechanisms involved in the evolution of defined models and their illustration through relevant materials found between the Baltic and Black seas in the Early Bronze Age, would seem to point to the need for a more integral analysis of the routes under discussion.

In this respect therefore it is necessary to answer the question whether it is possible to verify the unusually interesting research concept of a 'Crimea-Jutland' route. Did one of its long-distance branches, running from the Baltic shore through the valleys of the Vistula, Bug and Boh towards the shores of the Black Sea, function at the dawn of the Bronze Age? Are there indeed other, apart from maces, markers of this route between one and the other sea? If so, which peoples were behind its organisation and control, and how are they to be identified? Last, how did the route come to be and what degree of complexity can we assign to its organisation?

1. ARCHEOMETRY OF THE BALTIC-PONTIC INTERREGIONAL ROUTES (BPIR)

One of the most important means of transfer of goods, ideas, models, knowledge and people in prehistoric societies was inter-group exchange, formulated by M. Mauss as a 'total social fact' [Mauss 2001: 167]. In traditional societies this was never a purely economic transaction for it bore great significance in rituals, in particular for ceremonies and other scenarios [see Sahlins 1972: 149-183; 1992; Lévy-Strauss 1992: 107; Kadrow 2001: 163].

As far as traditional societies are concerned (pre-industrial, non-literate), the most important were certainly ceremonies of gift-giving exchange, especially in relation to observance of holidays in the ritual calendar. In communities with a more complex social structure, the redistribution of goods also played an important role. Thus exchange was one of the organisational factors in social structure, initiating and maintaining social relations, in particular in systems yet to fully develop commu-

nity institutions. In respect to the Bronze Age the question arises of long-distance journeys by specialists (explorers, craftsmen, mercenaries) and their significance in disseminating new technologies or means of combat. It is thanks to the knowledge and skills gained from these people that particular innovations and behaviourial models appeared well beyond the centre of their origin [Kristiansen, Larsson 2005: 39; 2007: 26].

The professional literature presents a number of forms, types and scenarios of exchange [Renfrew 1984: 119-121; Renfrew, Bahn 2002: 335-368], most of which can be classified as 'intellectual speculation' that has no specific application per se. Other sources concern for example the world of the Aegean or the Near East, regions significantly differing in their degree of complexity of socio-political and economic structures from that of Central Eastern Europe. In respect to the above mentioned regions of the Old World, only a part of these propositions, it may be argued, is applicable. It would appear therefore that transactions in this context were dominated by the non commercial and individual type, rather than trade as we know it in its traditional form [Sherratt 1993; Hänsel 1995 (Ed.); Kristiansen 1998; Harding 2000; Kadrow 2001; Kristiansen, Larsson 2005]. On account of the fact that exchange in this context also has an economic-business dimension, as well as a social one, it may be viewed not only as a part of the economy but also as an integral factor in the formative processes in most societies.

One of the archaeological measuring sticks of a route's existence is the dispersion of prestige objects (luxury, status-bearing), made out of exotic raw materials that appear well beyond common locations (resources) and centres of production. Their presence in other regions could have been tied to some form of organised distribution of exchange or trade (without delving into their semantics), be it long-distance, local or 'down-the-line'. In terms of these methods a cartographic representation of defined prestige products allows us to outline the relevant potential circulation routes of prehistoric peoples and their attendant cultural bi-products and models. Naturally, the appearance of prestige objects and their associate designs well beyond the geographical centre of production could have been the result of other phenomena (such as armed conflicts), though it would appear that only social contacts that were linked with a greater or lesser form of institutionalised exchange can serve to explain this issue in a systematic manner.

The most important raw materials that played a pivotal role in the establishment of routes between the Baltic and the Black seas could be said to be amber, copper, flint, basalt and salt. These all could be found in the Baltic-Pontic region [Makarowicz 2009b]. The distribution of prestige products recorded in this area has been analysed separately for the start of the Bronze Age (turn of the 3rd and 2nd millennia BC), when the impact of the Únětice, Mierzanowice and Strzyżów cultures can be seen. Above all, this has significance for the period of Trzciniec cultural circle growth in the remaining part of the 2nd millennium BC.

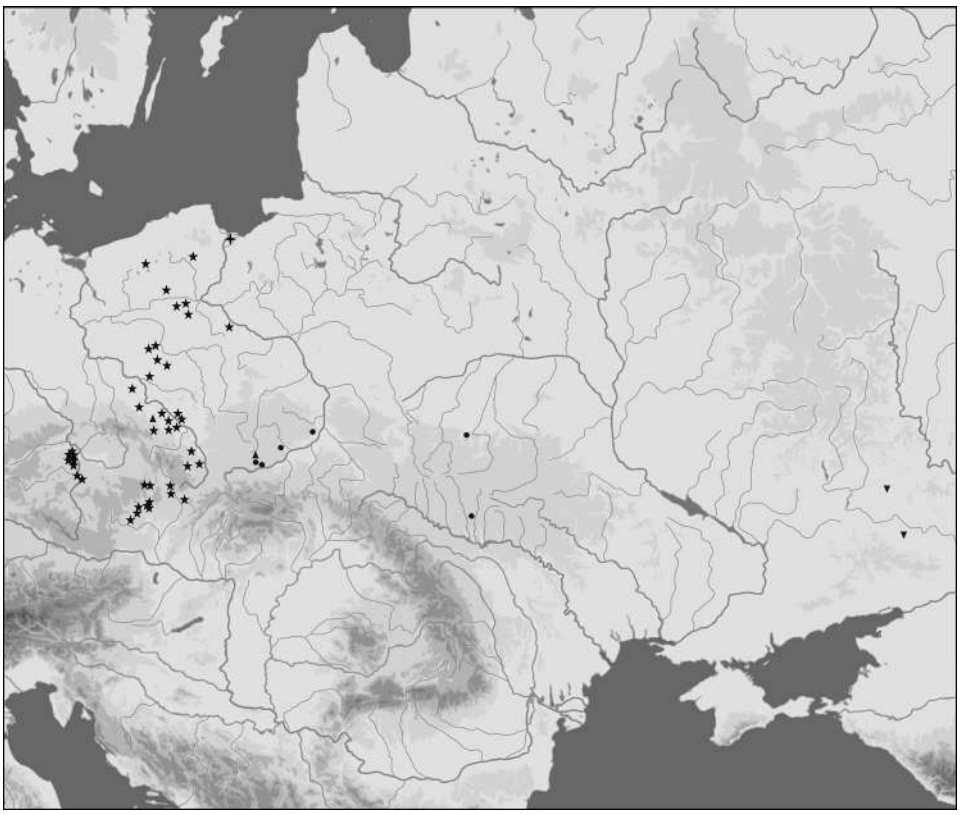

Fig. 2. Distribution of amber beads in the Early Bronze Age cultures of Central Eastern. Triangle – Bell Beaker sites; star – Únětice culture sites; circle – Mierzanowice culture sites; reversed triangle – Catacomb culture sites [according to Vangorodska 1985; Bukowski 2002]

1.1. THE TURN OF THE THIRD AND SECOND MILLENNIA BC

First, mention ought to be made of amber products whose distribution towards the south-east in this period is not clearly evident. These amber materials (beads) are in the main recorded in graves and their distribution does not show a clear 'transmission route' (Fig. 2).

In the west of Ukraine there are few records of 'Únětice' style metal products that dominated in the Baltic region [Makarowicz 1998; 2009b; Czebreszuk 2001a]. In the main, they are incidental finds such as a necklace with scrolled ends

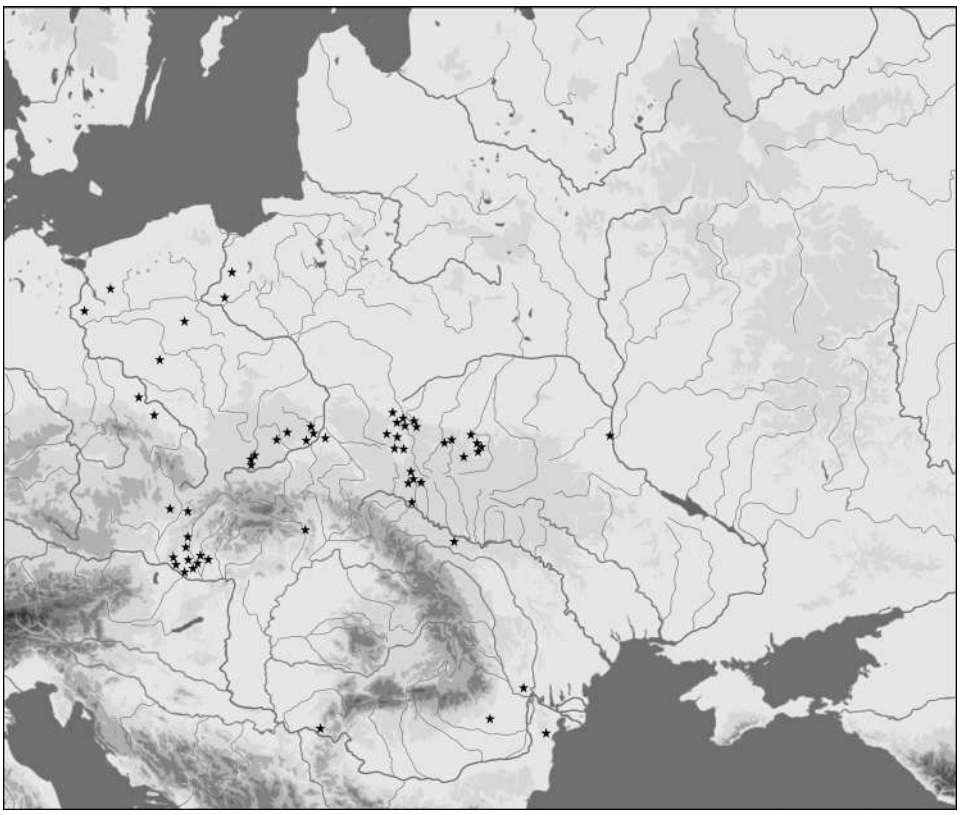

Fig. 3. Distribution of willow leafshaped ear-rings in the Early Bronze Age cultures of Central Eastern Europe [according to Kadrow 1995b; 2001]

(*Ösenhalsringe*) from Horodenka, daggers from Sarniki[1], Balice and Wysocko, found in Dniester region barrows of the Corded Ware culture, Cypriot pin from Putiatynce, pins and bracelets found in barrow VII from Balice, axes with turned sides from Chilczyce and Sokół as well as bracelets from the hoard in Lipa [Sulimirski 1968; Ryndina 1980; Makarowicz 2009b]. It should be mentioned, however, some of these artefacts could have also originated from the Carpathian Basin in the Otomani/Füzesabony culture [Mozsolics 1967].

The distribution of willow leaf-shaped ear-rings in the east and south-east (Fig. 3) was linked to the presence of the Mierzanowice culture (Grodek-Zdolbitsa

[1] For the purposes of this study, where excavations took place before 1939, Polish spelling has been retained for locations in western Ukraine as in the literature [e.g. Sulimirski 1968].

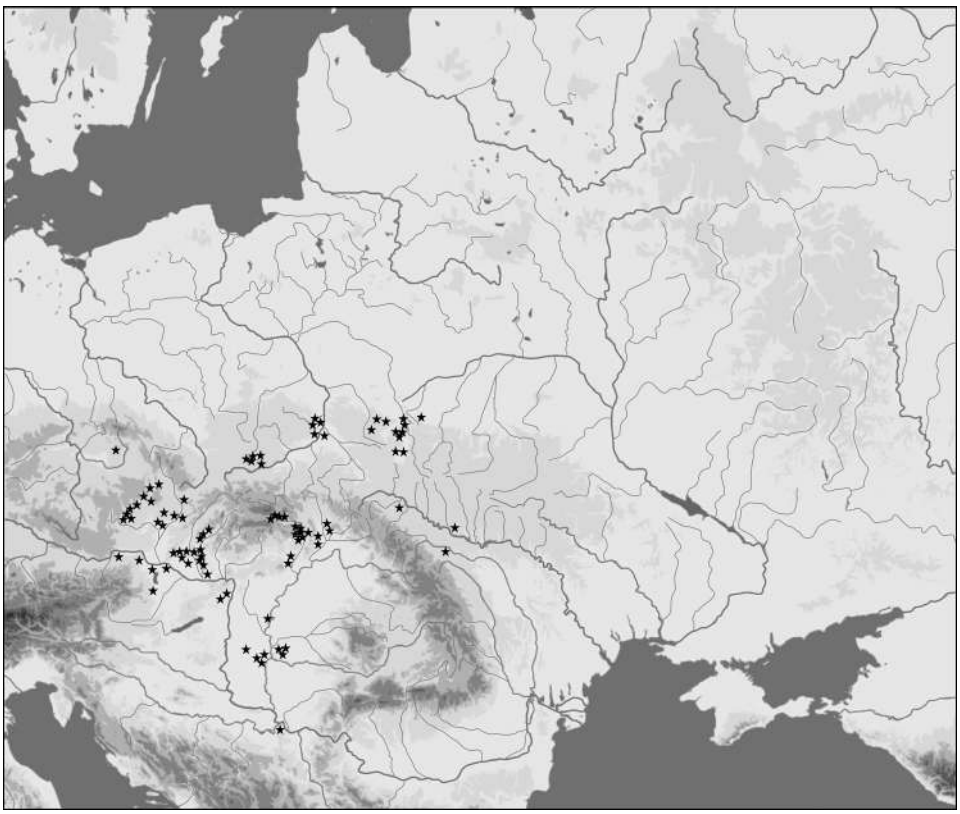

Fig. 4. Distribution of faience beads in the Early Bronze Age cultures of Central Eastern Europe [according to Kadrow 1995b; Bátora 2006]

and Pochapy groups) [Kadrow, Machnik 1997; Kadrow 2001] and in some part the Strzyżów culture, these made out of Volhynia copper [group I – Ryndina 1980], the main part (mostly the Corded Ware and Strzyżów cultures) made out of Carpathian-Transylvanian copper group IV (metal 'KT') according to E.N. Chernykh [Chernykh 1976] and some from Caucuses raw materials (group II). Among the 'Strzyżów' materials a selection of objects has been identified that most likely is the result of an alloy from the raw material of groups I and IV, local and Transylvanian copper.

The distribution of faience beads (Fig. 4), elements of necklaces found in the late Mierzanowice and Strzyżów cultures, is concentrated in the upper Vistula region as well as in the interfluvial area of the Wieprz and Bug rivers. Further east there is the odd find along the valleys of the Dniester and Prut. The center of production

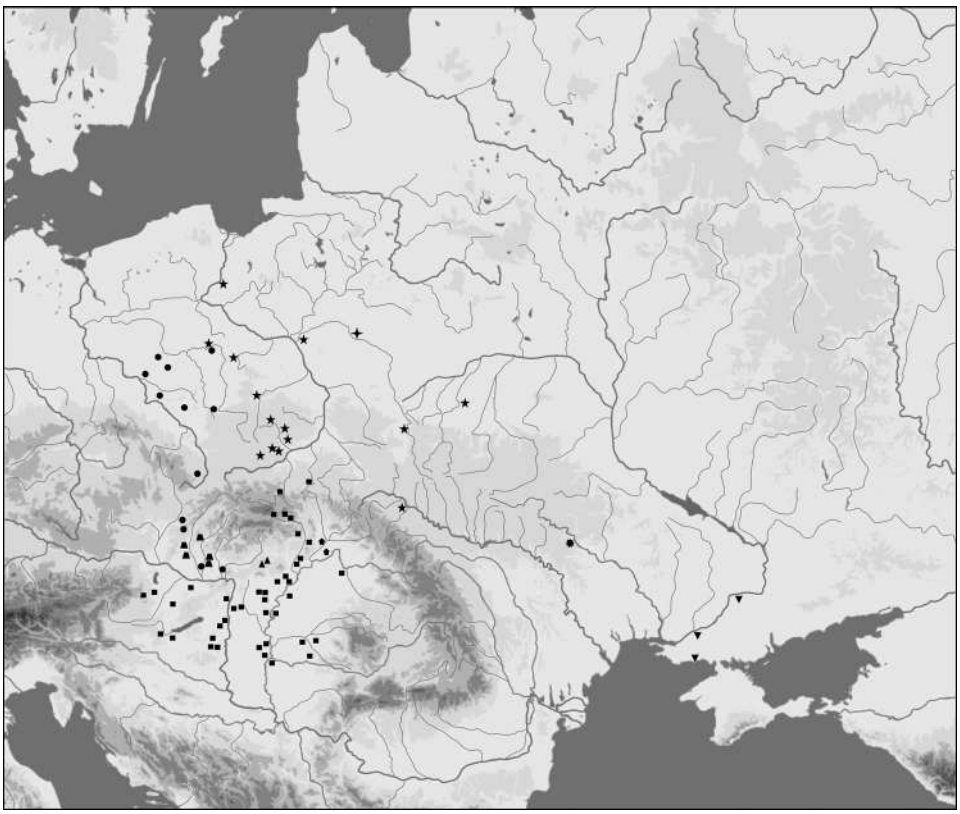

Fig. 5. Distribution of amber beads of the Trzciniec cultural circle in the context of finds of other contemporary cultures. Square – Otomani/Füzesabony culture sites; trapeze – Mad'arovce culture sites, star – Trzciniec complex sites (star with straight arms – raw material); pentagon – Suçiu de Sus culture sites, triangle – Piliny culture sites; triangle – Bilozerka culture sites; sun – Hordeevka cemetery [according to Makarowicz 2009b]

of these was in the Carpathian Basin and their appearance in Mierzanowice and Strzyżów culture inventories can be said to be linked to the Füzesabony culture [Kadrow 1995b; 2001].

To recapitulate, in this stage of contacts between the peoples of the Baltic and the Black Sea watersheds it is possible to maintain that the dispersion of prestige objects at the turn of the 3rd and 2nd millennia BC does not provide strong evidence of the presence of routes linking these respective territories. The dissemination of goods under discussion indicates rather, the interaction of peoples in neighbouring settlement regions (cultural settlements) than long-distance contacts of a trade nature.

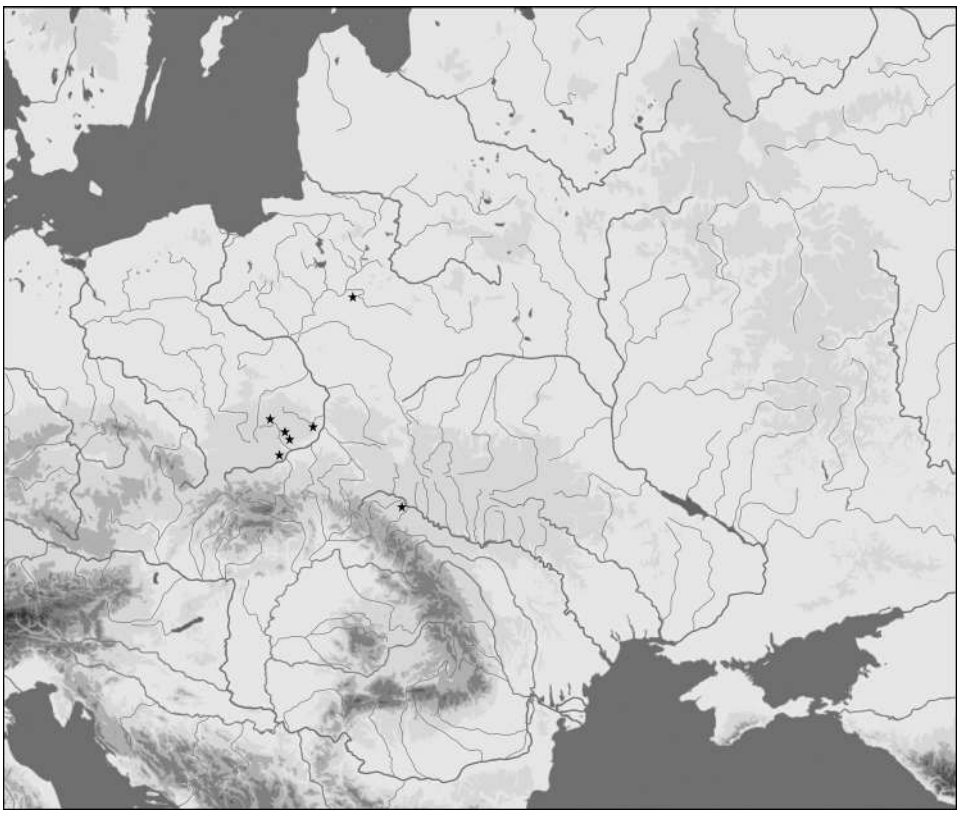

Fig. 6. Distribution of glass beads of the Trzciniec cultural circle [according to Makarowicz 2009b]

1.2. THE REMAINING PERIOD OF THE SECOND MILLENNIUM BC

The scenario outlined thus far changes with the appearance of societies of the Trzciniec cultural circle from the classical phase around 1700-1600 BC. The recording of a greater number of varied types of prestige products may be a sign of the activation of the Baltic-Pontic communication arteries during this period.

In this period goods made of amber (Fig. 5) continue to be recorded mainly in the interfluvial area of the Odra and Vistula, as well as in the Carpathian Basin, which ought to be linked with long-distance trans-Carpathian routes organised by the Otomani/Füzesabony culture with their northern partners from the Małopolska enclave of the Trzciniec circle [Makarowicz 1999; Górski, Makarowicz 2007b]. Nonetheless it can be clearly seen that succinite products, mainly beads, were 'exported'

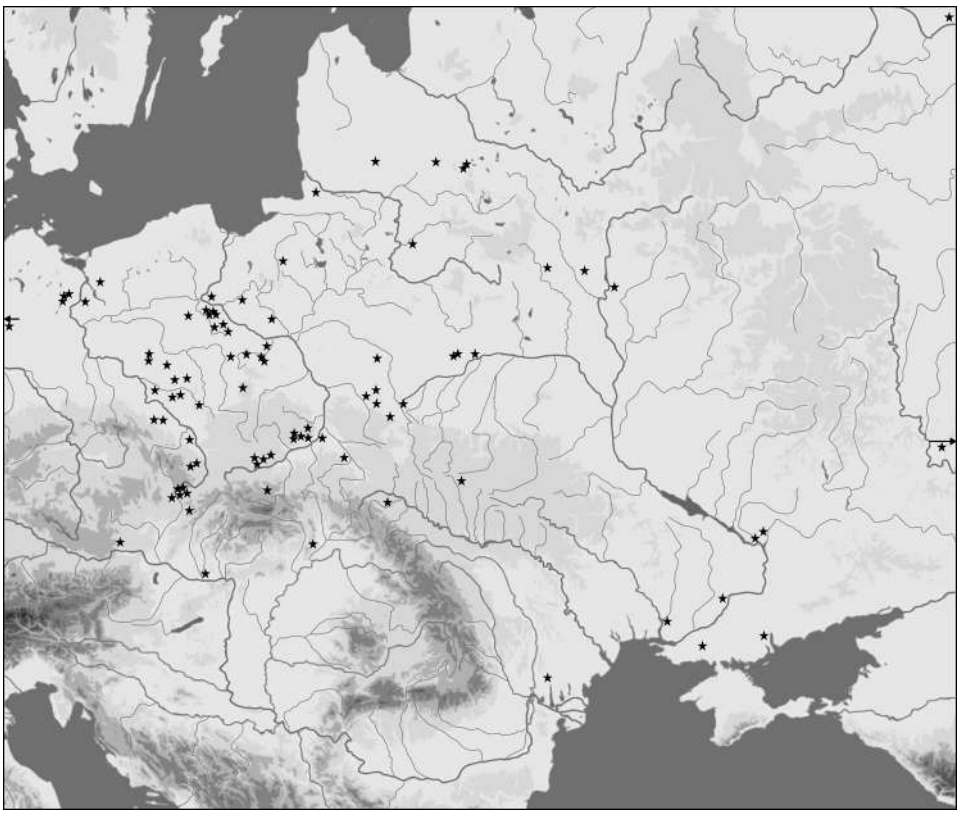

Fig. 7. Distribution of stone heads of fluted (melon-like) maces in Central Eastern Europe [according to Kośko 2002; Makarowicz 2009b]

also into the east and south-east. A similar situation can be said to pertain to glass beads, which were prestige elements of prestige necklaces that were ornamented also with other raw materials (Fig. 6)

Small fluted maces (Fig. 7) appear in the populated areas of the Trzciniec complex rather frequently though only some clearly originate from the aforementioned culture circle context [Kośko 2002]. It would appear that a particular type of these maces, B1 (with wide grooves without protrusion at the mouth), appeared in the Odra-Vistula interfluvial area in the context of the Tumulus culture and later Trzciniec cultural circle, and thereupon reached out to the east [Makarowicz 2009b].

Axes and axe-hammers made of stone can be found in graves and settlements in the main cultural enclaves, in particular in the upper and middle Dniester basin, as well as dispersed along the interfluvial area of the upper Vistula and Prosna, not

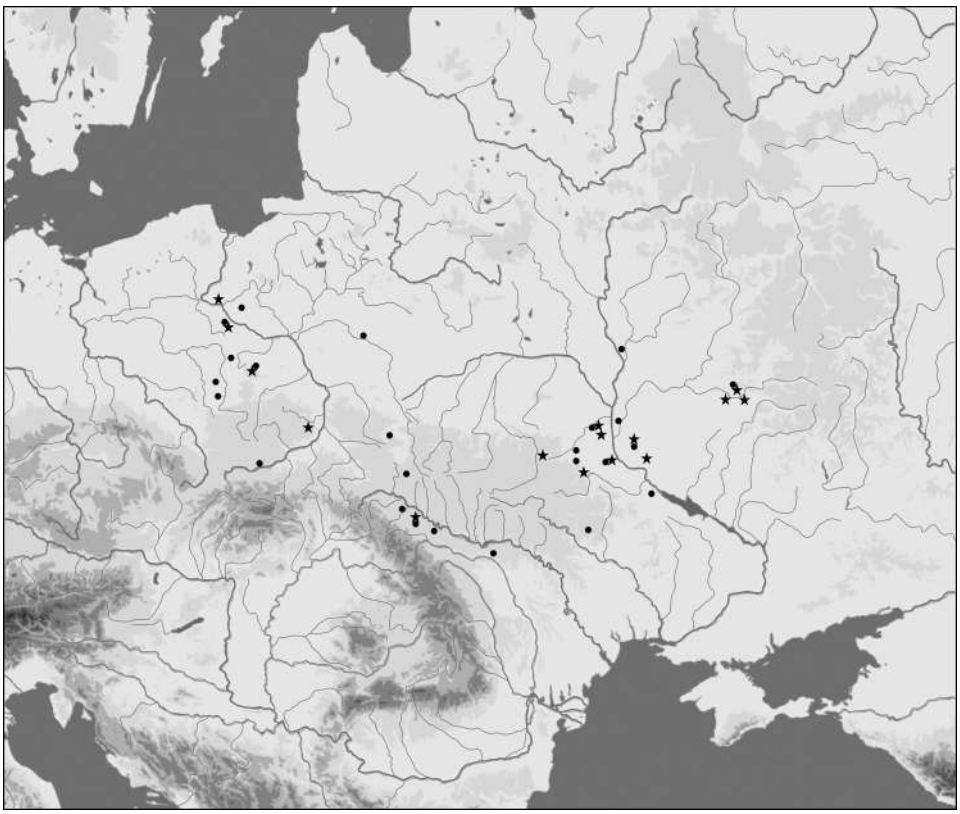

Fig. 8. Distribution of stone axes and axe-hammers of the Trzciniec cultural circle. Axes – star; axe-hammers – circle [according to Makarowicz 2009b]

forgetting the upper reaches of the former (Fig. 8). The recording of such items in the valleys of large rivers or their watersheds, might testify to the distribution of these artefacts and confirm the presence of communication routes.

The distribution therefore of products that can be classified as prestigious, such as axes and daggers (Fig. 9), as well as flint sickles [Taras 1997; Libera 2001; Makarowicz 2009b] can be linked rather clearly to regional appearances of chosen raw materials. Their concentration can be said to be mainly in the populated south uplands of the Trzciniec cultural circle. They are found in enclaves near Volhynia flint deposits, on the Volhynia upland bordering with the Volhynia Polissya, in particular, over the middle Styr and upper Horyn rivers, the upper Dniester basin and the Lublin upland, as well as to a lesser degree in the Małopolska Upland.

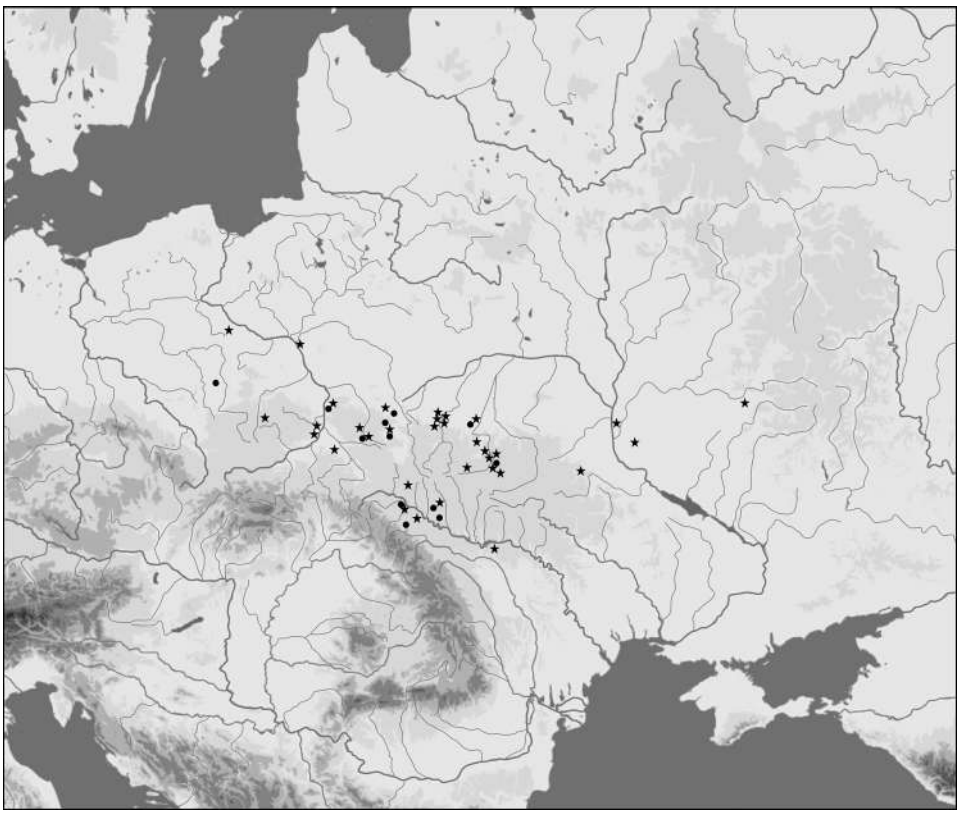

Fig. 9. Distribution of flint axes and spearheads of the Trzciniec cultural circle. Axes – star, spearheads – circle [according to Makarowicz 2009b]

In the remaining enclaves of the 'Trzciniec' area the above are found only occasionally. It is out of this particular raw material that the majority of sickles, axes and daggers are produced and their supposed link to the Trzciniec cultural circle may be considered contentious. The far-reaching dispersion of the above artefacts therefore confirms the existence of a vast network of inter-regional links in the system of the culture framework under discussion.

It is interesting to note the geographical spread of sites where so called horn-like spindles, like maces, were considered to be prestige items (ruling insignias?). These can be found in a geographical band from the interfluvial area of the Wieprz and Bug up to the middle Dnieper region (Fig. 10) in the main settlement concentrations of the Trzciniec complex, though there are no records of these in the western part.

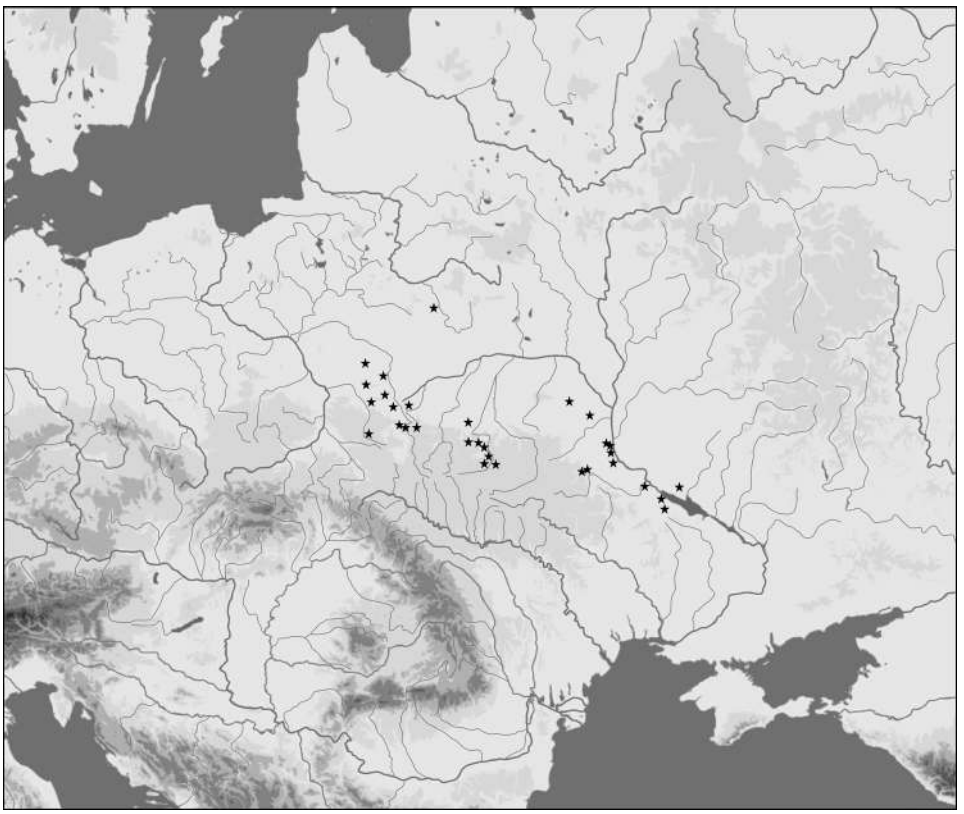

Fig. 10. Distribution of clay horn-like spindles of the Trzciniec cultural circle [according to Taras 2007; Makarowicz 2009b]

There is no proof of Ukrainian copper ores being used by the various enclaves of the Trzciniec cultural circle. A few analyses of the chemical composition of materials from lavishly furnished barrow graves (Ivanje[2] and Netishyn, Volhynia upland [Sveshnikov 1968; Bereznaskaya *et al.* 2004]) as well as pins and bracelets from Ditinichi and Kołosivka as well as pins from Gulaj Gorod, have shown that this is a metal originating from Carpathian Basin ores [Berezanskaya 1972; Chernykh 1976; Makarowicz 2009b]. Further, the style of many prestige artefacts such as axes from an unidentified Volhynia site and in Ivanje, barrow I, or for that matter the ceremonial hammer-axe from Zabolotov (Fig. 11: 1, 2, 4), point to their origins in the Otomani/Füzesabony culture [David 2002; Klochko 2006; Makarowicz 2008]

[2] Unpublished spectral analysis of 10 objects by E.N. Chernykh, courtesy of Y. Brovender and L. Orlovska, to whom I am extremely grateful.

Fig. 11. Prestige artefacts of the Trzciniec cultural circle from the Volhynia upland. 1 – Ivanje, barrow I; 2 – unidentified Volhynia site; 3 – Ivanje, barrow II; 4 – Zabolotov [according to Makarowicz 2008; 2009b]

or show their connections with other cultural traditions (e.g. a dagger from Ivanje, barrow II – Fig. 11: 3) [Sveshnikov 1968; Makarowicz 2008]. A similar situation can be said to be the case with bronze goods from the west of the 'Trzciniec' area, in the main represent, FB1 metal group (SAM terminology), from the Carpathian Basin [Dąbrowski, Hensel 2005; Makarowicz 2009a].

The concentration, in the most intensely settled areas, of dispersed daggers (Fig. 12) and spearheads (Fig. 13) made of bronze can be linked to the Trzciniec circle and in the east to the Leboikivka, Krasny Mayak and Kardashinka metallurgical tradition. These appear mainly in graves and hoards though less often in the settlements, and only occasionally can be considered as an effect of patterns transmitted between societies of the Baltic and Black Sea catchments.

Multi-spiral ornaments of arms (bracelets and armlets) made of bronze linked to the Trzciniec circle were recorded in hoards (mainly in the west) and in graves (usually in the east). The latter for the majority was found in barrow graves or as an element of richly furnished 'flat' burials (middle Dnieper region). Some concentration of these items was noted in sepulchral contexts in the upper Horyn region and the middle Dnieper basin, between the Teterev and Ros rivers (Fig. 14) Generally speaking, the goods analysed were found in larger settlement concentrations of the Trzciniec circle in a broad band running from north-west to south-east. Most often, they can be found on the upland part of the Trzciniec cultural circle and in areas

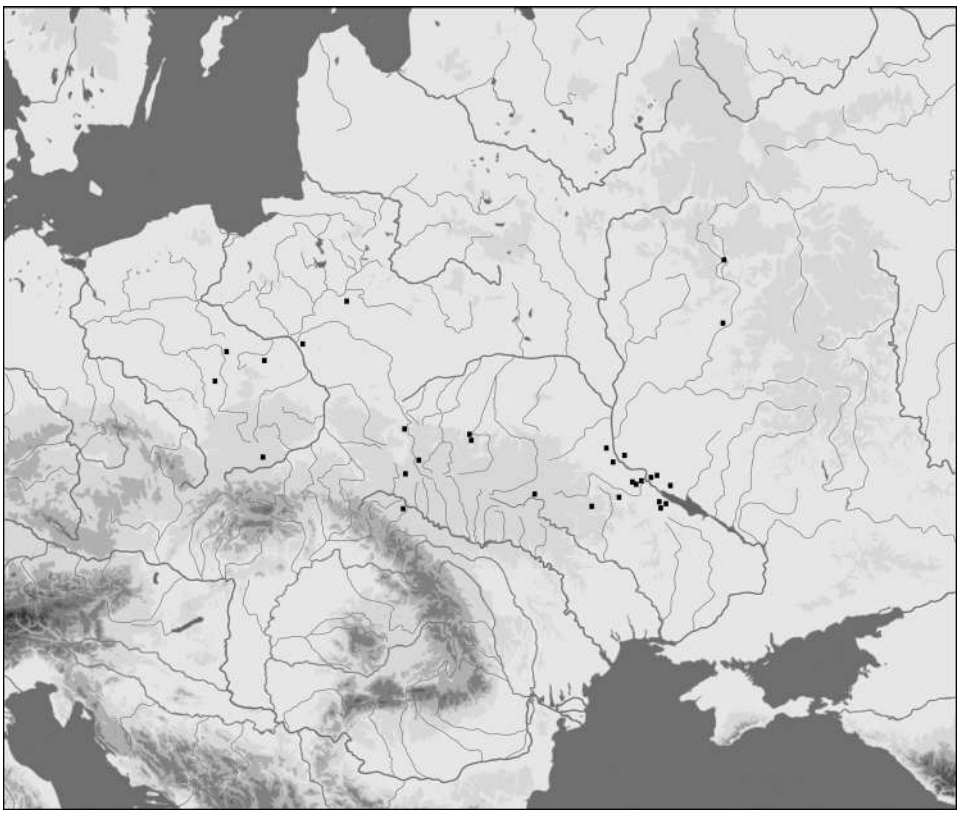

Fig. 12. Distribution of Trzciniec cultural circle bronze daggers [according to Makarowicz 2009b]

somewhat to the north, though there is no record of these materials in the lowland belt that extends north from the middle Vistula up to the Prypets basin.

The ornaments of arms, legs and the neck with shield-like ends made of bronze originate from similar contexts to multi-spiral ornaments. In the west part of the Trzciniec territory they usually appear in hoards (though not only), while in the east, mainly in graves, particularly in barrow graves. They are mostly concentrated between the upper and middle Vistula and Prosna, less so in the Dnieper upland, upper Sluch, as well as in the interfluvial area of the upper Dniester and Prut. Occasional such finds have been found in the Volhynia and Zhytomyr Polissya, as well as the middle Dnieper (Fig. 15).

Characteristic for the Noua-Sabatinivka complex though incidental for the Wietenberg, Monteoru and Coşlogeni cultures, are pins with a rhomboid head that have

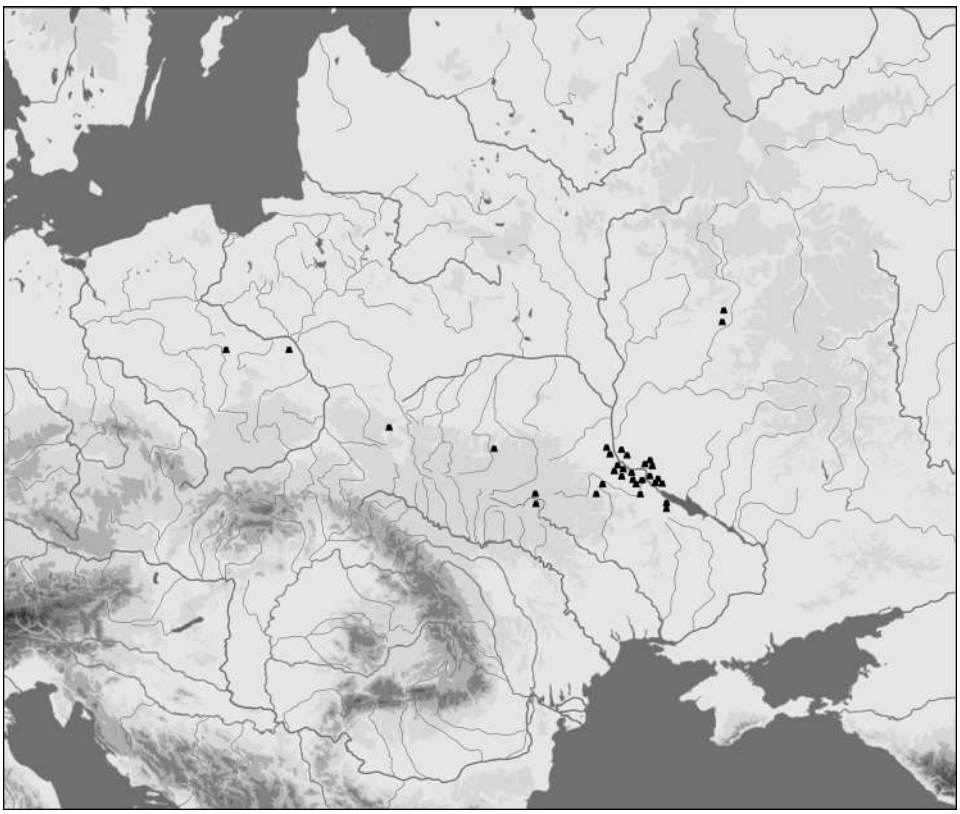

Fig. 13. Distribution of Trzciniec cultural circle bronze spearheads [according to Makarowicz 2009b]

been recorded in 'Trzciniec' graves in Komarów, barrow 6, upper Dniester basin, Gulaj Gorod and Malopolovetskoe, site 3 in the middle Dnieper region [Sulimirski 1964; Berezanskaya 1972; Bierezańska 1972: 296; Lysenko 2001]. The majority of these appear on the eastern periphery of the Carpathian ranges (Romanian plain, Moldavian upland) and the steppe of southern Ukraine in the Black Sea plain (Fig. 16). The range of differences among such pins can be found in the inventories of Early Bronze Age cultures in Central and Eastern Europe [Kaiser 1997; Sava 2002: 181; Krushelnytska 2006].

Pins with Otomani/Füzesabony culture designs featuring 'nail-like' and 'scroll-like' (pastoral) heads, appear mainly in graves. In the Baltic-Pontic area they can be found rarely and have been recorded in several key 'Trzciniec' settlements in the Wielkopolska-Kujawy plain, Małopolska upland, the upper Dniester basin and

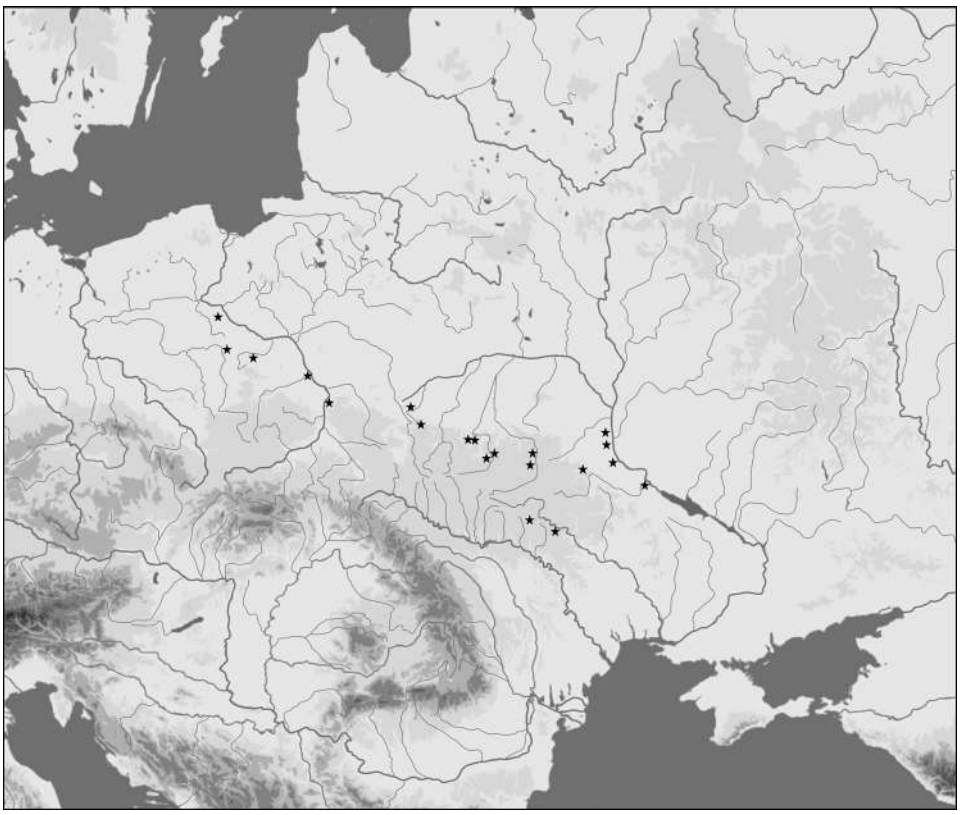

Fig. 14. Distribution of bronze multi-spiral arm ornamentation (bracelets and armlets) of the Trzciniec cultural circle [according to Makarowicz 2009b]

in the Volhynia upland, as well as sporadically in the middle Dnieper and lower Vistula (Fig. 17).

Diadems have been documented mainly in graves, in particular barrows (rarely in hoards). Occasionally these appear in various settlement enclaves of this cultural unit, one of which was found in a barrow in Bahr, upper Boh basin (Fig. 18).

Some materials made out of gold, exclusively ornamental such as gold rings and lunulae being elements of necklaces, appear in various parts of the Trzciniec complex, mainly in barrow graves and in one particular hoard (Fig. 19) Rings made out of wire with a returning spiral (*Noppenringen*), made out of bronze or gold, are usually linked to the traditions of the metallurgical craftsmanship of the Únětice culture [Moucha 1963: 36; Zich 1996: 226; Bartelheim 1998: 61; Kadrow 2001: 93].

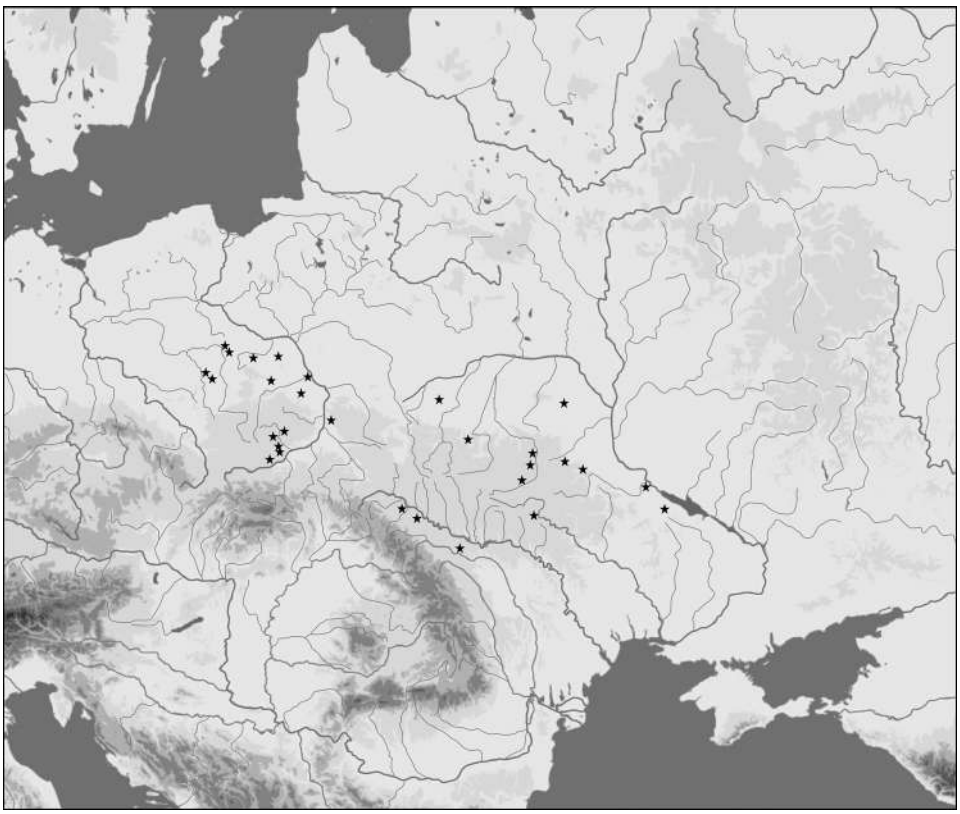

Fig. 15. Distribution of bronze hand, leg and neck ornaments with small spiral shields (bracelets, armlets and necleces) of the Trzciniec cultural circle [according to Makarowicz 2009b]

These materials also can be found in the Carpathian Basin, amongst others, in the Füzesabony and Gyulavarsánd cultures [Bóna 1975: 134, 159]. It is perhaps possible that as a particular 'Únětice' heritage they represent in the majority of cases not rings but ear rings. In the east, goods made of gold were found in barrow cemeteries near the valleys of large rivers, for example the Dniester, Boh, Sluch and Horyn, in the context of larger regional groupings of the Trzciniec circle.

Of particular interest for the reconstruction of BPIR is the distribution of horse harness – cheek pieces from the Bronze Age [Kristiansen, Larsson 2005; 2007]. Apart from their presence in central settlement clusters, they have also been found along the valleys of rivers (Fig. 20). These items testify to the use of horses, not only for horseback riding, but also as a locomotive force for light carts, documented in

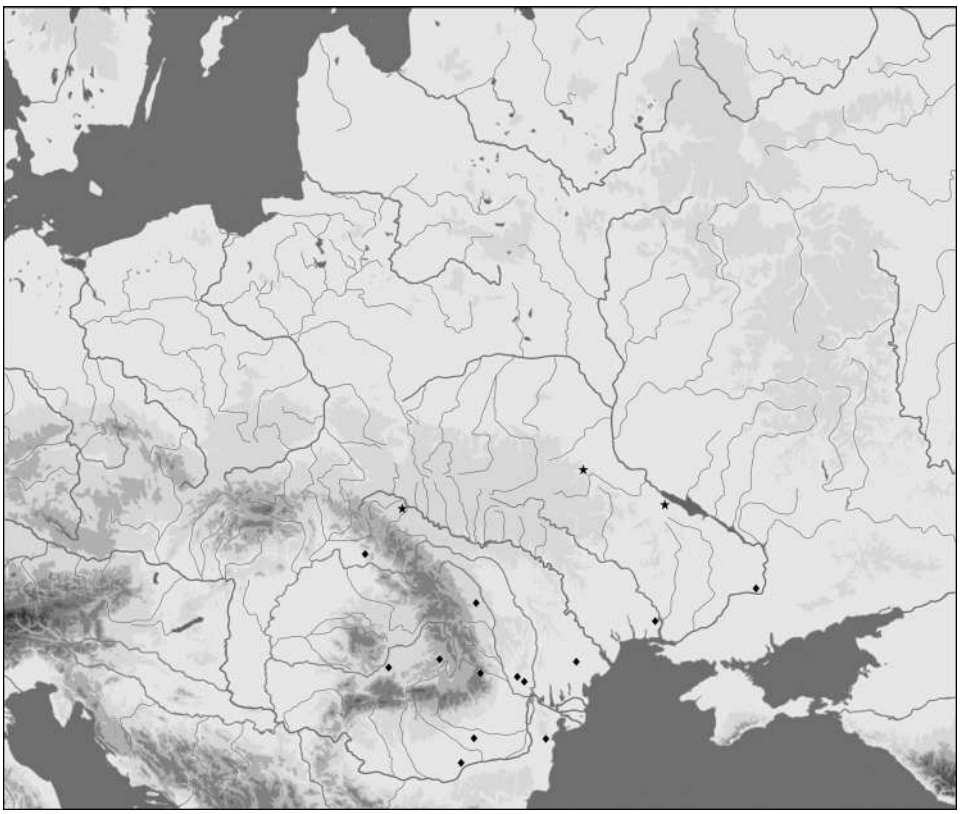

Fig. 16. Distribution of bronze pins with a rhomboid head (star marking Trzciniec cultural circle site) [according to Sava 2002; Makarowicz 2009b]

the above mentioned period in Early Bronze Age cultures of the Carpathian Basin, as well as in the Eastern Europe. The significant role of the horse in the Trzciniec complex as the main domestic animal has been confirmed by numerous deposits of post-consumption bone remains and graves where ritual burials of this animal took place (Fig. 21).

The general picture outlined thus far would seem to suggest a significant revival of contacts between the peoples inhabiting the regions of the Baltic and Black seas in the 2nd millennium BC. Their increased intensification ought to be linked therefore to the establishment of a new cultural formation bearing structures of a *long duree* – Trzciniec cultural circle [Makarowicz 2009b], over the populated catchment areas extending from the Baltic to the Black sea.

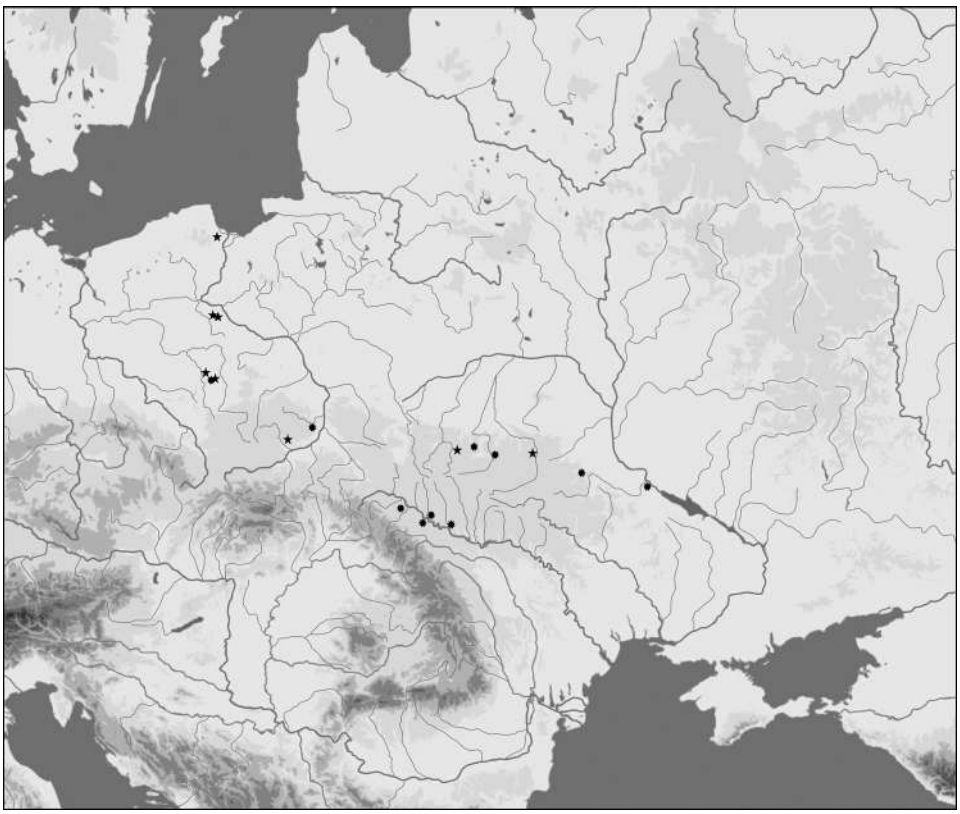

Fig. 17. Distribution of bronze pins with a 'nail-like' and 'scroll-like' heads of Trzciniec cultural circle. Circe – pins with a 'nail-like' head; star – pins with a 'scroll-like' head [according to Makarowicz 2009b]

2. THE ORGANISATION OF BALTIC-PONTIC INTERREGIONAL ROUTES

In accepting the thesis of a system of long-distance communication routes existing, which linked the largest settlement centres of the Trzciniec circle as well as those with the most important European centres of culture, the need arises to define its organisational form. This could be said to include the actual territory over which they functioned, their fundamental beginning and end points, intermediate elements broken down into stages and stopping points, contact zones, principle travellers known as 'people of the route' [Kośko 2001; 2002], as well as the mechanisms of circulation of people and artefacts, transmission of cultural patterns, fashion, innovation, knowledge, how-know and cultural concepts.

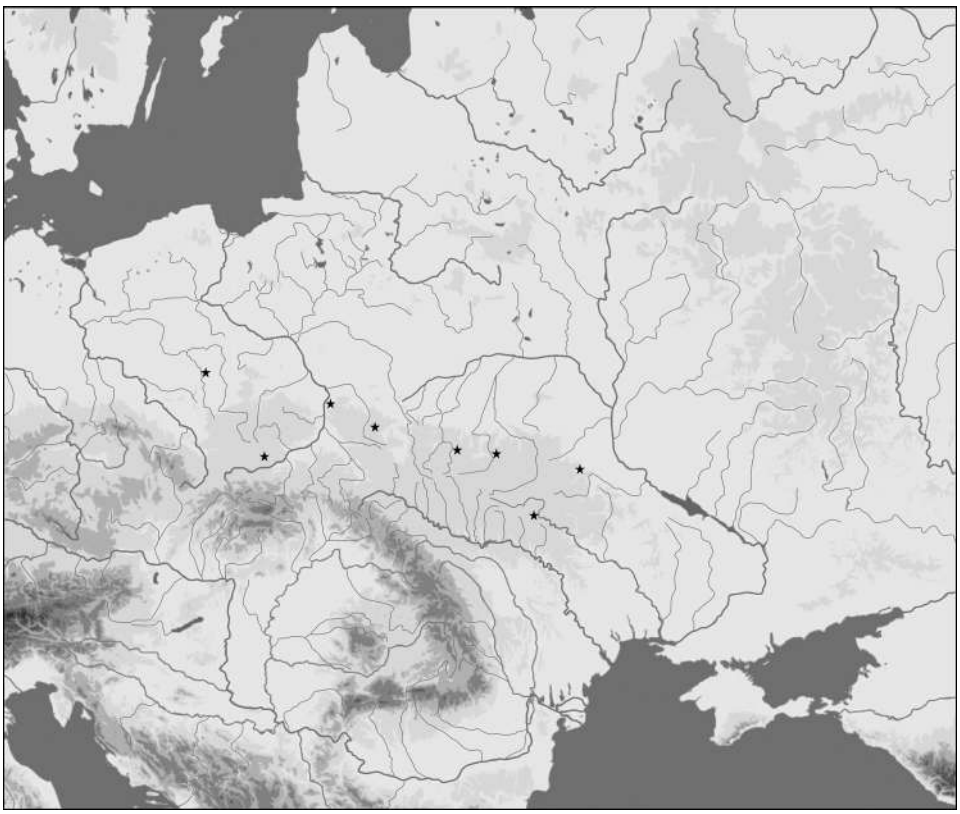

Fig. 18. Distribution of Trzciniec cultural circle bronze diadems [according to Makarowicz 2009b]

The distribution of prestige objects and some materials (in relation to their traits) of a more common nature (vessels, ornaments) among the population of the Trzciniec circle indicates their concentration in the aforementioned settlement centres. The majority has been found in the context of rituals (graves, hoards, ceremonial objects) or those undefined (occasional finds), whereas only a small part was found in settlements – in dwellings and domestic features. These dominant contexts of finds relating to previously mentioned objects does not, however, mitigate the presence of routes. Prestige items (status, insignias) were rarely left (mislaid) on these communication channels. Usually such artefacts not only found their way to the main centres of culture near the major dissecting byways but also at a certain distance from them.

In many cases the appearance of valuable, socially esteemed objects or patterns in larger agglomerations was tied to people specialising in exchanges leaving a stra-

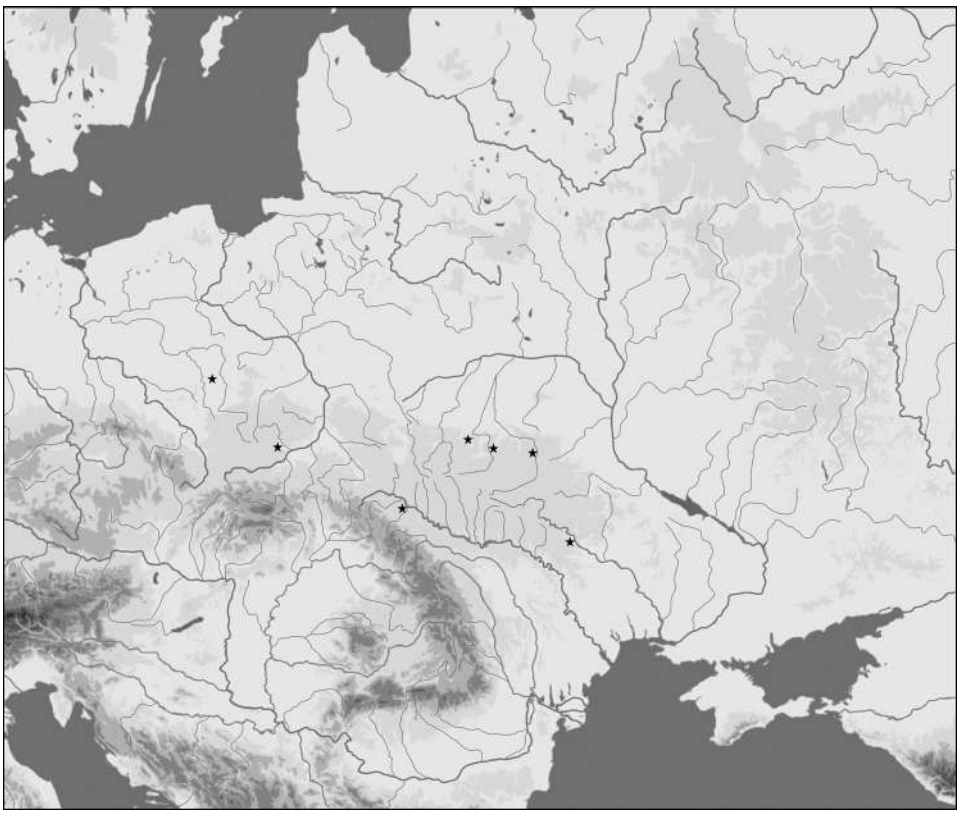

Fig. 19. Distribution of gold artefacts from the Trzciniec cultural circle [according to Makarowicz 2009b]

tegic route (transcontinental) and then using one of lesser importance. As noted by S. Kadrow [Kadrow 2001: 225], the 'influence' of external cultures (technological inventions, models, organisational forms, prestige items etc.) does not have to spread in a particular fashion, each time leaving signs of a particular stage. On the contrary, according to world systems theory, which assumes a hierarchy in each cultural, economic and political dimension, some phenomena (metallurgy of bronze or chieftain-based organisations) appear only where there existed a demand for a particular innovation and the appropriate conditions for its adaptation.

Thus the mechanisms of distributing prestige products, patterns, innovations or knowledge can vary from long-distance, direct and successive exchanges to forms defined by their immediate environs to local transfer known as 'down-the-line', or neighbouring 'prestige chain exchange' [Dąbrowski 1972: 193; Renfrew 1984: 119-121; Harding 2000: 187-196; Renfrew, Bahn 2002: 335-368].

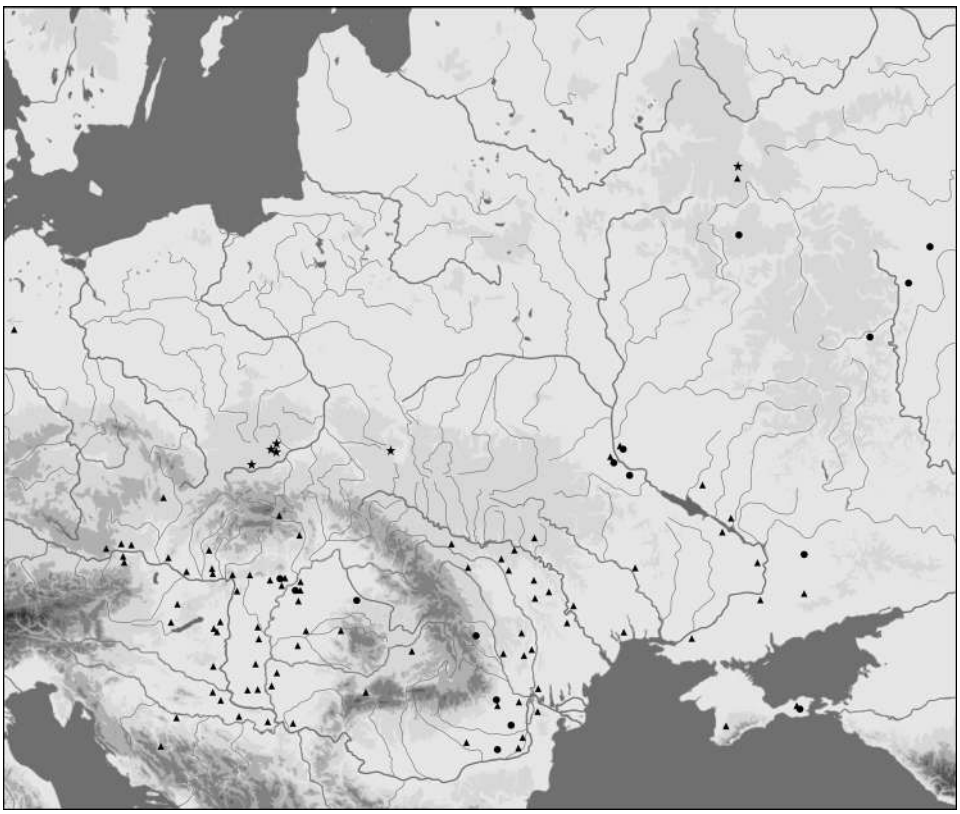

Fig. 20. Distribution of horse cheek pieces. Star – Trzciniec cultural circle sites. Star and triangle – Central European cheek pieces; circle – East-European cheek pieces [according to Boroffka 1998; Kristiansen, Larsson 2005; 2007; Makarowicz 2009b]

The appearance of particular objects under discussion near river valleys or in the watersheds of main rivers running across the Trzciniec area as well as beyond towards important centres of civilisation could have signalled the presence of permanent or period-specific communication routes functioning. Examples of long-term, stable routes in this period (though sometimes ones changing course) are the long-distance links with the north (Baltic region) to southern Europe in the direction of the Carpathian Basin and further to the Aegean and its environs. At the end of the first half of the 2nd millennium BC, of key importance in this regard was the interaction of the Małopolska enclave of the Trzciniec complex with the nearby groups (northern enclave) of the Otomani/Füzesabony culture.

Thanks to the northern routes running through the 'Trzciniec' agglomerations in the Małopolska upland and beyond through the Carpathian pass along the La-

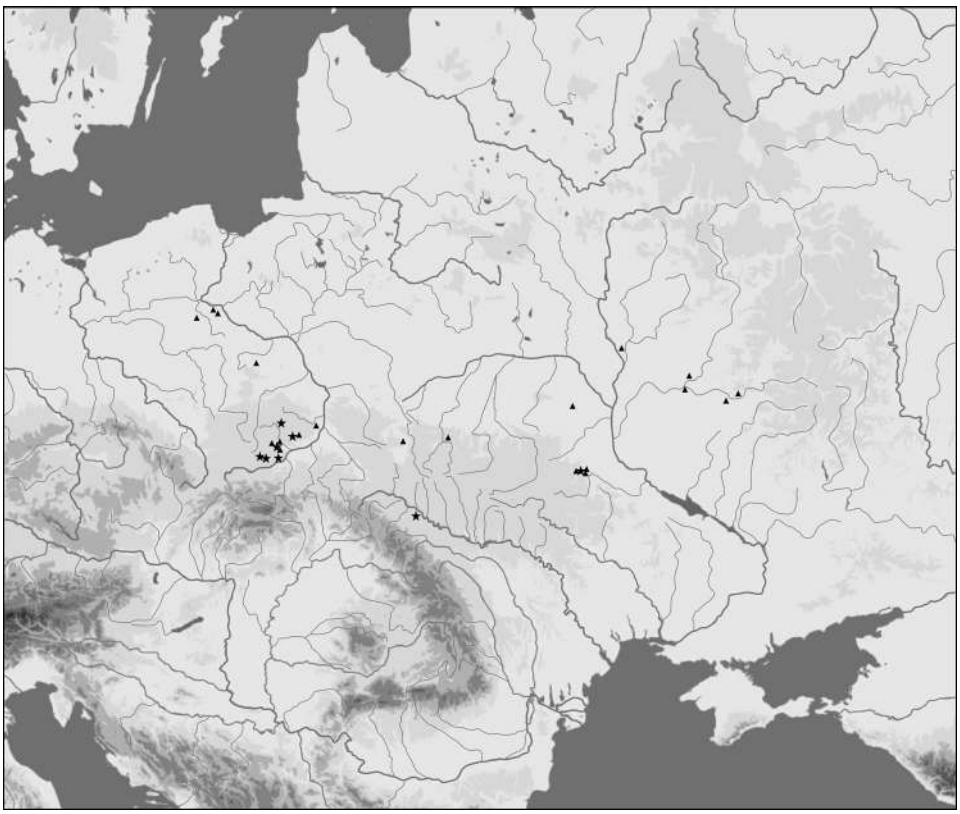

Fig. 21. Distribution of horse graves and post-consumption deposits of horse bones in the funeral and settlement contexts. Star – horse graves; triangle – post-consumption remains of horse [according to Makarowicz 2009b]

borec, Ondava, Topel and Torysa rivers to various cultures in the Carpathian Basin, amber was found [Markova 1993; Gašaj 2002; Bátora 2006: 203-208]. Similarly, in Otomani/Füzesabony culture settlements located on the northern side of the Carpathian arch, 'Trzciniec' pottery was also found, perhaps an effect of exogamy.

No doubt, for the societies of Volhynia and Dnieper 'Trzciniec' enclave regions, as in the case of peoples from the Małopolska upland and Kujawy-Wielkopolska plain, contact with the cultures of the Carpathian Basin was highly important, in particular with Transylvania and Moldavia, especially with the Otomani/Füzesabony culture, then that of Noua. The significant accumulation of objects from the trans-Carpathian region in the upper Vistula and Dnieper spread further also into the northern part of the Baltic-Pontic area, which testifies to the possible activity of the

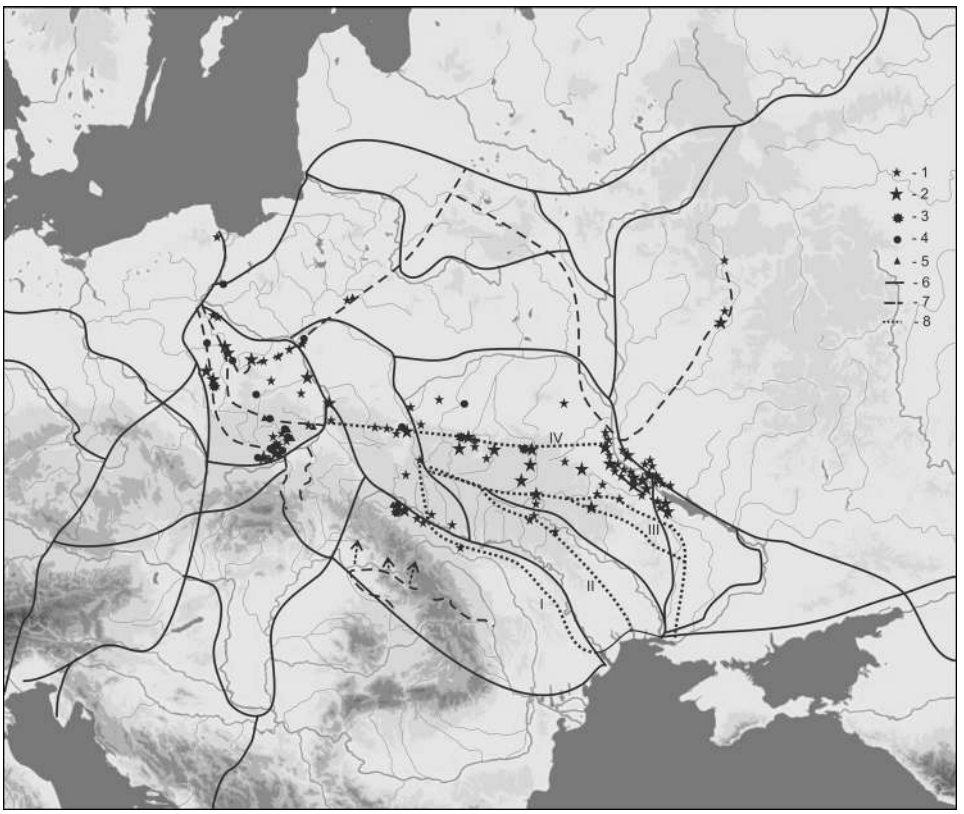

Fig. 22. Distribution of prestige goods and the potential water and overland long-distance and local routes in the Baltic-Pontic region and its surrounding territories in the second millennium BC. 1, 2 – bronze goods (1 – one item; 2 – more than one item); 3 – gold goods; 4 – amber beads; 5 – glass beads; 6 – routes proposed by M. Gimbutas [Gimbutas 1965] and A. Kośko [Kośko 2002]; 7, 8 – routes proposed in this paper. I – Wolosky route; II – Kuchmansky route; III – Black route; IV – Volhynian route [according to Gimbutas 1965; Kośko 2002; Makarowicz 2009b]

'Otomani/Füzesabony' societies in the organisation of communication links not only from the Baltic region to the Carpathian Basin [Górski, Makarowicz 2007a; 2007b], but also from this region in the direction of the Black Sea [Makarowicz 2008, 2009b].

The BPIR were no doubt less important in regard to economic and socio-political factors than long-distance Baltic-Carpathian links. These though, were significant for the dissemination and circulation of particular patterns, materials and ideas, as well as the translocation of people. Their range and intensity, in respect to initial research on this issue, is only beginning to become clear (see other studies in this publication).

The potential use of natural water byways, in particular in the lower reaches of rivers, is exemplified by the boat found in Pińczów, South-eastern Poland, radiocarbon dated to 1500-1300 BC [Dąbrowski 2004: 41], and land routes leading along the watersheds of large rivers. No doubt the lion's share of the route was done by foot. The most important 'water' communication branches linked to river valleys, running basically in a meridional direction, ran along the valleys of the Vistula, Warta, and Prosna towards the 'Trzciniec' enclave in Małopolska, running up the Wisłoka, Wisłok, Dunajec and smaller rivers towards the Carpathian pass, further to the Ondava, Laborec, Topel and smaller rivers in the direction of the Carpathian Basin (Fig. 22).

An important role in the transmission of cultural patterns and products in the above mentioned territories was no doubt played by the route running down river of the Sotesh to the Tisa and further up its reaches. Potential routes along river valleys of the tributaries of the Tisa right bank leading through the Carpathian pass were also significant (see Otroshchenko..., in this volume), ones that lead to the tributaries of the right bank of the Dniester and further north and east through the valleys of the Styr, Horyn and Sluch to settlements in Volhynia, Polesie and the Dniester upland, then on to tributaries of the right bank Dnieper, over the middle Dnieper region and further east up the Dnieper, Desna and Sejm. The most important long-distance communication routes of the 'Trzciniec' peoples ran, along the valleys of the Vistula, San – Dniester, Vistula – Wieprz – Dniester, Vistula – Bug – Boh, Vistula – Bug – Prypets, Vistula – Narew – Nemen, as well as Vistula – Bug – to the right bank tributaries of the Prypets (Styr, Sluch and Horyn) (Fig. 22).

It is a great deal more difficult to reconstruct the communicative routes of the Trzciniec circle area, extending over the north, north-west, east and north-east from the Dnieper. The dissemination of cultural models, translocation of people and their goods, transfer of knowledge and technology no doubt occurred with the central Dnieper settlement nucleus along the Desna and its tributaries, as well as the upper reaches of the Dnieper and the Prypets (Fig. 22) [see Lysenko, Lysenko..., in this volume].

Overland communication routes away from river valleys, running through river watersheds can be said to be the second category of 'road' under discussion (Fig. 22). A valuable insight into the means of travel, circulation of raw material, goods (including luxury ones), innovations, cultural patterns in the past, also in the Bronze Age, is given by the analysis of the course of well documented long-distance overland routes used by Tatar forces [Gloger 1978: 329]. From the Baltic-Pontic area we are familiar with several of these routes such as the Kuchmansky – running along the watershed of the Dniester and Boh, the Black (with branches) running between the Dnieper and the Boh, the Złoty (Gold) – between the Dnieper and the Don, the Wolosky running southwards from the Dniester [Gloger 1978: 329]. Moreover, of significance proved to be the more 'trade-like' Volhynian route that ran

from the upper Vistula (near Zamość) to Kiev, intersecting latitudinally (the ford) of the middle Styr, Horyn, Sluch and Teterev rivers Sujkowski 1918. The more regional Chumacky route (at times unmade), ran through the vast 'Trzciniec' cemetery complex in Malopolovetskoe, site 3 [Lysenko 2001; 2004: 85].

The land routes (watersheds) did not in fact have the features of a 'road' but rather, were wide arteries measuring several hundred metres or even several kilometres of terrain, used for the movement of people, animals and perhaps even carts. These were characterised by the presence of (in some parts) barrows marking sometimes the general direction of the 'road' [Gloger 1978: 329; Makarowicz 2009a; 2009b]. The custom of raising barrows in the line arrangements, especially in the southern part of the 'Trzciniec' area, in the deforested parts of watershed ridges, could be an indication that such communication arteries were present. Among many other functions, the role of the barrows as a compass point is emphasised often in the professional literature, as mentioned previously in this study in respect to 'Trzciniec' burial rituals [see Makarowicz 2009b]. There is no irrefutable proof of using the above mentioned channels over time during the Bronze Age. The finds of many prestige objects from this period, however, in their respective geo-cultural contexts, can be said to convey a fulsome store of information prompting a thesis that would acknowledge the early functioning of these communication links.

The discovery of horse harness, in particular cheek pieces as well as horse graves and numerous deposits of bones of this animal, could testify to the use of horses for horseback riding, as a pack animal and one for pulling carts or other forms of transport. Proof for this not only comes from a region of a highly developed metropolitan civilisation of the Near East and Anatolia [Burmeister 2004; Bernbeck 2004; Crouwel 2004b; Hofmann 2004; Kristiansen, Larsson 2007]. From the Catacomb culture and Sintashta complex there has also been found wooden carts, horse graves and elements of horse harness [Gening *et al.* 1992, Figs. 94, 106; Jones-Bley 2000; Epimachov, Korjakova 2004; Otroshchenko..., in this volume]. In the Carpathian Basin and in regions to the north of the Carpathian arch, clay cart models or their parts, as well as bone cheek pieces [Boroffka 1998; 2004] have been found, while from the Aegean region, terracotta models of carts and their iconographic representations are known [Drews 1993: 104-134; Crouwel 2004a]. It can be seen thus that the closeness of the Otomani/Füzesabony culture lent itself to disseminating these innovations northwards where the Trzciniec circle was placed.

Journeys by horse and cart were not possible through river valleys, they would have had to be made a certain distance away, no doubt using watershed routes. Using cattle as pack animals or as a locomotive may have been common practice, though there is no direct evidence for this. Indirectly, zoomorphological artwork, numerous small figures of these and other animals from Early Bronze Age cultures of the Carpathian Basin and its environs [Gancarski 1988; Csányi, Tárnoki 1992: 205, No. 403-413, 417-419; Olexa 2002, photo. 111].

The creation of long-distance communication network branches numbering several hundred and even over a thousand kilometres in all, required considerable organisational abilities and cooperation with the societies of the region concerned through which they ran [see Makarowicz 1998: 253] The presence of civilisational templates from the Carpathian Basin, in particular the Otomani/Füzesabony culture, on the north of the Carpathian arch can point to these peoples as ones of ingenuity, organisation and enterprise (network of 'trade agencies' or representatives among local community).

In the latter part of the first half of the 2nd millennium BC in East-Central Europe only the above mentioned elites of cultural centres had the necessary technological means and ruling cast that allowed for the creation of a northern branch network of widespread contacts ([see Kadrow 2001: 230] regarding this as the most developed economy in this part of Europe). The Otomani/Füzesabony culture was characterised by a hitherto unknown complexity of socio-political structures that created proto-state organisations (fortified settlements, great communal cemetery complexes, spectacular riches, advanced metallurgy and means of transport, specialisations, beginnings of warrior aristocracy) [Kristiansen 1998: 370; Kadrow 2001: 83, 125; Gancarski (Ed.) 2002; Kristiansen, Larsson 2005; 2007]. The presence of amber in barrow 33 in the Komarów cemetery, together with vessels bearing the Noua culture style [Sulimirski 1968] could suggest the participation of other cultures from the Carpathian Basin (beside the Noua culture as well as Costişa culture in long-distance exchanges, perhaps in this case successors of 'Otomani/Füzesabony' representatives).

The main impetus for community elites was the need for northern raw materials, foremost ones such as amber deposits perhaps not only Baltic but also Ukrainian (Fig. 23), as well as salt deposits from the Baltic and Black Sea [Kośko 2001; 2002], those inland from the Carpathian mountains in Ukraine [Krushelnytska 2002], in Moldavia and north Romania [Dumitroaia 2000] as well as Kujawy and the interfluvial region of the middle Warta and Vistula (see briquetage vessels from Polesie), site 1 in the context of Trzciniec pottery featuring 'Otomani/Füzesabony' style [Górski *et al.* 2010]. Copper, potentially, in this regard was also sought in the Carpathian foothills, upper Dniester region and Volhynia Polissya in Ukraine (Fig. 24) as well as basalt and Volhynia flint [Chachlikowski 2010; Makarowicz 2009a]. Probably the north could have also been the source of supplying farm products, animal furs, honey as well as potential nuptial partners, in particular women. On the other hand, the more advanced south offered knowledge in the technology of making products from bronze, ready-made prestige goods made of metal (copper, bronze, gold as well as the raw material for their production), amber, glass and animal horns. These products were stored by 'Trzciniec' elites and used as an imprimatur of the ruling class that was arising as a political substratum. Such goods were also used in an advanced system of rites in these communities, which had the aim of confirming

Fig. 23. The main sources of amber in the Baltic-Pontic region. 1 – succinite; 2 – other species of amber [according to Makarowicz 2009b]

the unity and identity of the group [Makarowicz 2003; 2005; 2009b]. The demand for goods beyond the Carpathian region was linked to the need for ready-made luxury items of an iconic nature confirming status, ones foremost processed, not raw. Such forms of exchange, in the context of world system theory, is characteristic for relations between cultural centres and their peripheries [Frank 1993; Sherratt 1993; Kardulias (Ed.) 1999; see for the Trzciniec complex – Makarowicz 1998: 292-298; Górski, Makarowicz 2007b].

It can be assumed therefore that particular parts of valley routes mentioned above, river and inland, were controlled by the local 'Trzciniec' elites who took certain profits from controlling exchange or maintaining the availability of certain key junctions (being concerned with avoiding conflicts and their subsequent destabilisation, loss of exchange continuity and protection over contact and stopping points).

Fig. 24. The main copper ores in the Baltic-Pontic region [according to Chernykh 1976; Makarowicz 2009b]

These elites interred their dead under kurgans with at times splendidly furnished graves [e.g. barrow I and II in Ivanje – Fig. 25, barrow VIII in Netishyn – Fig. 26, barrow IX and XII in Kolosivka in the Volhynia upland as well as barrows 6, 8 and 33 in Komarów – Fig. 27 in the upper Dniester – Lagodovska 1948; Sulimirski 1964; 1968; Sveshnikov 1968; Bereznaskaya *et al.* 2004].

The rich ornamentation in prestige items out of bronze has been documented in kurgan graves found near potential routes such as Komarów, Bukówna, upper Dniester basin, Bar near the Boh, Ditinitshi near the upper Horyn as well as numerous mass graves in the Małopolska upland such as in Żerniki Górne, site 1, where artefacts of necklaces out of amber, glass and bronze were recorded [Kempisty 1978], in Dacharzów, site 1 in the Sandomierz upland where bronze products have been documented in monumental graves of a stone-wood construction [Florek,

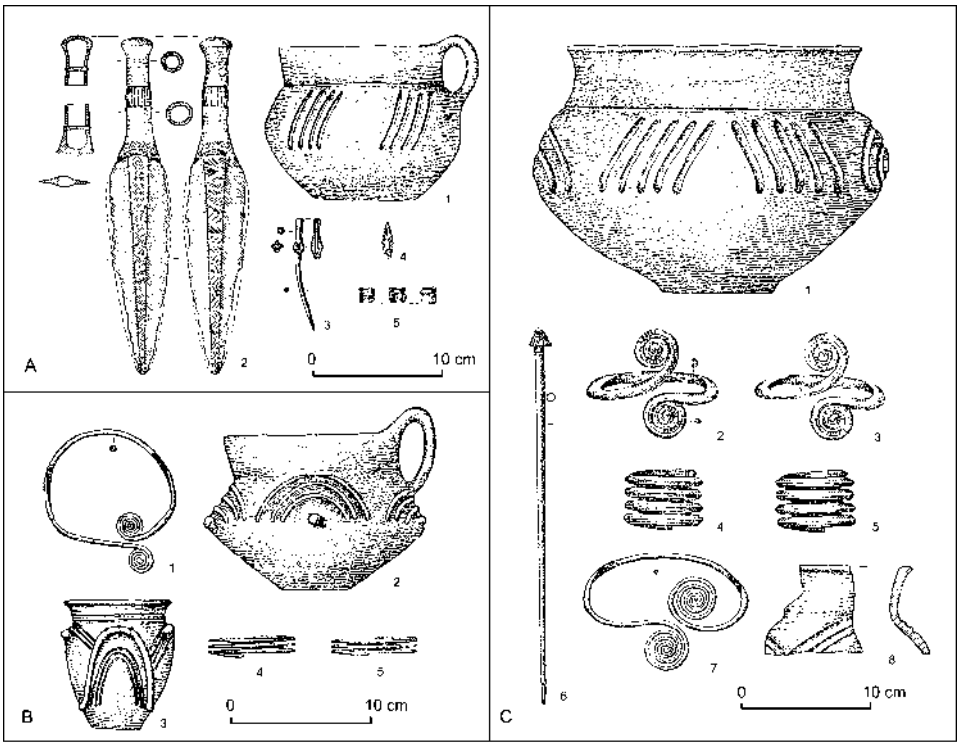

Fig. 25. Richly furnished graves of the Trzciniec cultural circle from Ivanje, barrow II, Volhynia upland. A, B – grave 2; C – grave 1. A – 1 – clay, 2, 3 – bronze; 4 – gold; 5 – flint. B – 1, 4, 5 – bronze; 2, 3 – clay. C – 1, 8 – clay; 2-7 – bronze [according to Sveshnikov 1968; Makarowicz 2008]

Taras 2003], as well as in elite graves in the Malopolovetskoe cemetery complex, site 3 in the middle Dnieper region, which were furnished with bronze products (Fig. 28) [Lysenko 1998; 2001].

Naturally, it ought not be assumed that the elites directly oversaw the proper functioning of the routes, though they did keep watch and provided for the community that was dependent upon them. It is difficult to define the status of the 'peoples of the route' themselves, those travelling together with goods and at the same time, bearers of cultural patterns. Clearly, they were communities involved in exchange (artisans, merchants) and trade, thus specialising in such activities tied to travel across regions known and unknown [see Kristiansen, Larsson 2005; 2007].

The exchange of raw materials and ready-made products out of bronze and amber was often tied to the institution of 'itinerant blacksmiths' or 'chief blacksmiths' who were specialist metallurgists distributing bronze products far afield from

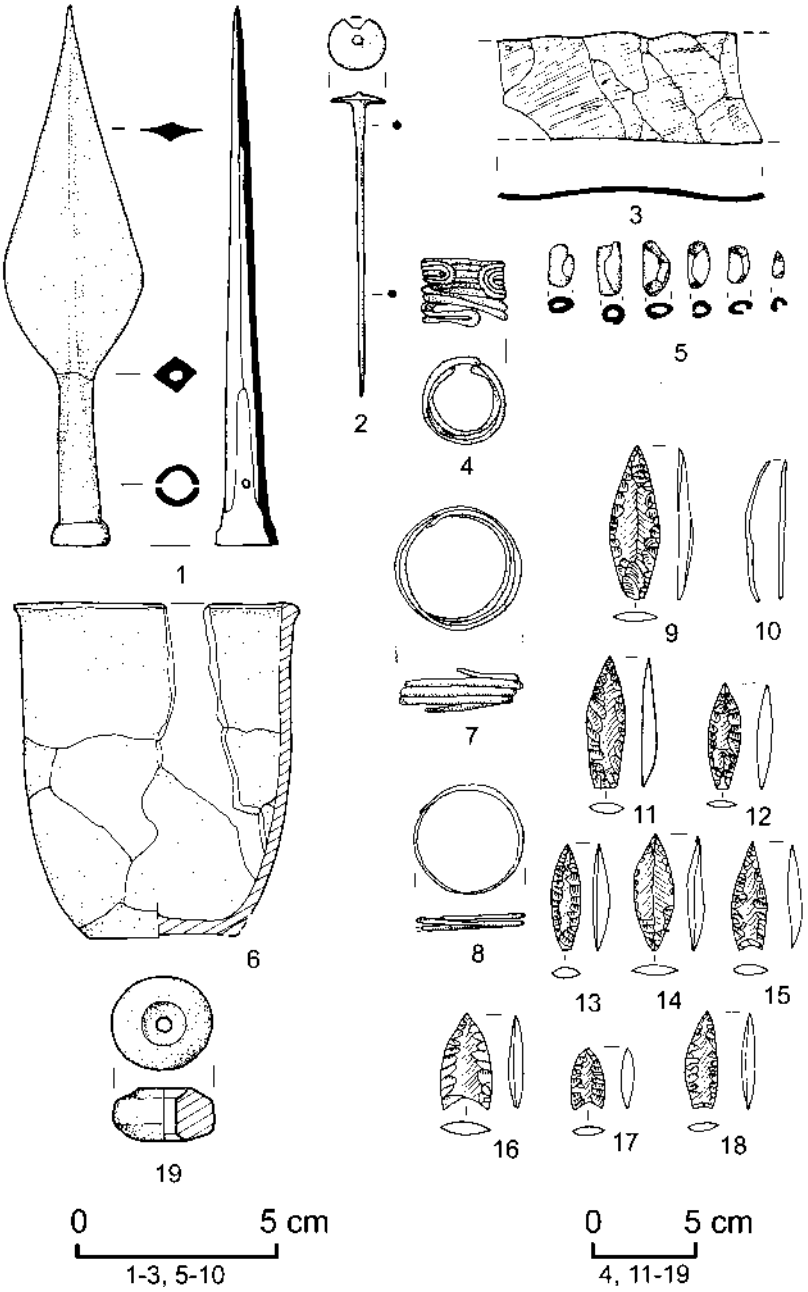

Fig. 26. Richly furnished graves from Netishin, barrow VIII, Volhynian upland. 1-3, 6, 9, 11-18 – grave 1 (western); 4, 5, 7, 8, 10 – grave 2 (eastern), 19 – from the mound. 1-3, 5, 7, 8 – bronze; 6, 19 – clay; 4 – gold [according to Berezanskaya *et al.* 2004]

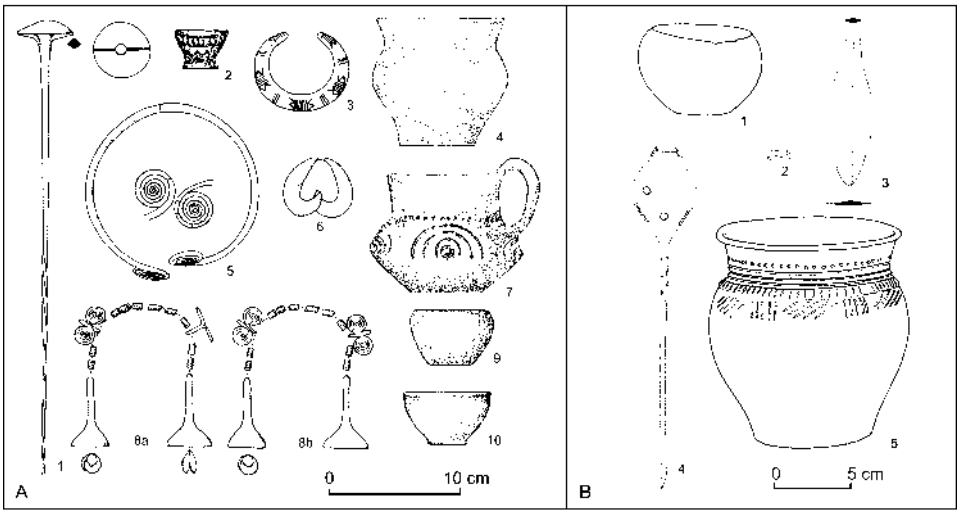

Fig. 27. Richly furnished graves from Komarów, upper Dniester basin. (?). A – grave from the barrow 8: 1; 3, 5 – bronze; 2, 4, 7, 9, 10 – clay; 6 – gold; 8a i 8b – bronze and gold. According to Sulimirski 1964; 1968. B – grave from the barrow 6: 1-5 – clay; 2 – gold, 3, 4 – bronze [according to Sulimirski 1964]

their workshops [Sangmeister 1972; Kośko 1979: 172; Butler 1990; Sherratt 1994: 259; Vandkilde 1996: 265; Makarowicz 1998: 260; 2000; 2003; 2005; Harding 2000: 236, see also for warrior chiefs/bronzesmiths – Kristiansen 1998: 379]. Evidence of an indigenous metallurgical production such as casting forms and spoons, toyers for blacksmith bellows as well as numerous products out of bronze have been also found in the west [Blajer 1998; Dąbrowski 2004; Makarowicz 1998: 250], as in the east part of the Trzciniec cultural circle [Berezanskaya 1972: 76-92; Bierezańska 1972: 275-280; Dąbrowski 1972; Dergachev 1986: 151; Klochko 1994a: 115-118; Klochko 1998; 2001a; 2006].

It would appear, however, the movement of people and goods along communication routes took place rather in larger groups and for various reasons, these were not journeys made by individuals as such (see criticism of the 'itinerant blacksmith' concept in [Vandkilde 1996: 263; Makarowicz 1998: 251]. There is good reason to believe that the transmission of so called cultural templates and products from a foreign territory into the heart of the Trzciniec complex took place thanks to the function of communicative routes linking the northern, sea bound part of the aforementioned circle with communities inland and enclaves of the uplands.

It ought to be remembered that the majority of Early Bronze Age cultural agglomerations from Central Eastern Europe were kinship-based communities made

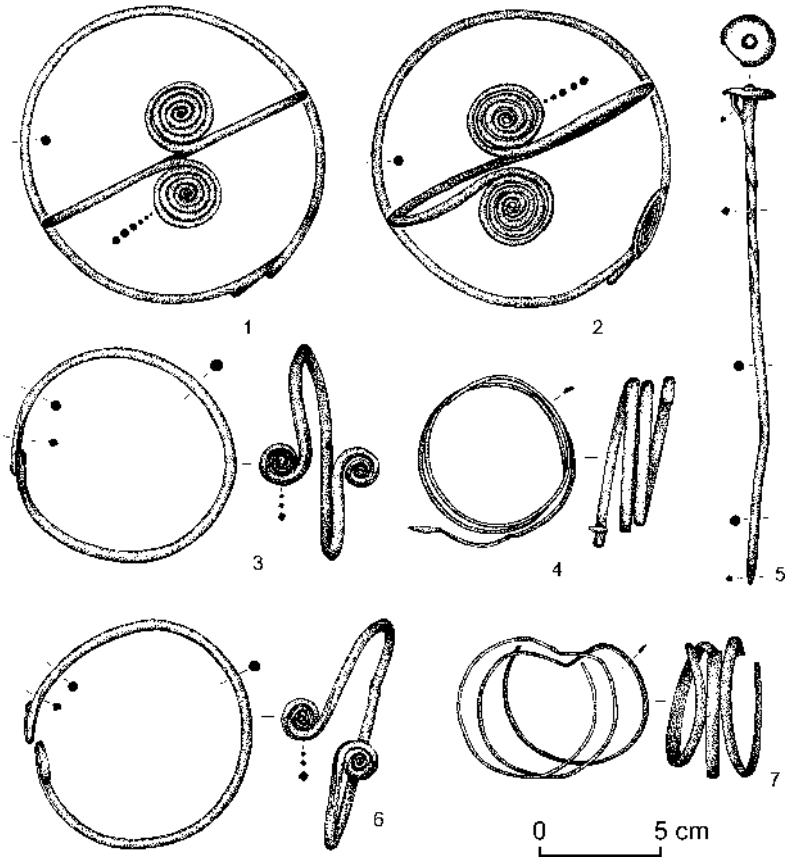

Fig. 28. Richly furnished grave from Malopolovetskoe, site 3, grave 1-93, middle Dnieper area. 1-7 – bronze [according to Lysenko 1998]

up of families composing larger social units (lineages or clans) [Kadrow 2001; makarowicz 2003, 2005]. Communities such as these, are a matter of fact, a great deal more active in *ad hoc* organisation of various local forms of enterprise, though it would appear that stability, the long-term and permanent function and maintenance of routes (as socio-economic and political 'institutions') would have had to have meant either breaking the 'kinship code' and establishment of proto-state societies (as in the case of the Otomani/Füzesabony culture) or the evolution of kin-related and descent groups that usually created relatively simple segmentary organisms (tribal) developing towards chiefdoms.

In the period under discussion, the Baltic-Pontic region is witness to the establishment of chiefdoms, cultural organisms that were limited in their physical

geography, with the rise of an warrior aristocracy substratum, for example: western Małopolska, upper Dniester basin, basins of the upper Styr, Horyn and Sluch in Volhynia, as well as some regions of the middle Dnieper region, the environs of the Malopolovetskoe cemetery complex, site 3. In this respect, the case of post-Trzciniec Hordeevka and similar sepulchral objects in the Boh basin should be noted, reflecting substantial social changes in the latter half of the second millennium BC in this region (see Ślusarska..., in this volume). It would appear therefore that the long-distance routes across the Trzciniec circle did not function in a continuous fashion but had their rise and fall. Arguably its culmination could be said to be the period of growth in the culture unit under discussion.

3. CONCLUSION

In the above study the distribution of prestige products at the beginning of the Bronze Age in the territories of the Baltic-Pontic region has been linked to the presence of long-distance and local communication routes. At the end of the 3rd millennium BC signs of their function were not clearly visible. The significant rise of exchange in this region came about in the first half of the 2nd millennium BC. The main initiators and reapers of profits of communication links on the north-west – south-east axis were arguably the communities of the Otomani/Füzesabony culture. Their northern partners in this respect were the 'Trzciniec circle' groups whose elites took active part in the organisation and maintenance of the key junctions of routes.

The above interpretation is given credence by finds of metal products, bone cheek pieces of horse harness and vessels with a trans-Carpathian style in the regions extending into the heart of the Trzciniec circle as well as the presence of Baltic amber goods in the graves and fortified settlements in the Carpathian region and its environs. The scale of exchange, measured by the dispersion of prestige artefacts, suggests that the transmission of cultural models, ready-made products and know-how in the Baltic-Pontic region could have been to a large extent formalised. In the 2nd millennium BC communication routes in these territories became one of the main "cultural institutions" stimulating overall progress.

Translated by Ryszard J. Reissner

Baltic-Pontic Studies
vol. 14: 2009, 338-367
PL ISSN 1231-0344

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GROUND COMMUNICATIONS OF THE EASTERN AREA OF THE TRZCINIEC CULTURE CIRCLE

The Trans-European Forest – Steppe Way, uniting the Urals region and the Hungarian Plain, is one of the principle ground arteries of the late Bronze Age. Its location in the Right-bank Dnieper area, in the eastern part of the Eastern Trzciniec culture circle, can be identified by the mapping of adornments of the late Bronze Age linked in their origin to the Carpathian cultural genesis source.

Ancient ground communications are rather specific archaeological monuments. Unlike settlements, graves, treasures and other kinds of monuments localized directly in the field, ancient routes in most cases, can be identified only as a result of a complex study by mapping archaeological materials (treasures, metal artefacts, horse harness, concentration of burial monuments, co-existence of components of different cultures, etc.) and comparing it with specific features of the landscape (minimum cuts of the relief, minimum occurrence of marches and forests, presence of the necessary crossing points across rivers, particularly wide ones with swampy flood-lands), springs and water-filled gulches, presence of convenient places for (waterway) crossings, etc.

A number of studies specially focusing on research into the issue of Eastern European communications of the Early Bronze Age [Kośko 2001], the late Bronze Age [Otroshchenko 1986; 1995; 2007; Gorbenko, Grebennikov 2007], the Scythian period [Boltryk 1990], the Ancient (Old) Rus [Motsya, Khalikov 1989; 1997] have been published lately. The study of ancient communications enables us to take a different perspective on many late pre-historic processes. Connected with a network of water and ground transportation arteries, Eurasia appears not as a patchwork blanket of various cultures, but as a whole functional system, individual parts of which are interdependent and mutually complementary.

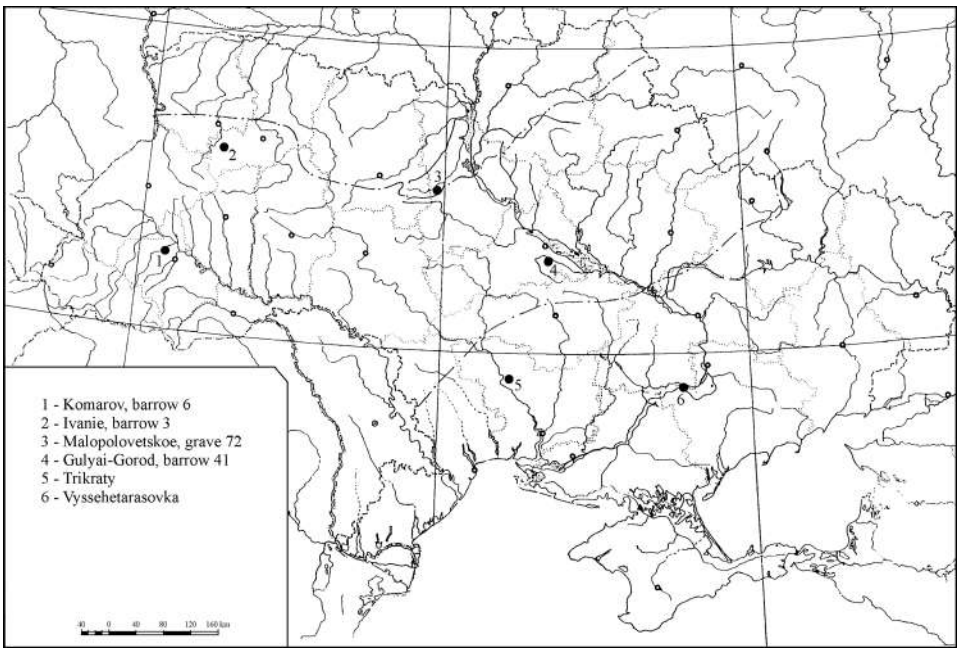


Fig. 1. Spreading of plate-headed pins from the territory of Ukraine

The Trans-European Forest – Steppe Way, uniting the Urals region and the Hungarian Plain, is one of the principle ground arteries of the late Bronze Age [Otroshchenko 1995]. Its location in the Right-bank Dnieper area, in the eastern area of the Eastern Trzciniec culture circle, can be identified by the mapping of adornments of the late Bronze Age linked in their origin to the Carpathian cultural genesis source [Lysenko 2002; Lysenko S.S. 2006].

1. TCC ADORNMENTS AS MARKERS OF GROUND COMMUNICATIONS

For the purposes of mapping, a generalisation of different types of adornments was performed. As a result, they were grouped in two major types: the 'Komarov type adornments' and the 'Hordeevka – Belogrudovskaya type adornments'.

The 'Komarov type adornments' were deemed to include categories of adornments analogous to those found in the Komarov, Voitsekhovka, Ivanie, Malopolovetske burial sites of the Trzciniec culture circle (TCC). These included pins with

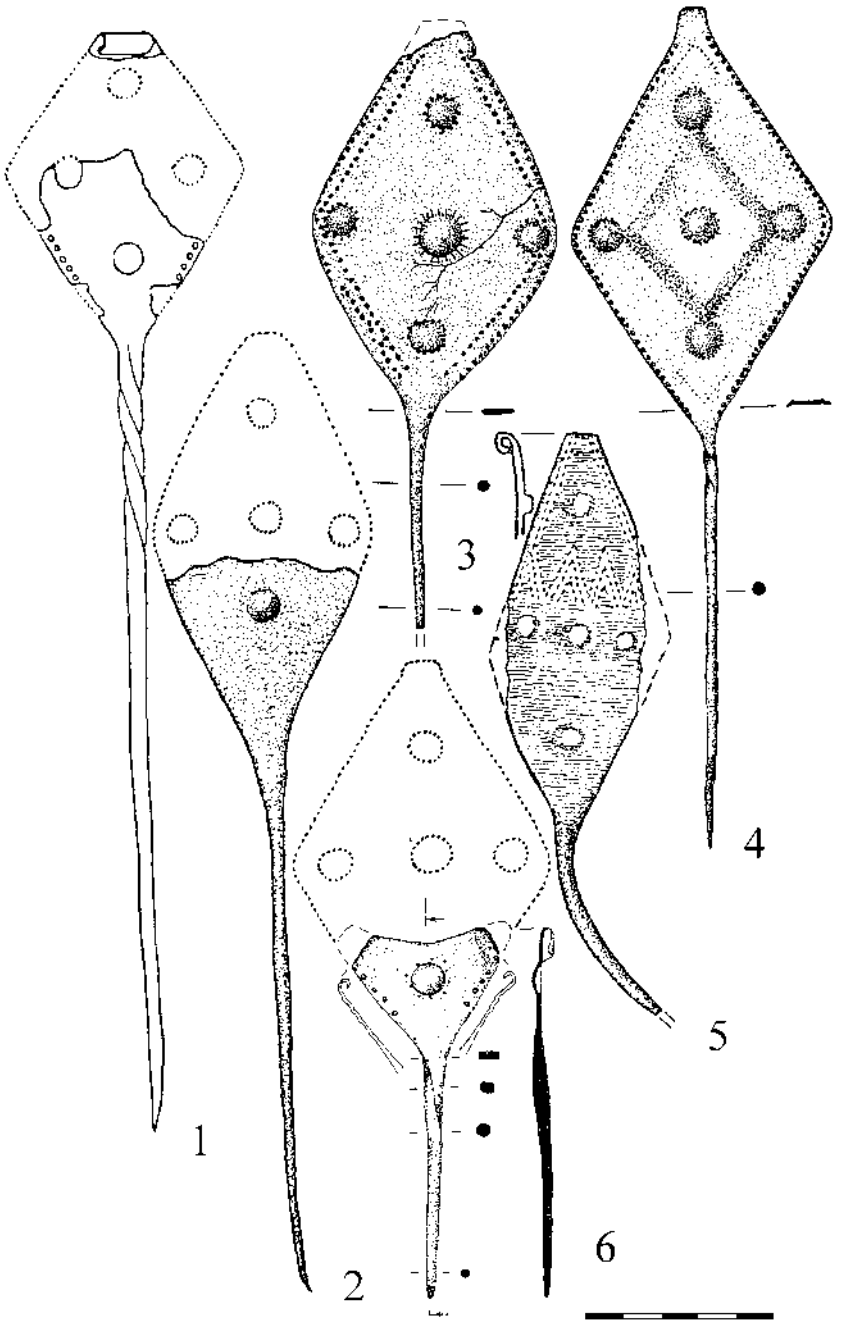


Fig. 2. Plate-headed pins from the territory of Ukraine

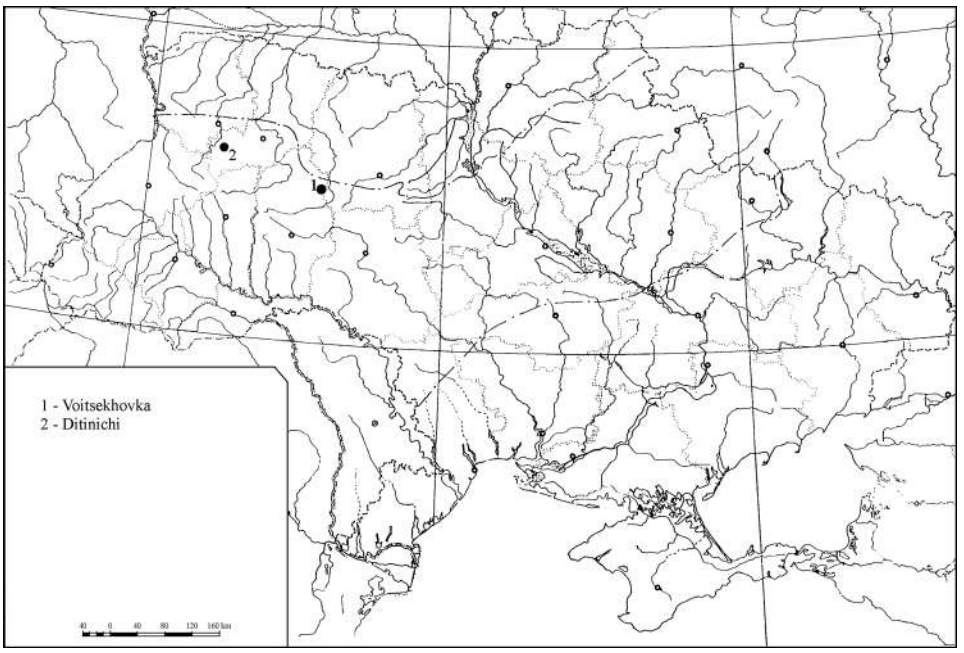


Fig. 3. Spreading of spiral-headed pins from the territory of Ukraine

forged plated (lamellar) rhombic heads (Fig. 1-2), spiral-shaped bezel heads (relatively small compared to the needle's length) (Fig. 3-4), nail-like heads (either with or without an eye) (Fig. 5-7), torques spiral-twirled terminals (Fig. 9-15), bracelets with spiral-twirled terminals (Fig. 16-21), multi-spiral bracelets with spiral-twirled terminals, multi-spiral bracelets (made of fine, segment-shaped in section wire with stiff ribs, triangular in section or with clearly expressed ribs) (Fig. 22-27), rings with spiral bezels (Fig. 28-29) and double-spiralled fibulas (Fig. 30-31). In the monuments of the eastern area of the Trzciniec culture circle, these pieces of ancient jewelry belong to the early and classic phases and are dated within 1600-1200 BC.

Pins with forged plated (lamellar) rhombic heads are represented in the TCC monuments by four artefacts: Komarov, barrow 6 (Fig. 2:1), Gulyai-Gorod, barrow 41 (barrow 41) (Fig. 2:3-4) and Malopolovetske-3, grave 72 (grave 72) (Fig. 2:6). All are decorated with large 'pearls' and punch ornament on the contour. A slightly modified version of such pins (with richer ornament or with the 'pearls' alone) was represented in the Noua-Sabatinovka-Coslogeni culture circle area: Vyshetarasovka (Fig. 2:5), Trykraty (Fig. 2:2), Beleny, Medzidia and Ulmu.

Pins with spiral-twirled heads, which had been made relatively small compared to the needle's length, were found in only two locations: Dytynychi, barrow 2

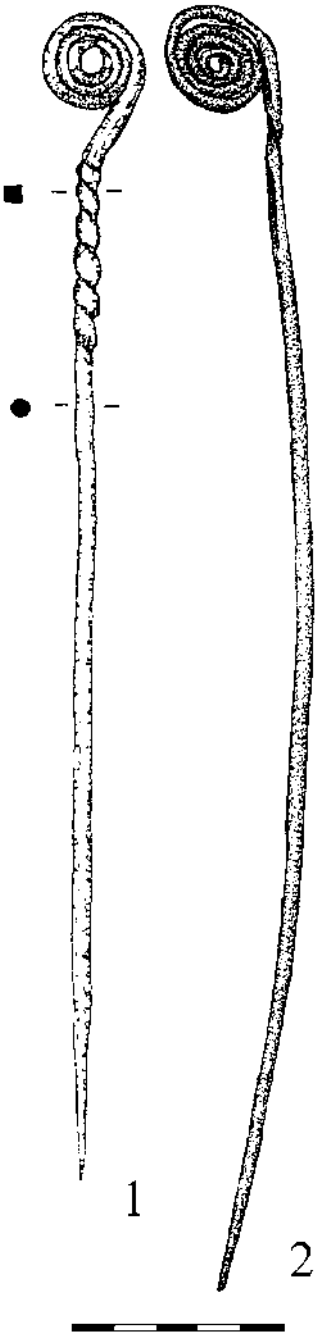


Fig. 4. Spiral-headed pins from the territory of Ukraine

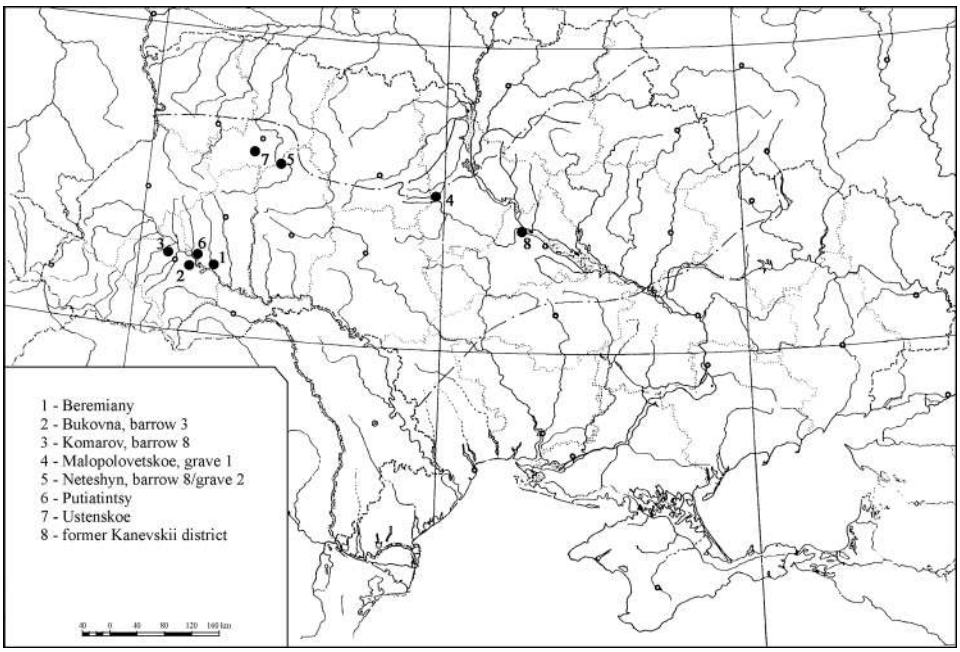


Fig. 5. Spreading of nail-headed pin from the territory of Ukraine

(Fig. 4:1) and Voitsekhivka, barrow 5 (Fig. 4:2). Pins with nail-like heads are represented by nine objects. Three have an eye: Malopolovetske, grave 1 (Fig. 7:3), former Kanevsky district (Fig. 7:1) and Ustenske (Fig. 7:2), whilst the others have no eye: Komarov, barrow 8 (Fig. 6:3), Bukowna, barrow 3 (Fig. 6:4), Beremiany (Fig. 7:4), Putiatyntsi (Fig. 6:1, 7:5) and Netishyn, barrow 8/grave 2 (Fig. 6:2).

Apparently these were pins found only in the Ivanie burial site and had no direct analogies; large pins with forged lamellar wide triangular heads (Fig. 8:1), with a conical head (Fig. 8:3) and a small pin with a hollow head and bulges (Fig. 8:2).

Eleven torques with spiral-twirled terminals, made of relatively thin wire, predominantly round in section, were found in Komarov, barrow 8 (Fig. 13:2), Voitsekhivka, barrow 2/grave 3 (Fig. 12:1), Kustovtsi (Fig. 15:1), Ivanie, barrow 2/grave 1 (Fig. 13:1), Bar (Fig. 14:2), Tekline, barrow 347 (Fig. 14:1) and Malopolovetske-3, grave 1 (Fig. 10), 68 (Fig. 11), 72 (Fig. 12:2). A torque with a large forged, square in section, half-turned hook from grave No. 63 of the Malopolovetske burial site can be also considered as a version of this type of torques (Fig. 15:2).

Bracelets with spiral-twirled terminals are represented by 14 objects. They included the objects made of relatively thin wire: round in section (Voitsekhivka, barrow 9/grave 2 (Fig. 18:1, 3)), Kustovtsi (Fig. 20:2), Uniev (Fig. 18:4), Troyaniv

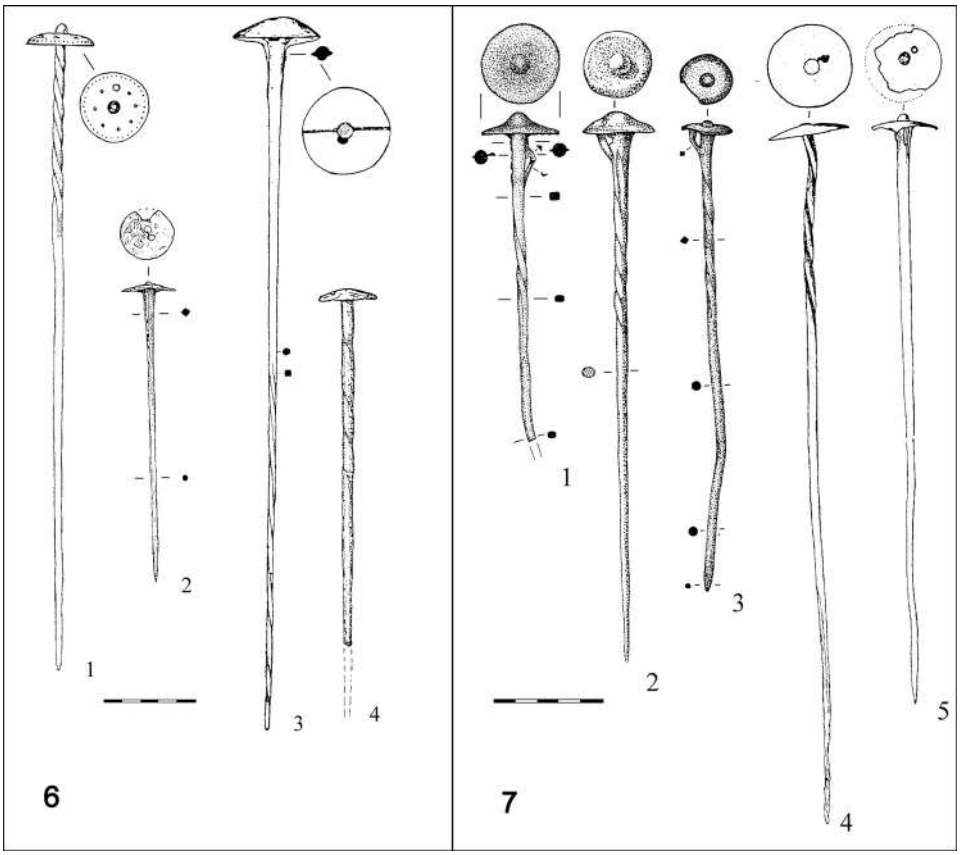


Fig. 6-7 Nail-headed pins from the territory of Ukraine

(Fig. 19:3), Malopolovetske-3, grave 1 (Fig. 17:1-2), the Kiev region (Fig. 17:3), former Kaniv district (Fig. 18:2), Ivanie, barrow 2/grave 5 (Fig. 20:1), segment-shaped in section (Ivanie, barrow 2/grave 1 (Fig. 19:1-2)), Ovruch (Fig. 19:4), triangular in section (Middle Dnieper area (?) (Fig. 20:3)) and rectangular in section (Vasiliev (Fig. 21:3)). Objects close to the latter, made of a narrow plate, sub-rectangular or segment-shaped in section, are also known to have been found in the Donets basin, the Srubnaya culture area: Vozrozhdenie-2, barrow 2/5 (Fig. 21:4-5) and Novoselivka, barrow 1/grave 5 (Fig. 21:6-7). Ends of the wire were woven into 'shields', tetrahedral in a number of cases (Malopolovetske-3, grave 1) or trihedral (Ivanie, barrow 2/grave 1).

Multi-spiral bracelets with spiral-twirled terminals were found in two monuments: Bukiwna, barrow 3 (Fig. 21:1) and Chersk (Fig. 21:2). Large multi-spiral

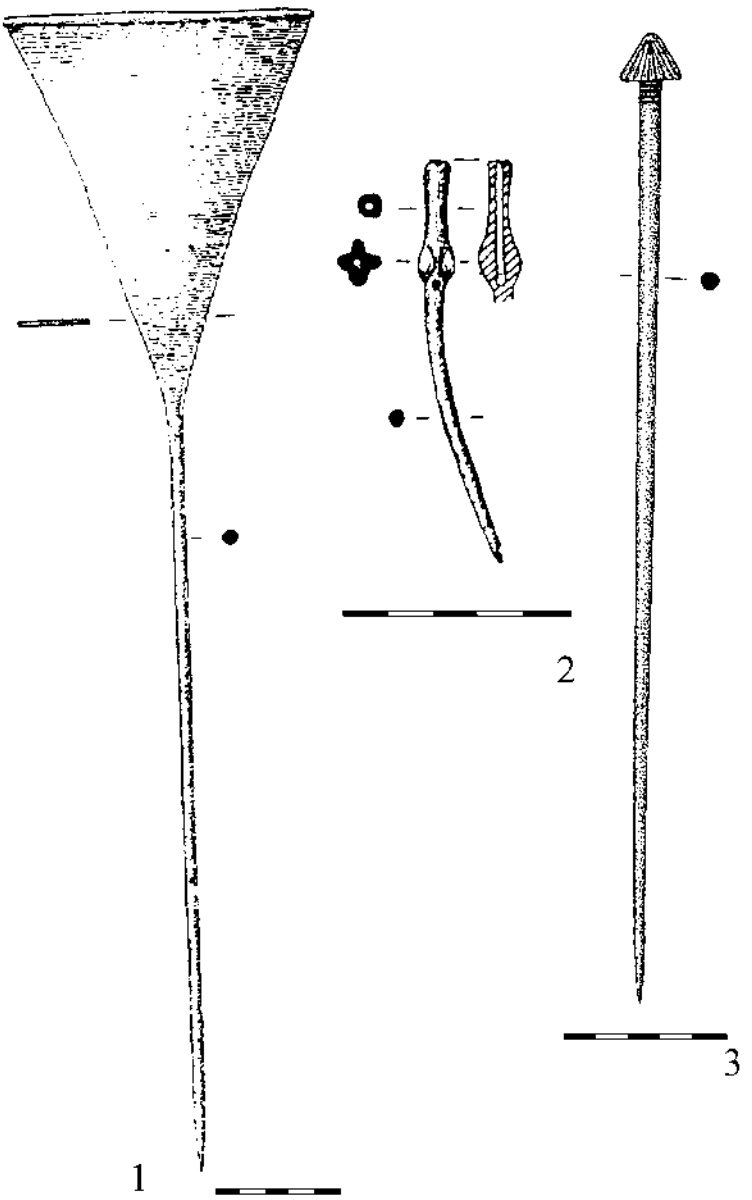


Fig. 8. Pins from the Ivanie burial site

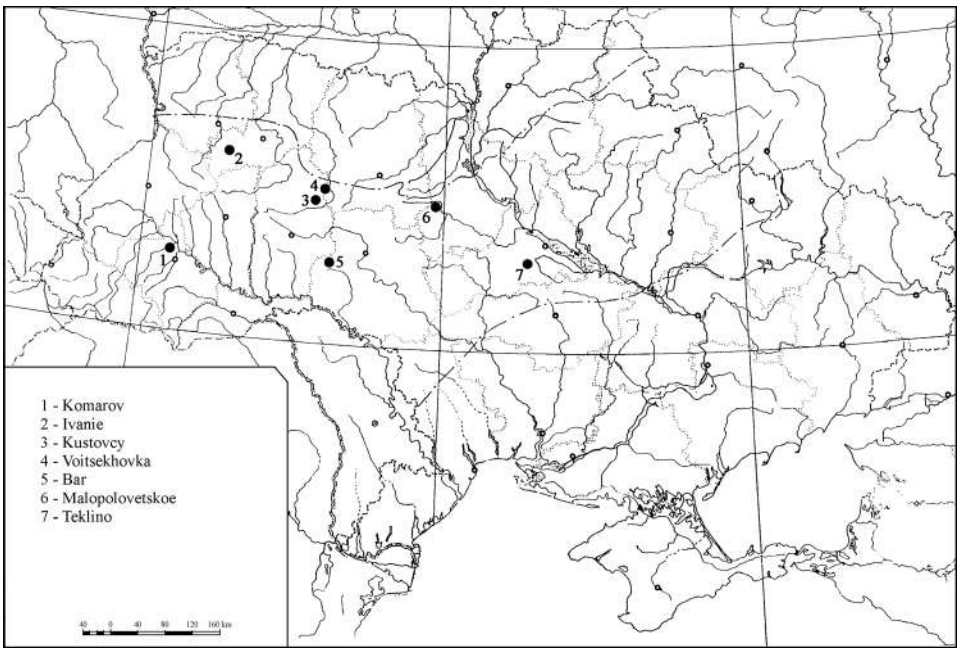
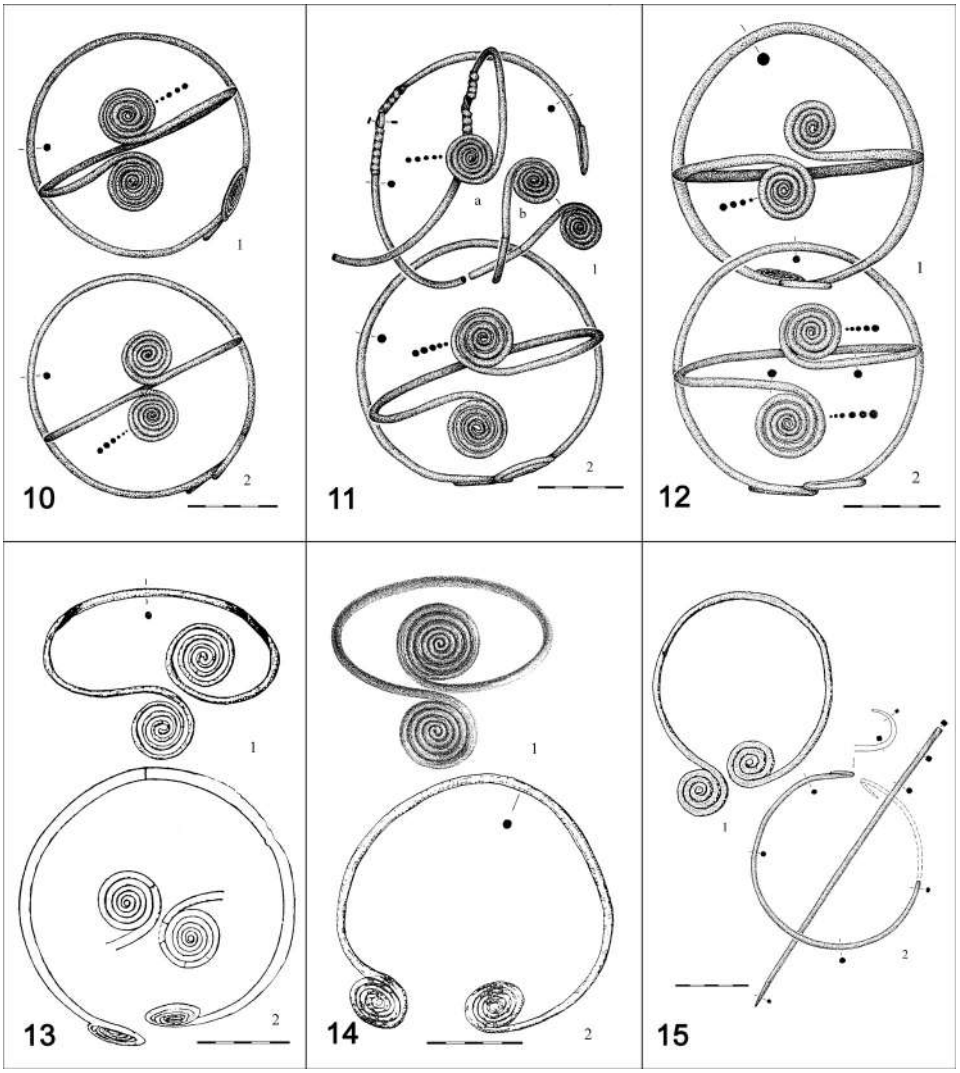


Fig. 9. Spreading of torques with spiral 'shields' from the territory of Ukraine

bracelets with spiral-twirled terminals originate from the Hordeevka burial site, barrow 16 (Fig. 35).

Multi-spiral bracelets were represented by 31 objects. Bracelets made of fine wire, segment-shaped in section, were found in the monuments of Malopolovetskoye-3, grave 1 (Fig. 25:1-2), Kozarovychi, grave 43 (Fig. 27:3), Hryshchentsi (Fig. 24:5), Bar (Fig. 24:7), Chebotarka (Fig. 26:6-7), Voitsekhovka, barrows 2, 5, 6 (Fig. 26:1-5), Peresopnytsia (Fig. 24:3-4), Dorohoshcha, barrow 1/grave 3 (Fig. 26:8-9), Netishyn (Fig. 25:3-4), Ivanie, barrow 2/grave 5 (Fig. 24:1-2), Skurch (Fig. 24:6). Bracelets with stiff ribs, triangular in section or with clearly expressed ribs, come from the monuments of Malopolovetske-3, grave 63 (Fig. 23:5-6), Trypillia (Fig. 23:3), Dorohoshcha, barrow 1/grave 2 (Fig. 23:4), Ivanie, barrow 2/grave 1 (Fig. 23:1-2), Kustovtsi (Fig. 24:8), and NHMU reserves, No. a270/13 (Fig. 27:2). A separate case is the wide-ribbed bracelet from Kamyanka – Buzska (Fig. 27:4). Apparently, a fragment of a ribbed bracelet had been used to make a pendant, found in housing 1 (1988) at the Khodosovka – Dibrova settlement near Kiev (Fig. 27:1).

Rings with spiral bezels, made of fine wire, round in section, were found in the eastern TCC area only at the Komarov burial site, b.8 (Fig. 29:9-12). However, successors to similar rings, though with a much smaller diameter of the spiral, were



Figs. 10-15. Torques with spiral-twirled terminals from the territory of Ukraine

found in the area of the Berezhnovka–Mayovka Srubnaya culture: Luhansk, Trykotazhna Fabryka (Knitting Factory), b.1/g.12 (Fig. 29:15), Novopodkryazh, gr.III, b.1/g.7 (Fig. 29:13), Pokrovka, b.3/g.10 (Fig. 29:14), Khashcheve, b.5/g.14 (Fig. 29:16) and Chuyun-Cha (the Crimea) (Fig. 29:17-18). The multi-spiral rings with spiral bezels, made of fine wire, round in section, were found in the eastern TCC area only in two locations. One of the finds, made in Luhove ("Chekhi") (Fig. 29:8), was related by T. Sulimirski to the Vysotsk culture, though the circumstances of that find are

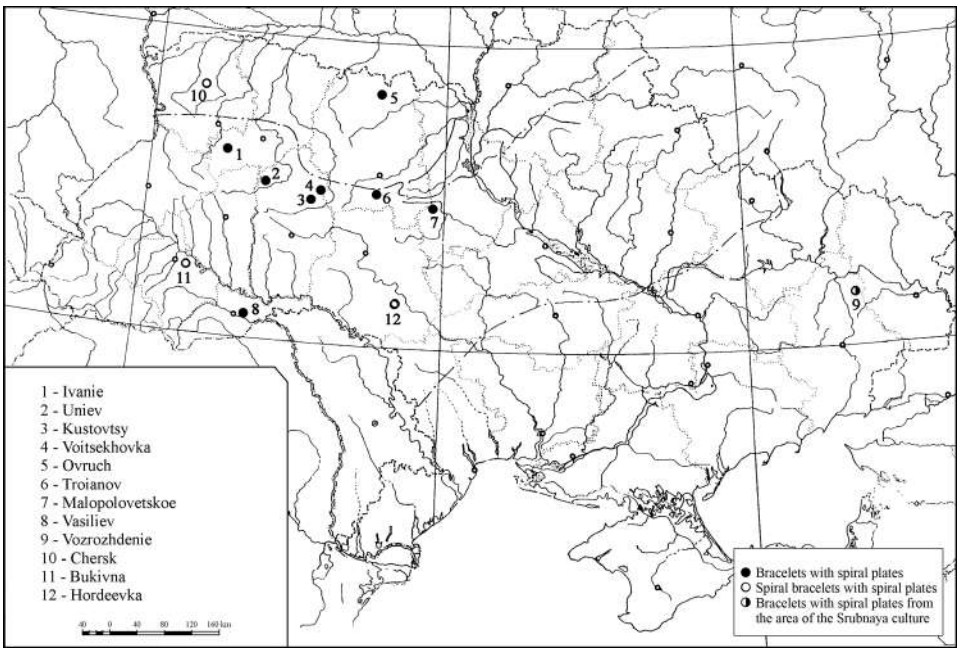
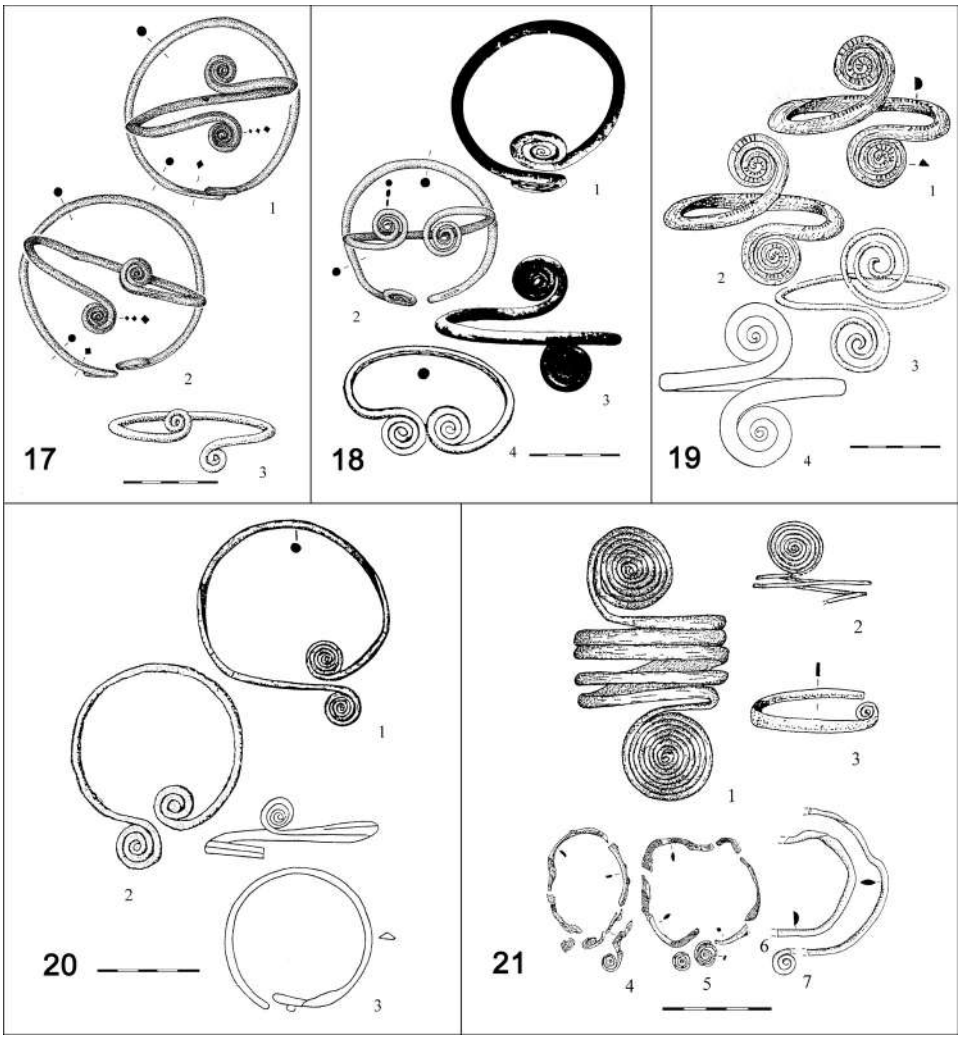


Fig. 16. Spreading of bracelets spiral-twirled terminals from the territory of Ukraine

unknown. Four more artefacts (Fig. 29:1-4) come from barrows 9, 21, 31 of the Hordeevka burial site. A broken multi-spiral ring with a spiral bezel was found in the area of the Berezhnovka–Mayovka Srubnaya culture in the Vozrozhdenie – 2 burial site, barrow 2/grave 5 (Fig. 29:5). A later replica of similar artefacts comes from the Belozerka burial mound, the Verkhniaia Khortytsya (Fig. 29:6-7).

Seven double-spiral fibulas were found in the TCC's eastern area in Tekline, barrow 347 (Fig. 31:1), Ovruch (Fig. 31:2), Kiev-Obolon (Fig. 31:3), Voitsekhivka, barrow 2 (Fig. 31:5), barrow 6 (Fig. 31:4), Kustovtsi (Fig. 31:6) and Dytynychi, barrow 1 (Fig. 31:7). The selection did not include pins with loop-shaped heads, padlock-like pendants, round plaques with a loop in the centre and a number of other adornments, which were also found in the aforementioned monuments of the Komarov line of the TCC, but having a far wider dissemination area.

Jewellery of the 'Hordeevka–Belogrudovskaya types' is represented by various categories of adornments, which have analogues among those found in the Hordeevka burial site (1500-1000 BC). They include: Hordeevka-type pins with a small ring-like head and 3-4 'flutes' on the needle somewhat below the head (Fig. 32:1-6), rod-like pins of the Hordeevka type with bulges (Fig. 33), long ball-like-headed



Figs. 17-21. Bracelets spiral-twirled terminals from the territory of Ukraine

pins (Fig. 34), large multi-spiral bracelets with spiral-twirled terminals (Fig. 35), multi-spiral bracelets, made of fine wire, round in section, ornamented along their full length with groups of inlays (Fig. 36), massive whole-cast bangles, decorated with engraving (Fig. 37-38), pendants of the Belogrudovskaya type (Fig. 39-41) and three-petal beads (Fig. 32:7-10).

Pins of the Hordeevka type with small ring-like heads and 3-4 coils on the needle somewhat below the head were found in the monuments of Hordeevka, barrows 11, 16, 27 (Fig. 32:1-5) and Hradizhsk (Fig. 32:6).

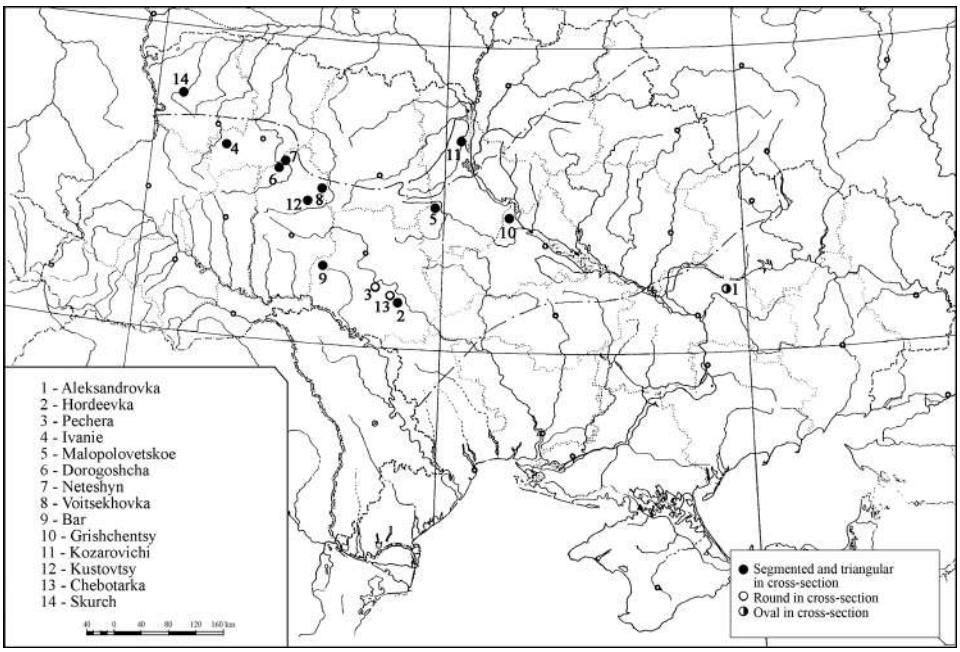


Fig. 22. Spreading of multi-spiral bracelets from the territory of Ukraine

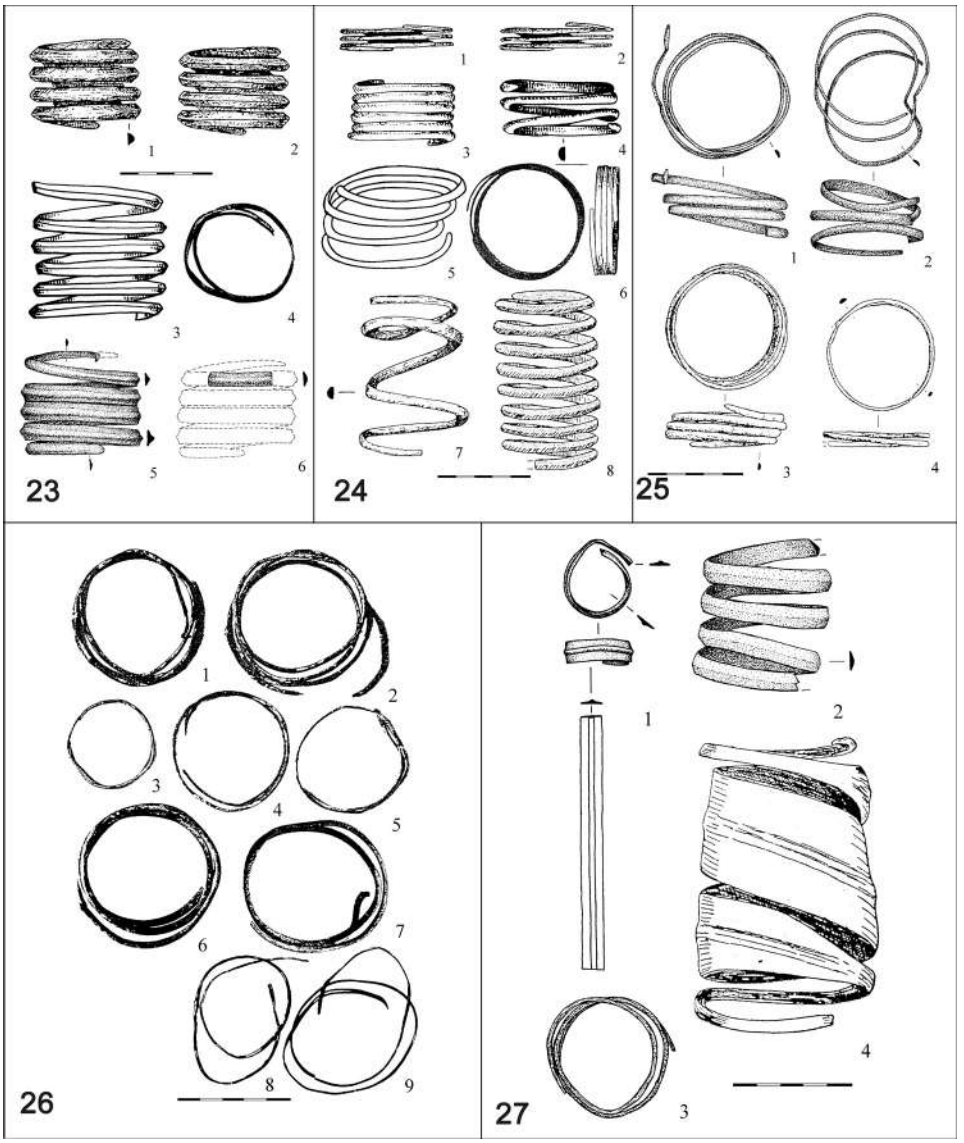
Rod-shaped pins were found in barrow 16 of the Hordeevka burial site (Fig. 33: 1-2). Similar "depasportised" (undocumented) pins are kept at the NHMU, a211/ 1700-1701 (Fig. 33:3-4).

Ball-head pins were found, besides Hordeevka, barrows 6, 24, 31 (Fig. 34: 1-3) and also in a Chebotarka grave (Zabolotne) (Fig. 35:4-5).

Multi-spiral bracelets made of wire, round in section and ornamented with groups of notches along its full length, were found in Hordeevka, barrows 6, 16 (Fig. 36:1-4) and Pechora, barrow 1/5 (Fig. 36:5-6). The latter feature brings the multi-spiral bracelets with 'shields', found in barrow 16 of Hordeevka, closer to the Hordeevka–Belogrudovskaya type.

Massive whole-cast oval bracelets, ornamented with engraving, were found in Hordeevka, barrow 9 (Fig. 38:1), Skurche (Fig. 38:2), and former Kaniv *uyezd* (district) (the Khanenkos collection) (Fig. 38:3). A typologically close round bracelet was found in the Stare Selo hoard in the Cherkassy district (Fig. 38:4).

About 50 Belogrudovskaya-type pendants were identified, including those in Hordeevka, barrows 3, 6, 14, 16, 24, 26 (Fig. 40:1-7), Bilyi Kamin (White Stone), grave 2 (Fig. 41:10-11), Sobkovka, Zolnyk 1 (Fig. 41:9), Moshurov (Fig. 40:8), Velyka Andrusivka (Fig. 41:4,7), Veremiyivka (Fig. 40:10), Bobrytsya (Fig. 41:8),



Figs. 23-27. Multi-spiral bracelets from the territory of Ukraine

Kyriyivka (Fig. 40:11), Honcharivka (Pochapy?) (Fig. 41:12), Kompanytsi, grave 1 (Fig. 40:15-16), Gai, Sokolovo, grave 2/grave 3 (Fig. 40:20, 41:3), Igren-Pidkova-2, 3 (Fig. 40:21, 41:1-2), Kichkas-A, grave 35 (Fig. 40:12), Verkhniaia Khortytsya (Fig. 40: 1314, 17-19, 22-23), Balka Pushina (Fig. 40:9) and Dibrova-Hay-III (Fig. 41:5-6).

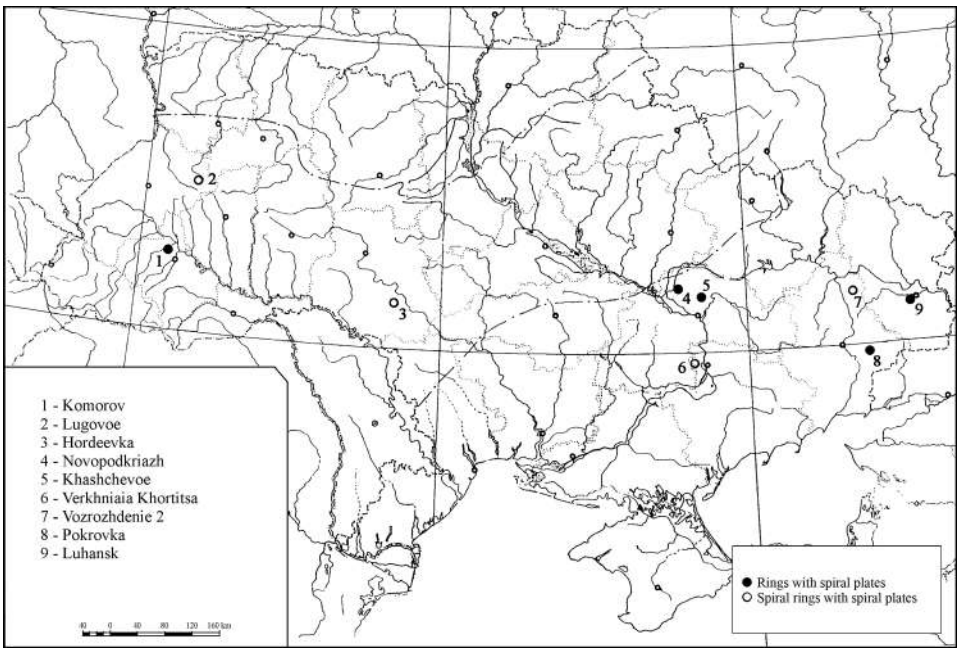


Fig. 28. Spreading of rings with spiral bezels from the territory of Ukraine

Three-petal beads were found, apart from the Hordeevka burial site, barrow 11 (Fig. 32:7-9), near the village of Zarubyntsi near Kaniv, opposite the crossing place across the Dnieper (Fig. 32:10).

The territorial division of jewellery of the Komarov type and the Hordeevka–Belogrudovskaya type becomes obvious immediately as they overlap only partially (Fig. 42). The former dominate the northern part of the forest-steppe area (the Upper Dniester area, Volhynia forest-steppe, the Middle Dnieper area), while the latter are common for the southern forest-steppe, mostly in the forest-steppe Bug area, which is the territory of the earliest Belogrudovskaya monuments (Hordeevka, Pechera), and the southern part of the Middle Dnieper area. It should be noted that the differences in the costume complexes of the pro per Komarov and the Hordeevka–Belogrudovskaya areas are most clearly expressed in comparison of the most outstanding burials: Komarov, barrow 8 (Fig. 43), Ivanie barrow 2/grave 1 (Fig. 44), Malopolovetske, grave 1 (Fig. 45), on the one hand, and Hordeevka, barrow 16 (Fig. 46), on the other hand. While generally close, the Komarov complexes are strikingly 'austere' and the Hordeevka ones are 'festal', with neck torques replaced with amber necklaces, and with an abundance of small adornments: pendants, ring-pendants, etc.

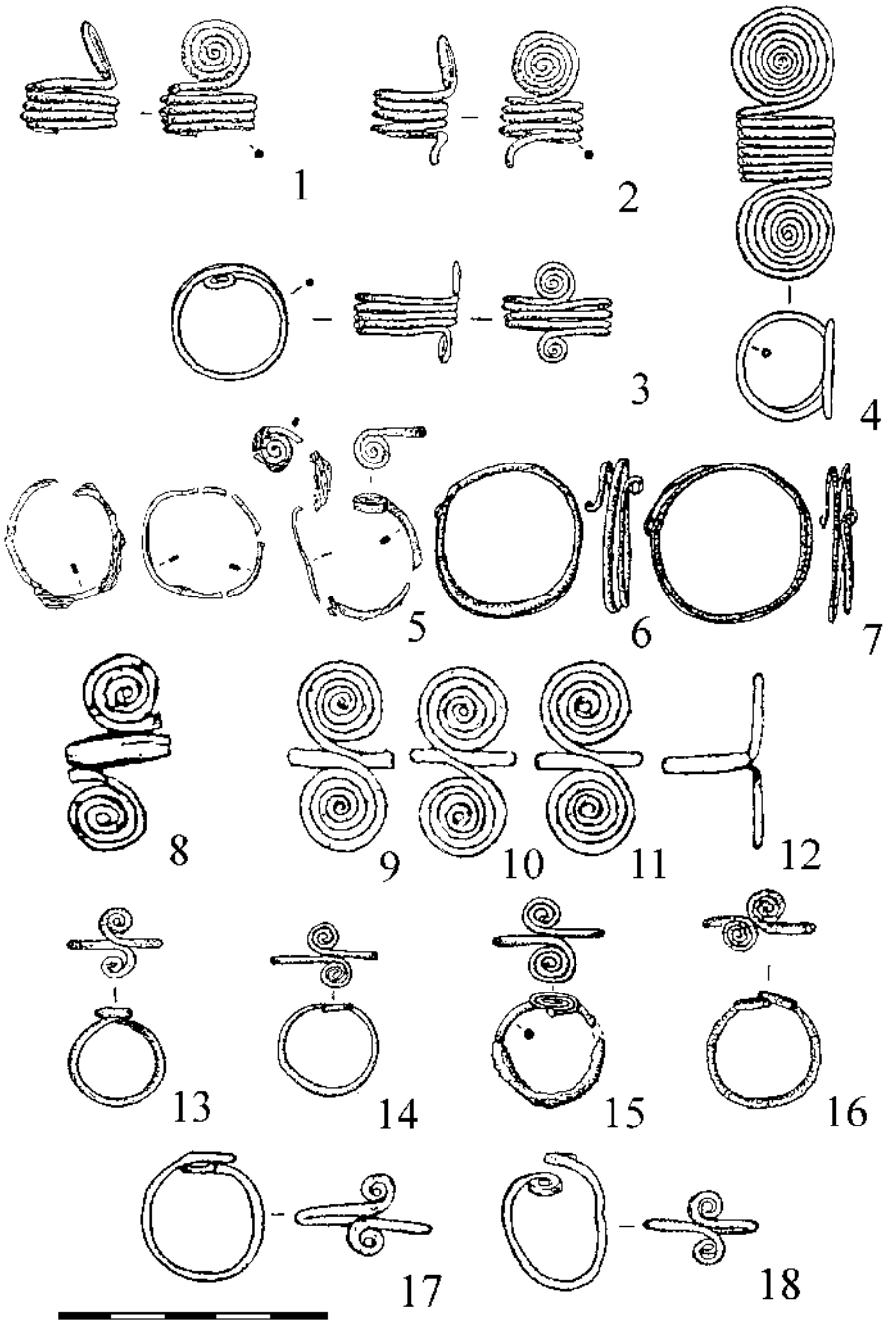


Fig. 29. Rings with spiral bezels from the territory of Ukraine

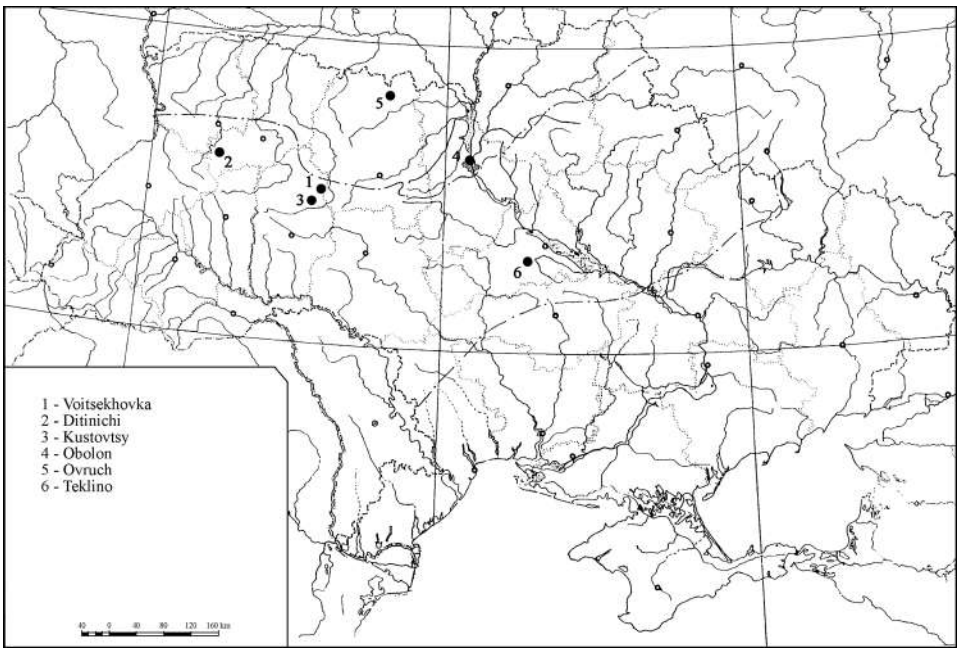


Fig. 30. Spreading of double-twirled fibulas from the territory of Ukraine

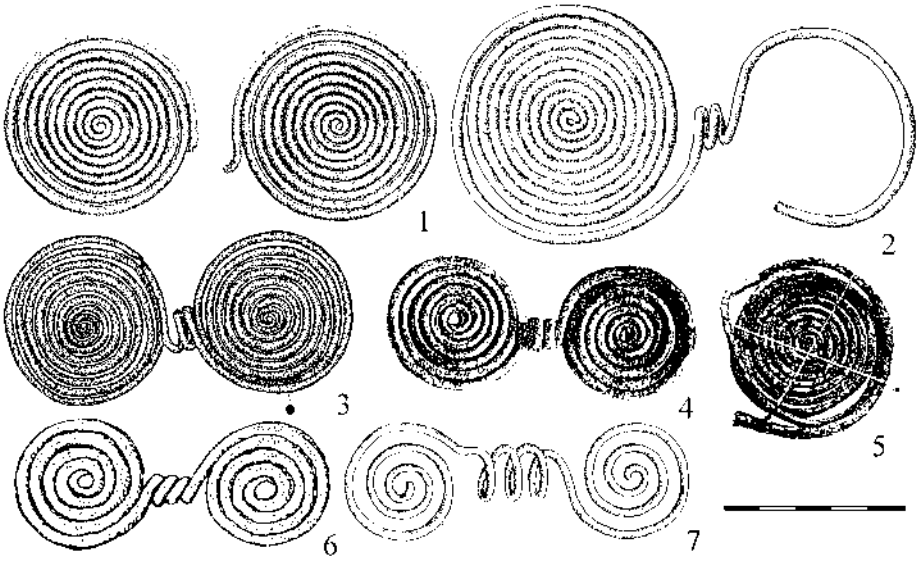


Fig. 31. TCC double-twirled fibulas from the territory of Ukraine

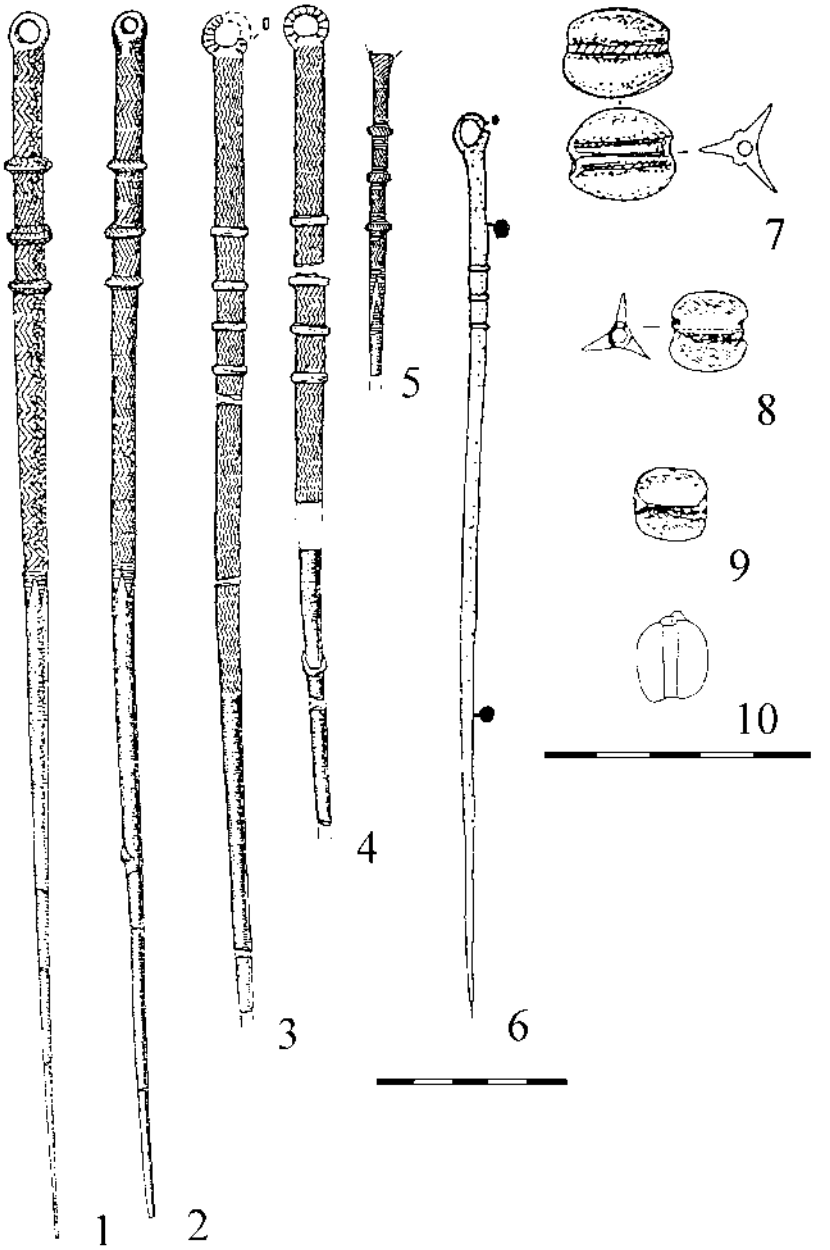


Fig. 32. Pins of the Hordeevka type with a small ring-type head and three-petal beads from the territory of Ukraine

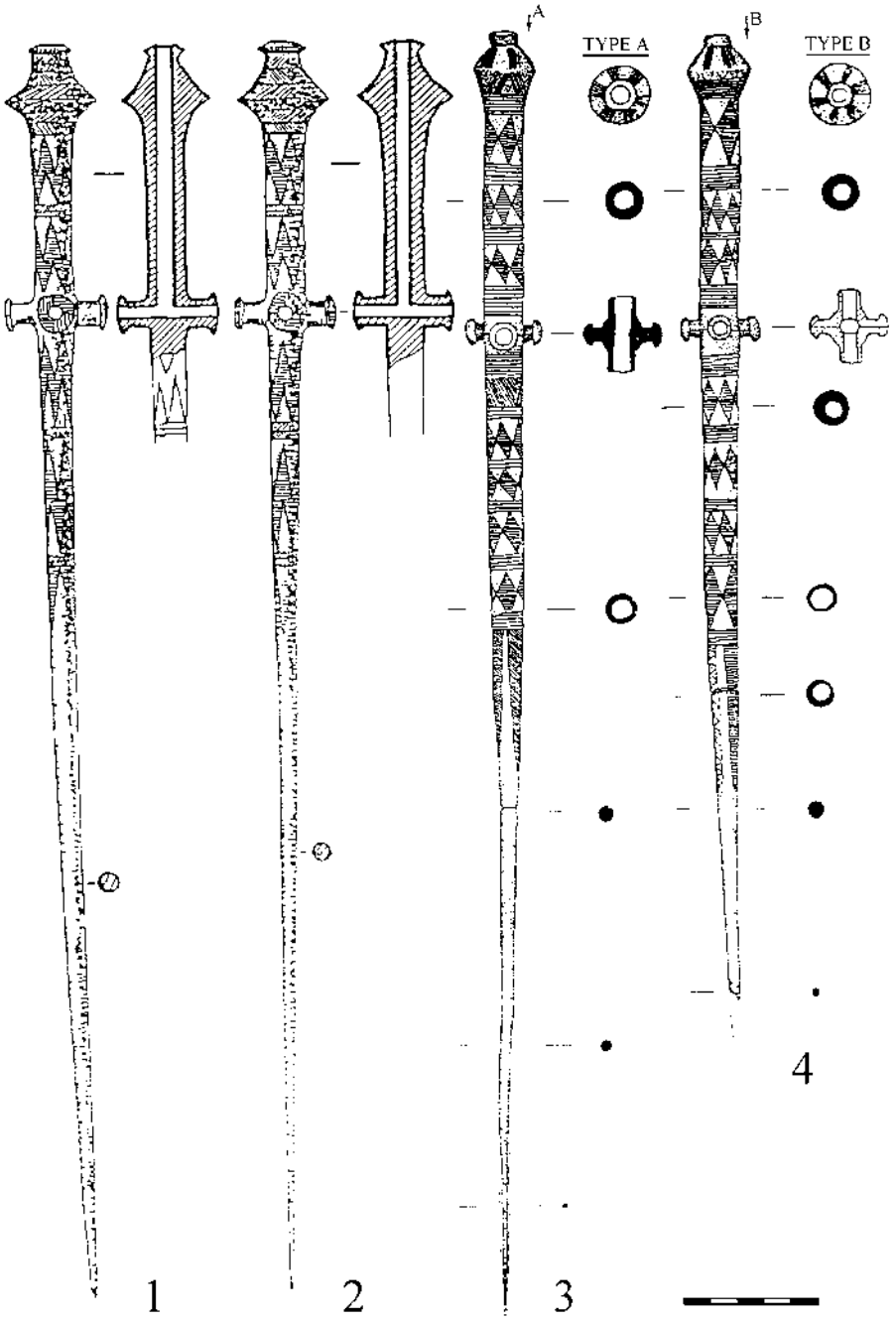


Fig. 33. Rod-like pins of the Hordeevka type

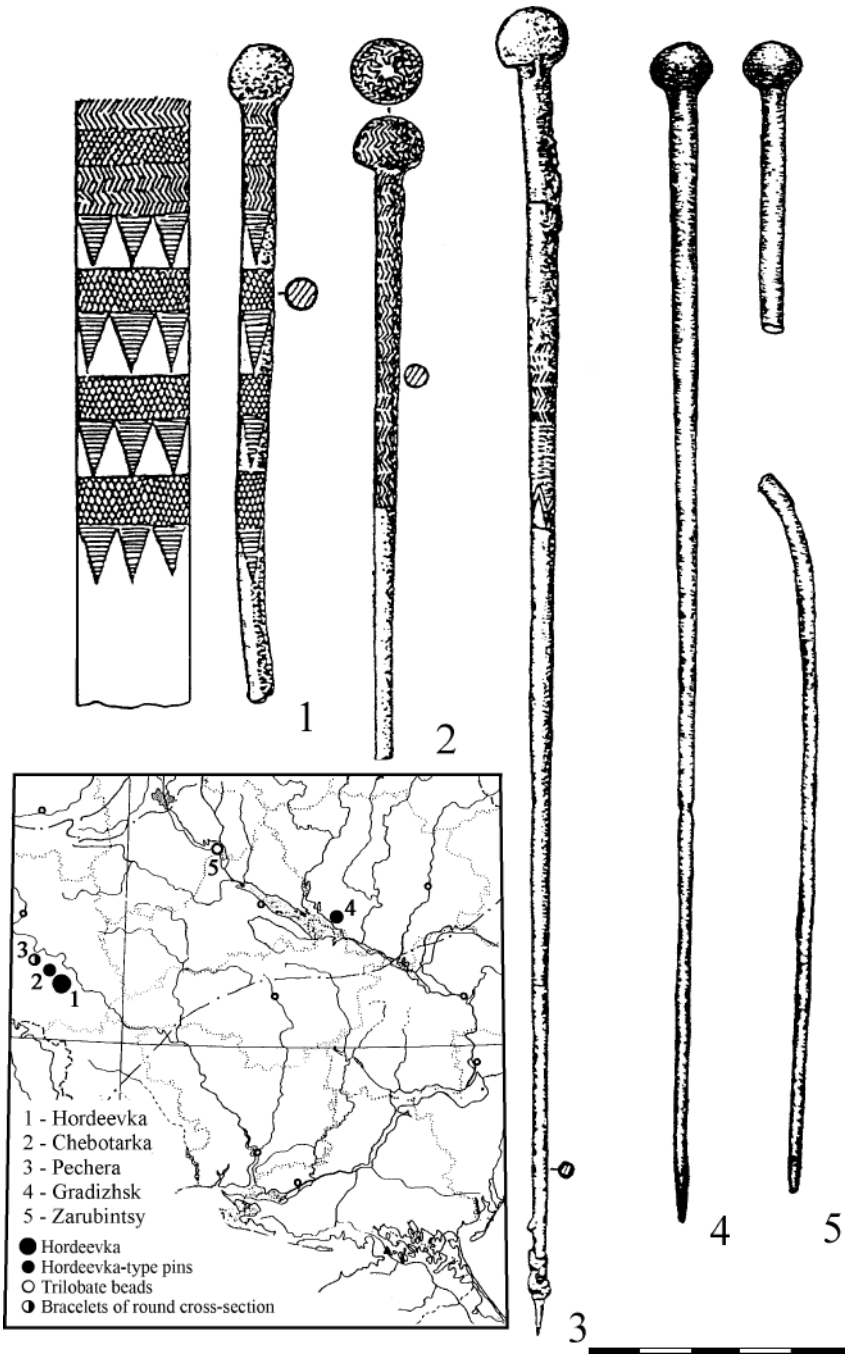


Fig. 34. Pins with ball-head of the Hordeevka type, and a map of proliferation of adornments of the Hordeevka-Belogrudovskaya types, represented at Figs. 32-34

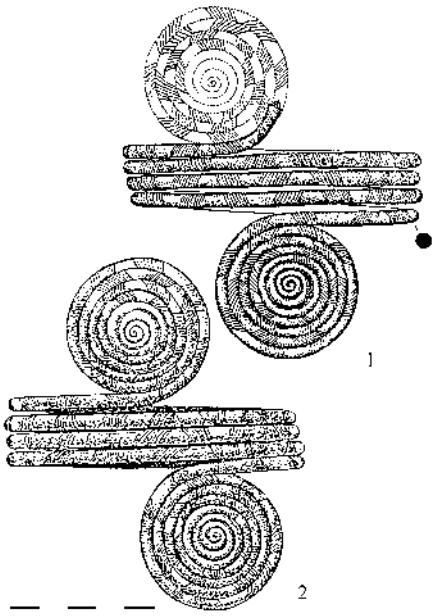


Fig. 35. Large multi-spiral bracelets spiral-twirled terminals. Hordeevka, barrow 16

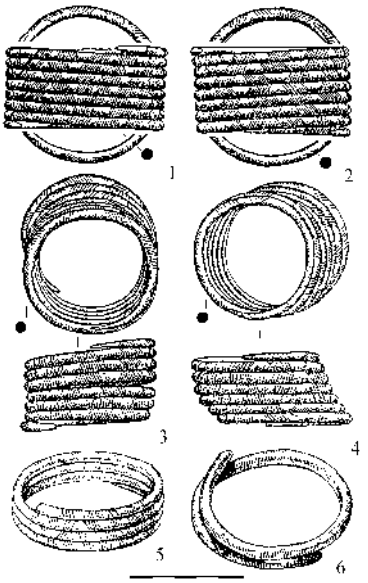


Fig. 36. Multi-spiral bracelets made of wire, round in section, from the territory of Ukraine

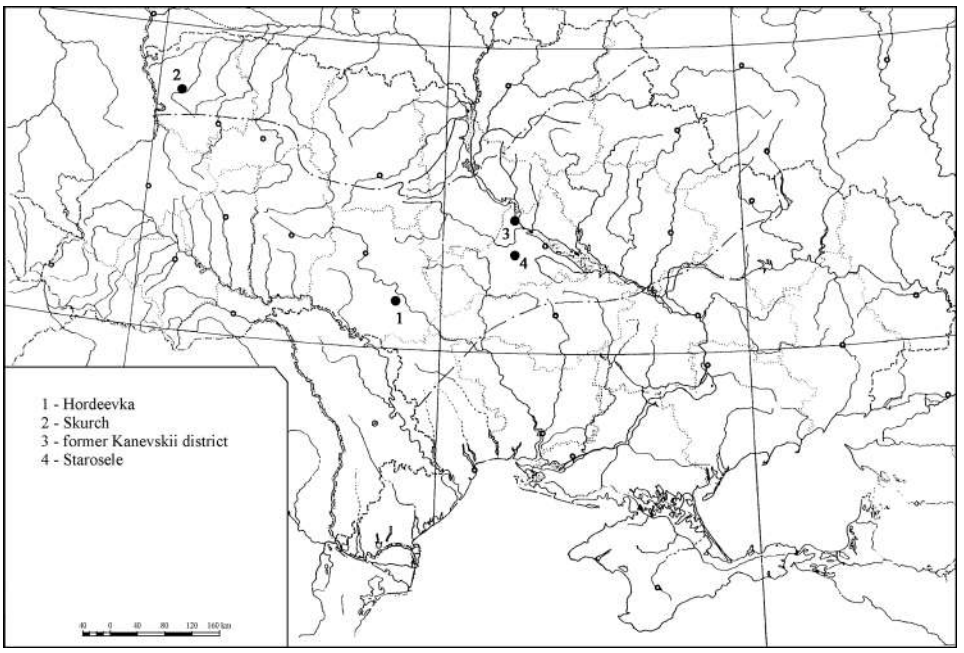


Fig. 37. Spreading of whole-cast ornamented bracelets from the territory of Ukraine

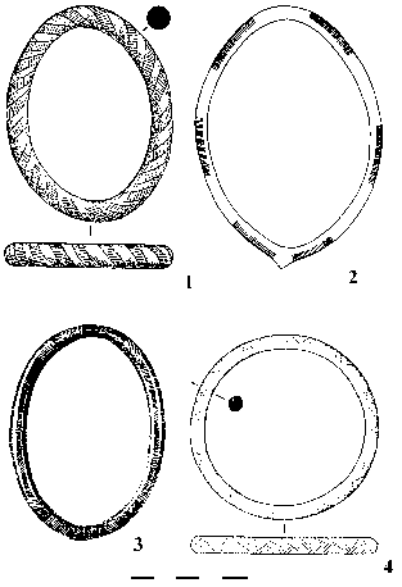


Fig. 38. Whole-cast ornamented bracelets from the territory of Ukraine

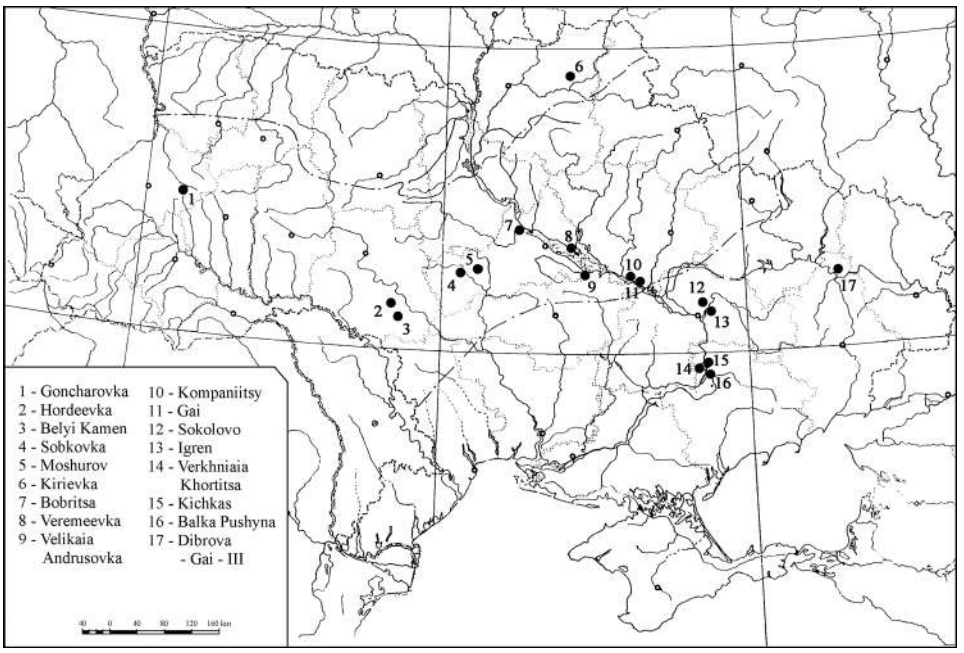
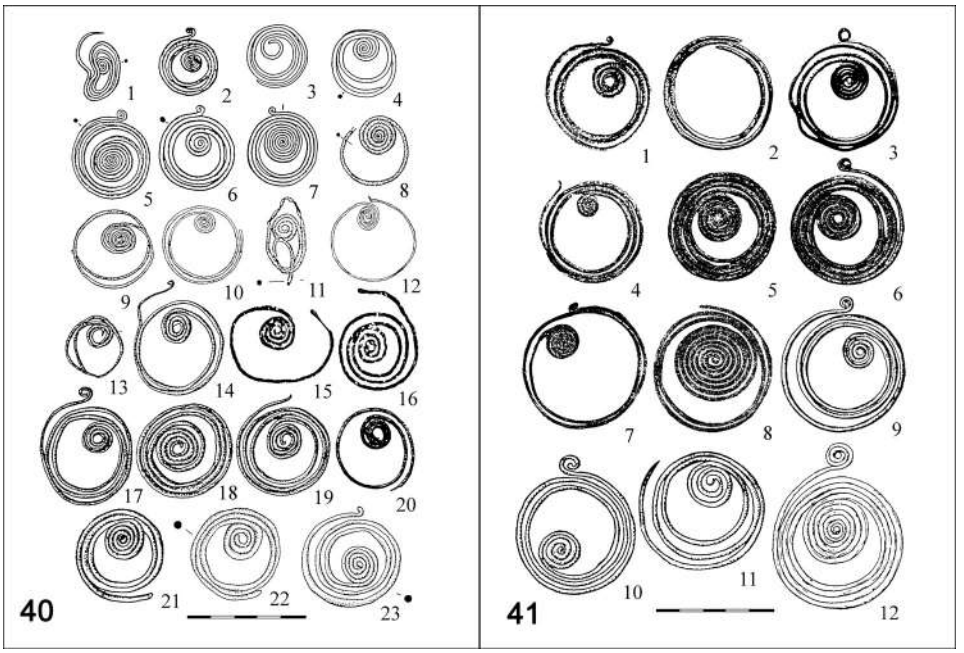


Fig. 39. Spreading of pendants of the Belogrudovskaya type from the territory of Ukraine

2. MAIN DIRECTIONS OF GROUND COMMUNICATIONS IN THE TCC'S EASTERN AREA

Comparison of the results of mapping late Bronze Age adornments with the geographical situation allows identification of three general directions of the Trans-European forest-steppe route (Fig. 42): the Northern direction that linked the Middle Dnieper area with the Vistula basin and by-passed the Carpathians from the north, the Carpathian direction, which went through the Dniester area towards the Carpathian mountain passes and further to the Hungarian plain, and the Southern direction, which went by the southern forest-steppe and by-passed the Carpathian mountains from the south.

The northern forest-steppe way went along the edge of the forest-steppe area and the Polissya, by-passing the latter's swamps from the south. Its general direction is marked by the settlements of Ivanie, Dytynychi, Ustenske, Dorohoshcha, Netishyn, Voitsekhivka, Troyaniv, Malopolovetske and Kiev. This segment of the way



Figs. 40-41. Pendants of the Belogrudovskaya type from the territory of Ukraine

also features the spreading of the Luzhytsa-type bracelets: Kozyntsi (Fig. 47:1), Vytachiv (Fig. 47:2), Pohreby (Fig. 48:2), Babychi (Fig. 48:3), Maryanovka (Fig. 48:4), a fragment of a depasportised artefact from the Zhytomyr district (Fig. 48:1) and a Senyava-type torque: Olesko (Fig. 49). Importantly, a number of ornamental themes on the Senyava-type torques coincide with those on whole-cast bracelets.

In the Kiev district this route is additionally marked and detailed by a chain of burial mounds and barrow groups, as well as by the location of ancient crossings (fords) and present-day geographic names [Lysenko 2005]. From the crossings at Kiev to the western part of the Zhytomyr district this route can be reconstructed along the line of towns and villages of Kiev – Khotov – Kremenyshche – Gvozdov – Velyka Buhayivka – Vasylkiv – Mytnytsya – Olenivka – Fastovets – Palyanychentsi – Pylypivka – Korolivka – Trylisy – Malopolovetske – Yakhny – Novoselytsya – Pavoloch (Fig. 50).

The crossroads of transportation communications are probably the key to an understanding of the Malopolovetske burial site, the reasons for its long-lasting existence and the richness of the monument as well as the mixture of various cultural traditions appearing there. The monument is located at the crossroads of the 'Caravan Route', leading to the crossings near Kiev, and the 'Milky Way', which

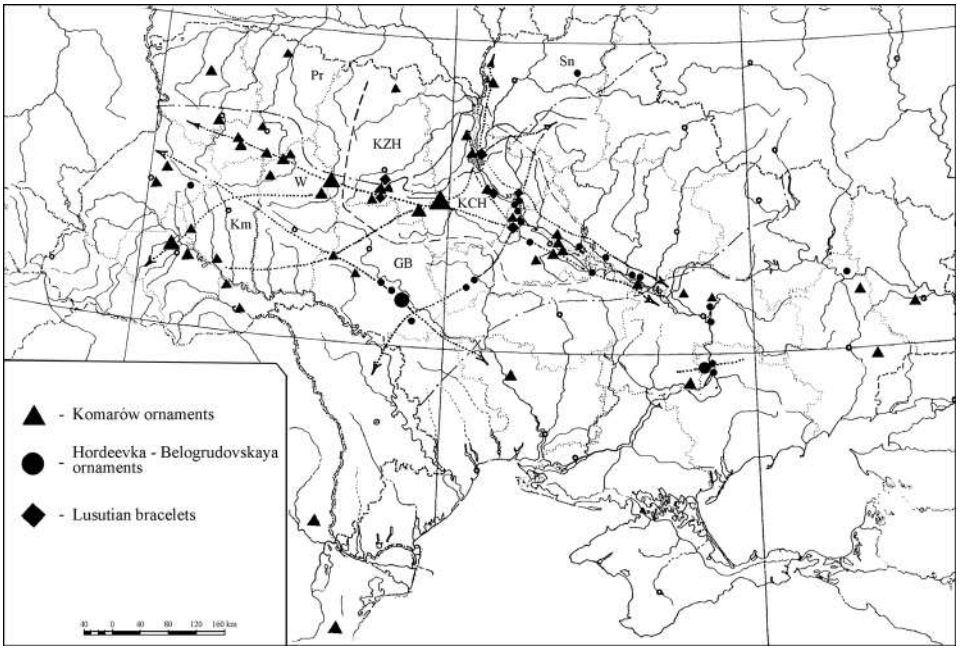


Fig. 42. Reconstruction of ancient communications in the TCC's eastern area

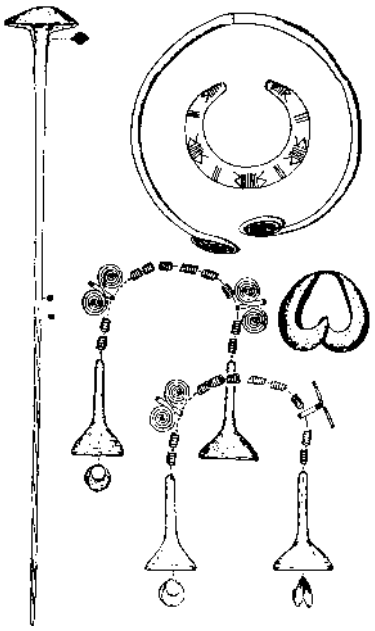


Fig. 43. Komarów, barrow 8

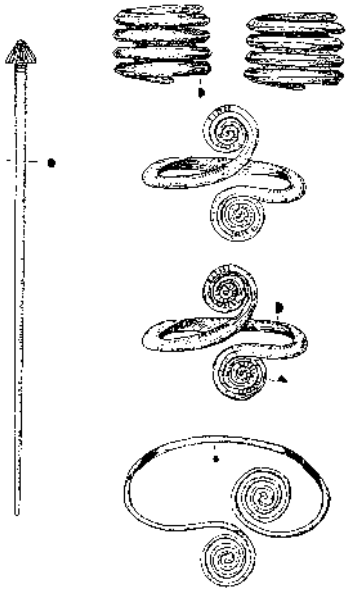


Fig. 44. Ivanie, barrow 2, grave 1

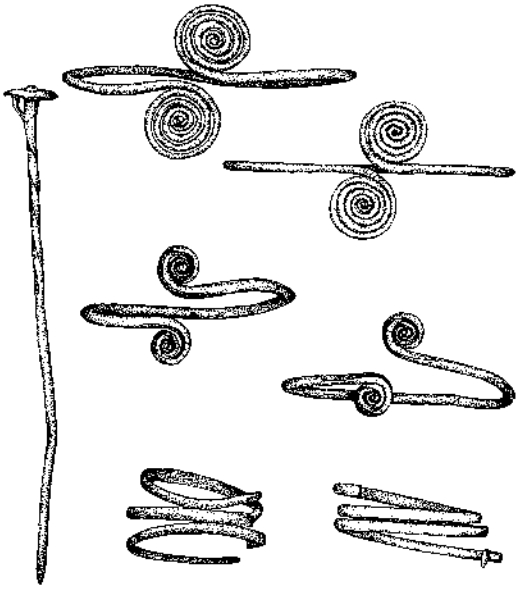


Fig. 45. Malopolovetske, grave 1

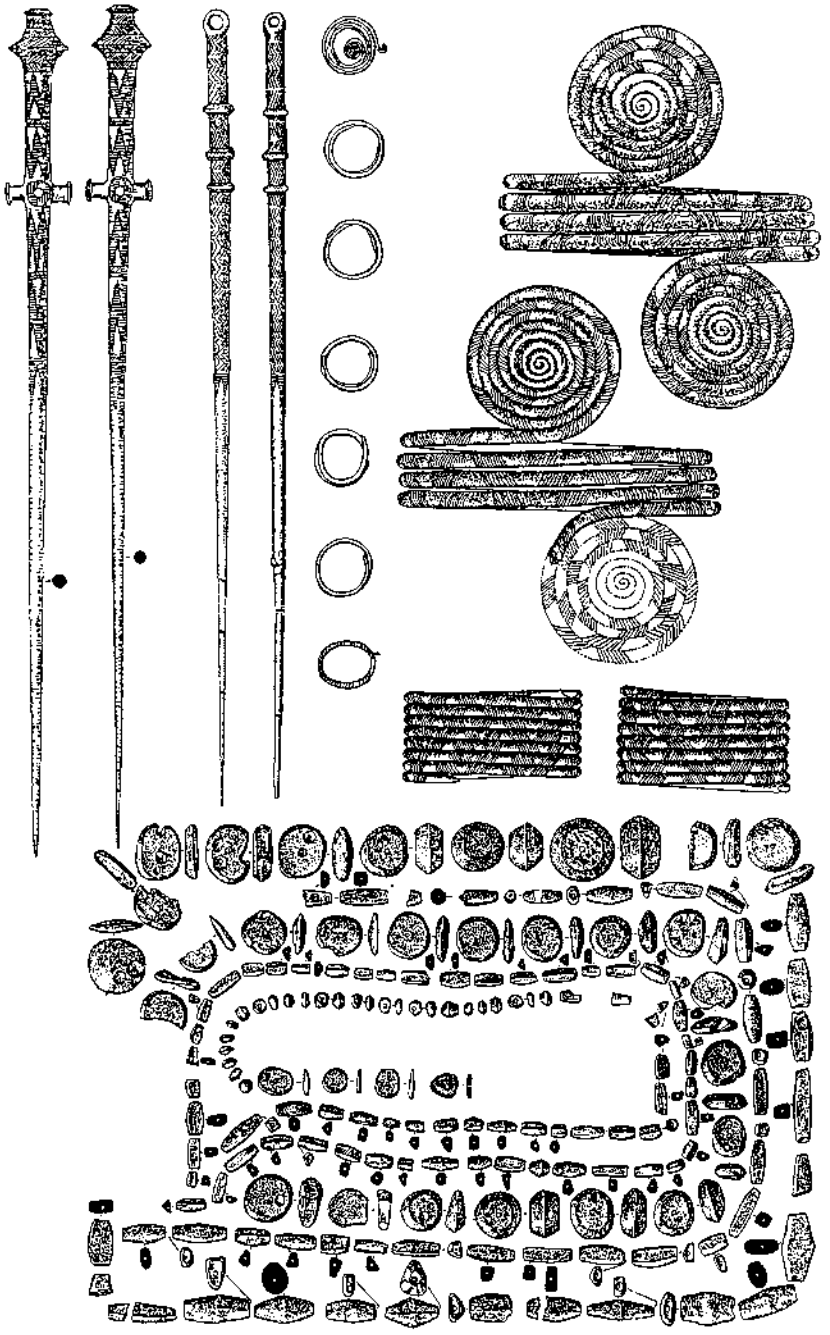
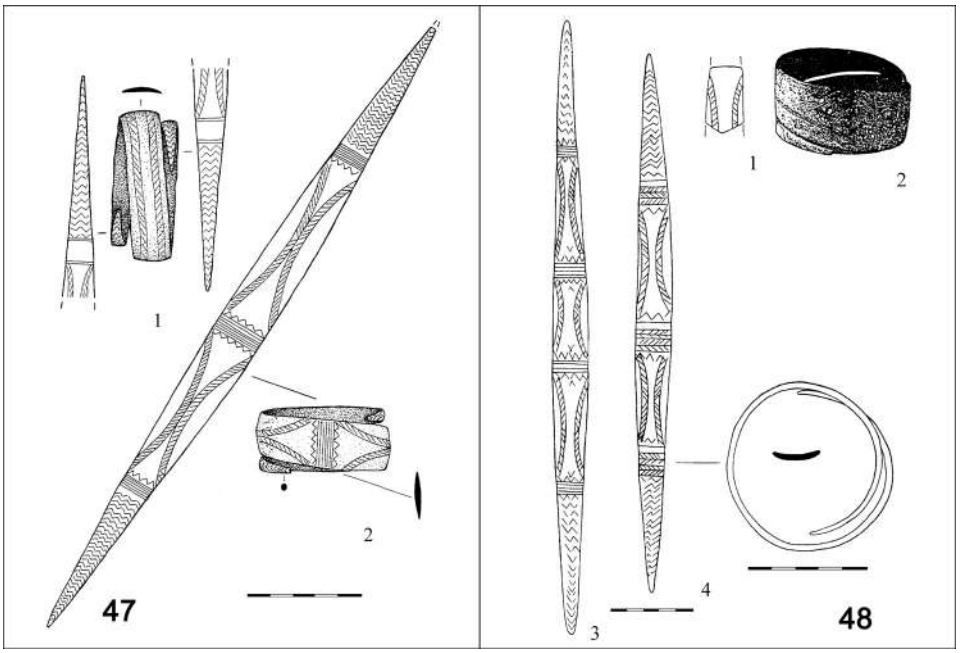


Fig. 46. Hordeevka, barrow 16



Figs. 47-48. Bracelets of the 'Luzhitsa' type from the territory of Ukraine

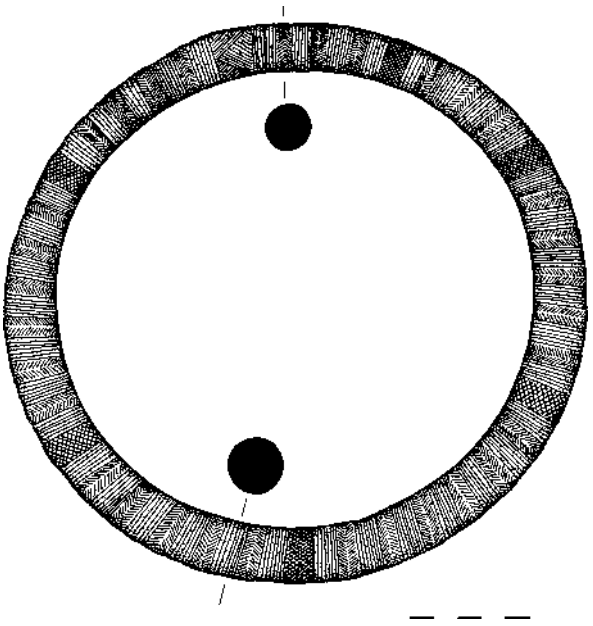


Fig. 49. Torque of the Senyava type from Olesko

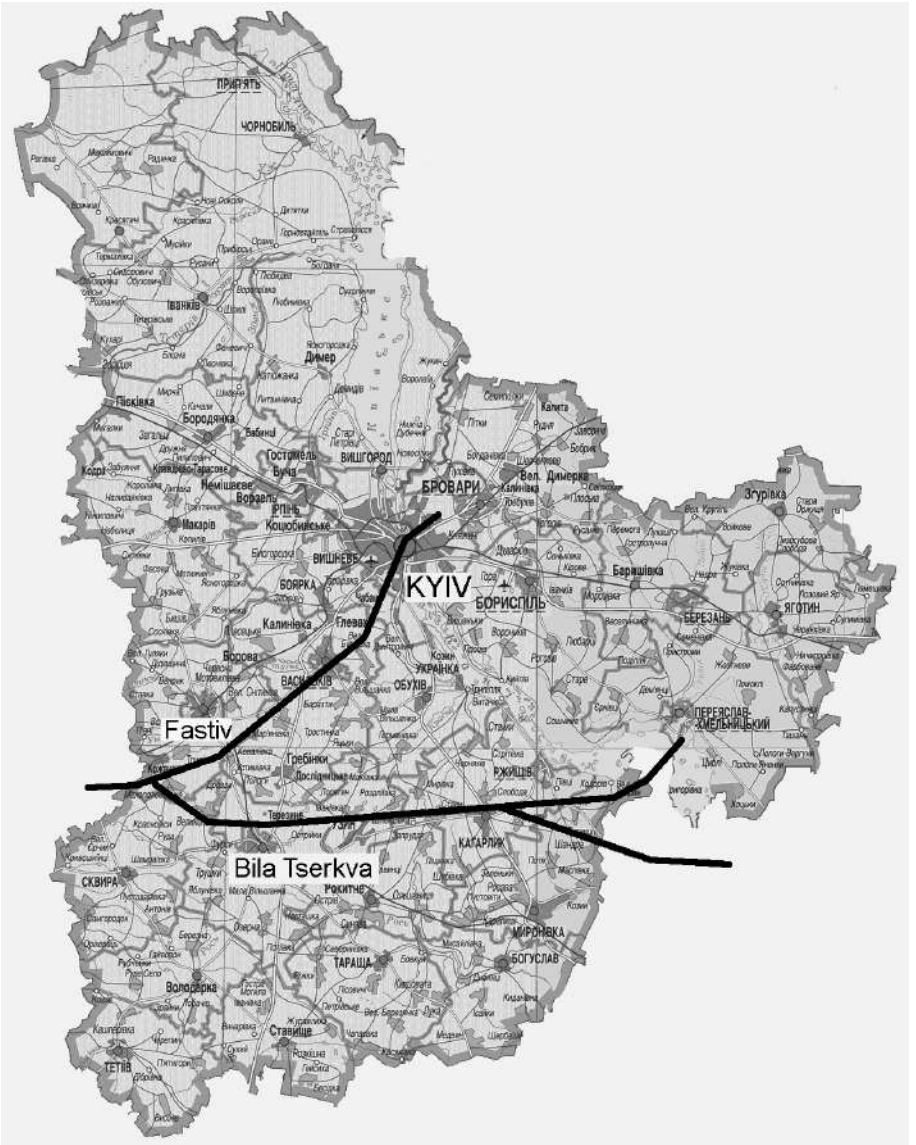


Fig. 50. Reconstruction of ancient ground communications in the Kiev region

stretched its branch to the Lower Ros area, to the water crossings near Kaniv and Trakhtemyriv (Fig. 50).

The Carpathian forest-steppe route, probably separated from the Northern route somewhere in the vicinity of Voitsekhivka, surrounded the Smaller Polis-

sya by the Sluch and Horn' rivers' watershed and, crossing the Dniester near Ivano-Frankivsk, went towards the Carpathian mountain passes. Possibly a branch of that way separated from the mainstream at an earlier point, in the Upper Ros area, and went to the Dniester basin across the upper flow of the Southern Bug.

The southern forest-and-steppe route is marked by adornments of the Hordeevka-Belogrudovskaya types, registered at the Southern Bug, the Synyukha basin, and in the areas of crossings near Kaniv and Trakhtemyriv. Further on, at the left bank of the Dnieper, this route probably went along the watershed of the Trubizh and Supoy rivers and merged with the left-bank segment of the forest-steppe route that went from Kiev. The use of the Southern Route that linked the Bug area with the Lower Danube defined the peculiarity of the Hordeevka–Belogrudovskaya group of the TCC.

Apart from the ground ways along the West-East line, there were routes along the major water arteries (probably, combining movement by land and by water): the Dnieper, the Dniester, and the Bug ways, which was also reflected by the spreading of individual types of adornments.

Shifting a number of accents from the regions to inter-regional communications, in the process of mapping the materials, allows taking a somewhat different perspective of the TCC. The predominant majority of jewellery objects were found in the Forest-steppe, in the monuments of the Komarov line of development of the TCC. Hence, the division of the TCC into the Trzciniec (forest) and Komarov (forest-steppe) strands is based not only on different environmental features of the Right-Bank area (and therefore different economic-cultural types), but also the far more significant involvement of the forest-steppe TCC groups in macro-regional contacts. On the other hand, one of the key reasons for the latter is the convenient location of ground transportation arteries, caused by landscape peculiarities of the Right-Bank forest-steppe.

It can therefore be concluded that the system of ground communications of the TCC organically fits into the system of ancient routes of the Baltic–Pontic region, reconstructed and based on materials of other periods, while at the same time substantially clarifying and enriching our knowledge in this matter.

Translated by Inna Pidluska

Baltic-Pontic Studies
vol. 14: 2009, 368-374
PL ISSN 1231-0344

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HORDEEVKA – IMPLICATIONS OF ARCHEOLOGICAL RESEARCH ON EXTRA-REGIONAL RELATIONS (CULTURES OF THE BOH-BUG RIVERS BASIN)

This study will follow the conference theme of trade routes and connections between the areas of the Vistula and Dnieper river basins, in particular the Boh-Bug river system joining two seas, the Baltic and the Black. It will not concern itself, however, with further proof of the functioning of this system but rather, a brief history of issues to do with the Hordeevka[1] cemetery complex. On account of its location on the Boh, the presence of various topogenetic elements, foremost all the points of its interpretation, it represents an ideal illustration of issues in respect to the above.

Twenty years of research notwithstanding, our understanding to date of this site remains as yet incomplete. Research discussion on the cemetery complex of Hordeevka can be said to be focused on in principle, around the following integrally related issues.

1. FINDS

The site was discovered in 1986 during melioration works. It is located on the right bank of the Boh, 5 km from the village of Gordiyvka (Hordeevka) in Trostyanets district, Vinnytsia district in Ukraine and covers an elevated flatland between the two right tributaries of the Boh, the Bitiug and Trostanchik rivers. The plateau on which the cemetery complex is found covers approximately 3 km^2(2 x 1.5 km).

[1] Hordeevka was established in the professional literature by S.S. Berezanskaya and V.I. Kločko [Berezanskaya, Kločko 1998]. The name of this site is a transliteration of the Ukrainian into German, based on the voiced g [h], and also appears in the literature as Gordievka and Gordiyvka.

There are 45 almost circular mounds documented, of which 40 contained graves. Most probably there were more barrows, though they were completely destroyed by intensive farming [Berezanskaya, Lobay 1994: 148].

The site was archeologically researched in 1986-1989, Lobay from the Vinnytsia Regional Museum initially leading the dig. In the next three years, on account of the unique nature of finds, S.S. Berezanskaya took the helm of the team (V.I. Klochko, B.I. Lobay, Machostych, O. Vangorodska). The documentation from this research can be found in the Ukraine NAN Archeological Institute Archive in Kiev, and artefacts in the Vinnytsia Regional Museum [Berezanskaya, Kločko 1998: 1]. In 1995 barrow 46, which contained one child grave[2] was examined (not included in the study on the site).

On this site only barrows were found (burials under the kurgan). The actual graves themselves varied greatly, from those of a simple design to those with plank facing forming a canopy, supported on four posts. The dead were laid either on their side, in a crouched position or rested supine. It was also noted that each of the graves had been robbed not long after burial, as might suggest the shifting of the remains of the dead.

The initial dig was directed towards the position of the grave end and subsequently, the barrow inventory could be said to be fairly comprehensive – though it is not possible to formulate a taxonomy for the internal arrangement. It would appear also that a similar lack of commonality was the case with the shape of utensils. A great number of decorative elements were also found, some of which had no analogy to either local culture or neighbouring groups.

A significant use of decorative elements made out of amber is atypical for the burial rites of northern Pontic societies. In this respect it should be noted that in the cemetery complex of Hordeevka over 1,500 amber beads were found, such as Tyrins and Alemure. Weaponry on the other hand, apart from two arrow shafts and fragments of steel daggers or swords, does not appear in barrows of this complex. There are, however, bronze knives and the remains of a horse harness.

2. INITIAL ATTEMPTS AT INTERPRETATION – THE CHRONOLOGY OF CULTURE HYPOTHESIS

According to S.S Berezanskaya and B.I. Lobay [Berezanskaya, Lobay 1994], this site is witness to an advanced process of social stratification. The lack of a settlement in the view of researchers may be proof that so called select persons were laid to

[2] Courtesy of M. Potupchika from the Vinnitsa Regional Museum (oral relation).

rest in such complexes, from one vast territorial community. The almost complete absence of weaponry and the presence of a large number of decorative costumes gave rise to the theory that this is a cemetery complex for females [Berezanskaya, Lobay 1994: 153].

The issue of chronology was resolved by a comparative analysis of metal objects from the barrows with that of materials from the Central Europe area. The cemetery complex has been dated to 15-10 centuries BC, corresponding to BC-HA2. On the basis of observable differences in the material (mainly ceramic), researchers proposed to extrapolate two phases of ritual cemetery use. The first was synchronised with the Komarów and Trzciniec cultures (KoC & TrC), the second with that of the group encompassing Bilozerka (BzC), Wysocko (WyC), Belogrudovka (BgC) and Tarnobrzeg-Lusatian (TLuC). According to S.S. Berezanskaya and B.T. Lobay [Berezanskaya, Lobay 1994: 152], Hordeevka is a reflection of the intensified influence of traits from the Central European Tumulus culture circle (TCC), a result of migrations from the west of unidentified as yet cultural groups espousing a barrow culture.

The view that this cemetery complex was related to the TCC was strengthened by S.S. Berezanskaya and V.I. Kločko [Berezenskaya, Klochko 1998], who proposed a division into four phases based on a comparative analysis of metals (mainly knives), ceramics and harnesses with materials from the Carpathian and East-Mediterranean regions. The study gave designations of ^{14}C (one for phase I and 4 for phase IV) together with calibrated dates. The basis of the chronology, however, remained conventional dating without calibrations. Phase I was dated to 1500-1300 BC (BB-BD), II to 1300-1200 BC (BD-HA A1), III to 1200-1100 BC (HA A2) and IV to 1100-1000 BC (HA B) [Berezanskaya, Kločko 1998: 19-20].

A thorough comparative analysis of burial rites (Hordeevka barrows) was conducted and that of Ukrainian cultures at the end of the Middle and Late Bronze Ages. The researchers concluded that this cemetery complex is a reflection of the Mnogovalikovaya ceramic culture (MnCC) imposing its influence on local traditions with the introduction of new designs from the eastern tumulus cultures (mainly pre-Lusatian and Carpathian). This synthesis of traditions was to lead to the emergence of a new eastern group of barrow culture. Moreover, the differences between Tumulus culture (TC) per se and that observed in Hordeevka were a result of the existence of strong traditions in the local cultural substratum [Berezanskaya, Kločko 1998: 21-25].

This hypothesis was followed by S.S. Berezanskaya [Berezanskaya 1998: 325--341], who argued that in common with a barrow culture, Hordeevka featured:

1. topographical location of a cemetery in a watershed,
2. a large number of kurgans with a single grave,
3. a preponderance in the early phase, of the dead laid in an extended supine position, head towards the west, varying south-west and north-west,

4. a large number of artefacts including many knives and the particular composition of decorative elements such as bronze, gold and amber on the costumes,
5. wooden construction of the tumulus,
6. the custom of leaving only a few utensils in the barrow [Berezanskaya 1998: 340].

The community constituting the settlement researched was most likely that of the pre-Lusatian and Carpathian TC. The noticeable differences in rites resulted from the still strong traditions of the particular cultural substratum. The dating of this site, mainly based on typochronology, supported the thesis that this settlement was contemporaneous with that of other barrow cultures. This hypothesis was upheld in subsequent research [Berezanskaya 1999: 148-153; Berezanskaya, Shumova 2002: 151-154].

3. THE OPEN CULTURE HYPOTHESIS

According to V.I. Klochko [Klochko 1996], the uniqueness of Hordeevka ought to be viewed in terms of events that took place in Europe in the latter half of the first millennium BC such as the expansion of the Urn Peoples and the peoples of the 'Sea', the latter leading to the destabilisation of the eastern Mediterranean communities. Amber, in respect to the settlement of Hordeevka, played a particular role and its abundance here would seem to indicate the existence nearby of local production processes. V.I. Klochko proposes two alternative hypotheses that explain this cemetery complex as one that separated from the local culture.

The peoples of this necropolis maintained relations with 'the northern barbarians' (often the source of conflicts in the eastern Mediterranean) and maybe supplied amber to them or even took part to some extent in historical events known as 'the expansion of the Sea Peoples' [Klochko 1996: 129-131; 1998: 343-351]. This hypothesis of mutual exchange would also explain the presence of Mediterranean objects in Hordeevka such as amber beads and certain types of knives. This leaves the question of where the amber came from. In this context it is mainly succinite but this does not preclude the fact that it might be either a gemstone from the Baltic shore or one locally sourced in Volhynia [Ślusarska 2000, 2007: 371-375; Shumova 2005: 231-234].

In the light of the above hypothesis, Hordeevka can be understood as a record of a certain process of separation, whereby, at this stage of development, a community from a local culture takes control of particular unidentified goods. These peoples could have also migrated onto the interfluvial area of the Dnieper and Dniester rivers, following the route of the Boh in the ancient Greek tradition known as Hypanis [Klochko 2006: 245-250].

4. THE HORDEEVKA SYNCRETIC CULTURE HYPOTHESIS

The I. Krushelnytska hypothesis of the 'Hordeevka culture' or Late Bronze Age culture of the central Dniester basin, in principle corresponds to the above discussion, albeit raising questions as to the principal assumptions put forward by S.S. Berezanskaya [Berezanskaya 1999; Berezanskaya, Shumova 2002].

In this regard, the former placed emphasis not on the presence of so called foreign objects in tumulus complexes, but rather on what the finds can suggest about interaction with the local culture. According to I. Krushelnytska, there are no grounds for relating this cemetery complex with any Central European group. Moreover, the graves in Hordeevka are perceived to be a reflection of a new culture developing out of a local tradition, as would suggest the custom of placing utensils and decorative elements originating in style from the BzC, BgC and Chornoles culture (ChC).

It is, however, because of the site's vastness, richness of archaeological inventory and complexity of construction in the view of I. Krushelnytska [Krushelnytska 1998], possible to interpret Hordeevka as a centre of ritual ceremonies. This site therefore represents a new cultural group that reflects the process of disintegration of cultural patterns during the Bronze Age and the emergence of a new evolutionary stage that subsequently manifested itself most completely in the ChC [Krushelnytska 1998: 196]. Unfortunately, to date, Hordeevka remains the only example of a new culture so defined.

I. Krushelnytska's thesis that the cemetery complex is integrally tied to the local culture is borne out by a comparative analysis of burial rites. In this respect, both the topography of such complexes (in watersheds) and barrow rites (single burial under the tumulus), are nothing new for eastern cultures of the Black Sea area. In fact, this is the norm for this area as far as the Bronze Age is concerned, as is placing the dead to rest on their side, hands raised towards the face. Moreover, in tumulus cultures of the kurgan type, the construction is mainly a stone one, whereas in the previously mentioned Carpathian barrow culture there is neither a construction nor a kurgan over the grave.

Apart from the debatable appropriateness of including the Carpathian culture (CaC) in the generally understood realm of TCs, it is noted that in the eastern branch, cremation appears very early and achieves almost equal status as a burial rite. Moreover, use of fire per se in rites of the Black Sea area has an equally long tradition as does the filling of the kurgan.

In TCs it is possible to note much more rigorous observation of kurgan interior composition, to take the presence of weapons in male graves as an example (completely absent in Hordeevka). Naturally, this factor might be explained by the fact that weapons were taken whenever such graves were pillaged.

The forms of metal objects, which supporters of tumulus theory argue are proof for their theory, have a very long history. There is no doubt that the range of objects in this study corresponds to those of the Carpathian-Transylvania metallurgy complex. An analysis of the metals showed that these may even have been produced locally from the available raw materials by means of 'commissioning' or by replication [Goshko 1998: 49-76, 2005: 235-240], which comes as no surprise. Here, it ought to be noted that the interfuvial area between the Dniester and Dnieper came under the influence of Central European metallurgy traditions much earlier, well before Hordeevka arose to the stage of development commensurate with the Noua-Sabatinowka cultures [Klochko 1998: 343-351; Ślusarska 2000]. Both the results of ^{14}C and materials analysis shows that the initially accepted range of dates corresponding to BB-HB cannot be maintained. Rather, following K. Ślusarska, the beginnings of Hordeevka as a cemetery complex can be related to the BD/HA period of breakthrough in culture [Ślusarska 2003c: 365-381].

Further proof of such dating can be said to be the results of pottery analysis conducted by M. Kranc [Kranc 2003], which posits that utensils from this necropolis correspond to those of the BzC (mainly Baltic groups) and in part, those from the BgC. Moreover, there are also a number of traits observable that are derivative of the Thracian-Hallstatt (Kishinev- Corlaeni, Neprotovo, Sahara-Solončeny) cultures (THaC) as well as those of the lower Danube (Babadag, Insula Banului).

5. CONCLUSIONS

The above discussion has been concerned with outlining the uniqueness of the Hordeevka cemetery complex, one that is interpreted as a burial place for a certain narrow social group, akin to a necropolis for the 'aristocracy'. The unusual richness of finds in the tumuli, uniqueness of ornamental compositions and presence of rather large numbers of objects exogenous to the borderland peoples of the forest steppe and the Black Sea steppe, would seem to allow for a hypothesis relating Hordeevka to the presence of a highly developed framework of interaction between the respective groups of this area at this point in time. One such culture that left behind this cemetery complex may well have functioned as a controlling stratum for the exchange of goods along the Boh basin. This form of monopoly was in all probability the source of a strong economic position, which translated into a particular social status for its members. In this context, independence from the local culture was underlined by ostentation in burial rites, acceptance of goods and acculturation of customs from neighbouring cultures.

At the end of the Bronze and the beginning of the Iron Ages there can be observed a significant intensification of interaction between cultures separated to a greater extent by geography. As a result of a process of cultural integration, new groups arise, syncretic in nature. At the intersection of trade routes where the most sought after goods appear, groups emerge that aspire to be the controlling forces of this trade. The predilection to find a unique niche in the local culture is reflected in the need to manifest the group's status through objects and their use, as well as ceremonial rites. In this particular regard, it can be said Hordeevka is not unique.

Translated by Ryszard J. Reisner

Baltic-Pontic Studies
vol. 14: 2009, 375-390
PL ISSN 1231-0344

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THE 'DYKYI SAD' FORTIFIED SETTLEMENT AS A UNITING LINK IN THE CONTEXT OF ECONOMIC, POLITICAL AND CULTURAL RELATION OF 1200-1000 BC (THE BALTIC SHORE, THE PONTIC REGION AND THE MEDITERRANEAN)

The article is devoted to an archeological monument of the final Bronze era, "Dykyi Sad" ("Wild Garden"), located in the historic centre of the present-day city of Mykolaiv, Ukraine, at the merging point of two rivers, the Southern Bug and the Ingul. In its days (late 1300 – early 900 BC) the fortified settlement occupied the cape of a steep edge of the plateau at the left bank of the Ingul River. A number of archeological constructions with remainders of stone basements (housing, economic, ritual and defense constructions) were discovered in the "Dykyi Sad" territory. The finds made there represented remarkable samples of material culture of its dwellers (ceramic pottery, stone and bone tools, and bronze objects).

The settlement represented the northern point of the Black Sea maritime route; it controlled the main meridional land routes by the watersheds; towards the north-east to the Dnieper crossings of the eastern way, to the north towards the Forest-steppe area and to the north-west, to Central and Eastern Europe, as well as the pathway across the Southern Bug to the Balkans and the Danube area.

A complex analysis of the archeological material of the "Dykyi Sad" enables us to believe that the "Dykyi Sad" fortress was the same as the one mentioned by Homerus, at that time and that very region, "the city of the people of Cimmeria", the dwellers of which maintained close cultural and political contacts with the neighbouring population of the ancient Oecumena.

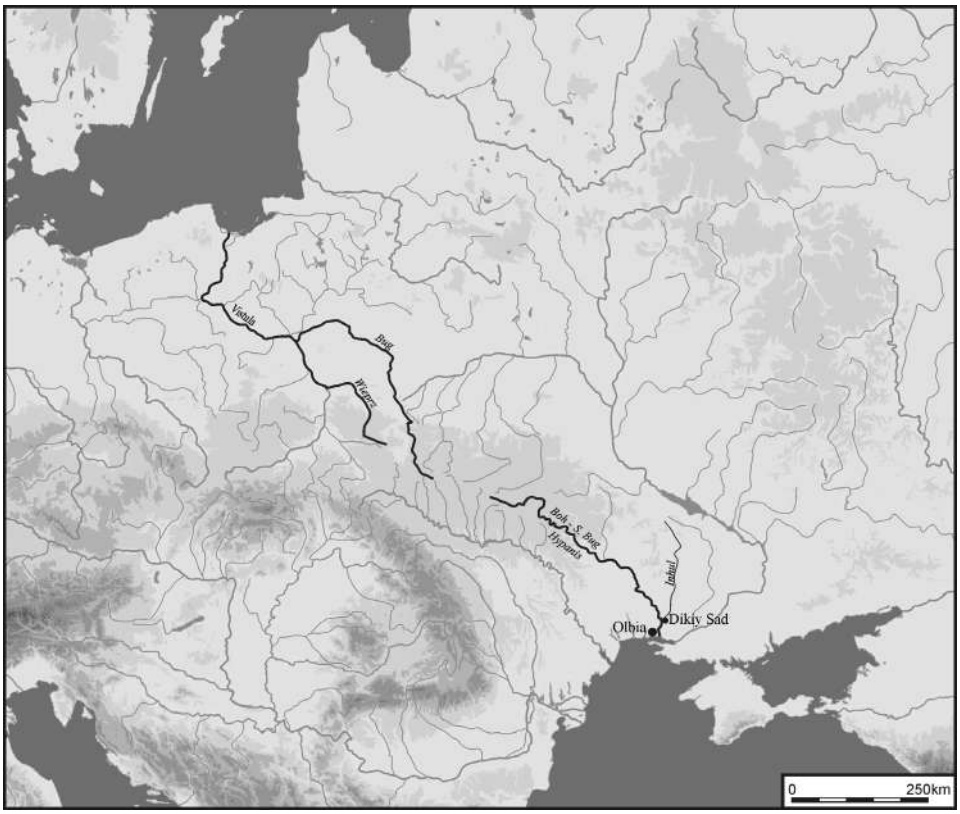

Fig. 1. Map. Localisation of the "Dykyi Sad" fortress, Mykolayiv city

1. THE FORTRESS SETTLEMENT'S TOPOGRAPHY

The "Dykyi Sad" fortress settlement is located at the point of merger of the Southern Bug and the Ingul rivers (Fig. 1). In its days (late 1300 – early 1000 BC) the settlement occupied the cape of a steep edge of the plateau at the left bank of the Ingul River. The cape was shielded from the steppe with ravines and two fosses between them. The total area of the preserved territory is about 3 hectares (Fig. 2). In construction terms, the settlement consisted of a "citadel", surrounded with a fosse (16 buildings), the "suburbs" (4 buildings), the "*posad*" part of the town around the citadel that contained 16 more buildings and the outer fosse, which circled the entire settlement [Gorbenko 2004; 2006]. The architectural constructions

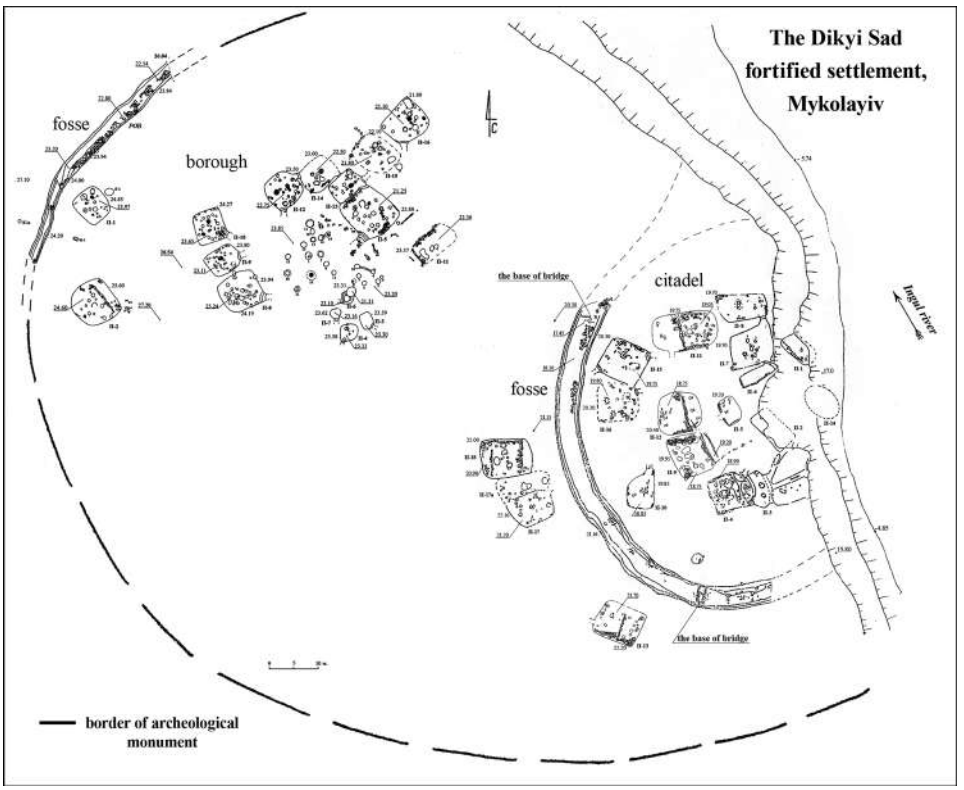

Fig. 2. Plan of the "Dykyi Sad" fortress, Mykolayiv city

were located in rows along the Ingul River and were practically adjacent to each other, thus forming a single architectural complex. Most of the studied premises and structures emerged simultaneously and were located on a levelled ground. The cultural layer outside the constructions was practically destroyed in modern times, and the material, obtained as a result of the study, dates back to the final Bronze Age and is typical for the Oecumena of the cultures that had surrounded "Dykyi Sad" [Gorbenko 2000].

The ravine in the north had a very wide mouth and created a significant bearing-out cone, a natural navigation situation, a moorage that ensured a convenient step-by-step upward way to the settlement from the riverside. One of the intact steps of the terrace contained remainders of a minor on-the-ground construction synchronous to the settlement and its accompanying material, ceramics and bones. Across the river there was a sand terrace, on which there was a mixed forest that

used to supply the settlement with various kinds of timber, as well as with products of hunting, which gave – in addition to meat and skins – some technological products such as animal bones, deer horns, and board fangs. In addition, one of the main strengths of the location was the abundance of various kinds of fish, for which the merging place of water streams was the best feeding area, and bays with small submergible meadows that served as spawning sites. The steppe part of the Mykolaiv peninsula plateau, confined by deep ravines from the east, was a closed, well-sheltered pasture with a variety of plants.

Most importantly, due to the natural conditions, it could be used as a pasture all the year round. Based on the analysis of environmental conditions in the region's topography it was the most comfortable place in the Lower Bug area. In the geopolitical sense, the settlement was the confine of the extreme northern point of the Black Sea way and controlled the main meridional land routes by the watersheds; north-eastwards to the Dnieper crossings of the eastern way, northwards to the Forest-Steppe and north-westwards to Central and Northern Europe, as well as the crossing over the Southern Bug river known as the way to the Balkan – Danube area. Floodplains with sandy spits, with a narrow and shallow riffle between them, were ideal places for crossing for land caravans and an extremely inconvenient place for navigation. One of such formations existed in the area where the Ingul River merged with the Southern Bug. Therefore, the settlement controlled a very important transportation link represented by crossings and a convenient harbour. All these phenomena were noted in the historic past, and only the rise of the water level within the last 50 years covered – and in some places diluted – these formations.

Possibly, the cargo was re-loaded in that place from sea ships to river vessels with the movement towards the Bug rapids, where there was a more convenient exit to the Bug – Dniester watershed, to the north-westward (Baltic and Central European) way. From the economic point of view, the options of the northward way are almost equal in terms of advantage. The way across land was longer, and the way by water was not convenient, as the ships had to go against the current, even though a slight one. Meanwhile, taking the water way back when going down from the north, particularly with a maximum load, gave a significant saving of time and effort. Simply floating down from Voznesensk takes no longer than 12 hours, while travelling by land requires several days to cover the same distance. As the key factor defining the choice of the route, we decided on horse-drawn (wheel) transport, which requires a solid land surface with a minimum number of crossings, whereas horse-back (riding) transport allows more options that are practically impossible to calculate to the full extent. The entire way from the Southern Bug to the Upper Western Bug and the Yablonetskiy Pass does not have a single crossing and is the shortest. Therefore, there is no doubt that this monument bears significant strategic importance (Fig. 1).

2. MAIN FEATURES OF MATERIAL CULTURE AND CRAFT-WORKS

Analysis of materials remainders allows identification of the principle activities of settlement dwellers, the nature of economic and cultural connections, chronological framework and key stages of existence of the monument. Moreover, it is quite possible to raise the issue of the nature of the ethno-political situation in the region in the period of global climatic, environmental and therefore economic changes that took place in the late Bronze Age [Gorbenko 2005].

The complex of ceramic artifacts is the most representative, and allows identification of the main forms (*korchaha* jars of amphora-type, goblets, bailers, bowls) and ornament motifs (scratched lines, impressions, coils, flutes), typical for archeological cultures of the Upper Black Sea Oecumena (Fig. 4, 5). Mid-sized pots with a smooth S-shaped outline have analogues among ceramic items found in the region in the previous period, except one specific feature: the "Dykyi Sad" pots with a narrower elongated bottom part (bottom diameter at 10-14 cm). The most probable explanation being the small – for saving fuel (wood) in the steppe – diameter of deep oven pits, where ready-made charcoal was put, followed by the pot. Such pits occur in most of the structures concerned.

Ornamentation of this kind of pottery is both typical and specific. It includes a reduction of the number of coils, typical for the earlier period and domination of various "scratched" ("drawn") systems. Generally, these were oblique strokes, almost vertical cuts, including the so-called "nail inlays", located at the pots' shoulders, sometimes in two rows. There were also more complex structures that consisted of solid horizontal recessing lines that created compositions with "inlays" and drawn "shaded" triangles, located under a horizontal "frieze" with their tops down. Compositions of this type, with more complex versions, are typical for a later period of this region (900-700 BC).

In 1200-900 BC, the regional connections are visible best in the "*korchaha*" type of ceramics. This term is rather vague, and in general covers vessels rather more than pots, and less than "pithoses", i.e., ceramic barrels, storage vessels typical for the southern, more harvest-rich regions (in our monument they were successfully replaced with various pits in the floors under the roofs). There are two main types of such "*korchaha*" amphorae in the collection; the wide-necks, represented by single objects and more similar to the type of vessels that occurred in the eastern (Srubnaya?) regions; and narrow-necked, in contrast to the wide, almost globular body and similar to the ones occurring in an earlier period of our region. Most probably, the tall-necked fluted "*korchaha*" amphorae of the central European "Villanova type" (Villanova) of the Ha A1 period emerge at the later stage of the existence of the monument. The same circle of artefacts includes multiple bowls, as well as some goblets and scoops of the fluted open type. A specific indicator of economic

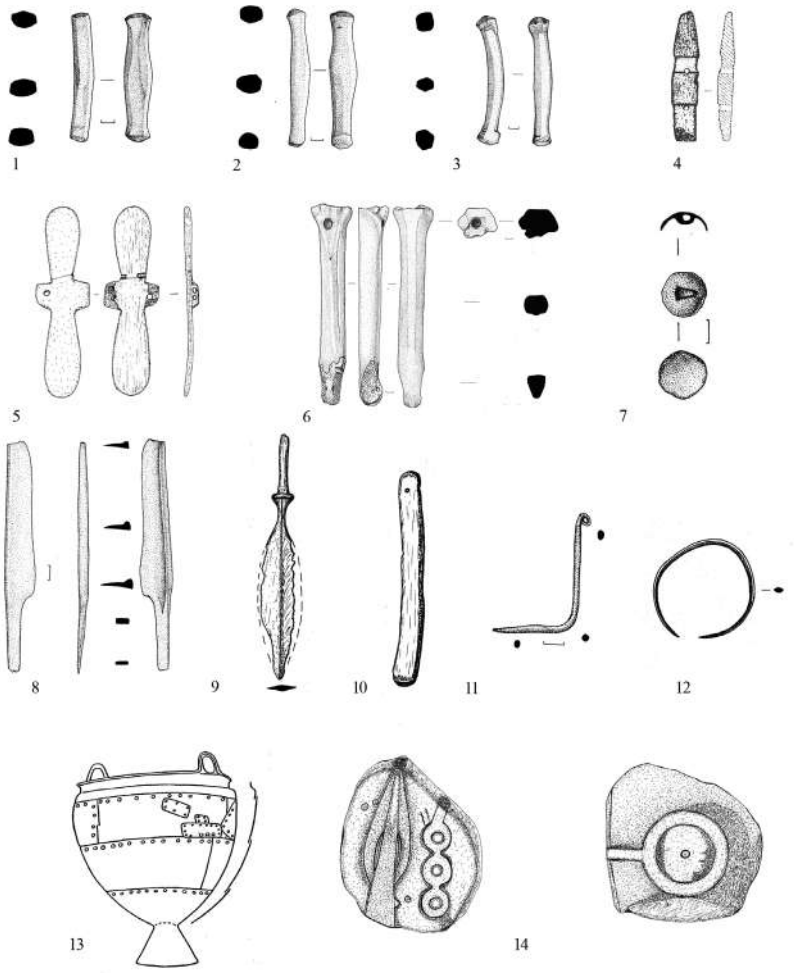

Fig. 3. "Dykyi Sad", Mykolayiv city. Objects of horn, bone, bronze and stone 1927, 1956, 1991-2006. Blanks for making bridle mouthpieces (1–3); Cable-making tools (4); Deer horn plaque (5); "Skating blade" (6); Bronze plaque (7); Bronze knife (8); Bronze dagger (9); Bronze saw-knife (10); Bronze pin (11); Bronze bracelet (12); Bronze pot (13); Moulding form (14)

activity is the large number of fry-pans of various shapes and sizes, as well as flat circular braziers, ornamented predominantly with oblique inlays at the edges.

Analysis of these and other features (ceramic dough, angobing, moulding methods) allow defining their origin both as an ideal implementation (cultural borrowing) and as a material one (place of production, raw materials, craftsman – manufacturer). Technological specifics of making ceramics do not give additional

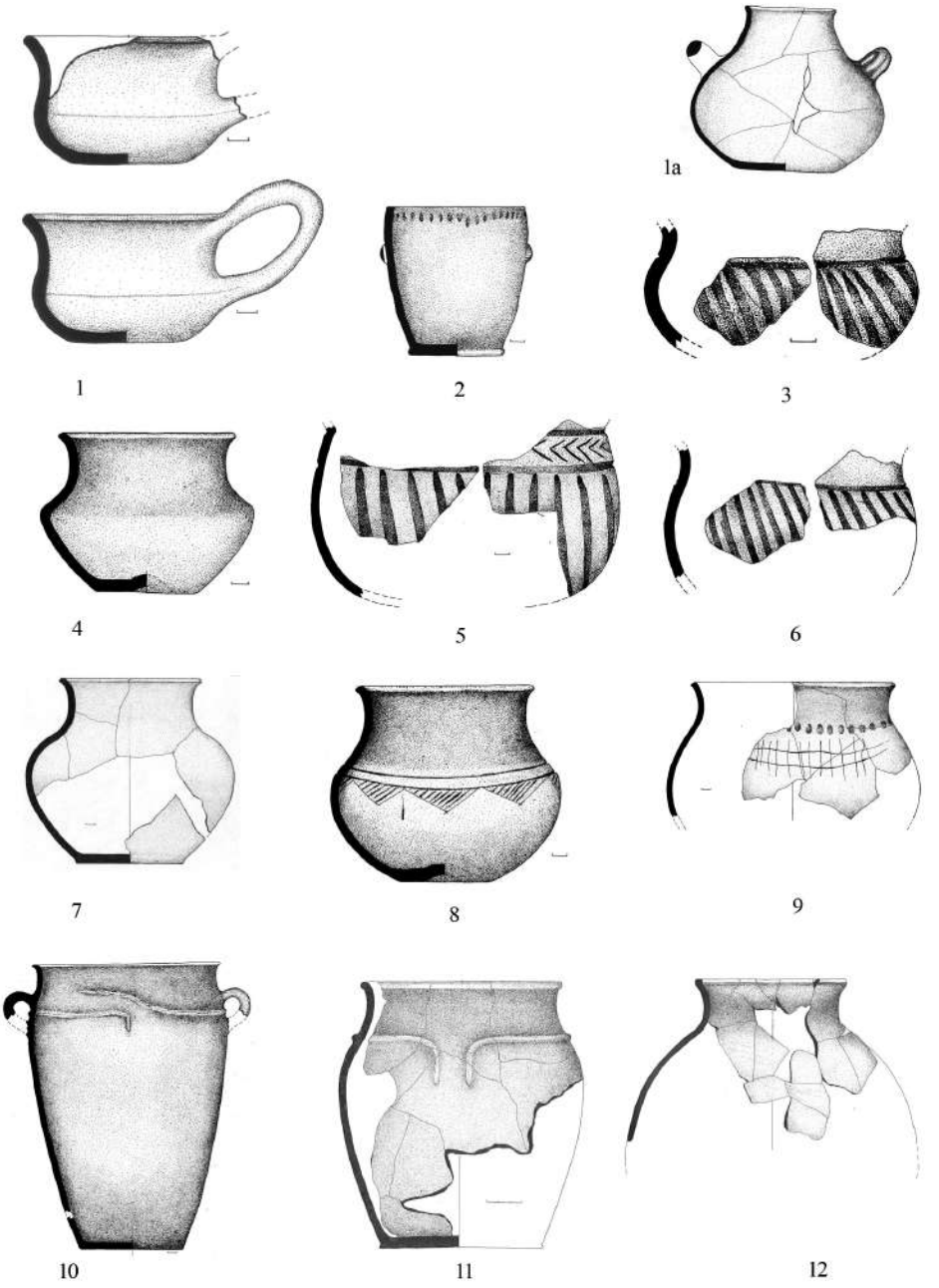

Fig. 4. "Dykyi Sad" fortress, Mykolayiv. Ceramic pottery, 2006. Ceramic pottery – bailer (1), pot with handles (1-a), jar (2), goblets (3-4, 6), cube-shaped pots (5, 6-9), pots decorated with coils (10-12)

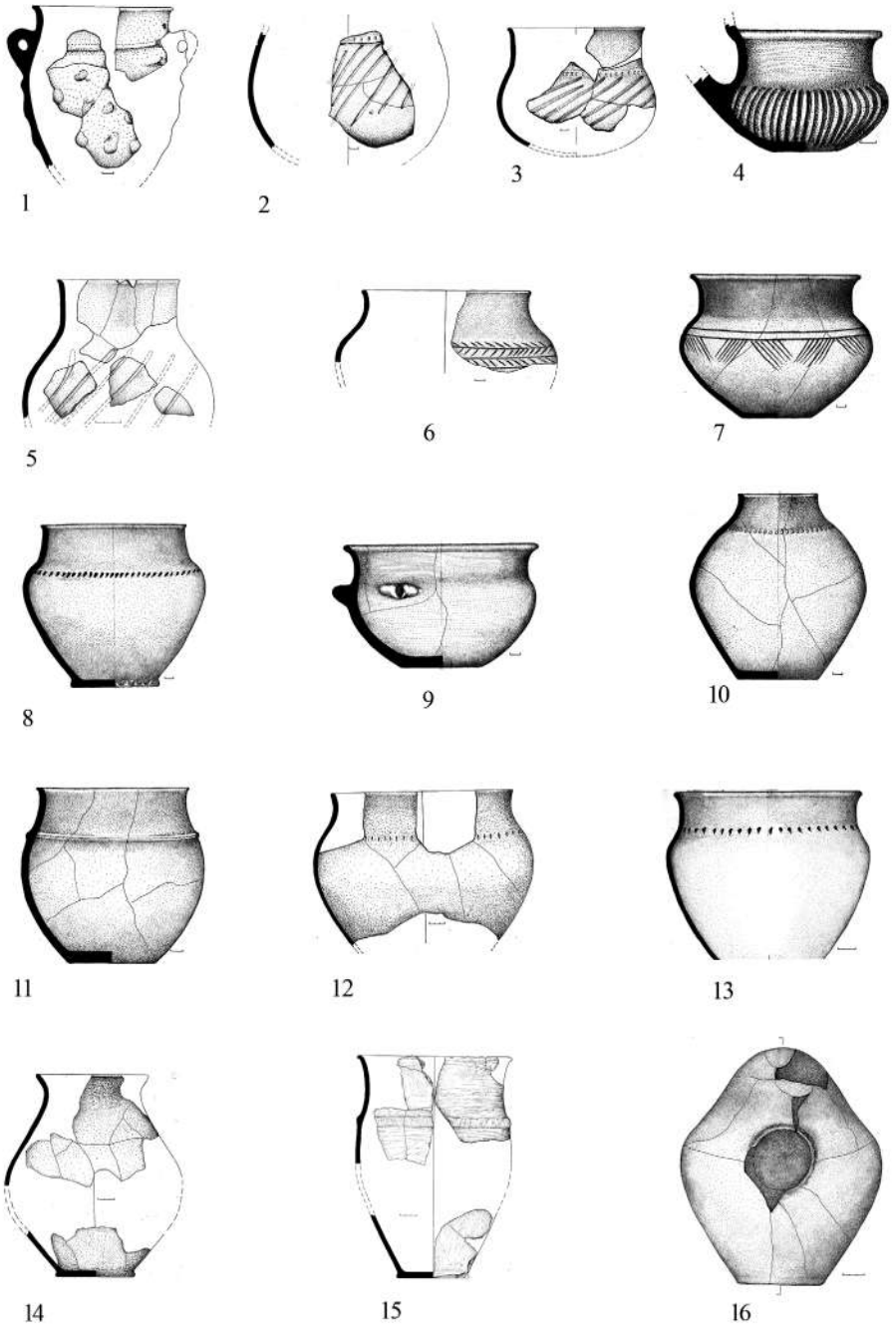

Fig. 5. "Dykyi Sad" fortress, Mykolayiv. Ceramic pottery, 2007. Ceramic pottery: goblets (3), bailer (4), cube-shaped pots (2,5), pots (1, 6-8, 10-13, 15), *korchaha* amphora (14), vase (9), urn (16)

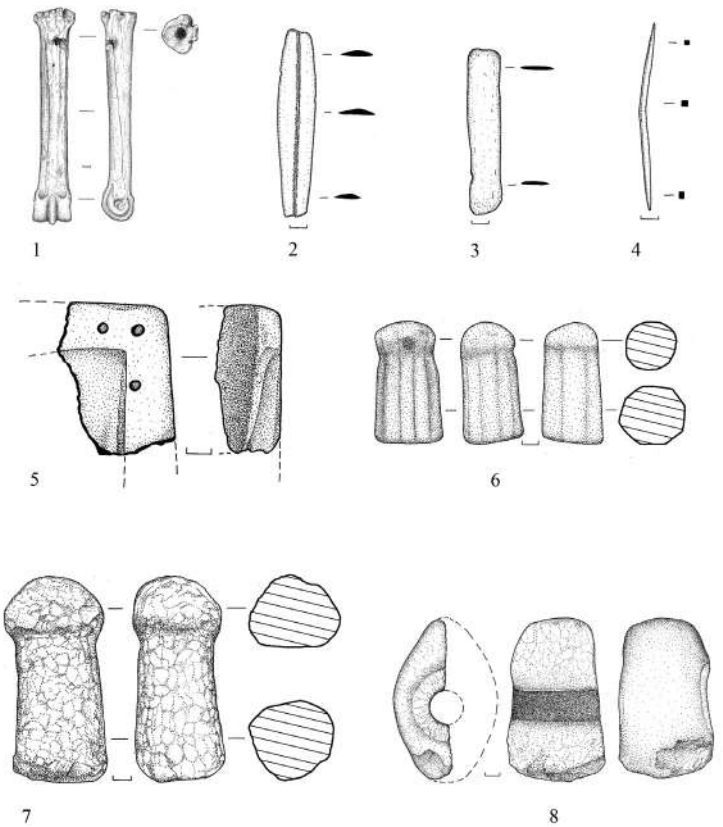

Fig. 6. "Dykyi Sad" settlement, Mykolayiv. Bone, bronze and stone artifacts, 2007. Semi-finished "blank" for a "skating blade" (1); Bronze knife blade (2); Bronze saw blade (3); Bronze awl (4); Casting form – celt (5); Stone beater (6); Stone phallus model (7); Stone axe (8)

opportunities for identification of contacts with neighbouring regions; only mica admixtures in some ceramic fragments can possibly suggest imports from Transylvania, where mica serves as one of the thinners. There were also finds of fragments of ceramics with rosy-shade angob, particularly on the inside, typical for cultures of Central and Western Europe (Villanova). There were also locally produced vessels (judging by the texture, the method of surface finishing and the ornament, but made with the use of a pattern obviously made from imported samples. An example of such imitation is an unusual vessel, most probably a funeral urn, similar to objects from a number of cultures from Northern Europe, but not typical for ceramic objects produced in this region. Similar shapes of vessels can be found on the territory of the Baltic region (Fig. 5:16).

The complex of metal artifacts includes 70 objects (Figs. 3:7-13; 6:2-4). Among the metal items there are daggers, knives, saw-knives, awls, two fishing hooks, a fragment of a small chisel, pins, riveted cauldrons, celt axes (5 typological forms), a dart-head, an ear-ring, bracelets, fragments of long "*proniz*" beads (piercing tubes) (about 10 details), a fragment of a fibula (or a pin), and bronze plaques. The finds of three stone casting forms, a nozzle and a crucible are directly connected with bronze casting production. The first form was double-sided, one side for making bronze dart-heads, and the other side for making three small rings and a large ring, a horse bridle element of a bracelet. The other form was one-sided and served for making celts, while the third form was used for making large chisels. The types of objects and analysis of the metal, point to trading contacts between the settlement's dwellers in the northern, western and eastern directions. A bronze knife and a plaque have direct similarities in the materials of the Carpathian region (Fig. 3:7-8). The various types of celts represent eastern and western regions of the Northern Pontic area (the Kardashinka, Negresti, and Ruginoasa types) [Dergachev 1997]. The discovered pit-kilns with strong (up to 2 cm thick) burnt layers of the walls and the bottom were suitable at least for secondary metal processing: re-melting small objects, soldering, hot forging etc.

Multiple stone objects (over 100 objects) include small hammers, grinders, grain-grounders, anvils, moulding forms, plummet weights, beaters, stone objects (Figs. 3:14; 6:5-8). They provide information in two aspects. First, the origin of the raw materials (produced from local materials excavated in the valleys of the Southern Bug and the Ingul rivers, and also from the materials widespread in other regions (Southern Carpathians, Asia Minor, and the Mediterranean). Petrun, who performed the petrographic analysis, noted the Mediterranean kind of stone that had been later imported to Olbia as ship ballast. Most probably in that case, there was communication with Asia Minor and Hittite Millawanda (later in Greek Miletus).

It should be noted that the finds contain practically no stone of eastern origin, from the Donets basin, the Caucasus, the Urals etc. (the petrographic analysis results have not been formally published); the purpose of the production tools (based on "tracelogical" analysis, those tools had been used for processing of wood, grain, metal and other raw materials). The objects display traces of processing methods used, both those which continue local traditions, and those indicating innovations connected to learning new borrowed technologies. Importantly, no flint tools were found, which had been rather common in earlier times. Also, there were no sickles among the finds, neither solid nor knapped-bladed ones.

Bone objects (over 100 items) belong to local types and, most probably, were produced in the settlement's workshops (Figs. 3:1-6; 6:1). The whole cycle of manufacturing has been traced from bone, unfinished horn, to ready-made items and identification of usage of a specific object (bridle mouthpiece, "*konki*" skating blades, tools for leather dressing etc.). The rigging gear (Figs. 3, 4), including a large

needle for net-making, "*svaika*", a cable-making tool, most probably, an innovation from the Mediterranean, was found for the first time.

Most probably, the principle scheme of its production was imported from the Mediterranean, although – taking into account the fact that the 13th-12th century BC migrants from Central and Eastern Europe were called "the Sea Peoples" and had their own ships – production of tools for cable-making could have been a local tradition. The object was made of bone and most probably, was not a working tool but a votive object. Such a tool, no doubt, had been used by all navigators of the Oecumena, but apparently it had been made of hard wood and, therefore, was not preserved. Votive objects imply the existence of a certain cult, and such a cult is more typical for the peoples for whom sea trade is not sporadic but the basis of life.

The tracelogical analysis performed allowed identification of the main kinds of craftsmanship, classed by activity. One of the key positions is occupied by bone-processing where the finds included a large number not only of ready-made objects, but of semi-finished forms and production waste. Avery important kind of production was wood-processing; the finds included a large number of stone balls for flat horizontal rollers, counterweight fly-wheels for vertical wood-turning machines, small hammers for metal processing and possibly, for paint-grinding. Also, a small number of grain-grinders was found. In fact, such craftsmanship was known to have occurred in this region in the previous period (the Sabatinovka culture), but the emergence of new types of objects (bridle mouthpieces, a leather-strap bridle plaque, cable-making tools, respectively) implies innovation in manufacturing technologies that no doubt, suggest the bridle mouthpieces emerged locally. This is proven by the finds of a full technological chain from semi-finished horn to ready-made objects.

The workshop with such a full technological process is the only one found so far in the whole Eurasian region. The finds of similar bridle mouthpieces in the area from the Danube to the Altai Mountains allow making a statement about the priority of production of such objects in our region. We can also speak about sufficiently intensive means of movement (transportation) (horses) and about the permanent trade flow in this region.

Certain connections are suggested by some quantity of artifacts that cause no doubts about the location of their origin. Importantly, those artifacts are not objects of exchange – trade. First of all, those include stone originating from Asia Minor (the Aegean area), which had come to the region as a piece of ballast in the process of sea traveling. Finds of that group include bones of a dolphin, remainders of the sailors' food during the voyages. Raisin stones could also have been the sailors' food or an additional object of trade. An imported wolverine skull had been probably used for votive purposes by the migrants (travelers, merchants) themselves. Migration of bearers of this culture, not the technologies as such, is suggested by anthropological data (skulls in cult burials). One can argue about the migration of master

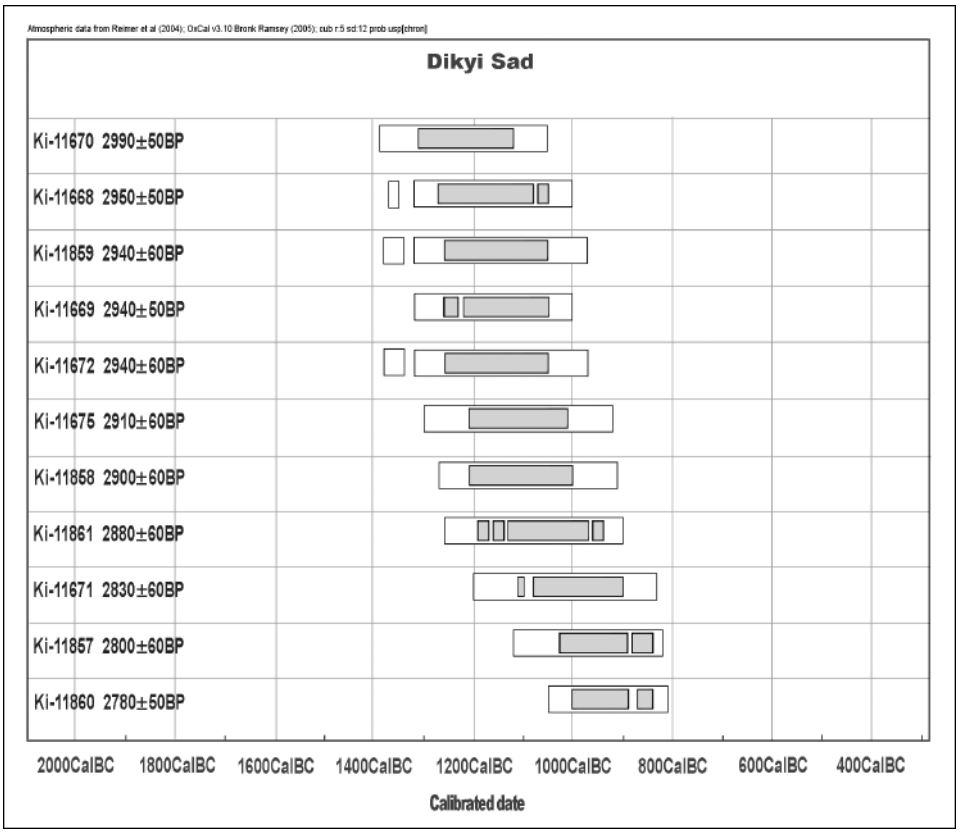

Fig. 7. "Dykyi Sad" fortress, Mykolayiv. Absolute dates

house-builders who had known the technology of building adobe walls on stone basements with the use of a regular brick-mould system, earlier unknown in the region.

3. DATING THE SETTLEMENT AND ARCHITECTURAL CONSTRUCTIONS

The lifetime of the monument, according to ^{14}C dating, falls within the range of 1250 – 900 cal. BC (Fig. 7). Generally, the lifetime of the monument, according to both the ^{14}C and the typological dating falls within the range of the late 13th

century to the 12th century BC (^{14}C, some forms of ceramics). The foundation dates back to the mid 12th century – mid11th century (^{14}C), the 10th century is the top date taken by some ceramic shapes, related by the typological methodology to the 10th century (or possibly to the early 9th century) BC, (the so-called "Cimmerian steppe" ceramics are known more commonly by the burial mound graves). There is no doubt about the monument's lifetime within such a broad time range. The remainders of housing and production constructions that had existed practically at the same time, bear traces of repair works and re-planning; therefore, it is quite realistic that the monument could have existed for more than 300 years.

Most of the dug-in constructions of the "citadel" and the "*posad*" had been in the form of occupied housing [Gorbenko 2007]. They were built in the shape of a rectangle with rounded corners and stretched in a long axis along the Ingul River and have preserved stone masonry fragments (socle constructions and façade coating). The sizes of the rooms ranged from 4-6 to 7-8 meters, made up to 0.8-1.1 meters deep. The ground constructions were used by the local dwellers as economic constructions cattle enclosures, workshops and storage facilities. Some of these rooms contained remainders of stone basements of the walls (socle constructions), which had been made of local limestone in one row, from two to five layers with bonding elements. The roofs had been made single-sloped or double-sloped and the stamped-down floor had borne traces of many layers of clay applied to it. The economic/ household, ritual and pole pits, and open hearths had been located at floor level in the buildings. The pits, as well as the foundation pits of the buildings, had been filled with ceramics, animal bones; some ritual (cult) pits had been purposefully filled with clean soil and sometimes contained human skulls without the lower jaw, turtle shells and small "fortune-telling" stones

The cult complexes of the fortress's "citadels" were deepened constructions with adobe walls and stone wall foundations (facing and socles). The roofs were double-sloped and the stamped-down floors had traces of a more accurate clay covering. There were ritual pits at the floor level of the constructions. The filling of the pits contained, in various compositions, human skulls, turtle shells, animal bones, early ceramic vessels, and stones. Most such pits were covered with fire-beds [Gorbenko 2001].

Of particular interest is the earliest ritual – a cult complex that consisted of an oval room with two large fire-beds at both sides of the entrance and a ramp, about 1 meter wide, specially cut into the slope. The declivity angle of the ramp was about 30 degrees, while its long axis was aimed at the summer sunrise (observation made on June 21). Analysis of the cult rooms of the settlement's citadel allows the conclusion that its dwellers had regularly practiced various rituals connected with worshiping the sun, the moon and fire (the ritual pits, the cult ramp), had honoured the spirits of their ancestors and heroes (burial of skulls in special pits) and had practiced the cult of cattle-breeding fertility [Gorbenko 2001].

The settlement's fortifications consisted of two moats (the outer moat around the settlement and the central moat around the "citadel"). The outer moat went along the south-west – north-east axis. Its researched part is 45 meters long, 2-3 meters wide and 1.2 – 1.3 meters deep from the mainland soil level (the other part of the moat was destroyed by contemporary constructions). The filling contained fragments of ceramic pottery, stone working tools, a fragment of a celt casting mould, animal bones, and a cattle horn. The south-eastern wall of the moat contained massive limestone slabs (the stones had slid down into the moat).

The stone slabs displayed slight traces of processing where they had been slightly hewn. Given the location of the slabs, one may assume them to have been the facing of the inner wall of the moat. It is also possible that the facing had served the function of a foundation of a fence or a defense (fortification) wall. Judging by the nature of the obstructions, the stone laying had consisted of three or four layers. The slabs had been presumably laid on a clay-mud mixture with elements of strengthening "bandaging". The moat surrounding the "citadel" of the fortified settlement with a large curve had stretched along the south-east – north-west axis. The researched part of the moat was 80 meters long (the total length had been about 120 – 130 meters), 5 meters wide, and 2.5 – 3 meters deep below the mainland soil level. The moat had been filled with an ash layer rich in ceramics, stone, horn and animal bone tools, bronze, animal and fish bones, and human skulls and bones. In the lower part of the moat there were preserved slabs that had served as a facing of the moat's inner wall.

The eastern part of the excavated section of the moat contained an intact original construction that consisted of large limestone slabs, provisionally interpreted as a bridge. The construction, rectangular in projection, stretched across the moat along the north – south line with a slight deflection to the north – east. Its dimensions were 3.64 x 2.0 meters, and the central part – due to the shift of the slabs – was 1.4 meters wide. The bridge presented itself as double-façade brickwork. The inner part of the foundation of the bridge, most probably, served the function of casing for the outer walls of the construction, and the traces of burning, where remainders of ceramics of the Belozerka type and animal bones at the bottom under the central part of the basement, point to traces of a certain ritual that involved making a building sacrifice. It is possible the sacrifice had been made in the ceramic vessels, which had been placed into the foundation of the stone construction in order to give sacral strength and power to the construction.

Judging by the construction of the stone foundation, the bridge had probably been made of wood and served for entering the "citadel". The upper part of a human skull, buried at the bottom of the moat and accompanied by ceramics of the Belozerka culture, a laying technique used to build the bridge construction and the finds (ceramics, bone tools) – all leave no doubts about the age of the set-

tlement's fortification constructions as definitely belonging to the late Bronze Age [Gorbenko *et al.* 2005].

The finds made in the studied area of the "*posad*" included a fortification moat with remainders of stone facing, 11 "rooms" located at the ground level and slightly or significantly deepened constructions. Among those constructions there were household/economic premises: cellars, repositories, adobe-walled houses with remainders of stone constructions, three housekeeping pits and an economic ground containing 21 pits (both housekeeping and ritual/cult ones). The pits were located on a flat ground between the huts, thus making a kind of central economic square of the "*posad*". The pits contained fragments of ceramic pots, animal and fish bones, remainders of charred seeds of common millet, "*dvuzernianka*" wheat (*Triticum dicoccum*), common grape vine (*vitis vinifera*) and charcoal.

Therefore, the architectural composition of the "Dykyi Sad" allows defining it as a fortified settlement, a "town" with the full set of definitions of that socio-econmic structure that includes the 'citadel', the "*posad*", the "*slobodka*" behind the outer moat, the cult and administrative and craft structures. Furthermore, the monument's materials displayed differences in the social purposefulness of individual complexes, which could be defined by the compositions of food (judging by the bone remnants), the selections of ceramic vessels, the level of "comfort" of the rooms and the number of various facilities, like the cellar pits, stove-pits in a number of premises, the variety of distinct cults that had not duplicated each other but determined the complex life cycle connected to protective magic (human skulls, anthropomorphous stellae, specific animals, fire rites) and most probably trade and fertility cults (stone phallus models). In addition, the settlement's materials contained objects bearing traces of a sign/symbol system (ceramic "tags"). The symbols on them, resembling the linear "B" writing, had been made with the help of three kinds of pigment paint [Grebennikov 1996].

Taking into account the presence of the Belozerka Steppe ceramics, it is possible to argue about the co-existence of the "Dykyi Sad" dwellers with bearers of that culture for as long as up to the beginning of the Iron Age in this region in 900 – 800 BC.

4. CAUSES OF EMERGENCE OF THE SETTLEMENT

The emergence of the monument was prompted by two reasons. First, a subjective geographic one as mentioned above, namely it was the highest point of the Black Sea shore with the exit to convenient watersheds and, unlike the Trasniestria (the Thracian world) and the Dnieper area (Eastern – Eurasian steppes), the Bug

region was thinly, specifically populated as a border (buffer) territory between the sedentarised Central Europe and nomadised Eurasia Steppe. Moreover, this was the shortest way to a direct watershed between the Southern Bug and the Dniester rivers with a watershed leading to the most convenient exits to Central and Northern Europe. Both from the West and from the East the hydrographic network for the Northward way by land is so confusing and complex that the watershed had been used from the Neolith epoch to Middle Ages, among others by Sarmatians to reach Central Europe (Hungary) and by Goths to the Northern Pontic area and the Crimea.

The reasons for the creation of such routes was the search for convenient ways to the Volhynia and Baltic deposits of amber. In addition, it was a convenient trans-shipment point of the ground – sea route and the crossroads of the east-west to north-south routes, as discussed above.

The objects remaining from the start of exploration of the territory included a building with a "ramp" and a lower cultural layer of the outer moat, separated with a hiatus from the upper layer of the filling. The ceramic material in those objects was typologically earlier in composition.

The second main stage was represented by the existing system of city planning of a "citadel", a moat, the "suburbs", the "*posad*" (a small semi-urban settlement) – which corresponds with the classical definition of the notion of a "city", "*cives*". Several objects displayed traces of destruction and fire. The filling of the rooms and the moat contained fragments of human skulls and individual human bones. However, the absence of arrow-heads in the cultural layer does not allow discussion of a possible military assault of the settlement.

The recorded traces of secondary use of earlier destroyed constructions, with the building of lighter wattled or cane-like walls, and the presence of ceramics typical for the steppe burial mounds of a later period, point to changes in the region with the beginning of the Iron Age. Recorded artefacts prove that the "Dykyi Sad" as a social-economic centre, a settlement, ceased to exist and was used as a traditional administrative and cult centre for long-distance trade connections. This point is also supported by the practical lack of materials in the upper layer of the moat filling.

Further archaeological studies of the monument will allow finally to identify the place of the settlement in the region's cultural and chronological scheme. The fact that the steppe surrounding the "Dykyi Sad "settlement (at its late stage) belonged to the Cimmerian culture allows its identification with the "city of the Cimmerian people" mentioned by Herodotus. The city dwellers reportedly maintained close economic, cultural and political contacts with the surrounding populations of ancient Oecumena.

Translated by Inna Pidluska

Baltic-Pontic Studies
vol. 14: 2009, 391-401
PL ISSN 1231-0344

Marcin Ignaczak

THE ROLE OF BALTIC-BLACK SEA ROUTES IN THE DEVELOPMENT OF LUSATIAN CULTURE SOCIETIES IN THE DECLINE BRONZE AND EARLY IRON AGES

The question of transit routes, taken to mean "mechanisms of cultural pattern circulation along the borderland between the East and West of Europe" [Kośko, Klochko..., in this volume], seems to be one of the basic issues in the study of cultures in the period of transition from the Bronze to the Iron Age. For this period, the regional borderland should concern, on the one hand, the eastern reaches of the tradition identified with the Polish branch of the Urnfield culture complex (Lusatian culture, LC) and, on the other hand, the western reaches of influence by the forest-steppe cultural environments of the Pontic Area. The border in space between these phenomena is not linear, though, and it is hard to define, relying on available sources. To make matters worse, it is difficult to visualize archaeologically as we need to answer at least one fundamental question: what are we to look for in the borderland? Also, can it be an assemblage of sources, having a single, common denominator? One can venture an opinion that from the point of view of issues discussed in this paper, any manifestations of cultural contact, identified through archaeological sources, will be meaningful.

The question of route thus should not be taken literally as a road along which moved the alleged makers of discovered objects. What should be attempted here instead is an identification of possible external inspirations observed against a local cultural background. The genetic context of such inspirations can bring us closer to explaining the role and function of the contact, but it will not allow us to identify beyond any doubt the route it took.

The literature has supplied already several interpretations of the course of cultural processes in the borderland, focusing specifically on the area lying between the Małopolska and Volhynia-Podolia uplands (closer to the European zone of mixed forests and the eastern forest-steppe zone [Kondracki 1988: 243, 248]). The inter-

pretations stress the role of regional contacts in the zones [Czopek 2003; 2007c; 2007d..., in this volume; Kłosińska 2005; 2007a; 2007b] and focus on cultural diversity in the eastern part of the Lublin and Western Volhynia uplands [Kłosińska 2005: 161], and in the Sandomierz Basin (to be specific its part known as the Przemyśl Gate [Czopek..., in this volume]) and well as the Sańsk-Dniester Plateau [Kondracki 1988: 400].

In each aspect, the interpretations adequately describe the issue referred to in the title. However, they should be elaborated on to answer a more general question about the nature of relationships and contacts taking place on the Polish Lowland as well.

1. CONTACT THROUGH THE PRISM OF NATURAL ENVIRONMENT

The interpretations of cultural pattern dissemination in the borderland between the East and West of Europe, presented so far, refer to natural terrain features, verified on the basis of natural data. The resulting picture of preferred routes within the oecumene of prehistoric societies clearly determines locations of contact zones. The picture may be modified only by historical verification, which is, however, hard to perform in respect of the period in prehistory under investigation.

Currently, our knowledge admits of two basic ways along which cultural impulses spread: the Dniester-San Route crossing the Przemyśl Gate that extended between Roztocze and the Carpathians [Czopek..., in this volume] and the Boh-Bug Route traced via the Volhynia Gate [Makohonienko..., in this volume; see earlier suggestions on the existence of the route: Kłosińska 2005; 2007a; 2007b].

Since the first of the routes is discussed in a separate paper [Czopek..., in this volume], I shall concentrate on the other one. Its presumed role has already been appreciated by an interpretation of the flow of movable finds and its potential natural advantages [Kłosińska 2005: 161; 2007a: 241]. If one takes into account phytogeographical divisions, then, the route crossed the border between two provinces: a steppe one, known as Pannonia-Pontic, and a forest one, called Central European Lowland-Upland [Makohonienko..., in this volume]. The zone where the incidence of eastern cultural elements was the highest along the route covered the western portion of the Volhynia Upland. It is there that the westernmost range of the Pannonia-Pontic Province is found. It is characterized by the domination of steppe vegetation and forms an ecological extension of the ecosystem typical of the Northern Pontic Area, being a natural bridge between the East and West. Hence, the area has clear advantages for the circulation of cultural elements.

2. WEST → EAST CONTACTS. BRONZE AGE STAGE. AN OUTLINE

A point of departure, or rather a prologue, for further discussion is a definition of the easternmost range of phenomena related to the Lusatian culture (or more broadly: Urnfield culture complex). Relying on the range of direct inspirations clearly seen in the pottery style, one can plot it in present-day Volhynia as far as the upper tributaries of the Pripet River [Pavliv 2008: Fig. 17; cf. similar approach Czopek 2007d: Fig. 6]. The area seems now to be the easternmost fringe of the LC oecumene. One can hardly speculate on the nature of this 'Urnfield' infiltration on the basis of single ceramic sources, but in the light of the most recent findings undermining the legitimacy of distinguishing the so-called Ulwówek group within the LC [Czopek 1997: 220-221; Kłosińska 2005: 171-183], they testify rather to the possibility of existence of a contact zone between the societies of the LC and those of the Wysocko (Vysotsk) culture (WyC) [Dąbrowski 1972: 211-212]. The contacts may not have lasted long but they fit into the general picture of interactions on the LC fringes [see the interactions between the Tarnobrzeg LC and WyC – Czopek 2007c: 214-216] and perhaps we should underline their relation to the migration of groups of people manifested by the presence of ceramic sources. An attempt to explain the material (source) aspect of this phenomenon may be the stressing of the role of exogamy in the societies of those times and the identifying of women as major pottery-makers [Mierzwiński 2003: 88-99; Kłosińska 2005: 177]. Strictly speaking, a certain amount of traits would be disseminated by migrating groups of people.

From the point of view of periodization of borderland cultures, appropriate propositions of the 'eastern exodus' of LC societies in the Bronze Age have already been made, chiefly in the context of the absolute chronology and temporal sequence of cultural patterns [Ignaczak, Ślusarska-Michalik 2003: 394-395, Fig. 4]. A problem of a slightly higher order would be to define the nature and intensity of these interactions as well as their historical import for successive cultural phenomena. However, solving these issues is not simple because conclusive evidence is supplied only by the dissemination of the Ulwówek beaker, a relatively rare form in LC contexts [Purowski 2003: Fig. 58; Pavliv 2008: Fig. 17], and all the other cultural traits seem to be not sensitive enough to analyze such interactions. A case in point here may be the widespread criticism of Tadeusz Sulimirski's conception of the LC's presence in the east, developed taking advantage of the discoveries of metal objects of the so-called 'Lusatian' provenance [Sulimirski 1936b].

What is only uncontroversial in the conceptions of LC's eastern impact is its assumed route, keeping to the Vistula and the area between the Bug and Wieprz rivers. What's interesting, most intercultural contacts would follow the drainages of the Vistula and Bug rivers at that time. The contacts should be distinguished from entirely different processes observed in the Tarnobrzeg LC and the WyC (i.e. in the

drainages of the Dniester and San rivers), where the coincidence of cultural indicators would be an effect of peculiar common origins of these two groups [Czopek 2005; 2007c; 2007d].

3. EAST → WEST CONTACTS. EARLY IRON AGE STAGE

The Vistula-Bug (Wieprz) route plays a considerable role in the 'reverse' (east-west) cultural trend whose origins are traced to the Pontic forest-steppe zone and whose patterns appear in the Early Iron Age. Sources attributed to the trend have been discussed in detail in the literature under the name of 'Brześć Kujawski type pottery' [Ignaczak 2008: 143]. The descriptions given there make it possible to specify rather clearly traits characteristic of genetically foreign pottery found within cultural complexes on the Polish Lowland. In short, as alien to the local (Lowland) cultural environment, the following pottery ornaments were recognized: pricked (impressed)[1] pits going around the vessel lip, pseudo-corded impressions arranged in gablelike motifs, reliefs in the form of strips decorated with finger impressions. What is also important is the fact that the stylistic value of the vessels is closely related to the technology of their manufacture. The latter is considerably inferior to the standards known from the Early Iron Age. This is seen, for instance, in the layered fracture of the pottery resulting from poorly worked body and an intentional admixture of grog to temper it.

The list of sites where these pottery styles are found on the Polish Lowland keeps on extending, with new sites being found as far as the Oder River (Fig. 1), and there are no indications that it might be closed at this stage. Any transformations of this tradition are being observed in a very discreet manner. As a kind of distinguishing characteristic of western complexes (in the drainages of the Oder and Warta rivers) one can consider a diminished share of ornaments, namely, pricked and impressed pits. Detailed investigations permit researchers to tentatively include metal sources in the discussion (they co-occur with pottery in shared contexts or are found nearby). In this connection, one should mention so-called nail-like ear bands and Scythian ice axes of eastern (forest-steppe?) provenance.

Apart from the 'hard' source evidence, some light on the question of dissemination of alien cultural patterns is shed by post-consumption remains [see Ignaczak 2008: 161]. I shall discuss this issue later in this paper.

[1] At present, the incomplete (inaccurate) description should be supplemented by a perforated ornament, frequently constituting the main stylistic element of the assemblages.

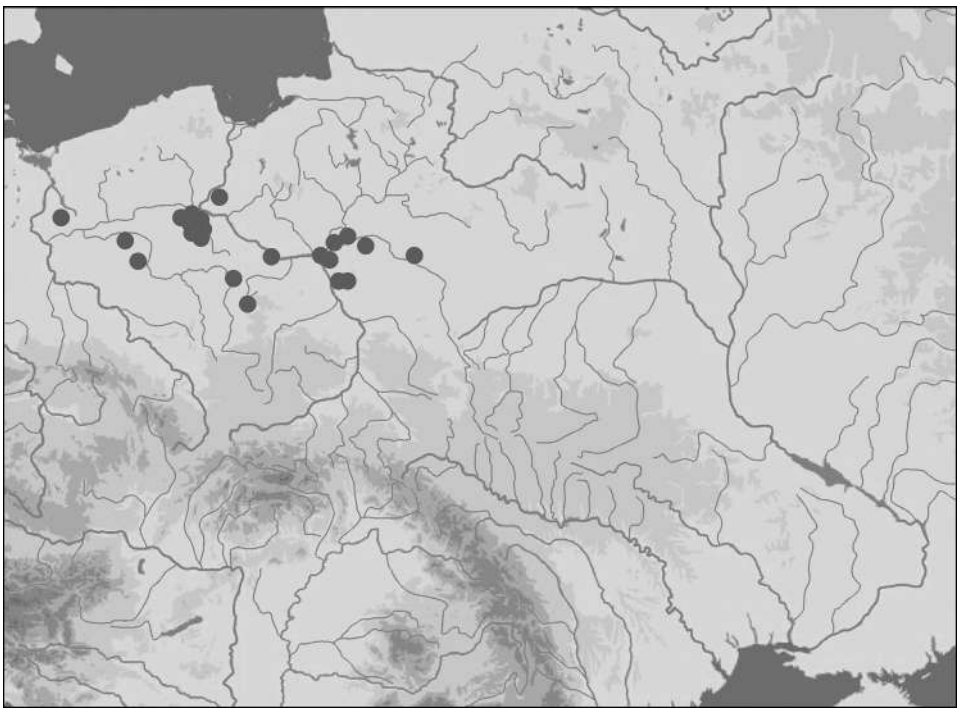

Fig. 1. Early Iron sites on the Polish Lowland with cultural elements originating from the Pontic forest-steppe zone

3.1. CONTACT THROUGH THE PRISM OF SOURCES

In prehistory, a contact zone refers to two possible situations: **(1)** a coming into contact of two or more groups arriving from different centres or **(2)** an arrival of a group of people at a new area (unsettled?) away from their homeland [Marciniak 2006].

A coming into contact of two or more different groups of people should bring about a specific, syncretic complex of sources. Hence, assemblages of the Brześć Kujawski type, dated to the Early Iron Age on the Polish Lowland, seem to exemplify the first of the possible situations. This is so because the contact points mentioned earlier, from the perspective of archaeological sources, are characterized by uniqueness of cultural indicators and, at the same time, maintenance of relations with the local world. The relationships were co-created by a probable proximity to LC populations. Absence of any good verification criteria of the so-called close neighbourhood makes us consider as such also the settling of remains of abandoned set-

tlements, respecting, however, their spatial structure. This can be observed on many settlements containing cultural elements originating on the Pontic forest-steppe. Relevant post-residential (post-settlement) remains are frequently located there next to compact LC layouts, frequently at their peripheries. The structures make up closed systems defined by the presence of a house (any hypothetical dwelling structure) and several household pits.

This kind of behaviour is observed at a majority of well-preserved settlements containing eastern sources. As examples may serve relics from Brześć Kujawski, site 3 [Grygiel 1995], Piecki, site 8 [Głogowski, Ignaczak 2004], Sławsko Wielkie, site 16 [Głogowski, Ignaczak 2004], Koluda Wielka, site 13 [Andrałojć 1993], Drohiczyn, site Kozarówka I and Kozarówka II [Węgrzynowicz 1978], Transbor, unnumbered site [Orlińska 2007], Dziecinów, site 22 [Andrzejowska 2008], or Kowalewice, site 6-7 [Marchelak, Tyszler 2003]. Presumably, reminders of similar situations, ceramic finds unearthed in the cultural layers of LC settlements with their position within stratigraphic arrangements indicate each time a younger age than that of the other settlement materials (chiefly LC of the Iron Age). Such discoveries have been made at Komorów, site 1, [Malinowski (Ed.) 2004; Malinowski 2006], Głazów, site 8 [Ignaczak, Affelski 2009] and Wyszków, site 1 [Ignaczak 2007].

Assuming that the finds are results of contact or a cultural interaction, their stylistically (in terms of meaning) cohesive character could have been a result of the search for common denominators by migrating groups of people. Quoting Marciniak, one can conclude that "elements of material culture that have the character of a sign or incomplete sign are actively used (mobilised) to build a group's identity" [Marciniak 2006: 16]. The search for identity applies to all artefact types, beginning with dwelling structures and ending with material objects such as pottery.

A claim may be ventured that the potters of this period lived in small insular enclaves located in areas actively used by earlier (partially contemporaneous) LC populations. The reason for such arrangements could have been the ecological characteristics of the areas that probably met exactly settlement preferences of the populations.

Only to a slight degree can the conclusions following from the pottery analysis be supplemented by the observations of metal sources. Two types of artefacts encountered in contexts of interest to us here, namely nail-like ear bands and Scythian-type iron ice picks, have other connotations both in terms of their manufacture and function.

The ear bands, owing to the fact that they co-occurred with the Brześć Kujawski pottery type [see settlements at Brześć Kujawski – Grygiel 1995, and Bielawska Wieś, site 5 – Michalski 1986; Ignaczak 2008] or were discovered in settlement contexts close to it [Grygiel 1995], gain attractiveness as objects of interpretation. Their detailed genetic analysis yielded several important observations. Their Early Scythian variety (formally the closest to specimens from the Polish Lowland) is encountered

above all in the drainages of the Boh and Dnieper rivers [Gawlik 2007: Fig. 1]. Surprisingly enough, they are common virtually only in the forest-steppe zone [Gawlik 2007: 229]. In the east, they occur also in the Late Bronze contexts, specifically in the younger phases of the Chornoles culture [Krushelnytska 1998; Daragan 2004]. The literature provides even extreme interpretations, linking the ear bands to the forest-steppe Chornoles culture and ignoring the role of the Scythian culture in their dissemination [Kaposhina 1956: 181]. Such views, however, are, in the light of current knowledge, considered as rather unfounded because of the absence of any prototypes – ear bands characteristic of the early phases of forest-steppe cultures [Gawlik 2007: 231]. What else may be interesting for us here is the division of this group of finds into several subsets and a relatively little resemblance of forms encountered on the Polish Lowland to the group of artefacts belonging to the Tarnobrzeg Lusatian culture (TLC). The latter have a massive form and large cones at the end of the ring [Gawlik 2007: 232]. This may correspond to a certain opposition between 'Tarnobrzeg' artefacts, which probably were manufactured in local centres [Czopek 2007a; 2007d] and show no links to the forest-steppe zone broadly understood [Gawlik 2007: 232], and artefacts from the Lowland that may manifest some eastern connotations [see specimens from Brześć Kujawski and Gustorzyn – Grygiel 1995: Figs. 28, 30]. The question, however, calls for a thorough consideration, in particular in the light of the latest TLC finds unearthed at site 22 at Grodzisk Dolny [Czopek 2007a: 179, Fig. 166] and other specimens from the Lublin province [Bukowski 1977]. Yet, the thesis, tentatively put forth, referring to the possibility of ear bands originally spreading from the area on the middle Boh holds in the light of current knowledge.

Another type of data is supplied by weapons, namely iron ice picks of the 'Scythian type'. They are evidence of contacts of similar provenance to that of the ear bands but their incidence is lower. Curiously enough, the ice picks are not found in areas immediately adjacent to the borderland. They occur only between the Oder and Vistula rivers and the context of their occurrence does not coincide with the Brześć Kujawski type pottery although in a few cases it is close to it. Cases in point are the relationship of finds from Bielawska Wieś [Michalski 1986] and a hoard from Bąków Dolny [Michalski 2002]. However, the evidence is too weak to construct any broader interpretation on it. What is important though is the bearing out of the thesis claiming that such finds occur in deposits of other cultures than those related to the armed presence of Scythian populations on the Lowland.

The last category of sources improving our knowledge on the East-West contacts is bone deposits from the assemblage found at site 3 at Brześć Kujawski [Grygiel 1995]. Obtained by detailed analyses, the picture of animal consumption at this site is rather typical [Makowiecka, Makowiecki 2005: 352, Fig. 2]. What draws our attention is the balance between domestic consumption species, a rare occurrence in settlement materials, and a high disproportion between the ages of slaughtered animals, mainly the cow and horse. In the case of both species, it was found that

very old animals had been eaten. In the case of the cow this means individuals even 14 years old and 15-20 years old in the case of the horse. A high share of horse bones, indicating a high position of the horse in the diet of the people inhabiting the settlement, may be indicative of an impact by peoples from the south-east [Grygiel 1995]. Indirectly though, this is borne out by the results of archaeozoological determinations for Scythian settlements where the share of the horse in the diet equals 31 per cent [Benecke 1998]. Small amount of data for the Polish Lowland prevents us, however, from generalizing the conclusions; the more so as the economic exploitation of the horse, especially on the steppes, is far more complex [Levine 1999]; besides its use for consumption extended probably to the ritual sphere [Marciniak 2004]. A higher chance for actual use may be enjoyed by conclusions concerning the populations of other species. Of equal importance may be the population of the pig. Being an animal of a relatively high breeding value, owing to the fast growth of individuals in a herd, it may be reared in periods of unstable economy [Lasota-Moskalewska 1997: 198-200].

3.2. CHRONOLOGY OF CONTACTS IN THE LIGHT OF ^{14}C ANALYSES

The absolute dating of Brześć Kujawski type materials relies on dates obtained for two areas of their occurrence: the Polish Lowland and western Ukraine. With respect to Poland, a detailed profile can be made of three regions: Mazowsze, central Poland and Kujawy [Ignaczak 2008]. For Ukraine, we have fewer dates; nevertheless, the most inspiring ones concern a Chornoles culture settlement at Subotiv [Klochko *et al.* 1998], which is one of the presumed departure environments of Brześć Kujawski type assemblages. The significance of the dates for the questions discussed here lies in the verification of the temporal sequence in the occurrence of the cultural patterns and the definition of their hypothetical departure and destination areas.

Special attention is, therefore, merited by the seniority of eastern assemblages, verified by calibration. They are dated to the interval of 1200 to 800 BC [Klochko *et al.* 1998: 667-673; Ignaczak, Ślusarska-Michalik 2003: Tab. 2]. For Polish Lowland sites, the probability of an event is the highest in two intervals: **(a)** first, surprisingly early for Mazowsze and central Poland, i.e. 800-660 BC, and **(b)** second, dated to the period of 750-400 BC, obtained for Kujawy assemblages[2].

An effect of general knowledge, a necessary (?) earlier dating of sources originating from Mazowsze and central Poland was attempted by building a sequence

[2] New dates for site no. 3 at Brześć Kujawski have considerably broadened the scope of interpretation presented in earlier publications [Ignaczak 2008]. Proper samples have been sent for analysis through the goodwill of Prof. Ryszard Grygiel, for which I am extremely grateful.

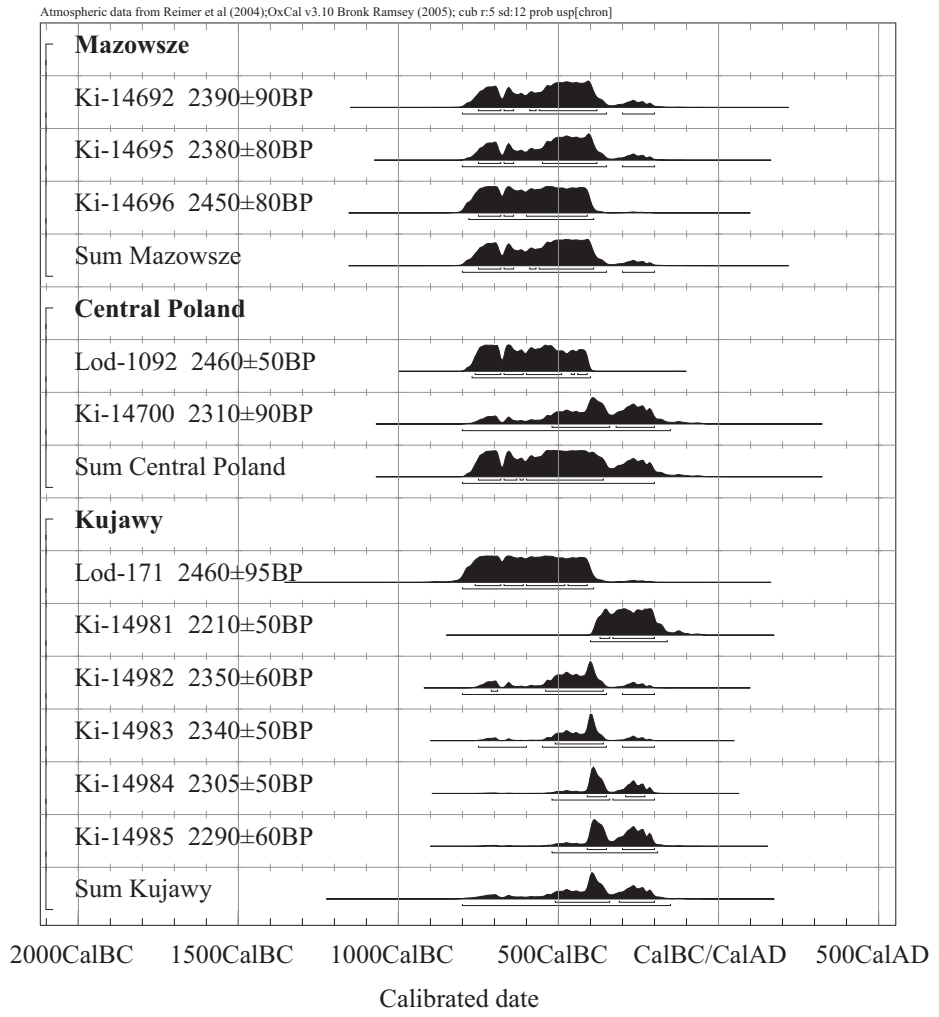

Fig. 2. Sum of probabilities of ^{14}C dates (using OxCal v3.10, Bronk Ramsey 2005) from sites containing Brześć Kujawski type artefacts

of ^{14}C dates (using OxCal v3.10 calibration software). In the sequence, a priority of occurrence was given to the results from Mazowsze and central Poland. The obtained results (see Figs. 2, 3) lend plausibility to the claim that elements from the east appeared gradually. The most credible intervals obtained by this method would look as follows: Mazowsze – from 560 to 390 BC, central Poland – from 600 to 360, Kujawy – from 510 to 340 BC. The results show that the cultural patterns spread from the east and their presence on the Lowland is secondary at least in respect of the Chornoles culture.

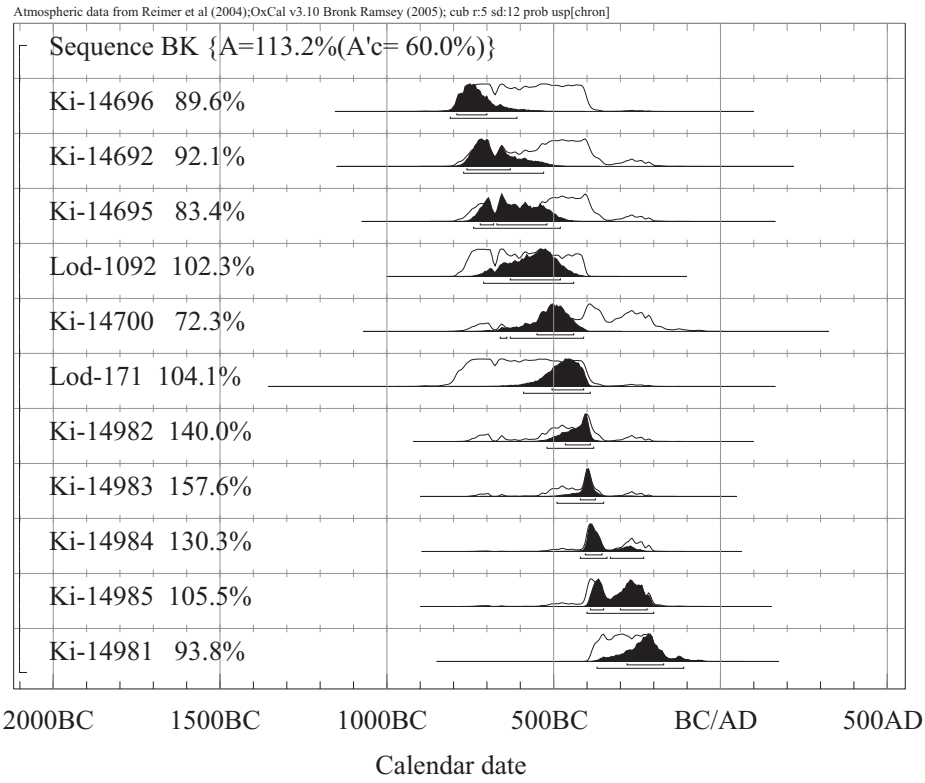

Fig. 3. Calibration sequence of ^{14}C dates (using OxCal v3.10, Bronk Ramsey 2005) from sites containing Brześć Kujawski type artefacts

4. CONCLUSION

It seems that the possibility of contacts between the forest-steppe societies of the Pontic Area and those of the decline LC must be necessarily accepted now. Presumably, the relations can be dated to Hallstatt D, which is indirectly shown by the obtained ^{14}C dates. The dating of the temporal sequence to 650-510 BC seems rather certain, with dendrochronological data supporting it as well [Trachsel 2004]. What we most probably deal with in this period is a dwindling away of LC patterns and a weakening of settlement processes. This, in turn, could have led to the infiltration of the Polish Lowland by forest-steppe societies (pressed by nomads inhabiting the steppes?). As regards the genetic aspect, it is worth mentioning that the cultural patterns appear on the Polish Lowland only in decline LC assemblages and disappear together with the culture.

The views on the impact of the forest-steppe societies in the areas located first in the drainages of the Vistula and then the Oder rivers have recently been associated with the hypothesis of the Neuri migrations [Czopek 2007c..., in this volume; Kłosińska 2007]. One cannot help feeling that they best describe the reality created by archaeological sources. For quite apart from the proper carriers of the eastern tradition (populations of the Chornoles, Cherepino-Lagodivsk or Leżnica cultures), it is hard to resist an impression that cultural contacts followed several routes at that time, with their common denominator being the forest-steppe as the departure area. A strong demographic stimulus could have spawned many routes of which two: Dniester-San and Boh-Bug-Vistula had a supraregional significance mainly because they ran through two natural passages: the Przemyśl and Volhynia gates.

Translated by Piotr T. Żebrowski

Baltic-Pontic Studies
vol. 14: 2009, 402-414
PL ISSN 1231-0344

Yuriy Boltryk

THE PONTIC-BALTIC ROUTE AND SCYTHIAN EXPANSION

The article attempts a reconstruction of probable directions of trade routes of the Early Iron Age by-passing the Southern Bug basin at both of its sides and along the right bank of the upper Western Bug. It justifies the idea of the use of trade routes for relocation of Scythian military units westwards in the search of gain. Material evidence for this is represented by occasional finds of prehistoric daggers in the belt of some parts of the routes and traces of Scythian attacks, archeologically proven in settlement structures at the Dnieper and Oder rivers. Probably the key points of the system of trade links, primarily the Central European amber transportation routes, were of special attraction to the aggressor's mobile units.

The communication arteries that emerged as a result of quests by many generations of travellers, received the best options of location of their routes. Therefore those routes had existed for centuries, and some of them are still in use today. The routes were optimal by virtue of their energy-saving feasibility and convenience, preference being given to landscapes with as few hills and slopes as possible, to dry or low-dampened areas. The most convenient routes in the steppe were river watersheds, while the areas close to the rivers were chosen in the forest areas [Shylyk 1981: 181]. Since the emergence of the wheeled transportation and up till the introduction of railways in the contemporary territory of Ukraine, *submeridional* routes served primarily for transportation of salt [Minns 1913: 7]. Salt is a stable commodity that is always in demand, as it is the only mineral consumed by humans with food. However, the routes made in *latitudal* directions were more important, as they were the routes of migration, hostile invasions and trade caravans. Often the trade routes were used as military routes. In those cases, or before them, trade caravans carried the necessary information. They gathered and accumulated information about neighbouring lands and their military capacity, special features of their landscapes

as theatres of probably warfare. Quite possibly, Scythians used information brought by merchants or travellers about places of excavation of precious metals, salt, and routes of transportation of valuable goods (for instance, amber), which is indicated by the geography of the aggressive nomads' warfare. Probably in the search for new gains the Scythians extended their tight control over the areas rich in natural salt with good properties. That is why, besides other factors, Scythians arrived to the Urmia Lake district in Iranian Azerbaijan, the area where the best salt in the Ancient world was found [Gomilevski 1881: 28] and later on, they extended their control over the lagoons of the Northern shore of the Black Sea.

In our view, it is not by chance that Scythians came to the Germ River (now Gediz) in Ancient Lidya. The river sand had contained considerable gold, the memory of which was kept in references to treasures of Croesus the Tzar. Later on, Scythians' attention was attracted by the gold mines of the Carpathian – Danube region and Dobruja. Within the Herodotus' Scythian quadrangle, from the Volhynia to the Donets basin, geologists have registered 250 manifested ore deposits and 16 deposits of gold [Kovalchuk 2003: 77], however, it is hard to say now which were known to the Scythians. Traces of gold are present in the alluvium of the left tributaries of the Southern Bug: the Sob, the Synyuga, the Saksagan, and the right tributaries of the Dnieper: the Ros, the Ingulets, and the Dnieper itself [Kovalchuk 2003: 81]. Actually, these are the territories of archaic Scythia, the boundaries of which are marked by findings of Scythian monumental sculpture that dates back to the 7th – 6th century BC (Fig. 1).

The potential attractions of the territory of Scythia should include what was mentioned in the writing by Pliny the Elder, namely that amber in that country was found in two places; in one it was white and the colour of wax, in the other it was yellow, called "*sualiternyk*" (XXXVII, 33).

In the context of the Scythians' quest of the territories that could bring them good gains, we should mention the issue of Scythian presence in Central Europe generally and in the Luzhitsa lands in particular, as has been debated lately. We first of all refer to the works of authors representing opposite views: J. Chochorowski [Chochorowski 1994], I.V. Bruyako [Bruyako 2005] and H. Parzinger [Parzinger 1998], M. Nawroth [Nawroth 2007]. The former argue about the probability of Scythian expansion, while the latter on the contrary, refute this. The key point for us in this debate is the issue of routes of Scythian raids. Most of those who share the idea that the Scythian raids of the areas between the Oder and the Vistula rivers had been real tend to believe that the most probable route taken by the nomads had been through the Moravian Gate, a passage between the eastern slopes of the Sudetes and Western Carpathians [Bukowski 1977: 261-265].

While fully supporting the views of advocates for this theory of Scythian arrival to the territory of contemporary Poland from the south, the Upper Danube plateau, we still do not exclude their invasions from Scythia directly, bypassing the Carpa-

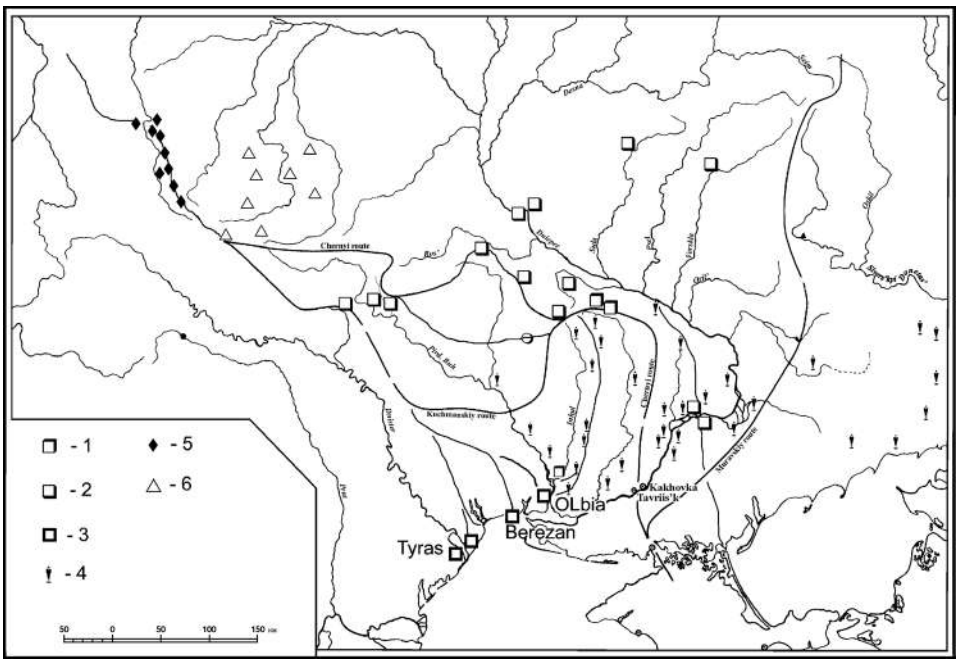

Fig. 1. Map – scheme of reconstruction of ancient routes of the Bog basin and the upper part of the Bug River. 1 – settlements of the pre-Scythian period; 2 – settlements of the Scythian period; 3 – ancient Greek cities; 4 - places of finds of monumental sculpture of 700 – 600 BC; 5 - settlements of the Lezhnitsa group [after Krushelnytska 1976]; 6 - settlement of the Mohyla group [after Krushelnytska 1976]

thians from the North. The possibility of using this route is confirmed by material evidence of the Scythian attack on the Trakhtemyriv settlement that we were able to trace [Fialko, Boltryk 2003]. The Scythians, having broken the resistance of the defenders of the largest fortification at the Middle Dnieper, which protected the most important fords, opened a convenient route for themselves to the Dnieper heights and further westward at the end of the first quarter of the 6th century BC. That bloody route was marked with occasional finds of daggers with frame-shaped hafts and bar-shaped handles, found in the area from Trakhtemyriv to Vakhnivka in the Vinnytsya district (the left bank of the Middle Bug) [Kosakivsky 1998].

Importantly, the occasional finds of daggers of a similar or close type originate from the areas adjacent to other settlements of the Dnieper right bank and the districts of salt excavation within Ukraine (Hnylyakovo Dachne – Khadzhi-Bei lagoon) [Diamant, Chernenko 1971: 159-160], Ivanivka (Yahorlyk), Byshkin (Siver-

sky Donets). Moreover, at least three of them (Vakhnivka, Ozirne[1], and Novovodyane[2]) [Bokiy 1993] lie practically in the lane of the Black Way, as indicated in the map by Beauplan, while the fourth dagger was found 17 km away near the village of Nesvatkove [Bokiy 1993], close to the town of Oleksandrivka, an important crossroad near the upper Tyasmyn.

There is yet another circumstance that convinces us that it is appropriate to use occasional finds of daggers with frame-shaped handles as evidence of armed clashes. In this context we refer to the absence of such finds in the left bank area of the Middle Dnieper. The only such dagger, closest to the Dnieper, was found at the Mgar monastery near Lubny, 80 km from Dnieper, while the next closest find was made in the Bilsk settlement, 150 km away. Meanwhile, the area from the right bank part of Kremenchuk to the northern outskirts of Kiev displays many such artefacts. This is the evidence of warfare waged at the edge of the right bank Dnieper plateau. Further separation in space of the occasional finds of similar daggers is connected, most probably, with these ancient routes.

The fortification over the Dnieper, overtaken by the Scythians, is made in similar fashion to destroyed settlements at the Oder River (Polyanowice, Wicyna, Strzegom) [Chochorowski 1994] by the presence of similar quiver sets used by the attackers, as well as by the traces of fire and deformation on arrow-heads. However, the presence of similar artefacts in the two extreme points located at such a substantial distance from each other (about 1,150 km directly) still does not allow reconstruction of an ancient main route between them. Meanwhile, there are reasons to assume the probable existence of an earlier route going in that direction. For the Bronze Age, its general direction from the Elba to the Volga was drawn by A. Kośko [Kośko 2002]. The extreme points of that way may also be marked by the finds of "Cimmerian" stellae such as the two stellae from Olbia and the "wolf's stone" from Zeehausen near Magdeburg [Olchowski 2005: 44-45]. Such a large distance from the main location of the stone pole-like stellae, connected with Cimmerians, naturally, looks surprising, but the presence of the stella from Gumarovo near Orenburg further to the east, to a certain extent, balances the situation. Moreover, if one of the options of the sub-latitudal land way from Olbia to the Volga region and the Urals area, reconstructed by Grakov for the Early Scythian Age, coincided with the eastern branch of the Belozerka period [Grakov 1947: 23-37], why cannot a similar westward way exist in the Late Bronze or Early Iron Age?

The finds of pairs of similar artefacts in the east and the west of Eurasia indirectly points to the existence of a transcontinental route. We are referring to the striking likeness of torques from Arzhan 2 [Chugunov *et al.* 2007: 70-71, Fig. 4]

[1] A random find near the Ozirne lake in the Zvenyhorodsky district of the Cherkasy region, currently kept at the Cherkasy local history museum.

[2] It should be noted that the crossroads of motorways and a railway are located near the village of Novovodyane of the Znamyanka district in the Kirovohrad region.

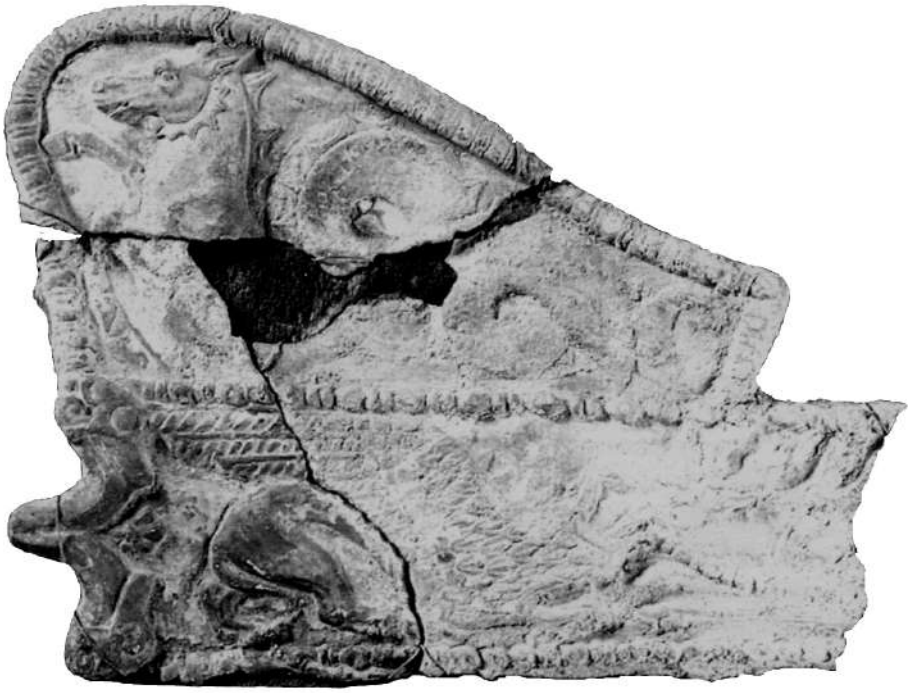

Fig. 2. Fragment of a bronze scabbard casing of a Scythian sword case from the area of an ancient River crossing near Grunwinkel in Karlsruhe

and Witaszkow [Nawroth 2007: 323, Fig. 6]. They are united by the presence of a square-section part in one and rectangular part in the other, while the commonly widespread neck decorations are round in section. This list should include another pair of practically similar but territorially distant artefacts such as the recent [2005] find of a fragment of bronze scabbard casing of a Scythian sword (Fig. 2) decorated with a scene that is similar to the golden decoration of a sword found in the Kul-Oba burial mound in the Eastern Crimea. That artefact was found during the excavation of a Roman settlement at an ancient crossing over the Rhein River near the south-eastern border of Germany, in the Grunwinkel district of Karlsrue (Baden-Wurtemberg lande[3]) [Metz 2006: 43-45]. The predominant majority of such sword scabbards, though decorated with gold, originate from barrows of members of the Scythian elite in the Steppe Scythia. Meanwhile, the Grunwinkel bronze sword scabbard could belong, most probably, to representative of a middle social group. Quite probably, the use of different metals for making the scabbards deco-

[3] Our attention to this interesting fact was brought by S.A. Skoryi, for which we are sincerely grateful.

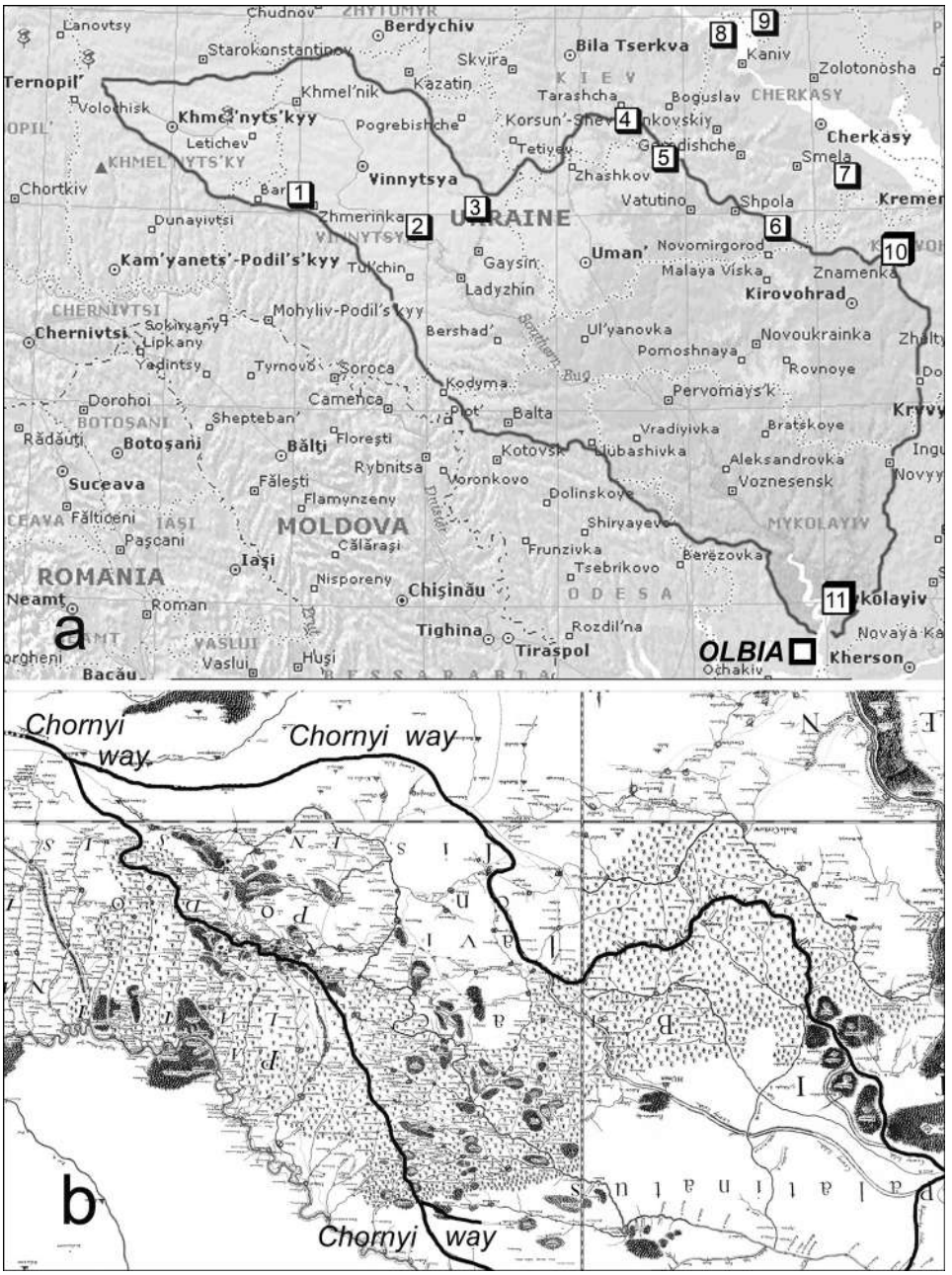

Fig. 3. Boundaries of the Bug basin and ancient routes around it, as marked at G. Boplan's map. a. Boundaries of the Bug River basin and the fortresses: 1. Severinovka; 2. Nemirov; 3. Kalnyk – Shabelnya; 4. Tarashcha; 5. Zhurzhentsi; 6. Pastyrske; 7. Matronine; 8. Trakhtemirov; 9. Karatul; 10. Chornyi Lis and Chutove; 11. Dykyi Sad. b. Fragment of G. Boplan's map (oriented northwards) [Atlas 2005]

rated with pictures of similar scenes resembling the situation with the beak-shaped cheek-pieces of the horse harness decorations, when the metal used for making the objects was changed, depending on the social status of their owners where the gold was substituted with silver, and silver, in its turn, was substituted with bronze [Boltryk 2004: 89]. Therefore, given the place of the find – next to the river crossing – the sword scabbard could have been lost at the venue of a military clash; another issue is who could have been the owner of the case (Scythians or Celts?) and how the object could have been brought so far from the area of their mass spread. A possibility of a military action by Scythians should not be fully excluded, but we admit that there is not enough proof to support such a claim. Though, the proximity of the place of the find to the amber route along the banks of the Rein and Rhone bring additional weight to the Grunwinkel artefact.

It is noteworthy that these finds marking the way in spatial terms are mostly lost weapons (occasional finds at the watersheds or places of river crossing), often prestigious objects deposited in treasures or lost, or objects from the elite graves. The latter's connection to the routes can be explained by the fact that, on the one hand, representatives of the elite controlled the movement of goods by the routes; on the other hand, the Scythian elite built its burial mounds along the trade routes as frontier lines, and these routes were also used to move the blocks of sod from wet areas, the construction material for the burrows.

The ways supposed to lead westward from the Southern Bug mouth can be traced at both sides of the river basin. It can be noticed that the outline of the Bug River basin coincides with the scheme of routes in that part of the territory of Ukraine as presented at the map of Beauplan (Fig. 3), thus, serving as yet another proof of interdependence of the watersheds and the routes. Beyond the upper part of the Bug basin the routes merge near Chorny Ostriv and continue as one route westward to a narrow passage between the upper parts of the Western Bug and the Styr. The passage of over 160 km of the way here is made complicated by a large number of small rivers flowing to the Dniester and Prypiat rivers. This belt is marked with archaeological remnants, but unfortunately they are not numerous, as most of the explorations were performed closer to major river beds. Given the long use of the ancient communication arteries, it is appropriate to use the finds of treasures and coins that date back to the Roman times to identify their location. The places where coins were found (once put on a map by Braychevsky) make chains that fit into a general scheme of two main routes in the right-bank Ukraine [Braychevskiy 1959].

One branch of *the Eastern way* began at the left bank of the Southern Bug opposite Olbia, and went up to the Chornyi Lis by the area between the Ingul and the Ingulets rivers.

In fact that way was one of the factors behind the emergence of Olbia, a Greek colony, as a marketplace city that served the needs of a crossing over the Southern

Bug. The most intensive usage of the Olbia – Forest – Steppe way occurred in 600-500 BC [Boltryk 2000: 128]. A version of the Olbia way along the left bank of the Southern Bug was traced by Shylyk in an effort to localise the Eksampay, the area mentioned by Herodotus, who had placed the knot of ancient trading routes in the sources of the Hnylyi Yelanets and the Mertvovod [Shylyk 1979: 450-456].

However, let us return to our version of the route that by-passed the Southern Bug basin from the east. Near the Chornyi Lis it merged with the way known in the Middle Ages as the Chornyi, running from the Qiz Kermen crossing (now Beryslav) at the lower Dnieper. At the edge of the steppe and the forest-steppe that way ran from the south along the Chornyi Lis, which housed the Chorny Lis and Chutove settlements, and the Melgunovsky barrow to their west. Further on, it ran close to the Lebedyn forest with a complex of four settlements (around the Pastyrske). Some sources refer to the way at this segment as to the Shpakovyi. Further advance of the way was marked by the Zhurzhynets and Tarashcha fortress settlements.

At the Eastern Podolia area, the Chornyi way went by Scythian barrows in Yatskovychi and Novoselytsya (excavations by Bydlowski), not far away (10 km) from a group of settlements near Kalnyk, Ukraine's largest burial mound Soroka, a barrow in Illyintsi (4th century BC), and further north by-passing the place where the dagger mentioned above was found, near the village of Vakhnivka. Since the way in that area went through a probably centre of Scythian land – Oratarii, it is worth mentioning the "Orativ" toponym, the name of a town located 8 km away from the route, and of a railway station along it.

Noteworthy for the Eastern Podolia – practically unstudied so far – the Nemyriv settlement was traditionally seen as its centre in Scythian times. Its prominent walls call for recognition of this, however, life in the settlement was destroyed in the 6th century BC and apparently, was never restored. Meanwhile, a new central place at the Sob River, in the vicinity of a Cossack town, Kalnyk, was formed 40 km eastward from the Nemyriv settlement in the 5th – 3rd centuries BC. In fact, the historic continuity, together with the presence of an important trading route nearby, lends itself to research. An indirect proof of the importance of this territory as a regional centre, in addition to a golden onlay for a gorythus from an Illyintsi barrow, can be seen in two cases of finding camel bones in the barrows of Yatskovychi and Navoselytsya. The camel bones indicate the occurrence of caravan trade in Scythia [Ostroverkhov 1981: 91] known, in addition to Olbia, in other ancient cities of the Northern Pontic shore, as well as in the Kamyana fortress settlement at the Dnieper [Tsalkin 1960; 1966] and, therefore, they include the Sob River settlements into that circle.

The Western Way, its various segments were referred to in the Middle Ages as "Tatarsky", "Zlodiysky", "Shpakovyi", but the most widespread name was the "Kuchman Way". It started from the Black Sea shore, rich in natural salt, and went northward in several strands. The main branch, apparently, was the one aiming at the Borysphenites harbour (settlements at the Berezan island, and subsequently Olbia).

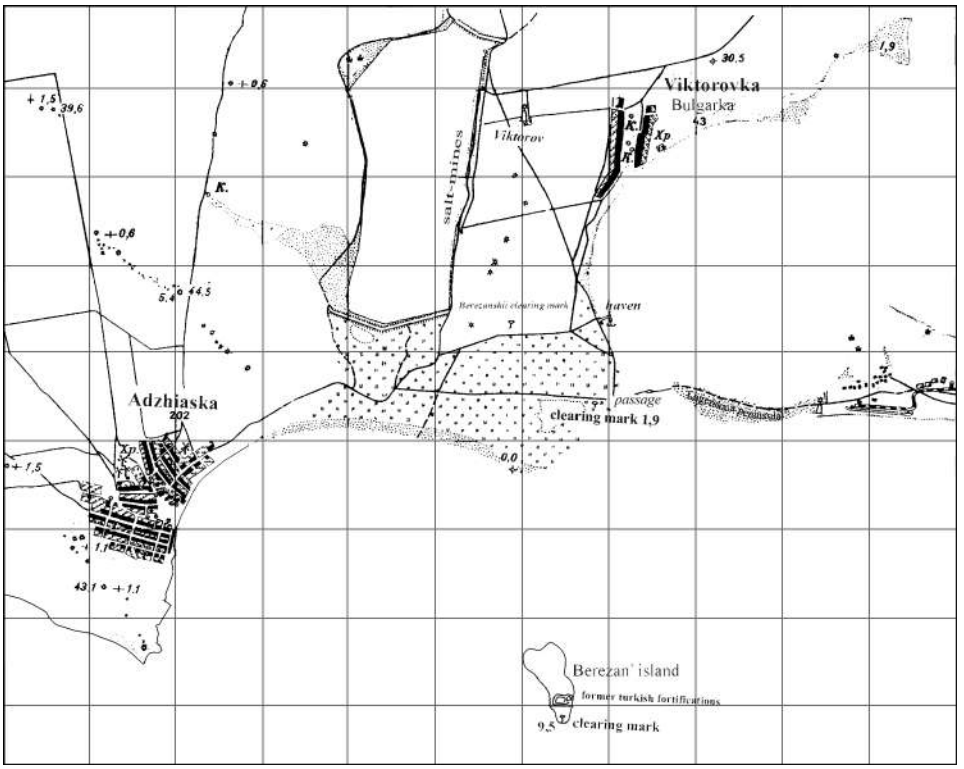

Fig. 4. Chains of barrows oriented to the Berezan island mark sections of ancient routes. Based on topographic map produced in 1907 – 1908

Generally, to the west of Gipanis the way served as a certain thread, which linked the lands of four peoples: Callipides, Alizones, Scythians-Oratays, and Neuri [Herodotus IV, 17]. The comment by Herodotus, the father of history that Scythians-Oratays grew grain for sale was an indirect indication that the information about these peoples had been brought by merchants.

Probable directions of the roads from the sea shore deep into the steppe are marked by chains of barrows that are lined up submeridionally. This phenomenon can be observed over the Koshary settlement at the mouth of the Tilihul estuary at its western bank. A military topographic map of 1907-1908 marks two close barrow chains stretching towards the Berezan island (Fig. 4). Given a currently widespread opinion (supported by satellite photos) that the Berezan settlement once lay in the peninsula, i.e., was connected to the mainland, it is quite logical to interpret those chains of barrows as an evidence of the existence of ancient routes.

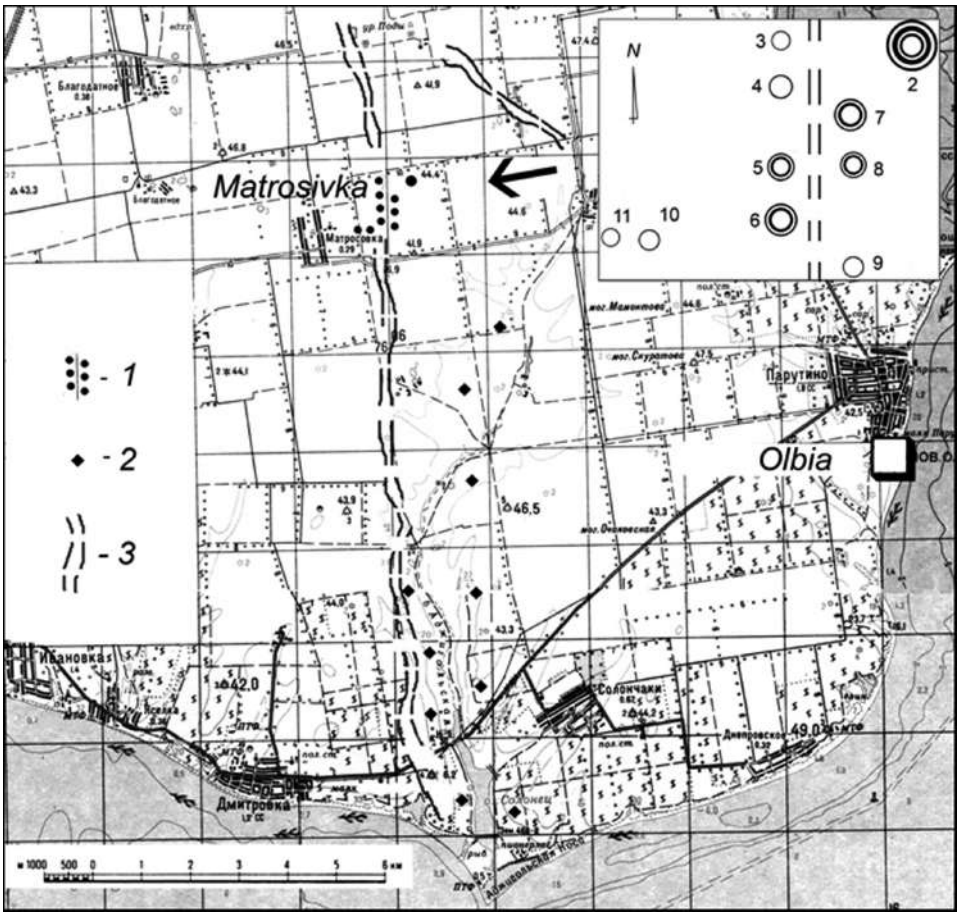

Fig. 5. Alley of barrows dating to the 5th century BC, excavated to the west of Olbia, near village Matrosivka. The barrows were built along the way leading to the area of natural salt collection. 1 - Alley of barrows; 2 - Settlements; 3 - Transit throught the reconstruction of the ancient road

More directions are marked by maps of Olbia of the 19th century. A.S. Ostroverkhov tried to trace the ancient routes by linking them to the landscape [Ostroverkhov 1981]. An interesting factor – and important for understanding of the situation – was noted 15 km west of Olbia near the village of Matrosivka. An alley of barrows excavated there, date back to the mid 5th century BC [Grebennikov 2008: 51], its direction showing that it was not connected to the city (Fig. 5) although it was located nearby. Analysis of the topographic situation in the area shows the connection between the ancient route (marked by the barrows) with the right bank of the Adji-Gol gorge, the name of which ("adji" by Turkish – "bitter") indicates

the presence of salt. The slopes of the gorge contained traces of ten settlements that had existed there in archaic and classic times. Dwellers of some of them could have served at the salt excavation in the lower part of the gorge and at the shore near it [Kryszycki *et al.* 1990: 21-24]. Importantly, the salt excavation at the Adji-Gol village (presently Solonchak) existed there till the beginning of the 20th century.

Therefore, dwellers of the Forest-Steppe were attracted to the lower areas of the right bank of the Bug River by the deposits of salt, reported by the Father of History [Herodotus IV, 53]. Dion Chrisost notes that "Olviopolites supplied salt to the majority of Barbarians, Hellenes and Scythians who lived in Chersonesos of the Tauria" (XXXVI, 3). The salt excavation between the mouths of the Bog and the Dniester were the main sources of that mineral in southern Ukraine, since the Sivash lake did not have deposits of salt in the times of Scythians and was a swampy area with fresh water [Staschuk *et al.* 1964: 164].

Steppes to the west of the Southern Bug display practically no artefacts of the Scythian material culture. All the more telling is the fact that the sea-side part of the route, closest to its basin, is marked by occasional finds, including a precious bronze mirror (Annivka settlement) and a Scythian horse nose cover plate (Novopetrivka) [Ostroverkhov, Toschev 1985], which originate from the watershed to the east of the Tilihul River.

Some 200-250 km from the sea, a network of secondary routes divided by the valleys of the Tilihul, the Kuyalnik and the Khadji-Bei, merged into a single highway beyond the river-heads of those rivers. Further on, it went by the narrow part of the area between the Dniester and the Bug to the Severynivka fortress, where caravans or "*valky*" crossed the Riv River or bypassed it from the south. Further movement along that route was through contemporary Bar and still further westwards up to the place where it met the Chornyi Way and its subsidiaries, beyond the Bug sources, leading to the aforementioned narrow segment between the sources of the Western Bug and the Styr. Further movement along the reconstructed route along the right bank of the Western Bug at the segment from Sokol to Ustylug is fixed with a number of monuments of the Lezhnytsya group of the early Scythian period, which were probably connected with the provision of services to travellers [Krushelnytska 1976: 60-61]. The topography of modern Lezhnytsya is represented with huts stretched along the road, where almost parallel to the Bug bank, it leads to the heights while by-passing the small tributaries of the Studyanka River, crosses it and merges with the village of Pyatydni, scattered in small *khutors* along the road on the height. The village is home to the most northern settlement of the Lezhnytsya group. The road follows to a convenient ford or crossing in Ustylug near the place where the Stydyanka River flowed into the Western Bug. It should be noted the topography of that place resembles the situation at the Dnieper River in the area of the Trakhtemyriv valley, which hosts another important crossing surrounded by settlement structures. The importance of those areas is further stressed by the fact that centres of prin-

cipalities, Volodymyr on the Bug and Pereyaslav on the Dnieper, were found there in the Old Rus period. Furthermore, natural fords emerged in the shallow places where the rivers made their turns and, even more so, in the meadows. The presence of convenient fords stimulated the growth of spacious settlement structures at both banks of the rivers, the importance of which depended on a number of directions that led to them.

The next western area, beyond the Bug, was fixed by Settlement 1 near Strzyżów, studied by J. Dąbrowski [Dąbrowski 1962]. The material culture of that settlement was close to the monuments of the Lezhnytsya group. The presence of a peculiar group of monuments stretched in one line along the Hubeshiv – Volodymyr-Volynsky-Sokal direction was noted some 40 years ago by Z. Bukowski [Bukowski 1966]. Based on his map of finds of elements of the Scythian military wear within the Lezhytsya culture, provided in his well-known paper of 1977, the settlement structures in the upper parts of the Western Bug and the Vistula give finds of Scythian arrows. However, arrows are absent in the layer of monuments of the Lezhnytsya culture. Possibly, this is due to rather early dates of those monuments (7th – 6th centuries BC), or scarce knowledge about them, or possibly also due to the small population in those settlements that had been located along a major road. Some hypotheses can be made, based on the conclusion drawn by Krushelnytska about house-ware (set of objects) of the Lezhnytsya group. She noted a small number of bailers, bowls and plain pots, alongside the abundance of covers-plates and scratched-surface pots [Krushelnytska 1971: 63]. This brings about a strong temptation to consider the above objects as kitchenware for travellers, designed for heating, while other kinds of dishes had to be made of wood or leather.

The finds of Scythian-type weapons in the settlements along the rivers demonstrate the presence of other routes and indirectly illustrate the aforementioned idea of K. Shylyk about the location of ancient routes in the forest zone along the submergible lands [Shylyk 1981: 181]. Unlike in the watersheds of the steppe area, moving along the route required less effort and energy.

It is difficult to determine the starting point of the Scythians' military missions, if we speak about properly Scythian territories of the early time. Was the meeting place located at Eksampey, the probable cult centre of Scythia, as mentioned by Herodotus – the Holy Ways, the sacral crossroads between the Dnieper and the Bug rivers? Or was it another locality in the Right-bank area? However, it is possible to point confidently to the locations of production of archaic bronze arrow-heads ordered by Scythians: the Bilsk fortress and the Yahorlytsya settlement (the left bank near the mouth of the Dnieper), where the casting forms and remainders of cast arrows were found, respectively [Ostroverkhov 1981: 26-29; Shramko 2002: 163-166]. Therefore, both the southern and the eastern directions should be taken into account. However, the raids of Mongol Batu Khan can be taken as a model, based on the example of Kiev he had taken on the Dnieper. For the Scythian

period, a similar role was played by the Trakhtemyriv fortress, located 80 km to the south of Kiev. Having taken Kiev on December 6, 1240, in the spring of 1241 the horse-riders of *temnik* (emir, commander of ten thousand warriors) Burunday went through Volhynia and Galicia/Halychyna to destroy Lublin, Sandomierz and Kraków, and finished the invasion over the Oder River with the destruction of Legnica. Meanwhile, Batu Khan himself went across the Carpathians to attack the Danube area, and in the spring of 1242 he arrived at the Adriatic shore. The scheme, to a certain extent, resembles the Scythians' actions [Yakovenko 2006: 93-94].

Summing up, it can be argued that Scythians moved to Central Europe by the trading routes (predominantly latitudal) in order to seek prey (gain) in the meridional routes for instance, such as the Amber Routes. Comparing the maps of the Amber Routes going from the Baltic shores to the Mediterranean with the map of dissemination of Scythian-type weaponry and elements of horse harness in the area of the Luzhitsa culture [Bukowski 1977: map 1] a certain dependence of agglomerations of finds on options of the routes is demonstrated.

Moreover, the most important of the options of the Amber Route came from the territory of Greater Poland and Upper Silesia to the Danube through the Moravian Gate. This is unlikely to be a mere coincidence. However, eastern and northern segments of the Amber Route are less rich in finds than the western ones. Possibly, this is due to lesser intensity of their usage because of the danger of nomadic attacks. Probably, the future existence of the Amber Routes, with a certain correction of their location, should be owed to the Haustadt civilisation that blocked the Scythians' further movement westwards in the 6th century BC. However, the aforementioned find of a fragment of bronze Scythian sward scabbard near the Rhein River crossing (Grunwinkel), can indirectly indicate a probable conquest by the nomads, in 400 BC, of the banks of the Upper Rhein, along which there was found one of the trans-European Amber Routes leading from the German shore of the Nordic Sea to the Lyon Gulf shore.

Translated by Inna Pidluska

Baltic-Pontic Studies
vol. 14: 2009, 415-438
PL ISSN 1231-0344

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AMBER IN GARMENTS OF POPULATIONS OF SCYTHIA (WAYS AND FORMS OF RECEPTION)

Amber adornments represent one of the ethno-local features of costumes of autochthonic populations of the Forest-Steppe Right-bank Dnieper area. The immigrant tribes of Scythian nomads, having occupied the territory of the Northern Caucasus, adopted the "amber fashion". Exploration of that decorative material probably occurred on the Baltic Sea shore. The so-called "amber routes" emerged as early as in the Bronze Age. The main artery by which the Baltic amber arrived to the Mediterranean, in particular, to Asia Minor, was the Southern Bug (Bug-Boh). Another way, by the Vistula, went further eastward across the Dnieper and further on by the Don and on to the Caucasus.

Archeological objects – remainders of headgear, clothes, footwear, as well as decorative means, including patchwork, embroidery, removable or on-lay decorations – are the most informative sources for studying the garments of tribes that populated the Scythian lands in 1000 BC. Adornments play an important role in the costume, as both selected categories of adornments and their combinations reflect a whole spectrum of social and kinship relations in society. Moreover, decorative elements served as certain markers of ethno-local peculiarities of the costumes. Surveys of the history of costumes of Scythian tribes demonstrated that in the costume complexes of the population of Forest-Steppe areas such markers are presented by pins, a type of earring (specifically, ones with nail-shaped tops) and necklaces of semi-precious stones [Klochko L.S. 2008: 220]. Although after a certain period the local populations borrowed new aesthetic principles of costume decoration and some adornment patterns from the nomad immigrants and Hellenic people, they still kept pins, ear-rings and necklaces as determining markers (indicators). The finds of necklaces (beads) attract special attention among the above three categories. Even a casual look at the composition of costume complexes, reflected in

removable adornments (jewellery) shows that 70% of Scythian women wore necklaces, predominantly made of a glass-like material. That is true, however, for the 5th – 4th centuries BC. In times of the Ancient World that indicator is also high, but only in the Forest-steppe Right-Bank area.

There, the objects made of gemstones: topaz, carnelian, agate, rock crystal, and amber – became popular. The latter, amber, is of particular interest because in that period as it also constituted a typical feature of garments in the Central and Northern Caucasus, a region where nomad arrivals, Scythians, comprised a significant proportion of the population. Therefore, there are reasons to identify two "amber fashion" centres in the territories traditionally linked to Scythians. These centres had existed for a certain period of time in the 7th – 5th centuries BC. Were there any connections between these centres, and if so, what kind of connections? What were the sources and ways by which the raw materials or ready-made objects (jewellery, adornments) arrived? What was the role of amber décor in the garments? Such questions arise in the process of studying amber ornaments used in the costume complexes on the territory of Scythia.

From the dawn of civilisation that resinous substance is known to have attracted people with its beauty and physical features, the proof of which can be found in archeological materials and written documents. Amber artefacts appear among the finds that date back to Paleolithic traces of human creativity where gemstones were used for the decoration of men's and women's clothes. Already in the Bronze Age, people knew how to colour amber and used it to make a variety of adornments of various shapes, which worked to satisfy people's aesthetic tastes and also served as charms and mascots. As for written documents, the oldest, a plaque with cuneiform scriptures, dates back to the 10th century BC. Amber was mentioned already in antiquity in the works of Homerus, Sophocles, Aeschylus, Aristotle, and Thales of Miletus [Savkevich 1970: 11-14]. Across millenia the beauty of amber and its properties became part of the literature where scribes studied legends that offered poetical versions of the emergence of the "sun stone" or "Heliades' tears" [Srebrodolsky 1988: 89].

Deposits of amber – succinite, fossillized pine (*Pinus succinifera*) resin were found in a number of regions. Geologically, the Baltic scuccinite is the most common. Identical (in terms of composition) gemstones also occur in the territory of Ukraine (near Kiev, Kharkiv, in the Volhynia district) [Srebrodolsky 1988: 11]. Amber-deposit rocks lie at a different depth – the further from the Baltic Sea, the deeper the deposits are located. Therefore, since the earliest times, amber has been extracted on the Baltic Sea shore, from the Rügen Island to the Western Dvina River. Exploration of the grand Klesove deposit in the Volhynia area has started relatively recently, for scuccinite lies there in rather deep deposits. Hence, apparently it was the Baltic amber that enjoyed demand in the Mediterranean countries and other regions of Europe. Experts speak about several ways of bringing these

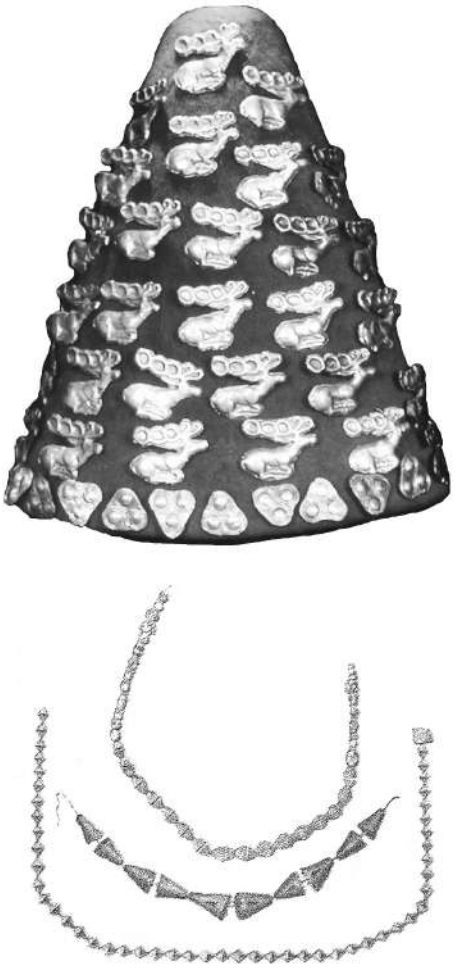


Fig. 1. Headgear and necklace from the costume of a woman buried in barrow 100 near v. Synyavka (Cherkassy district)

gemstones from their excavation regions. The amber was transported by the rivers that linked the Baltic Sea basins with the Black Sea and the Mediterranean. Therefore, one of the "amber routes" emerged in early 2000 BC, or possibly even in 3000 BC. The main artery through which the Baltic amber came to the Mediterranean was, probably, the Southern Bug ("Bug-Boh"). Due to that route the population of Asia Minor satisfied its demand for amber as sacral material, one with an aesthetic priority [Klochko V.I. 2008: 247].

Archeological finds of amber objects have repeatedly attracted researchers' attention. A monograph by Z. Bukowski can be mentioned as a summarising work [Bukowski 2002] where pieces of jewellery originating from the Baltic amber excavation region were analysed (found in the monuments dated from the Neolyth to the Early Iron Age). The scholar's key objective was to study the materials that came from the area between the Vistula and Oder rivers – amber though was not in great demand there in the Bronze Age. Later on, the region becomes a linking centre on one of the "amber" ways [Bukowski 2002: 131].

Analysis of amber necklace strings demonstrated that their elements (beads) were made of selected natural pieces of raw material (amber). By "correcting" them, the makers obtained artefacts of various forms. Holes in the beads were made with sizzling-hot sharpened rods. Such operations of processing amber "pebbles" were common and used by craftsmen in various regions. Generally speaking, making amber objects does not involve technologically difficult methods and this factor contributed to the wide spread of the decorative material.

As mentioned above, amber adornments comprised a typical detail of women's garments among the Forest-steppe Right-Bank area. This is proved by early Scythian finds made in women's tombs.

The most remarkable complexes were found in b.100 near the village of Synyavka and b.35 near the village of Bobrytsya (the Cherkassy district). These graves stand out due to the objects found in them, including golden ornament of headgear, nail-like ear-ringsand pins, as well as neck adornments made of gemstones and glass-like material. Hence, b. 100 contained a necklace of carnelian, agate and glass (26 objects), as well as of amber (a string comprising 84 octahedron beads) (Fig. 1) [Bobrinsky 1887, Smela I: 138, Table XVII, 10].

The costume of one of the women buried in Barrow No. 35 contained two strings of necklace: the upper one contained 32 pieces of topaz, carnelian, agate, rock crystal and peridot; the lower string consisted of 40 pieces of gemstones of various colours, including two large amber beads (shaped as irregular cut pyramids) [Bobrinsky 1887, Smela I: 112, Table XVIII, T.II, Table XXI, 1]. The costume of another woman buried in that grave was decorated with bronze nail-like ear-rings and pins. A dish had been placed at the dead woman's left hand; under the dish there was a long string which contained, alongside with black and white beads made of glass-like material, 125 small amber round beads [Bobrinsky 1887, Smela I: 112, Table XVIII, 7; T.II, Table XXI, 1] (Fig. 2, 2a).

Field reports contain references to amber objects unearthed among the finds made in the Perepyatykha barrow. The document referred to amber beads and a fragment of a plate that could possibly be used as an insertion [Skoryi 1990: 34, Fig: 5, 18]. That barrow was the "burial-vault of one of powerful Scythian chiefs" buried with accompanying persons, which included Iranian Scythians and representatives of local tribes [Skoryi 1990: 94].

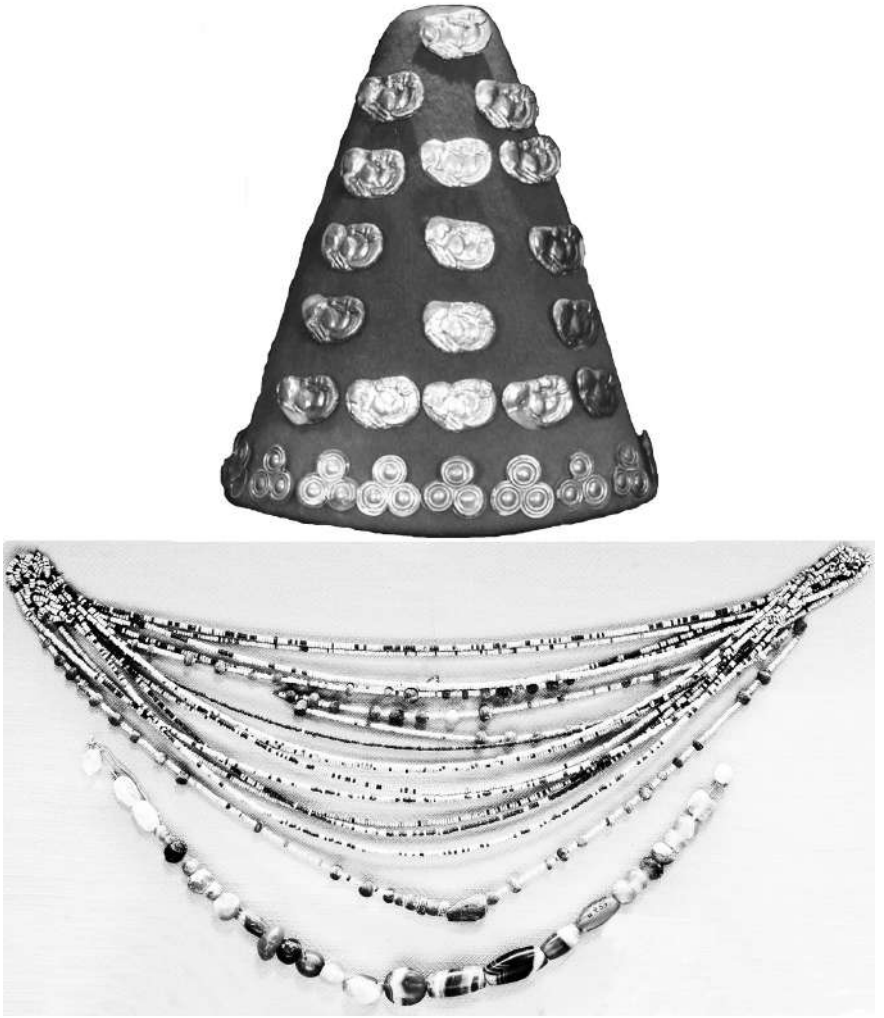


Fig. 2. Headgear and necklace from the costume of a woman buried in barrow 35 near v. Bobrytsya (Cherkassy district)

Amber adornments were also found in graves of women which did not belong to high social circles, though they had golden adornments in their costumes (barrow No. 25 near v. Kazarovka, Medvyn, excavations of 1906) [Kovpanenko 1981: 26, 47, 119].

Since the Scythian ancient times to our present day, the Repyakhuvata Mohyla barrow contained remnants of a forehead band (v. Matusiv of the Cherkassy di-

Fig. 3. Amber necklace from barrow No. 33 near v. Gulyai-Gorod

strict) [Ilyinskaya *et al.* 1979: 35]. The report noted that apparently, there had been a band on the dead woman's forehead, of which two rows of beads were left: 39 cylinder-shaped light-blue beads of opaque glass, and 32 globular amber beads (size: 0.4 – 0.7 cm). The adornments (beads) were small, and arranged as if in a simple ornament, i.e., sewn to a textile ribbon in two rows at its top and bottom edges, they would suffice to decorate a fragment of headgear from one temple to the other. The ribbon, apparently, was narrow (3-5 cm), for the necklace strings, sewn on a wide space, would otherwise lose the decorative effect. The woman's headgear in this complex also comprised golden ear-ringswith semi-sphere plaquettes and two bronze nail-like pins. It should be noted that a servant boy (adolescent) was buried at the woman's feet, which was probably an indication of the dead woman's special status.

Amber beads that had been parts of neck and wrist adornments were found among decorative details of costumes in women's graves in the barrows at the Tyasmyn River, near the village of of Zhabotyn (No. 524), Gulyai-Horod (No. 33, 38, 40, 330), Zhuravka (No. 406, 407, 432, 447).

Let us turn to the finds made in the barrows, which were studied near the village of Gulyai-Horod (Cherkassy region). Garments of the woman buried in barrow No. 33 had been decorated with a necklace. A small string consisted of cornelian (globular), geshire, and amber beads. The latter were distinguished by their number (they comprised most of the beads in the string), as well as diversity of forms and colours. Some of the beads can be conditionally described as truncated

– bi-conical (3 objects of different sizes: the largest one (d = 35 mm, h = 28 mm) had a rather large hole (d = 5x3mm); another one (d = 18 mm, h = 16 mm, with a hole d = 2mm) in the upper part was decorated with slightly polished facets that had trapeze-like contours; the smallest of the beads was oval in projection (d = 16x12 mm, h = 9 mm). The string also contained an unprocessed piece (18x19 mm), a parallelepiped bead (23x18 mm, h = 10mm) with a lengthwise hole in the side edge. These beads were almost of the same – light-brown – colour. Only a large disk-like bead was of a different – dark honey – colour (a fragment thereof was preserved: d = 34 mm, h = 18 mm (at the hole) and h = 6 mm at the edge, the hole d = 4 mm). The string was assembled from the ornaments that had been probably made at various times. This assumption is supported by the varying diameters of holes in the beads (Fig. 3). The burial was made in a barrow 1.4 m high where the dead woman's garments were completed with two iron bangles, one on each of her wrists. A stone dish was the most interesting among the accompanying objects. Today there is no unanimous view as to their purpose. According to V.A. Illyinskaya, they were "dressing-table" objects. However, I share the view expressed by B.A. Shramko who following B.N. Grakov and K.F. Smirnov, believed the dishes were used as portable altars [Shramko 1987: 102].

The beads (three pieces) made of unprocessed pieces of amber were a constituent part of the string of adornments in the costume of a woman buried in b. No. 38. Importantly, the dead woman's belongings also contained a stone dish with small pieces of red and yellow paint on it.

A selection of beads comes from barrow No. 40, in which three dead persons had been interred [Illyinskaya 1975: 15]. A short string of multi-colour minor gemstones – cornelian, rosy and brown peridot, glass-like substance, and amber – had belonged to the woman. The NHMU reserves contained 4 amber beads: a translucent dark-brown one, irregular cylinder-shaped (d = 24 mm, h = 17 mm, diameter of the hole = 2 mm); a light-brown bead with white crust on the surface (d = 17 mm, h = 5 mm, diameter of the hole = 3 mm); an almost black one, close to an oval shape with well-accentuated facets (length = 17 mm, width = 15 m, height = 5 mm); and a parallel piped bead (25x22 mm, h = 7 mm, d of the hole = 2 mm), light-brown with orange tinge (Fig. 4).

The dead woman's costume from barrow No. 330 included a string of beads made of glass-like substance, faience, amber, as well as of cockle-shells and fruit stones [Illyinskaya 1975: 17]. The amber elements – three opaque light-brown beads – probably had formed the centre of the neck adornment. This assumption appears particularly logical for a large bead, the shape of which in projection can be defined as a rectangular trapeze (size: lower and upper bases = 28 and 16 mm, respectively, the sides = 20 and 25 mm, height = 7 mm). The hole in the bead had been made diagonally, probably, on purpose, to "direct" its triangular (wedge-like) edge. Other beads are also distinguished by their pyramidal shapes. Possibly, this scheme of pla-

Fig. 4. Beads from barrow No. 40 near v. Gulyai-Gorod

cing the beads was caused by the meaning borne by the neck adornment. Its functional meaning, as a guarding object was emphasized by the selection of charms on the string, which included an arrow-head (Fig. 5). The same function was served by the iron bangles on each of the arms, and two iron pins crossed on the woman's chest.

An amber necklace was among women's adornments found in the barrows near the villages of Zhabotyn (No. 524) and Zhurivka (No. 406, 407, 432, 447) [Illyinskaya 1975: 20, 22, 24–26]. An overview of the accompanying objects from the graves revealed the presence of stone dishes in almost all of the complexes (except the robbed barrows No. 432). The buried women's garments contained noteworthy typical details, pins: bronze, silver, iron; usually two in each of the costumes, except in barrows No. 407 (Zhurivka) and 524 (Zhabotyn) – only one pin was found in each of the two barrows. The costume of a woman buried in b. No. 407 contained headgear decorations with golden plates in the form of triangles made or minor circles, and with a figurine of a deer. Besides, the costume contained bronze nail-like ear-rings, a wire bracelet, strings of beads made of glass-like substance, amber, glass and small glass beads. Barrow 432 contained only some preserved decorative items,

Fig. 5. A string of beads from barrow No. 330 near v. Gulyai-Gorod

Fig. 6. Amber adornments from barrow No. 432 near v. Zhurovka

a string of beads among them. It included faience, bone, and amber beads. The latter were only two pieces: a disk-like hark-honey bead (d = 23 mm; h = 12 mm) and an oval-shaped, flat bead (28x18 mm; h = 8 mm) (Fig. 6).

The grave in barrows No. 447 should be recognized as the richest one. The woman's garments contained golden decorative elements: two nail-like ear-rings, plates of different shapes – possibly, headgear décor (50 semi-spheres and 50 triangles), fluted beads (13 pieces), as well as a string of 26 stone beads made of rock crystal, cornelian, glass-like substance, and two amber beads: a small globular one (d = 11 mm) and a big pyramidal one.

The collection of the National History Museum of Ukraine (hereinafter, NHMU) contains a string of 67 elements: bone, glass, glass-like substance, and most of all, amber beads (17 pieces). According to the documents, the string from the collection made by O. Bobrynsky came from the Kaniv district (Inventory book, B 40-293). Therefore, 17 beads had been made of pieces of opaque brown (slightly tinged with orange) amber, probably, by the same craftsman. This is proven by a certain stylistic unity of all the pieces of jewellery. They display a clearly visible trace of processing raw materials where various contours of the "intermediate products" dictated the choice of shapes and location of facets. All of the beads regardless of their size have the same, rather large, hole (3 mm), probably made with the same tool. The pieces of jewellery deserve a more detailed account.

The largest was a pyramidal bead (length = 26 mm, width = 15 mm, height = 15 mm), another small bead also resembled a miniature pyramid (length = 13 mm, base width = 10 mm, height = 10 mm) and there was a pyramid-like bead with a hole on the side (possibly the item was re-used). There were several multi-faceted beads (they were approximately the same size: 18x20 mm, h = 13 mm; 20x20 mm, h = 12 mm; 18x20 mm, h = 16 mm), three beads were parallel piped (20x20 mm, h=11mm; 16x14 mm, h = 12 mm; 16x14 mm, h = 8 mm), some could be defined as trapeze-like (22x15 mm, h = 9 mm; length = 13 mm, h = 10 and 7 mm, height = 12 mm; length = 20 mm, width = 16 and 10 mm, height = 12 mm) and one bead was cylinder-like, though it also displayed traces of faceting (length = 15 mm, h = 10 mm).

Also there were several small beads, irregular-shaped but facetted (15x15 mm, h = 9 mm), though in some of the pieces the facets were barely visible: i.e., a bead 16 mm long, 12 mm wide, and 10 mm thick; another was 12 mm long, with its widest part at 12 mm, a narrow tip = 6 mm, and height = 7 mm.

As we can see, in terms of sizes and shapes the amber beads were harmoniously linked with each other and with other decorative elements. All of the components formed a neck piece of jewellery, in which the main aesthetic and meaningful emphasis was placed on the amber beads (Fig. 7). As mentioned above, the facetted pieces of jewellery – probably also made in the same workshop – belonged to the costume of a woman who had belonged to the aristocratic circle of society (i.e., the woman buried in barrow No. 100 near v. Syniavka). Possibly, that method of finishing individual pieces of amber had been practiced by local craftsmen who had used the raw materials brought from the Baltic shore areas.

Fig. 7. A string of beads from the finds of O. Bobrynsky in the Kaniv district

This assumption was brought forth by comparison of "facetted beads" with these found in the territories where there had been long traditions of excavation and usage of amber, i.e., near the deposits in the Baltic area. Some of the forms are alike: bi-conical, pyramidal, disk-like, cylinder – such beads comprise the strings found in the territory of Poland and Germany, as reported by the well-known Polish researcher Z. Bukowski [Bukowski 2002: 73, ryc. 55; 81, ryc. 59; 92, ryc. 64; 93, ryc. 65]. However, his monograph contains no reference to such complex shapes as for instance, octahedron ones. Interestingly, in the Bronze Age, Western European tribes were

Fig. 8. Amber bead (spindle-top) from the finds of O. Bobrynsky

more likely to produce amber adornment objects of complex geometrical shapes, while in later periods, as archeological monuments demonstrate, versions of globular beads and truncate-conical objects dominate [Bukowski 2002: 88; ryc.61-63, 73].

The NHMU collection contains individual amber finds from the excavations performed by O. Bobrynsky, which originate from the Middle Dnieper region. For instance, there are noteworthy large beads that resemble miniature spindle-tops. Possibly, that was the way in which these beads were used. One of the finds, light-brown with orange tinge, was disk-like and flat (d = 31mm, h = 10 mm, d of the hole = 3 mm). Another stands out due to its truncated-conical shape (whole d = 30 mm, d at the top = 24 mm, d at the bottom = 27 mm, h = 14 mm), in particular, due to the large diameter of the hole (7 mm) (Fig. 8). Probably, these items were really made as spindle-tops or their imitations. A similar artifact was found in the territory of Slovakia: a large truncated-biconical bead with a large hole belongs to the Pilin culture (dated to BB/2 – BC/1). The bead, placed on a pin, resembles a spindle with

a spindle-top [Bukowski 2002: 71, ryc. 54, 18]. Similar objects were found in the territory of Poland such as a truncated-biconical pendant from Gorszewice (gr. N 22) that has similar dimensions: total d = 30 mm, h = 18 mm, d of the hole = 10 mm; a similar object from Gorszewice (gr. N 16): total d = 24 mm, h = 10 mm, d of the hole = 8 mm. The materials are dated as HaC/D1 [Bukowski 2002: 100, ryc. 74, 1; 103, ryc. 80c]. Importantly, such amber objects, and also the ring-like ones with metal "pincers" attached, were found in the territory of the Lusatian and Pomeranian cultures, which demonstrate the usage of workbench tools for grinding the form.

The Ancient World knew about the ability of amber to "electrify" matter (Thales of Miletos). Some researchers allowed for an assumption that that *electron* (i.e., amber) spindle tops had been used in the spindling process for the purpose of cleaning wool. In my view, amber spindle tops were not widespread in practical use because of their rather light weight, which was not sufficient to ensure the spindle functions [Havryliuk 1987: 116-130]. Moreover, amber was an expensive material. Amber spindle tops had the meaning of sacral objects in that they raised the status of a woman as a person holding the thread of life of a family or kin in her hand. Probably, this idea is the source of the custom of putting various spinning tools – spindle tops, spindles and their imitations – into the grave [Yakovenko 2001: 12-14].

Amber adornments were not widespread among the Dnieper Forest-steppe Left-Bank tribes (for instance, in the Sula River area). Individual beads were found in several complexes of the 5th century BC. Specifically, in barrow No. 3 in the Staikyn Verkh ravine, a woman had been buried dressed in a costume that included various categories of decorative elements, including golden ear-rings, a necklace, application plates, bronze pins, bracelets, as well as a string of 22 gemstones: rock crystal, cornelian, amber and glass-like mass [Illyinskaya 1968: 29, Table VIII, 11-13]. Individual amber beads were found in robbed barrows No. 6 and "B" near v. Basivka [Illyinskaya 1968: 40, Table VIII, 11-13; XXX, 4].

Analysing the materials of archeological studies of the Belsk town settlement, the well-known Scythologist B.A. Shramko took note of the insignificant number of gemstone necklaces, particularly amber beads, aming the finds that reflected the town dwellers' culture. Meanwhile, in this scholar's opinion, the trading route by which amber had been brought from the Baltic area to the Caucasus went through Belsk [Shramko 1983: 102, 152, 181]. That transportation direction was analysed in detail by M.Gimbutas, who noted that it had been formed in the Bronze Age: by the Vistula, then further eastwards across the Dnieper, then across the Don and up to the Caucasus [Gimbutas 1965: 49, Fig.15].

The costumes of women in the Forest-steppe regions in the 4th century BC preserved some ethno-local features noticeable against the background of influence of the Greek and Scythian style. However, now any jewellery made of amber (and generally of any other gemstones) should be excluded from the list of the distinguishing "marker" elements. An amber necklace was found in only one grave, in

barrow 20 near v. Kholodnyi Yar [Petrenko 1967: 34]. Possibly, that was caused by the loss of access to the source of amber imports. As a result, the composition of neck adornments and decoration of various costume elements changed, and a key role began to be played by strings of glass-like and gold beads.

Summing up the materials containing information about amber in women's garments in the population of the Forest-steppe Right-Bank Scythia in ancient times, the conclusion can be made that the gemstone, as well as other elements like pins and nail-like ear-rings, had been an ethnographic feature of costumes worn by the region's dwellers. Furthermore, the dominating factor had been probably, not aesthetical requirements, but ideas about the amber's protective power, which probably made it a universal method of protection from the forces of evil. It should also be noted that the quantity and quality of amber reflected its owner's social status. Amber adornments in graves containing stone dishes where altars stressed the high social status of women in their social groups (one hypothesis is that the eldest women in a family (kin) served the functions of a priestess). The use of amber by the autochtonous population of the Right-Bank Dnieper area in the Scythian times was a continuation of a tradition that had been formed in these lands in the Bronze Age. Amber was a componenent of men's costume complexes of the Middle Dnieper tribes and women's costumes of the Komarov – Trzciniec communities [Artemenko 1961: 53–54; Berezanskaya, Kločko 1998: 13].

Deposits of the Baltic region are believed to be the main source of imports of that decorative material [Klochko V.I. 2008: 239]. According to most archeologists, the results of studies performed in the Right-Bank Dnieper area prove an "uninterrupted cultural development from the Late Bronze epoch to the early Slavic time, which covers the period of about 15 hundred years" [Illyinskya, Terenozhkin 1983: 229]. Possibly, the "amber route" that had ensured imports of the gemstone to the Bronze Age tribes continued to function during the Scythian period at this time. However, later on, probably in the 4th century BC, some developments (e.g., military activity of Celtic tribes) resulted in a closure of access to excavation or transportation of the raw material.

Some researchers suggested that in addition to the Baltic amber, amber from the Klesove and Kyiv deposits had been used for making jewellery on the territory of Scythia and also for trading with other regions [Petrenko 2006: 94]. The authors provided no arguments per se, as their versions are based on geological data. As far as the Klesove deposit is concerned, as mentioned above, there could have been difficulties in performing extraction there. However, it shouldnot be excluded completely from the list of possible sources of obtaining amber (at least for the local population's own needs). When digging for flits or copper ore, the region's dwellers would take off significant layers of soil and find deposits of amber. The Kiev amber is a product of the accidental washing-out of relict resin, i.e., that source was not one of a permanent nature [Srebrodolsky 1988: 18]. In my view, if amber

Fig. 9. Reconstruction of a neck adornment, based on materials from barrow No.1 near Krasnoye Znamya *khutor* in the Stavropol district (Krasnoye Znamya burial site)

were excavated in Scythia in a quantity sufficient for trading it, this fact would not have been ignored by Herodotus. Meanwhile, his "Melpomene" bears no facts in this regard. Instead, the "father of history" wrote: "As for the extreme lands of Europe, located in the West, I cannot give any certain information, for I do not believe that there is a river that flows to the North Sea and is called by Barbarians the Eridanus, from where they say amber is brought ... Notwithstanding, tin as well as amber, comes to us from the extreme lands of Europe" [Herodotus III, 115].

Let us look at another centre of "amber fashion", which emerged at the Northern Caucasus precisely at the time of the arrival of the Scythians. This was noted

by A.A. Jessen, whose research was published in 1940. Analysing the finds from the Mozdok burial site and other monuments of the Northern Caucasus region, this researcher concluded that amber adornments (alongside the kauri shells) became, at the early Scythian stage, "typical indicators of enhancing connections of the Northern Caucasus with the surrounding countries" [Jessen 1940: 48]. According to A.A. Iessen, the amber's sources of origin remained unknown, but there were no reasons to consider that decorative materials were Baltic ones [Jessen 1940: 48]. Summing up his work, the researcher stresses that it waspossible to assume "relations of exchange nature between the territories of Ukraine and the Pre-Caucasian area" [Jessen 1940: 50].

The study of early Scythian burial sites (Krasnoe Znamya, Novozavedenskaya II, Nartan) contributed substantially to the knowledge of the dissemiantion of amber in the region. V.G. Petrenko paid a lot of attention to this theme and gave a detailed review of amber beads from the graves of the Krasnoe Znamya burial site. Amber adornments constituted elements of women's as well as men's costumes. As for the latter, the most interesting ones are the finds from the southern part of the grave in barrow No. 1. First and foremost, these include 14 tetragonal plates, theso-called "separators" or "dividers": length = 1.8-3 cm, width = 1.1-2 cm, height = 0.4-0.6 cm, with three parallel channels of holes, as well as a shaped bead of the same kind: length 3 cm, width = 1.1-1.8 cm, height = 0.5-0.8 cm [Petrenko 2006: 29, 93, cat. 94, 95] (Fig. 9). Decorative "separator" plates were used for shaping the neck adormnents made of small beads, an interesting artistic "invention" that helped make jewellery with a varied harmony of elements. Several strings would be joined togther with the help of the plates which at the same time divided the strings into certain segments. Similar methods of making necklaces were registered with the help of finds in the Baltic region [Bukowski 2002: 20, ryc. 5:25; ryc. 10:51, ryc. 36]. Separators could be also made of bone [Bukowski 2002: 122, ryc. 97]. They were used not only as decorations for costumes but also for bridles. As far as the latter are concerned, amber separators occurred among horse harness details in the Northern Caucasus. It should be noted here that such amber separators emerged in the early Scythian age [Petrenko 2006: 94].

Therefore it would seem that the idea to use amber separators emerged in the areas of dissemination of amber in the territory of Europe. However, we can observe its implementation in other regions as well. For making the separator plates, flat pieces of amber were used where two or three channels of holes were made in the semi-processed pieces. Such objects enjoyed popularity and demand in the Northern Caucasus, hence it is assumed that gemstone workshops were located in the Caucasus too.

All the barrows of the Krasnoe Znamya burial site contained beads of various forms: irregular-cylinder (length = 8-19 cm, d = 0.45-0.6 cm), truncated-biconical (h = 0.8 cm, d = 1.3 cm), globular-biconical (h = 0.7 cm, d = 1.2 cm), wheele-like

(h = 0.4 cm, d = 1.3 cm), pad-like (length = 0.9 cm, d = 0.4 cm), pentagonal prism (length = 1.3 cm, section = 0.5- 0.8 cm), column with corrugated surface (length = 2.5 cm) [Petrenko 2006: 93]. These types of beads are similar to these coming from the Novozavedensky II and Nartan burial sites. Some typical features of the adornments allow making comparisons between the finds of the Northern Caucasus, the Middle Dnieper area, and Central Europe. Some types of beads allow making assumptions about their origin, first of all, for shaped beads (column with corrugated surface). Among the finds of the Lusatian culture we can see pieces of jewellery made in the form of thin tubes covered with fine lines. Probably that technology of décor was developed in the territory of the Lusatian culture [Bukowski 2002: 20, ryc. 5:25; ryc. 10:51, ryc. 36]. Other types of beads probably also arrived to Scythian garments from the Baltic region. The Middle Dnieper region probably played an intermediary role in dissemination of amber, both for raw materials and ready-made products. It is possible that the Scythian nomads borrowed the habit of decorating their costumes with amber from the population of that very part of Scythia.

Refined artefacts with amber, found in the Kelermes barrows, demonstrate another method of using that decorative material. A special example is the golden plate on a forehead band from barrow 1/III. That was a plated ribbon (66.8 cm x 3.7 cm) that twined round the helmet. The semantic and compositional centre of the bond was represented by an amber inset (Fig. 10), a round translucent gem placed in a socket made by a fine golden stripe [Galanina 1997: cat. 15; Table 28, 29]. The motifs that form the forehead band décor are the solar symbols. Apparently, amber was linked in the minds of Scythians with the Sun cult. The use of amber as the compositional centre of a diadem stresses its determining function in the costume. L.K. Galanina noted that the making of the diadem had displayed skills of Ionian craftsmen. The Kelermes barrows, in addition to the diadem, produced several other objects decorated with amber with the use of the inlay technique. Hence, rectangular and triangular sockets were made on the convex surface of the "throne details", placed on the edge where red amber would be in-laid in the sockets in the so-called "cloisonné inlay" [Galanina 1997: 118, cat. 35, 36]. Another method of using the gems was to fasten them in sockets ("champlevé"). That method was used for making the décor on a gorytus clasp [Galanina 1997: 112, cat. 34; Table 32, 32]. These versions of inlay technique were typical for the South-Western Asian engraving "*torevt*" goldsmiths. According to some scholars, such examples confirm the hypothesis about the emergence in South-Western Asia of workshops that served the needs of the Scythian aristocracy [Galanina 1997: 114].

The number of pieces of jewellery found in the costume complexes of the tribes that grew in the vast spaces of the Northern Pontic region in the 5th – 4th centuries BC is small. Therefore, at that time steppe Scythians made almost no use of amber for decorative purposes. However, this gem served as the centre of the composition in a ritual vessel from the Bratolyubovka barrow. Hence, in the consciousness of

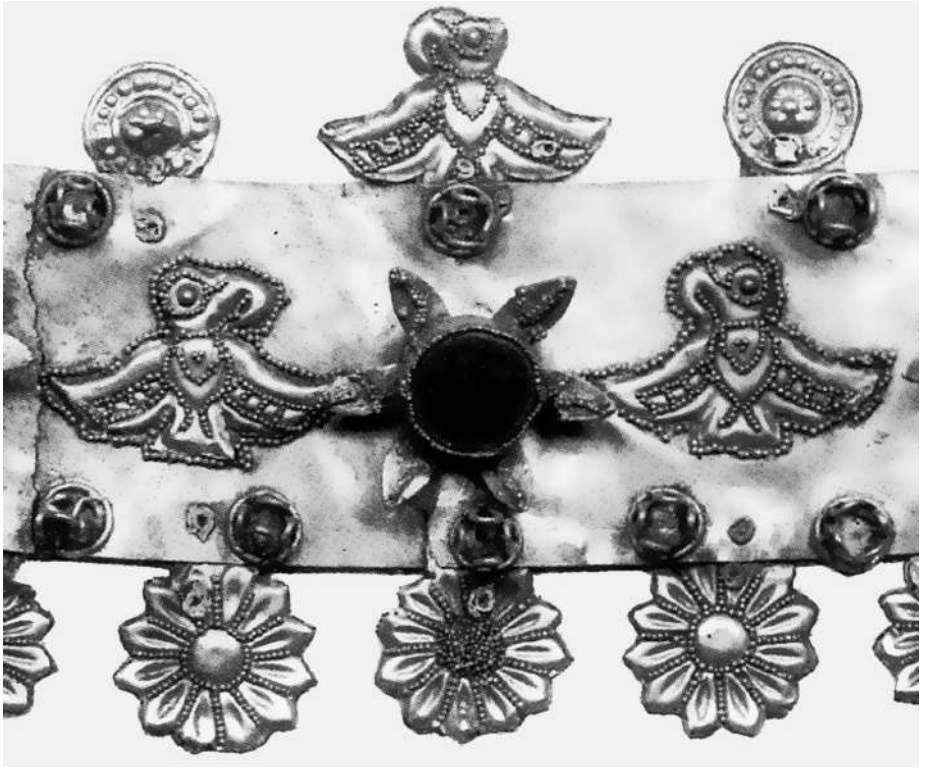


Fig. 10. Decoration of the forehead band from barrow 1/III of the Kelermes burial site

Scythians, amber preserved the meaning of a solar symbol [Bessonova 2007: 42–49] (Fig. 11). The scarcity of amber objects in the garments of Scythians of that time could be probably explained by the same reason that caused a similar phenomenon in the population of Forest-steppe Scythia, i.e., the disruption of communications with the sources of extraction of this decorative material.

Among the finds of the Steppe region, special attenion has been attracted by a ring found in a woman's grave in the Malyi Chortomlyk barrow: an amber bead had been placed on a shaft that links both ends of the hoop [Mozolevsky 1987: 71-72, Fig. 6, 13] (Fig.12). Remnants of pendants (1 – 2 pieces) as parts of strings of beads made of glass-like matter were recorded in some other steppe monuments. However, the general number of amber adornments in the nomads' garments is small.

The "amber route" was restored only during the Sarmatian times. That was reflecfted in the emergence of adornments in the Sarmatian costumes and in dissemination of amber in the ancient cities of the Northern Pontic area.

Fig. 11. Golden phiale with an amber inset (Bratolyubovka barrow, Kherson district)

As mentioned above, the scribes of the ancient world wrote at length about "electron" (as Hellines called amber). Already in the time of Homerus that decorative material was also used for ornating walls (King Menelaus's rooms), and for making jewellery. The latter had verses of the "Odyssey" devoted to them, which told about a gold-set amber necklace for the parents of Eumaeus. We can also read about a necklace of golden and amber beads given to Penelope by one of her suitors [Homer VI, 18].

Meanwhile, Greeks, immigrants to the Northern Pontic area, stared wearing jewellery made of that material only in the 1st century BC. In earlier times, even the dwellers of Olbia, Thyros (cities located close to the main arteries of amber supply, the Dnieper and Bug rivers) preferred objects made of glass and faiance. While studying these kind of adornments (strings of amber beads), E.M. Alekseyeva noted that although that decorative material had been expensive, in the 1st-3rd century BC, it was really in fashion [Alekseyeva 1978: 22]. Finds in the Northern Pontic burial sites point to a high level of gemstone finishing. The craftsmen made shaped pendants in the shapes of "*lunnitsa*" (crescent), astragalus, or a ram's head. In addition, a variety of beads enjoyed high demand: globular, elongated, cylinder,

Fig. 12. Ring with an amber from the Malyi Chortomlyk barrow (Dnipropetrovsk district)

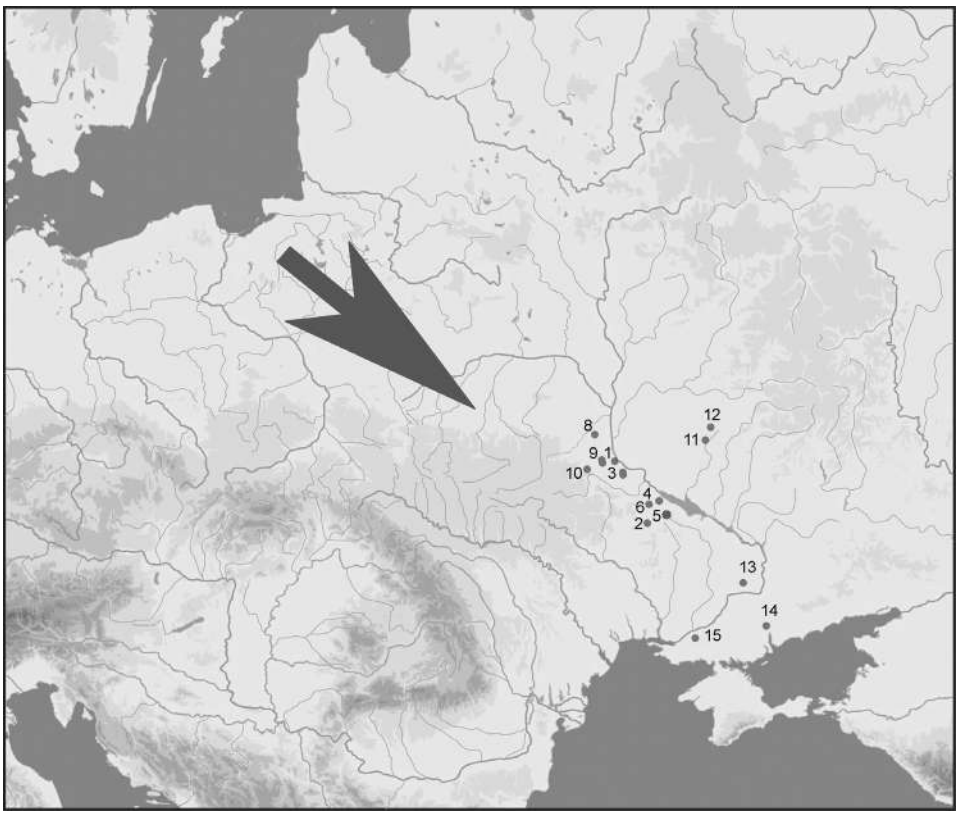
truncated cone, etc (44 types, after E.M. Alekseyeva). It can be assumed that the "amber routes" from the Baltic Sea to the Bug and Dniester rivers had been restored. That amber was referred to as "Scythian". For instance, Diodorus wrote about transportation of the gemstone from Scythia [Diodor V, 23]. Also, Plinius wrote that white and yellow amber was extracted in Scythia [Plinius 1819: 332].

Within the specified theme it is impossible to ignore a string of beads from the NHMU collection, which, according to the records, was passed over to the museum in 1897 by the Emperor's Archeological Commission. According to the same source – according to the documentation of the museum's reserves the necklace had come from Kerch, but it is unknown how it made its way to the antiques collection of V. Khvoika (Fig. 13). Exhibits from private collections always raise questions. In this case it should be determined, first of all, whether that string of beads was a whole chain, when it had been made and the location where that piece of jewellery was found. Hence, the string of beads appears to be a harmoniously made neck adornment, in which the beads had been carefully matched by shape and size. Meanwhile, a detailed study of the beads suggests that they were not probably made in one workshop. That assumption is based on the differing diameters of the holes: some of them were 5 mm in diameter. The large bead placed in the centre (a tri-faceted irregular-shaped bead, length = 35 mm, width = 34 and 19 mm) that hole was technologically justified, but in much smaller objects the channels were

Fig. 13. Amber necklace from V. Khvoika's collection

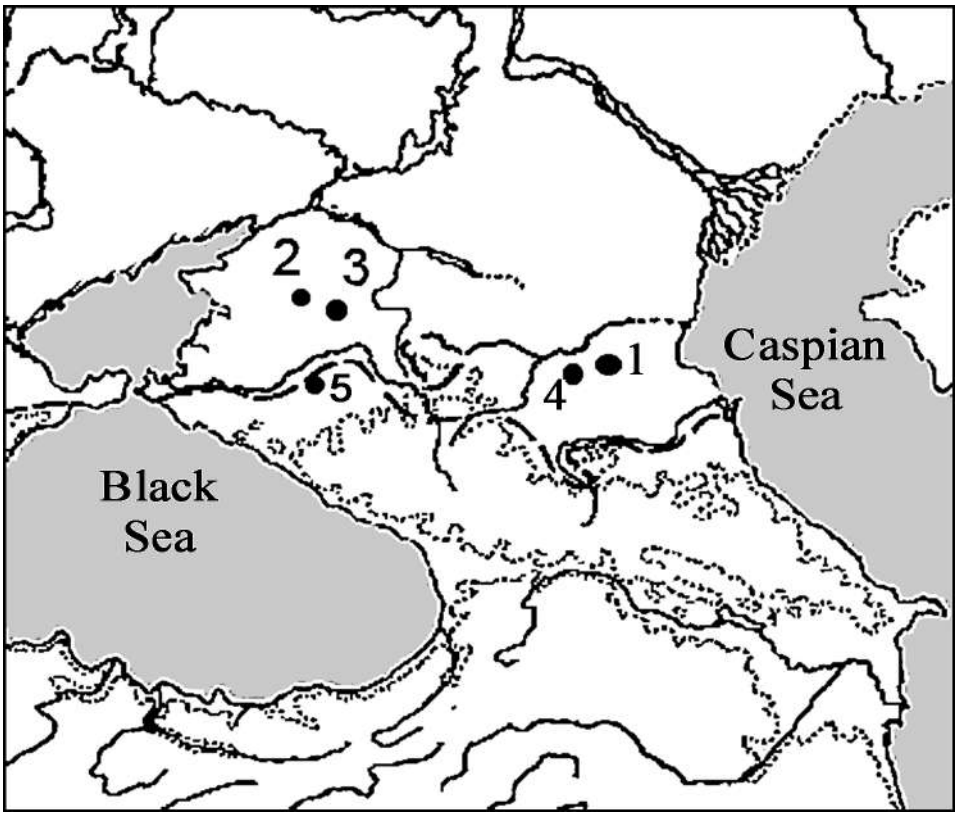
made with the same tool, a rather thick shaft. The holes of most of the beads were 2 mm and 3 mm and importantly, this did not depend on a specific bead's size. For instance, the large tri-faceted bead (length = 32 mm, width = 31 and 17 mm), the diameter of the hole was = 2 mm, while in a small quadrangular bead (13x10 mm) the hole was = 3 mm. Colours and shapes of the beads catch the eye: a row of dark-brown translucent beads are covered with a whitish crust.

As for the shapes, some of the pieces of jewellery are distinguished by their prehistoric appearance, while others were rather "stylish" and made quite skillfully. Several are parallel piped-shaped (18x18 mm, h = 9 mm; 13x10, h = 10 mm; 14x14 mm, h = 12 mm; 10x10, h = 9 mm; 19x20, 10), the tri-faceted ones also stand out (length = 17 mm, h = 13 mm; length = 18 mm, h = 13 mm; length = 24 mm, h = 14 mm); attention is drawn to cylinder-shapes and flattened-cylinder beads: 15 pieces (length = 16 mm, height 12,7 mm; length = 17 mm, height 9 mm; length = 14 mm, height 7 mm; length = 15 mm, height 11 mm), there are beads shaped as tiny truncated pyramids (length = 12 mm, h = 8 mm) and one like a rhombus (length = 14 mm, h = 7 mm, length = 18 mm, height = 7 mm; h = 10 mm).



Map 1. Archeological monuments containing amber adornments, on the territory of Ukraine: 1. Synyavka Ta Bobrytsya; 2. Matusiv; 3. Zhabotyn; 4.Gulyai-Horod; 5.Zhuravka; 6. Kholodnyi Yar; 8. Perepyatykha; 9. Kazarovka; 10. Medvyn; 11. Aksiutyni; 12. Basivka; 13. Malyi Chortomlyk; 14. Melitopol barrow; 15. Bratolyubovka barrow

The list of shapes and sizes is needed for comparison with these listed in the study by E.M. Alekseyeva. Most of the jewellery from among these listed have similarities among the objects found in the territory of Olbia and Panticapaeum. Hence, E.M. Alekseyeva noted that the majority of the beads found in antique cities are distinguished by their irregular shape. No information about their dates is available. Meanwhile, some of the types: truncated pyramid-shaped, parallel piped, cylinder and flattened cylinder – date back to 1st – 2nd century AD [Alekseyeva 1978: 23-26]. That was the time when, most probably the amber dissemination transportation routes were restored. According to E.M. Alekseyeva, "... objects both made of amber processed in the Mediterranean and of these processed in the north-east, probably, in western European provincial cities, arrived" to the territory of the Northern Pon-



Map 2. Archeological monuments containing amber adornments, on the territory of the Northern Caucasus: 1. Mozdok burial site; 2. Krasnoye Znamya barrow; 3. Novozavedenskaya II burial site; 4. Nartan burial site; 5. Kelermes burial site

tic area [Alekseyeva 1978: 23-26]. The researcher noted that the assumption about amber processing in the Northern Pontic area was hard to prove. However, she argued that the possibility should not be dropped altogether, for in that territory, in ancient cities, there had been workshops in which complex jewellery skills had been used. Amber is known not to require such techniques. Probably, Sarmatians received their amber objects from these workshops. However, that is a theme for another study.

Therefore, as we can see, some questions asked at the beginning of this article have already been answered. Centres of "amber fashion" in the spaces that have been traditionally linked with the Scythian culture had existed within the 7th – 5th centuries BC. In a women's costume of the Forest-steppe Right-Bank Dnieper population a necklace combined with golden adornments emphasized high social

status of its owner and was away to single her out in the social group to which she belonged. Moreover, amber became an ethno-local marker (together with nail-like ear-ringsand pins). The autochthonous tribes of the Middle Dnieper area contributed to the introduction of the "amber fashion" within the aristocratic circles of nomad Scythians when the latter dwelled in the lands of the Northern Caucasus (Fig. 14, 15). The gemstones became elements of (mainly) men's costumes due to one of the "amber routes", which included the rivers of Vistula, Bug, Prypiat, Dnieper, Don, and Kuban. Borrowing prestigious elements is a typical trace of a nomad culture. The reduction of imports of amber adornments did not change the attitude to that decorative material in the 4th century BC as to a solar symbol.

Translated by Inna Pidluska

Baltic-Pontic Studies
vol. 14: 2009, 439-461
PL ISSN 1231-0344

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THE TERRITORY OF BELARUS IN THE SYSTEM OF COMMUNICATION ROUTES OF 3000 – EARLY 2000 BC

The general knowledge of monuments dated back to 3000 – early 2000 BC in the territory of Belarus allow reference to only some aspects of identification of communication routes formed within the system of common European transit migrations of people, goods and ideas between the Baltic Sea and the Northern Pontic region. It should be kept in mind that the watershed zone between the rivers of the Baltic and the Dnieper areas goes across the territory of Belarus, from the south-west to the north-east, by the plains and highlands of its central districts. This geographic phenomenon created, within Belarus, natural conditions for close contacts between cultures of the Baltic and the Dnieper areas. Individual region' specialisation in production of certain objects, the uneven spread of necessary kinds of raw materials, and social change caused by the rise of local elites contributed to more active contacts and development of communication routes, including for the purpose of obtaining prestigious and rare goods. Imported objects comprise one of the key indicators of the existence of specific exchange routes. Beside imports, other factors that identify directions of communication are exogenic cultural elements, the genetic origin of which can be traced.

The communication route themes that are the most promising for exploration are the **(A)** Dnieper; **(B)** Dnieper – Dvina; and **(C)** Prypiat routes.

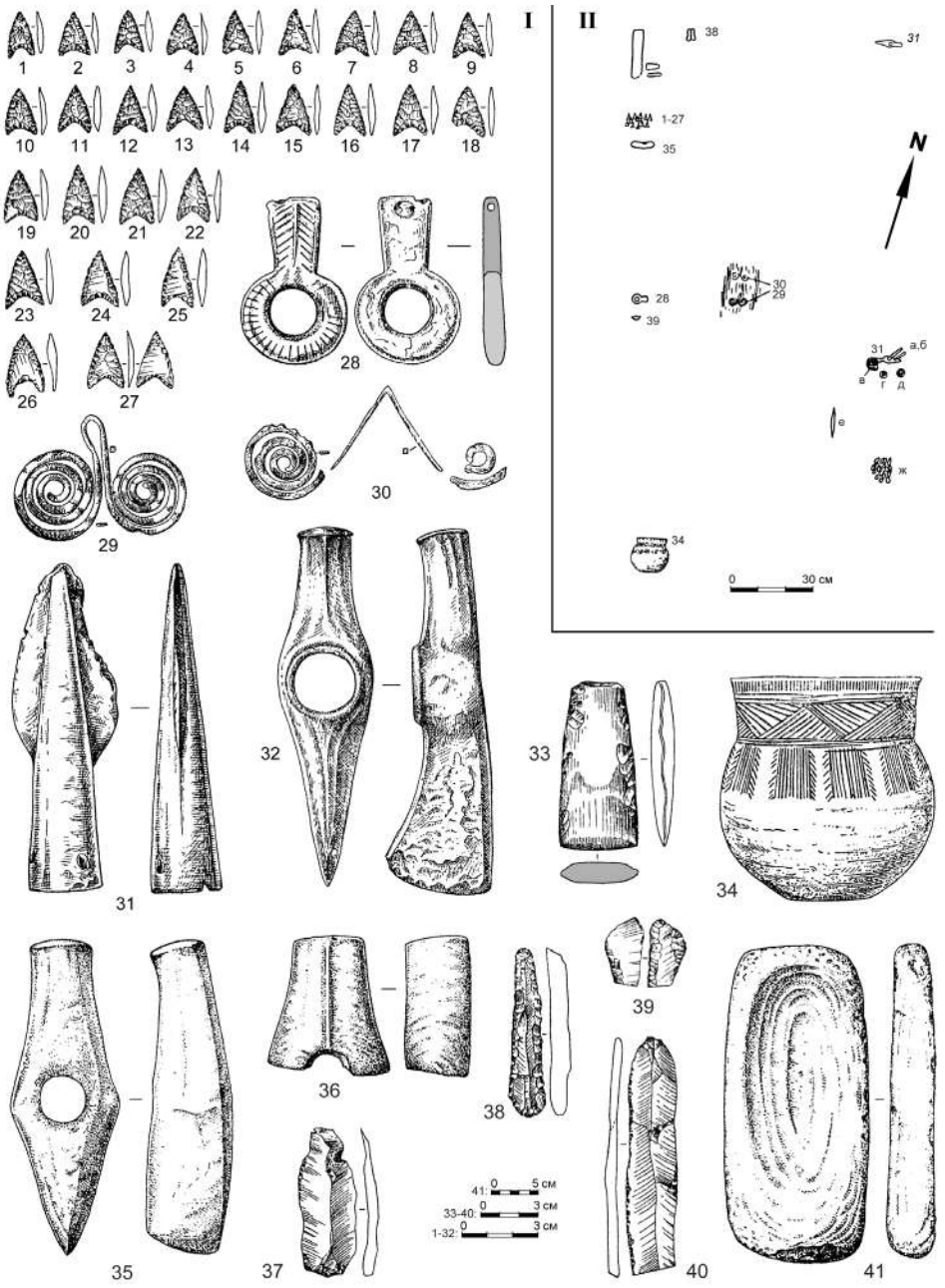

Fig. 1. Barrow cemetry at Khodosovichi-Moshka, Rogachev district. I – grave-goods from barrow 11, grave 1; II – plane of the grave [after Artemenko 1967]. 1 – 27, 33, 37 – 40 – flint; 28 – amber; 29 – 32 – copper; 35, 36, 41 – stone; 34 – ceramics

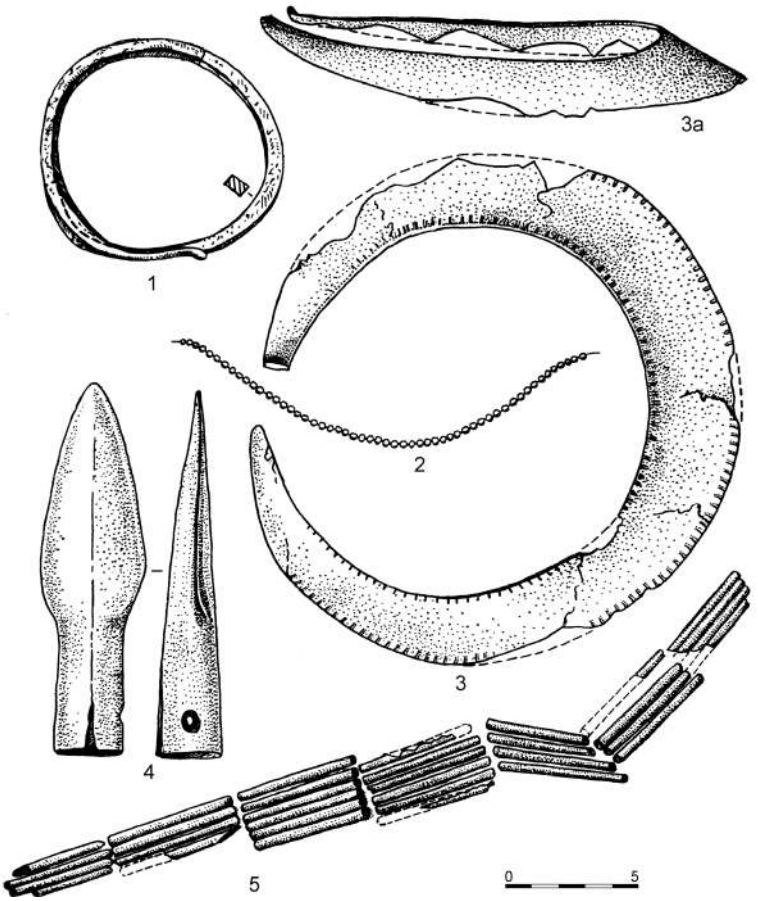

Fig. 2. Flate grave cemetry at Strelitsa, Rogachev district. Metal artefacts (1, 3 – 5) and beads (untested material) from grave 53 [after Artemenko 1967]

A. THE DNIEPER ROUTE

The Dnieper route played an exclusive role in the system of Baltic – Northern Black Sea cultural interaction. The process of emergence of culture structures in the territory of the Upper Dnieper region in 3000 – early 2000 BC depended directly on the directions and activity of communications, including those performed by the Dnieper.

The bulk of the Middle Dnieper Culture (MDC) burials are located in the Upper Dnieper area. Presumably, the absolute majority of those burials emerged

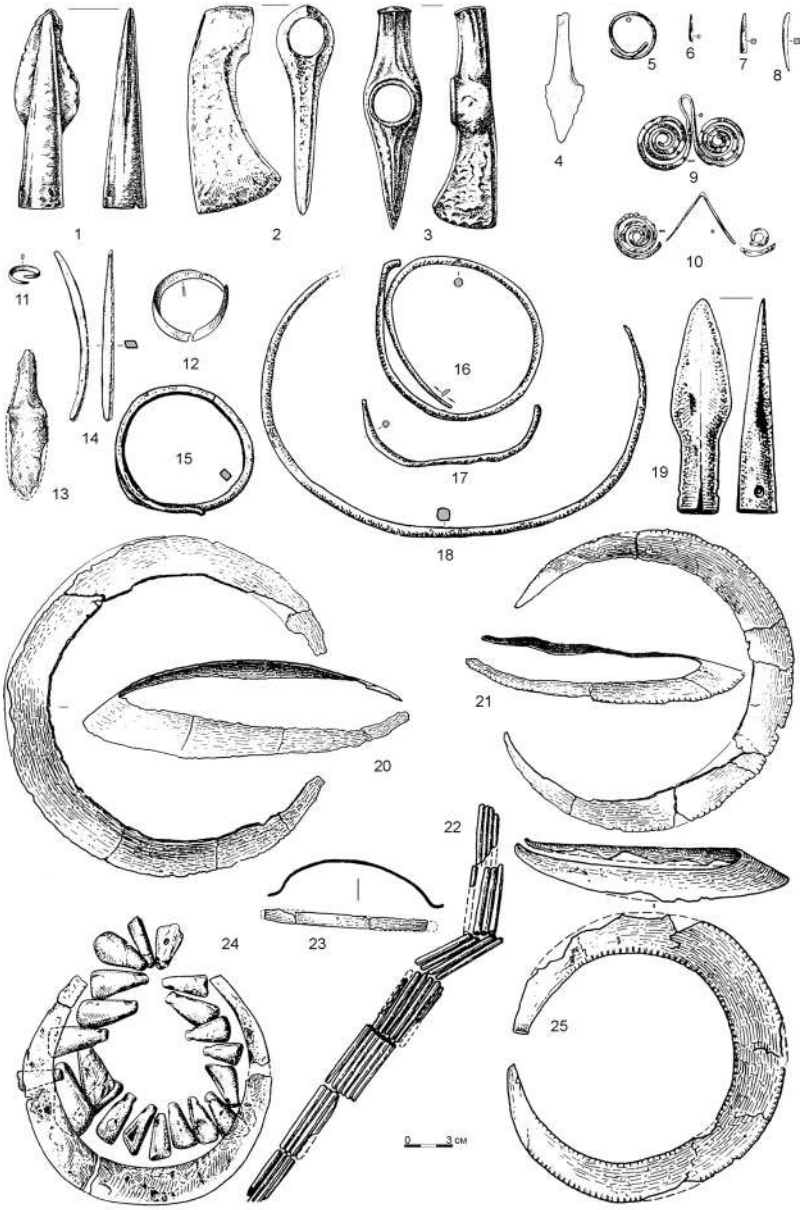

Fig. 3. Territory of south-eastern Belarus. Copper and bronze objects from graves of the Middle Dnieper culture. 1, 3, 9, 10 – Khodosovichi-Moshka (barrow 11/1); 2, 8 – Khodosovichi-Moshka (barrow 10/2); 4 – Khodosovichi-Moshka (barrow 12/1); 5 – Khodosovichi-Moshka (barrow 10/4); 6 – Khodosovichi – Sergeyeva Griva (barrow 1/2); 7 – Khodosovichi-Palyk (barrow/grave 3); 11 – Proletarsky, grave 1; 12 – Strelitsa, grave 4; 13 – Strelitsa, grave 2; 15, 19, 22, 25 – Strelitsa, grave 53; 14 – Strelitsa, grave 44; 16, 24 – Strelitsa, grave 43; 17, 18 – Strelitsa, grave 88; 20 – Strelitsa, grave 8; 21 – Strelitsa, grave 7; 23– Strelitsa, grave 20

within 2600/2500 and 1700 BC [Kryvaltsevich, Kovalyukh 1999: 151–162; Kryvaltsevich 2004a: 98–102; 2006a; 2007]. Among the tombs of the Upper Dnieper area, special attention should be paid to individual MDC complexes that contain an unusual quantity and quality of grave-goods. The most noteworthy in that sense are the graves of the Khodosovichi – Moshka barrow group (barrows 11/1 and 10/2) [Artemenko 1964a] and Strelitsa cemetry (graves 53, 43) [Artemenko 1976]. The "rich" graves contained relatively expensive and prestigious objects made of copper, bronze, amber, high-quality flint, imported to the Upper Dnieper area from distant regions of Europe (Fig. 1, 2). The use of metal and some other rare and imported goods in the burial rites meant that the communities populating south-eastern Belarus embarked on significant social transformations. The status of some groups of the population increased, and the key roles were played by a certain category of men. Their high social status was signified by appropriate burial rites and specific complexes of prestigious objects. So far, the only place on the territory of Belarus that displayed the above degree of social differentiation, manifested by the creation of "rich" burial complexes and accumulation of relatively large quantities of prestigious burial artefacts, weapons, rare ornaments and the like, has been found only in the Upper Dnieper area. Therefore, it should be assumed that such social change was directly dependent on the local elite's ability to organize and control communications used for the movement of imports. The objects made of early metals became the most expensive and prestigious goods of the time.

Aa. THE DNIEPER ROUTE AND THE ISSUE OF IMPORTS OF EARLY METAL OBJECTS AND FAIENCE BEADS TO THE UPPER DNIEPER AREA.

The earliest metal objects in Belarus were found in the Upper Dnieper area in burial complexes of the MDC. Specifically, they were found in the following closed complexes: the Khodosovichi – Moshka barrow cemetry (*kurgan* burials 10/4, 10/2, 11/1, 12/1) (Fig. 3:1–5, 8–10), Khodosovichi – Palik (barrow, grave 3) (Fig. 3:7), Khodosovichi – Sergeyeva Griva (barrow 1, grave 2) (Fig. 3:6); graves of the flat burial sites of Strelitsa (graves 2, 4, 7, 8, 20, 43, 44, 53, 88) (Fig. 3:12–25), Proletarskiy (Fig. 3:11), Prorva 2 (grave 1). Ten metal artefacts were found in the Khodosovichi barrow cemetries, 16 were found in Strelitsa, and one artefact in Proletarskyi and Prorva 2 each. Therefore, five MDC burial sites on the territory of south-eastern Belarus contained 28 metal artefacts. This number also includes some accidental finds [Artemenko 1964a; 1967; 1976; Klochko 1994a: 107–108; 2001a; Kryvaltsevich 2006c: Fig. 2, 1–3].

Metallographic research proved that the metal used for making the MDC grave-gooda can be divided into four groups: (1) a group of objects made of al-

most pure copper; (2) a group of objects made of copper-arsenic alloys; (3) a group of objects made as a result of melting the metals of groups 1 and 2; and (4) objects made of classic bronze (copper and tin alloy). The chemical composition of objects of group 1 was the closest to that of metal artefacts of the Balkan – Carpathian region. The copper-arsenic alloys of group 2 are typical for the complex of artefacts produced based on the Caucasian metallurgical traditions [Chernykh 1966: 65–66, 69, 71–72; Artemenko 1967: 37–40].

In terms of specifics of the raw materials used, it should be kept in mind that the metal objects could be brought to the Upper Dnieper area from the Northern Pontic populations and also from the groups that continued to develop the Balkan – Carpathian metallurgical tradition, based on the use of pure copper and tin-bearing bronze, including, probably, the deposits found in the Right-bank Ukraine [see also Chernykh 1966; Artemenko 1967; Klochko 1994a].

A comparative typological analysis of metal goods found in the burial complexes allows tracing more accurately the ways and directions of arrivals of copper and bronze to the Upper Dnieper area. Specifically, the finds in Khodosovichi – Moshka (barrow 10/2) included a shafthole axe (Fig. 3:2), made of the copper-arsenic alloy (99.2 % of copper) [Artemenko 1964a: 85; 1967: 38, 39, Table 2]. The object belongs to axes of the Kolontayevka type, produced by metallurgists of the Catacomb cultures. Most probably, it was imported to the Upper Dnieper area from the south, from a Catacomb culture population [Klochko 2001a: 138; see also Artemenko 1967: 39]. The Kolontayevka-type axes were produced predominantly in the Lower and Middle Dnieper areas, the Upper Donets and the Don rivers. The Catacomb welders (primarily, welders of the Donets Catacomb culture) managed to organize their local production [Korenevskiy 1976: 19-23, 28-30]. Most probably, the Khodosovichi axe should be synchronized with relevant artefacts of the Late Catacomb cultures, e.g., date it to the end of 3000 BC [see, i.e., Bátora 2006: 54].

The burial set of inventory of grave 1 of barrow 11 of Khodosovichi – Moshka includes a spearhead (Fig. 1:31). The base of the metal used for making the object is copper (97.2 %) and arsenic (2.7 %) [Chernykh 1966: 65-66; Artemenko 1967: 38, Table 2]. It belongs to the leaf-shaped spearhead type with a cast locked bushing [Artemenko 1964a: 44-45, Fig. 12, 13]. At that time, E.N. Chernykh noted the specific Khodosovichi artefact, as he did not find its analogue in the Caucasus [Chernykh 1966: 71]. Judging by the manufacture technology, the artefact belongs to the most ancient cast-bushing spearheads in Eastern Europe [Klochko 1994b: 189-190; 2001a: 134-135; 2001b: 253]. The find resembles Central European bushing spearheads of the Early Bronze Age, the Vatya III and Únětice cultures [Klochko 1994b: 189-190; 2001a: 134-135; 2001b: 253].

According to V.I. Klochko, the form-cast copper spearhead from grave 53 of Strelitsa (Fig. 2:4) also belongs to the oldest metal spearheads of Eastern Europe [Artemenko 1976: 83, 92, Fig. 9:39; Klochko 1994b; 2001a: 134-135; 2001b: 253-254].

The spearhead was made of almost pure copper with insignificant (natural) admixtures of silver, iron and nickel. The chemical composition is close to that of metal objects of the Balkan Peninsula and Pre-Carpathian area [Artemenko 1976: 92]. The spearhead has an open bushing with two holes for fastening a haft. The molding form for making that object has been made of a forged spearhead with an open bushing [Klochko 2001a: 134-135; 2001b: 253-254]. By the manufacturing technique and proportions, the forged open-bushing spearheads, which could have served as prototypes for the object found in Strelitsa, were widespread in the North-Eastern Pontic region among the catacomb culture populations. V.I. Klochko admits that so far it has been problematic to identify a precise place where the spearhead in question had been made. The researcher assumes, given the lack of direct evidence of the indigenous metal processing in the MDC communities, that the spearhead could have been produced in the zone of direct contacts between the bearers of the Catacomb and the Únětice metallurgical traditions, i.e., in the contact zone between the "Corded Ware" cultures of the Pre-Carpathians, the Podolia, the Volhynia district, and the Catacomb cultures of Ukraine [Klochko 2001a: 134-135; 2001b: 253-254]. Given the early Únětice chronology [periods I – IV = 2200-1950 BC – see, for instance, Kadrow 2001: ryc.10] and the Catacomb cultures [2750/2500 – 1900 BC – see, for instance, Pustovalov 1994: 117; Nikolova 1999: 126-128; Szmyt 1999a: 108-110; Avilova, Orlovskaya 2003: Fig. 3; and others] the spearhead could be dated between the end of 3000 BC to the very start of 2000 BC.

The complex of grave 53, and also of graves 7, 8, 43 of the Strelitsa burial cite contains specific copper objects that resemble Western European *"lunulae"* [Artemenko 1976: 73, 81-82, 83, 84; Kryvaltsevich 2006b: 22–34] (Fig. 2:3, 3a; 3:20, 21, 24, 25). Analyzing the aforementioned artefacts from the Strelitsa, I.I. Artemenko wrote that they had no direct analogues in Europe. In terms of the form, in his judgement, they resemble Irish golden *"lunulae"* [Artemenko 1976: 91]. This hypothesis provides the opportunity to search for closer genetic connections in the above respect.

All the copper *"lunulae"* of Strelitsa were made of practically pure copper with insignificant admixtures of other natural components, i.e., they belong to the first raw material group, which allows bringing them closer, in terms of chemical composition, to the Balkan – Carpathian metal objects [Chernykh 1966: 65-66; Artemenko 1967: 37-39, Tab. 1, 2]. The oldest types of the *"lunulae"*, primarily the European golden *"lunulae"*, have been seen by many researchers as the same as the complexes typical for the Bell Beaker Culture (BC). The proliferation of the BBC groups with various types and degree of their presence in the South-Western, Western, and Central Europe occurred in 3000 BC. Individual structural elements of the BBC have been found on the territory of Poland. There, their presence has been viewed in close connection with the evolution of a local Corded Ware Culture (CWC), primarily of the culture of singular graves, and dated to the second half of 3000

BC. The BBC traditions had "enriched" the local CWC. Another concept being developed involves the Northern European region of the BBC that embraced the territory from the Jutland to the Vistula River basin [Czebreszuk 2001b: 327-333]. Individual elements of the BBC have been discovered also in the Western part of the forest zone of Eastern Europe, i.e., to the east of the Vistula on the territory of the contemporary Eastern Baltic area and Belarus. They are present in the complexes dated back to the end of 3000 – early 2000 BC. The identified objects include not only specific morphological, ornamental features of ceramics and individual types of flint daggers, but also copper *"lunulae"* of the Strelitsa type [Czebreszuk, Kryvaltsevich 2003a: 107-116; Czebreszuk, Kryvaltsevitsch 2003b: 51-56; Matuszewska 2003: 24-25]. Most of golden *"lunulae"* were found in Ireland. They also occurred in Northern England, Scotland, Wales, Cornwall, Normandy and Bretagne [Vandkilde 1996: 182]. Within the Northern European BBC region, the golden *"lunulae"* occur in Denmark as well as in the territory of Poland (Malbork) [Vandkilde 1996: 182; Czebreszuk 2001b: ryc. 7]. Golden *"lunulae"* were produced by bearers of the BBC traditions. The Irish *"lunulae"* served as the main patterns for them. In the territory of Denmark they refer to the complexes of artefacts of the LN1 period [Vandkilde 1996: 184]. The LN1 is synchronized with Central European BrA1a or early EBA, dated between 2350 and 1950 BC [Vandkilde 1996; 2001: 333–360, Fig.1]. Therefore, the proliferation of individual elements of BBC in the areas to the east of the Vistula, including the territory of Belarus, could have taken place in late 3000 – early 2000 BC in the process of penetration of individual "Bell Beaker" ideas to the Eastern European cultural environment. The acceptance of the "Bell Beaker cultural package" could have occurred at the time when social differentiation was growing stronger in the local communities. Unusual things, primarily metallurgical objects, including the *"lunulae"*, flint daggers and amber adornments were highly appreciated by local groups of people and served as indicators of a relevant social status and ranging [Czebreszuk 2001b: 338; Czebreszuk, Kryvaltsevich 2003; see also Dąbrowski 1972: 99; Matuszewska 2003: 42]. The production and dissemination of the *"lunulae"* to the Upper Dnieper area, given the raw materials used, as well as the directions of "metal" exchange communications, could have occurred with the direct involvement of the population of the epi-Corded Ware circum-Carpathian complex.

The burial inventory of grave 53 of Strelitsa included a belt made of copper 5-cm-long tube-like long beads arranged in six rows [Artemenko 1976: 83, Fig. 9, 40] (Fig. 2:5). The tubes were sewn onto a 35-cm leather belt [Artemenko 1976: 92]. The tubes had been made of almost pure copper with insignificant (natural) admixture of silver, iron and nickel. Their chemical composition was similar to that of metal objects from the Balkan Peninsula and the Pre-Carpathian area [Artemenko 1976: 92]. The tube-like objects of copper ton-plate began to be actively used as adornments in the Danube River basin at the BrA1a stage [Kadrow 2001: 92]. Multiple tubes constituting parts of necklaces were also found among adornments of the

Table 1

Radiocarbon Chornology of Graves of the cemetry at Strelitsa

No	Monument, object	Lab Number	BP	Cal. BC -1 sigma	Literature
1	Strelitsa / grave 53 ?	Ki-6588	3515±60	1920-1760	Kryvaltsevich, Kovalyukh 1999
2	Strelitsa / grave 43 ?	Ki-6586	3500±60	1900-1750	Kryvaltsevich, Kovalyukh 1999
3	Strelitsa / grave 53 ?	Ki-6587	3460±70	1870-1690	Kryvaltsevich, Kovalyukh 1999
4	Strelitsa / grave 56 ?	Ki-6589	3440±55	1850-1680	Kryvaltsevich, Kovalyukh 1999
5	Strelitsa / grave 14 ?	Ki-6585	3425±45	1830-1680	Kryvaltsevich, Kovalyukh 1999

Catacomb cultures [Artemenko 1976: 92]. Traces of a belt consisting of 5-6 copper tubes were found in a child's grave in the Vorokovo burial site of the Fatianovo culture [Kraynov 1972: 163]. Most probably, taking into account the raw materials used, and also the direction of the exchange communications, the emergence of a belt with copper tubes in the Strelitsa could occur as a result of direct involvement of groups of the population of the epi-Corded Ware circum-Carpathian complex.

A relative chronology of most of the burial complexes of Strelitsa, including graves 53, 43, does not contradict the received radiocarbon data. Because of the odd nature of the collections of Strelitsa, it is not known for certain that specific dated materials belong to specific graves; therefore, the results obtained should be seen as an array of dates for the burial site [Kryvaltsevich, Kovalyukh 1999: 151-162]. By the ^{14}C-chronology, the intervals of the dates received for the Strelitsa fall within 1900-1600 BC (Table 1).

In general, analysing MDC metal objects, it should be noted that their absolute majority could have arrived to the Upper Dnieper area in late 3000 – early 2000 BC, i.e., at the late stage of development of the MDC. The main intermediaries and suppliers of the early metal goods were the neighbouring population of the Catacomb cultures as well as communities of the epi-Corded Ware circum-Carpathian culture complex. In both cases, the Dnieper River was most probably the main route by which relatively scarce copper and bronze objects arrived to the Upper Dnieper area from the South-West, South and South-East. Their dissemination further north to the upper current of the Dnieper, to the Sozh River could occur from the south from the Middle Dnieper area (Fig. 4). Probably some MDC groups in the Upper Dnieper area received metal objects due to their connections with the Middle Dnieper communities. Most such metal objects are found in the graves of the Khodosovichi barrow cemetries and in graves of the Strelitsa. In this connection, it should be noted that the Khodosovichi burial mounds contain metal objects of both the Catacomb and the Pre-Carpathian origins, while the Strelitsa mainly contains metal objects that probably were brought in with the involvement of communities of the epi-Corded Ware circum-Carpathian complex (mainly, the "wire and

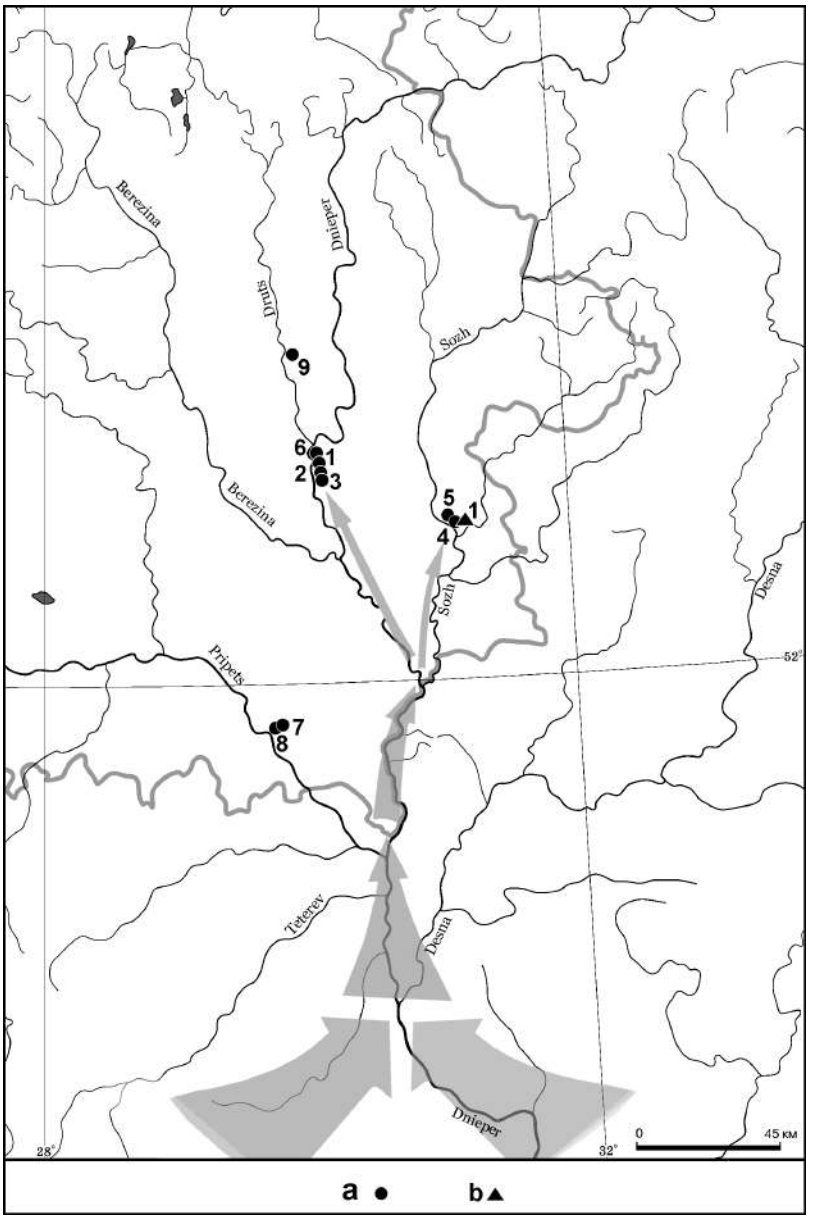

Fig. 4. The Dnieper route of dissemination of metal objects to the Upper Dnieper area in the late 3000 – early 2000 BC. The metal objects (a), one faience and one glass beads (b) in the monuments of the Middle Dnieper Culture. Metal objects (a) in the monuments include: 1 – barrow cemetry Khodosovichi-Moshka; 2 – barrow at Khodosovichi – Palyk; 3 – barrow cemetry at Khodosovichi – Sergeyeva Griva; 4 – flate grave cemetry at Strelitsa; 5 – flat grave cemetry at Proletarskiy; 6 – flat grave at Prorva 2; 7 – Borysovshchyna (accidental find); 8 – Tulgovichi (accidental find); 9 – Kalichonki (accidental find). Faience and glass beads found in the (b): 1 – flat grave cemetry at Strelitsa

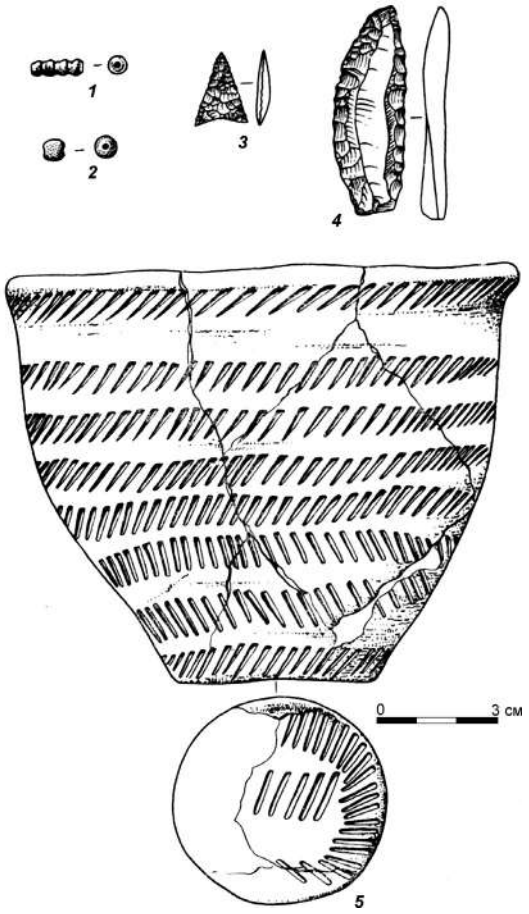

Fig. 5. Flat grave cemetry at Strelitsa, Rogachev District. Grave-goods of the grave 40 [after Atrmenko 1967; 1976]. 1 – faience, 2 – glass, 3 – 4 flint–; 5 – ceramics

tin-plate" technology, the use of the relevant raw materials, typological similarity). Moreover, most of the Strelitsa graves have a relatively late chronology [compare also Artemenko 1976; 1987a]. It should be kept in mind that the issue of emergence of indigenous metal processing in MDC communities remains topical and so far unresolved, as has been repeatedly discussed in archaeological literature [see for instance, Artemenko 1967: 37–40; 1987b: 15; Klochko 1994a; 2001a]. Meanwhile, it becomes absolutely clear that the local metal production could develop only in direct dependence on the metallurgy of the Catacomb cultures and the cultures of the Pre-Carpathian area, the Podolia and the Volhynia.

Faience and glass beads (Fig. 5: 1, 2) should also be regarded as expensive adornments brought to the Upper Dnieper area and, most probably, connected with the movement of prestigious objects by the Dnieper route. The four-segment and globular beads belonged to the grave-goods found in grave 40 of the Strelitsa cemetry [Artemenko 1967; 1976].

A major concentration of faience beads was registered in monuments of the Bronze Age of Central and Central-Eastern Europe [Bouzek 1985: 50-60; Kadrow 1995b: 86; 2001: 197, 198; Robinson *et al.* 2004]. There are reasons to assume that their local production emerged in Central Europe [see, for instance, Robinson *et al.* 2004]. In the Carpathian region faience beads emerged in the beginning of the Br A1b period or even in the very end of Br A1a. They could be classed into several types by their shapes, including the globular and four-segment ones. A large number of faience beads were found in the complexes of the Mierzanowice and the Strzyżów cultures [Kadrow 1995b: 86-89; 2001: 195; Robinson *et al.* 2004]. In those cultures they were one of the most common elements of the burial sets of objects.

The import of faience beads to the Upper Dnieper area came most probably from the epi-Corded Ware circum-Carpathian complex, where that kind of adornment, including those of multi-segmented shape, was widely spread. Some other prestigious goods were also brought from the Pre-Carpathian area and the Volhynia, as mentioned above. In the Pre-Carpathian area, faience beads occur very often in the graves containing objects made of copper and bronze. They are accompanied with adornments made of other materials: shells, bone, and amber. According to some specialists, faience beads had relatively high status significance, only slightly less valuable than metal [see, for instance, Kadrow 1995b; 2001; Baczyńska 1994]. In the Upper Dnieper area of Strelitsa, faience beads emerged, most probably in the period of their mass proliferation, namely within the development of late groups of the Mierzanowice culture, at the stage of existence of the Strzyżów culture, at the classic stage of the Nitra and Koštany groups, i.e., about BrA1b of the bronze epoch, or even at the very end of Br A1a (in absolute dates, within 2000/1950 – 1600 BC [compare Kadrow 1995b; 2001: 120, 197, 198; Robinson et al. 2004: 123]. The possibility of such direction of cultural connections, including the imports of faience beads, was indicated in his time by I.I. Artemenko [Artemenko 1987b].

Ab. THE DNIEPER ROUTE AND SOME EXOGENIC CULTURAL PHENOMENA IN THE UPPER DNIEPER AREA

The Dnieper was one of the main routes by which the Catacomb cultural traditions came to the Upper Dnieper area. I have already mentioned that some elements of the Catacomb cultures could be observed in MDC burial rites in the

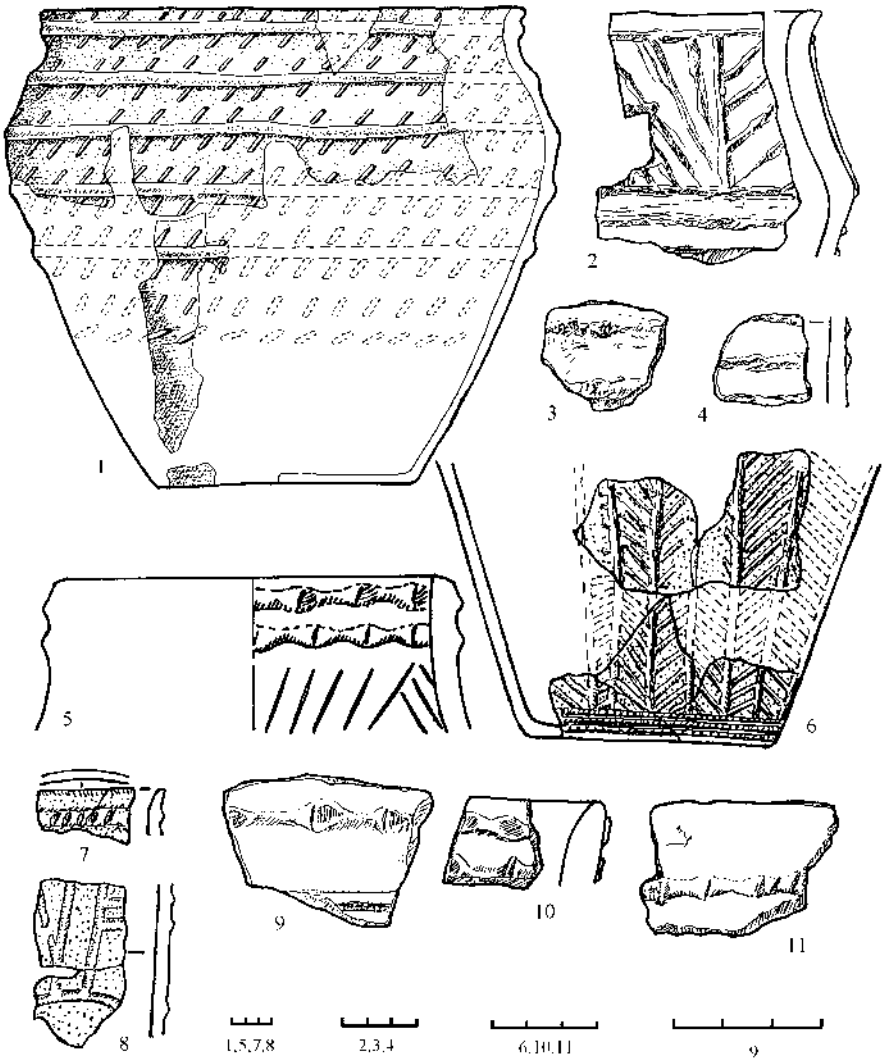

Fig. 6. Mnogovalikovaya pottery from monuments of the Gomel Polessie: 1, 5, 7, 8 – Zaspa 2; 2 – 4, 10, 11 – Abakumovy 1; 6 – Yurovichi 5; 9 – Byvalki – Rubezhnyi Rov

Upper Dnieper area, and there was a certain similarity of types of grave-goods. For example, some Upper Dnieper graves pots had been placed at the bottom of the grave upside down. Some of the MDC grave-goods contain types of drilled stone axes, flit arrow-heads and some other objects that are similar to those in the Catacomb cultures [Kryvaltsevich 2006a: 92–97]. Incidentally found drilled stone axes

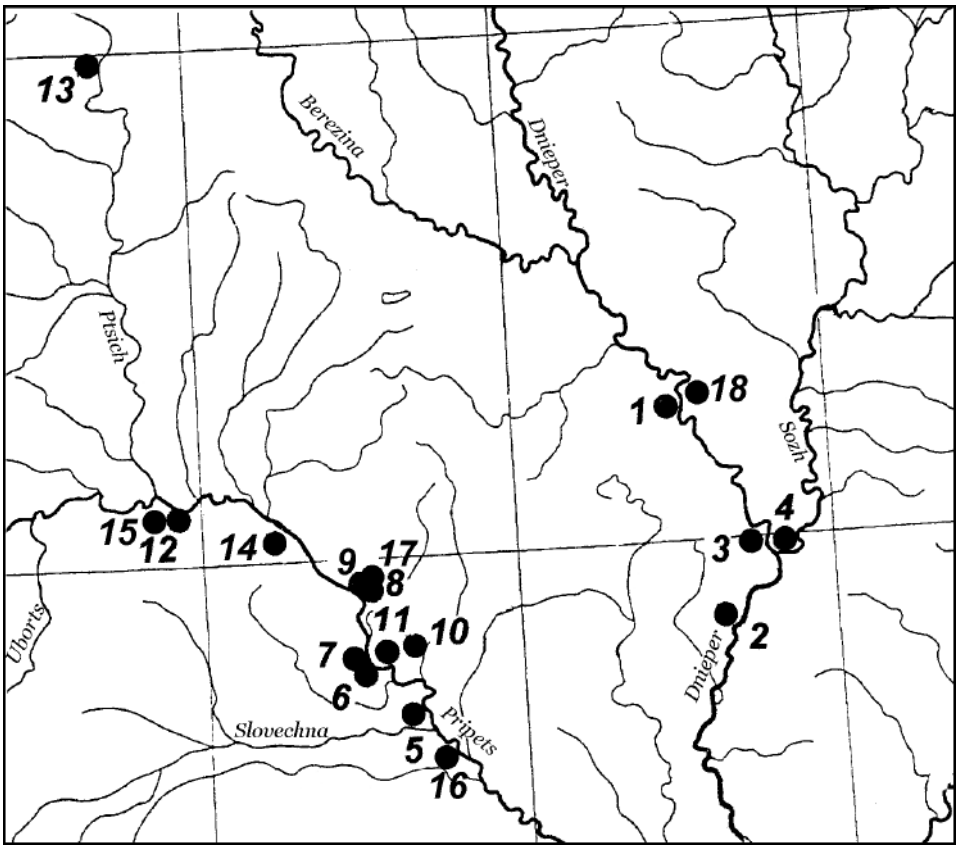

Fig. 7. Map of finds of the "mnogovalikovaya" ceramics in the territory of Belarus: 1 – Zaspa 2; 2 – Byvalki – Rubezhnyi Rov; 3 – Mokhov; 4 – Abakumy 1; 5 – Teshkov 2; 6 – Narovlya; 7 – Narovlya 2; 8 – Yurovichi 3; 9 – Yurovichi 5; 10 – Tulgovichi; 11 – Lomysh 2; 12 – Zhakhovichi; 13 – Borysovshchina; 14 – Mozyr; 15 – Yasynets; 16 – Dernovichi – Glinishche; 17 – Yurovichi, 18 – Belyi Bereg

with decorative elements typical for axes of the Catacomb cultures were registered in the Gomel Dnieper area (see, for instance, Fig. 8).

In the Gomel and Mozyr Polessie along the Dnieper, the mouth of the Sozh, as well in the lower current of the Prypiat, there are monuments which contain "*mnogovalikovaya*" pottery of the Babino culture circle or the Mnogovalikovaya Pottery Culture [Kryvaltsevich 2005: 149–156] (Fig. 6, 7). Monuments of the Mnogovalikovaya Pottery Culture were located primarily in the forest – steppe areas from the lower Danube to the Volga. "*Mnogovalikovaya*" pottery was also found in the Pre-Carpathian area and the Volhynia. In the immediate proximity from the Gomel Polessie territory, the "*mnogovalikovaya*" pottery was found in the Middle Dnieper

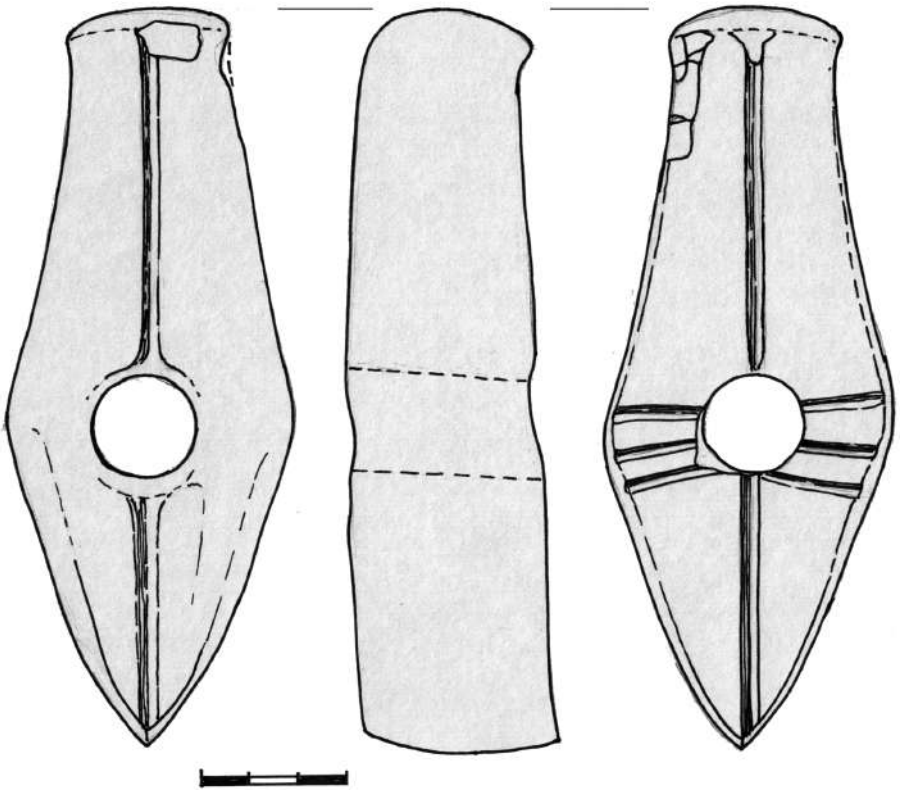

Fig. 8. Stone drilled axe. Prudishche (accidental finds). Funds of the Rechytsky Local History Museum, (No. KII5494)

area, the lower Sejm and the Desna rivers. The Eastern Polessie sites containing the "*mnogovalikovaya*" pottery should be regarded as the most northern points of its occurrence. The objects arrived to the Gomel Polessie from the south by the Dnieper and Prypiat rivers. The radiocarbon dates indicate that the forest – steppe monuments of the Mnogovalikovaya Pottery Culture in the territory of the Middle Dnieper area existed between 2000/1900 and 1600 BC [Klochko *et al.* 1999: 275]. Its proliferation to the Upper Dnieper area probably occurred in the second half of that period.

Materials of the Globular Amphora culture (GAC) were found in the Upper Dnieper area. Also an enclave of the GAC bearers was discovered by the Dnieper near the city of Smolensk (Turinshchina burial site) [Shmidt 1992], dated between 2670 – 2410 BC. The Turinshchina burial complex contains multiple features typical for the central group of the GAC. That allows an assumption that the burial site

emerged as a result of migration of the GAC groups from the Middle Neman area [Szmyt 1999a: 44; 2001: 178, 181]. Traces of the GAC have been known to be present in the Upper Dnieper materials of the MDC [Artemenko 1987b; Szmyt 1999a; Kryvaltsevich 2006a]. It is possible that from mid 3000 BC the "amphorae" traditions could come to the Middle and Upper Dnieper areas from Eastern Volhynia [Szmyt 1999a: 44; 2001: 178, 181]. In that case the Dnieper was the most probable route of their dissemination northwards.

B. THE DNIEPER – DVINA WAY

The Dnieper way continued up to the Dvina River, thus forming a communication corridor up to the Baltic shore. The communication by the Dnieper – Dvina watershed could occur both by the rivers and the ground, including the Orsha heights, where the upper currents of minor tributaries came close to each other. The functioning of the Dnieper – Dvina way can be identified by the relevant imports and exogenic cultural features.

The Baltic import is represented by amber artefacts registered in the territory of Belarus in the WDC and the Northern Belarussian Culture (NBC). In the Upper Dnieper area, amber objects were found in four WDC burial sites (Fig. 10): Khodosovichi – Moshka, barrow 11/1 (key-like ornamented pendant) (Fig. 1: 28); Strelitsa, grave 1 (disk-like ring with a hole in the centre), grave 43 (21 axe-like pendants) (Fig. 3: 24); Proletarskiy, grave 1 (9 axe-like pendants); and Pechkury (20 pendants). Their three key types can be identified (Fig. 9): I – key-shaped; II – a disk-like ring; III – axe-like [Artemenko 1967: 53, 56].

The most significant and rare amber piece of jewellery was a key-like ornamented pendant, found in the "rich" grave 1 of barrow 11 of Khodosovichi – Moshka [Artemenko 1964a: 43, Fig. 9] (Fig. 1:28). One peculiar feature of the artefact was the method of attaching the pendant to the cord. To put the cord through, a deep cavity with drilled holes going to it from the side walls of the upper part of the plaque had been made on the reverse side of the piece of jewellery [Artemenko 1964a: Fig. 11, 30; see also Loze 1979: 115; 2000: 71; Charniauski 2001: 142-143]. Pointing out to the Khodosovichi key-like pendant, I. Loze suggested that it could have been used as a head or neck adornment. Based on the Eastern Baltic material, the researcher identified five groups of amber key-like pendants, classifying them by the methods of constructing the holes for attaching them to the cord [Loze 2000: 70]. The fifth method corresponds with the way used to make the hole on the Khodosovichi amber artefact.

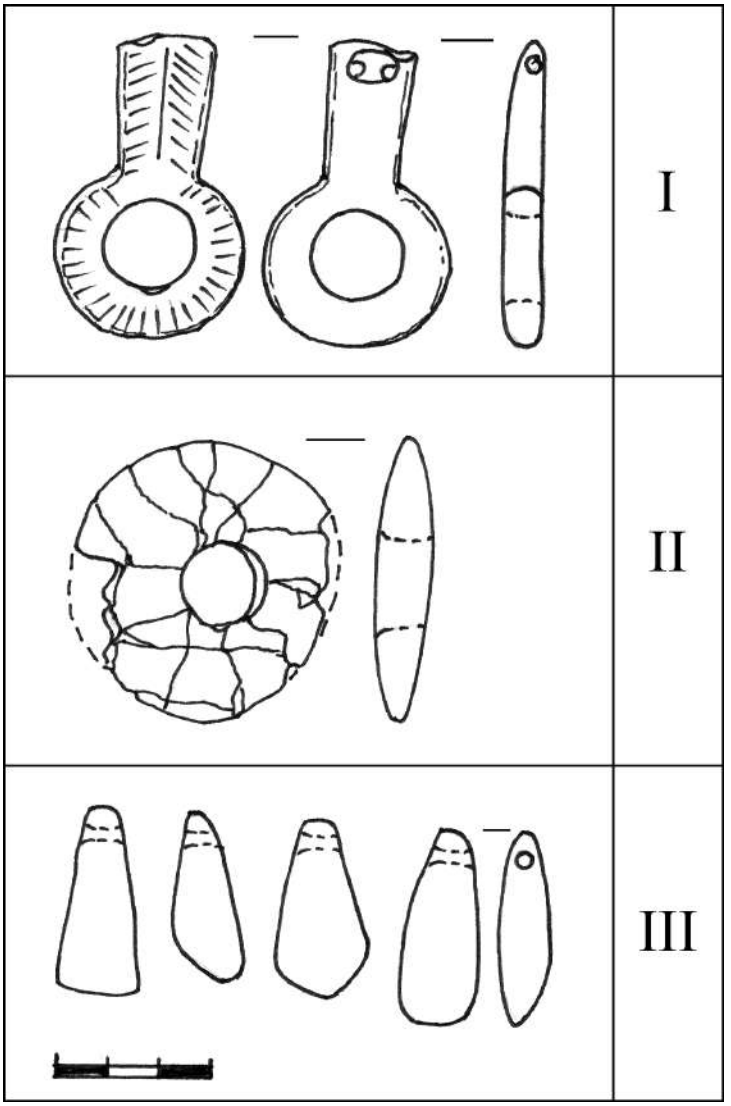

Fig. 9. Upper Dnieper area. Main types of amber artefacts from graves of the Middle Dnieper culture: I) key-shaped; II) disk-like rings; III) axe-shaped

In Abora 1 (Latvia, the Lubanas lowland), key-like amber pendants were found in the layers of late Neolithic and early Bronze age, dated, according to I. Loze, to 2000-1800 BC and 1800-1450 BC, respectively [Loze 2000: 75]. The assumption is that the pendant had been brought to Khodosovichi from the Eastern Baltic area,

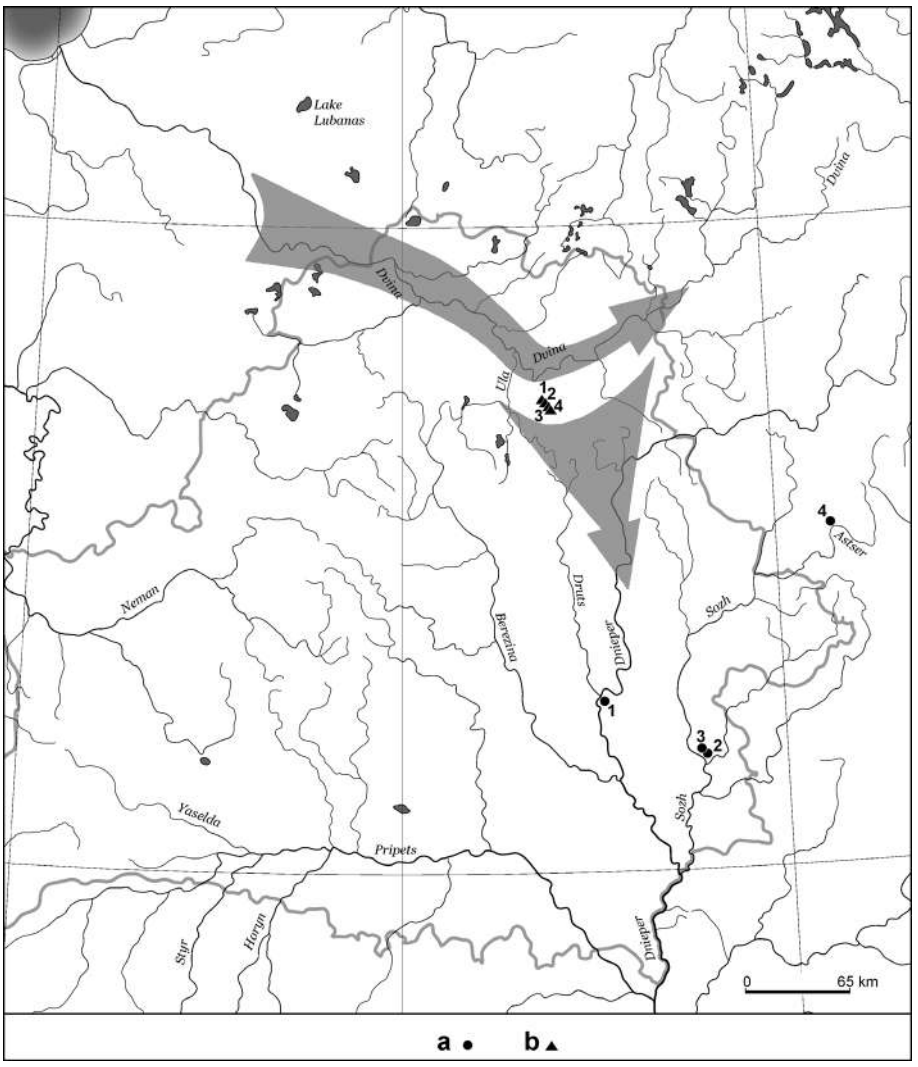

Fig. 10. Dvina – Dnieper route of dissemination of amber artefacts. Monuments of the Middle Dnieper (a) and Northern Belarussian (b) cultures with the finds of amber artefacts: a) 1 – Khodosovichi-Moshka (barrow 11, grave 1); 2 – Strelitsa (graves 1, 43); 3 – Proletarskiy (grave 1); 4 – Pechkury; b) 1 – Krivina 1; 2 – Krivina 2; 3 – Krivina 3; 4 – Osovets 2

most probably from the Middle Dvina basin, specifically from the Lubanas amber processing centre [Loze 2000: 72, 73]. Bone key-like pendants have been known from materials of excavations performed on the peatbog settlements Osovec 2 and 7 (the Krivina River, the Dvina's left tributary). Objects of that type were found there in the

upper part of the cultural layer together with ceramics of the Northern Belarusian Culture (NBC) [Charniauski Mi., Charniauski Ma. 2004: 28-30]. A fragment of an amber key-like pendant with traces of a similar ornament was found in the NBC layers of the Osovec-2 settlement [Charniauski 2001: 143]. Hence, the Khodosovichi amber pendant had been imported from the Eastern Baltic area in the period of the Baltic late Neolithic or the early Bronze Age. The time of use of this jewellery made of axe-shaped pendants (grave 43 of the Strelitsa burial site) corresponds with the period of existence of the copper *"lunulae"* (see above), with which it had been put in the grave. The most probable chronology of both the key-like and the axe-shaped pendants is late 3000 – early 2000 BC. Other types of amber objects from the SC graves (Strelitsa, Proletarskiy, and Pechkury) also have a close analogy in the Baltic monuments of the Neolithic and the early Bronze Age [Artemenko 1967: 56; Charniauski 2001: 143].

A large number of amber adornments and their fragments (about 40 finds) were registered in the Belarussian Dvina area in cultural layers of the NBC settlements of Krivina 1, 2, 3 and Osovec 2 [Charniauski 2001] (Fig. 10). These monuments did not have raw materials and traces of processing of amber. The shapes of the artefacts, traditional for Eastern Baltic monuments of the Neolithic and the early Bronze Age, allow an assumption about imports of ready-made objects to the Belarussian Dvina area from the Eastern Baltic region [Charniauski 2001: 141–144]. Amber proliferated along the Baltic shore to the Dvina River mouth, and further from there by the Dvina, including into the Lubanas Lake basin. The population of the Lubanas lowland acted as intermediaries in the exchange trade between the Baltic Sea shore and regions of North-eastern Europe [Vankina 1970: 112–114, Fig. 145; Gurina 1973: 19–22, Fig. 6; Loze 2000]. Most probably, ready-made amber artefacts were brought to the Upper Dvina area, including the Krivina peatbog settlements, from dwellers of the Lower Dvina area, including from the Lubanas lowland. Also from the Dvina area, some amber pieces of jewellery came to the territory of the Upper Dnieper area. Hence, the Dvina – Dnieper "amber route" functioned in the period of the NBC and the MDC (Fig. 10). At that time, amber moved further to the east and north-east by the Dvina area [see, for instance, Vankina 1970: Fig. 145]. The NBC population groups acted, in that case, as intermediaries in the process of dissemination of amber to the Upper Dnieper area and the Volga – Oka rivers basin.

The evidence of the operation of the Dnieper – Dvina communication direction can be also found in some other data. As a result of cultural connections between the Upper Dnieper population groups of the MDC and the NBC communities, ceramics of relevant types was brought to settlements of the Dvina area. The NBC cultural layers of the Krivina peatbog settlements Osovec 2, 7 contained ceramics, ornamentation and morphology which had direct analogies in the MDC [see, for instance, Kryvaltsevich 2001: 269, Fig. 8:2, 7; Charniauski Ma. 2006a: 186] (Fig. 11:3–5). Materials of the above settlements of the Dvina area sometimes con-

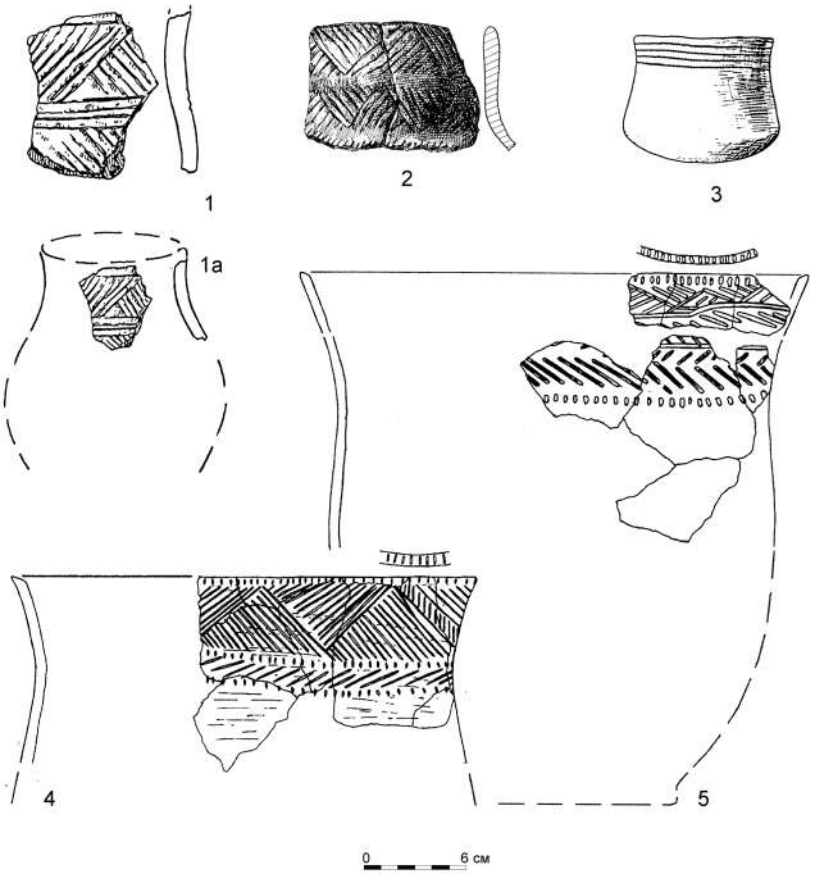

Fig. 11. Ceramics with elements of the Middle Dnieper culture, found in the monuments of the Lubanas lowland (Latvia) (1, 1a – Icha; 2 – Abora 1) and the Krivina peatbog (Belarussian Dvina area) (2 – Osovec 2; 3, 4 – Osovec 7)

tain objects made of the Dnieper area's flint stone (according to Ma. Charniauski). A rectangular in section copper awl was registered among the finds made in Osovec 7 [Charniauski Ma. 2006b: 18, Fig. 1:2]. The closest analogy to it should be sought primarily in the Upper Dnieper MDC complexes.

It is also assumed that the Dvina way was one of the directions by which MDC elements reached the Eastern Baltic region. For example, cultural layers of some settlements of the Lubanas lowland (Latvia) contained corded ware pottery with the *"parquet"* ornament, typical for the MDC [compare, for instance, Loze 1979: 97, Fig. 68, 10, Table XLIII, 10; Krivaltsevich 2003: 112–118] [Fig. 11:1–2]. Thus the Dnieper – Dvina way could be used for the dissemination of traditions of use

of certain types of stone drilled axes (for instance, boat-axes, axes with elongation of a shaft hole), known both in the Baltic region and the Upper Dnieper area [see, for instance, Artemenko 1967; 1987b].

C. THE PRYPIAT WAY

Water routes played the key role in movement of people and goods in the conditions of the swampy lowlands of the Prypiat Polessie. It should be noted the river network of the Prypiat Polessie was convenient for movement both from south to north and from west to east. In the context of the issues researched, attention should be paid to the significance of the Prypiat and its tributaries, which played the role of the main routes by which cultural traditions and ideas moved from the west to the east and from the east to the west. In this case the Prypiat way served as a kind of bridge between the Dnieper, the Bug and the Baltic region.

Some MDC elements were disseminated by the Prypiat way from the Dnieper area and the Eastern Polessie to western districts of the Polessie and the Upper Neman area. Specifically, the MDC features serve as a major component in materials of the south-eastern Neman area (the Shchara River and Upper Neman River basin) [Kryvaltsevich 2001] in the so-called Podgornaya Group [Lakíza 2008: 150–155]. In western areas of the Polessie, materials with the MDC elements have been registered in Yaselda (the Motolskaya group of monuments), Pina (Gnewchicy), Styr (Grivkovichi), Bobrik (the Kamen – Pogost Zagorodsky group of monuments). Ceramics of the mnogovalikovaya pottery of the Babino type came from the south and the south-east by the Dnieper and Prypiat rivers [Kryvaltsevich 2005] (Fig. 7).

The Prypiat way played a significant role in dissemination of traditions of some Central European Neolithic cultures: the Funnel Beaker culture (FBC), the Globular Amphora culture (GAC) and the Corded Ware culture circle (CWCC). Materials with FBC elements were found mainly in western areas of the Polessie, including in the basin of the upper current of the Prypiat [Kryvaltsevich 2004b]. The Prypiat and its tributaries have been the locations of individual finds of ceramics bearing GAC features, as well as finished trapeze-shaped flint axes, rectangular in section, and polished chisels, rectangular in section [Szmyt 1999a; Kryvaltsevich 2004b].

The Prypiat River was one of the most important ways of eastward dissemination of the CWCC traditions. Elements of culture – chronological complexes of central European CWCC groups, including those with traces of the "A-horizon", were identified in the Prypiat and Mozyr Polessie groups of monuments like Zagoryny,

Ozernoye, and Kamen [Kryvaltsevich 2004b: 147–153]. Probably, some elements of the CWCC came by the Prypiat Polessie to the Upper Dnieper area.

At the same time, it should be noted that the role and significance of the Prypiat in the eastward movement of the FBC, the GAC and the CWCC remains an under-explored issue. The arrival of some types of flint artefacts (axes, sickles, spearheads etc.), of high-quality raw flint and stone materials to some areas of the Prypiat Polessie also has not been researched. The above refers primarily to the Polessie territories where those raw materials are not present.

CONCLUSION

The watershed zone between the river basins of the Baltic and Black seas extended to the territory of Belarus. This geographical phenomenon contributed to making close contacts between cultures of the Baltic and the Dnieper areas. In the context of studying communication routes, a major significance is attached to the fact that the MDC burial sites studied in the Upper Dnieper area included individual graves that contained prestigious goods, weapons and jewellery, expensive goods brought from far-away territories. The emergence of "rich" burial complexes and accumulation of prestigious imported goods in the above is a proof of deepening social differentiation and the rise of the elite in communities of the Upper Dnieper area. It should be assumed that one of the functions of the emergent elite was the organization and control of communications by which imported goods, primarily the early metals, arrived. The Dnieper was the main way by which relatively rare copper and bronze objects came from the south-west (from communities of the epi-Corded Ware circum-Carpathian complex), the south and the south-east (from communities of the Catacomb cultures) to the Upper Dnieper area. Their northward proliferation to the upper current of the Dnieper, to the Sozh, probably occurred from the south, from the Middle Dnieper area (Fig. 4). The absolute majority of such objects could have arrived to the Upper Dnieper area in the late 3000 – early 2000 BC, i.e., at the late stage of development of the MDC.

The Mnogovalikovaya Pottery culture (the Babino-type culture circle) was disseminated to the Gomel Polessie by the Dnieper and Prypiat rivers in early 2000 BC (Fig. 7). The Globular Amphorae culture proliferated into the Middle and Upper Dnieper area from the mid-3000 BC. It may be assumed therefore that the Dnieper was one of the ways by which bearers of the Globular Amphorae culture moved to the Upper Dnieper area.

In late 3000 – early 2000 BC, a particular role was played by the import of amber objects from the Eastern Baltic region to the MDC population of the Upper Dnieper area. With the intermediary role performed by NBC communities, amber came to the Upper Dnieper area by the Dvina – Dnieper way (Fig. 10). That way was also marked by the proliferation of some MDC elements to the Dvina area. Their presence is registered in the NBC (the Krivina peatbog settlements), as well as in the Corded Ware population groups of the Eastern Baltic region (for instance, in the Lubanas lowland).

The Prypiat way played an important role in the period 3000 BC to the first centuries of 2000 BC. The MDC traditions proliferated from the Dnieper area and the Eastern Polessie by the Prypiat and its tributaries, to the Upper Neman area and the Western Polessie. Bearers of the Mnogovalikovaya Pottery Culture (the Babino-type culture circle) came from the south and south-east, by the Dnieper and Prypiat rivers up to the Mozyr ridge. The Prypiat and its tributaries were one of the ways of eastward dissemination of particular Central European cultural traditions such as the Funnel Beaker culture (FBC), Globular Amphora culture (GAC) and the Corded Ware culture circle (CWCC).

Translated by Inna Pidluska

Baltic-Pontic Studies
vol. 14: 2009, 462-474
PL ISSN 1231-0344

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THE BRONZE AGE COMMUNICATION ROUTE SYSTEM IN THE NORTHERN PONTIC AREA

The article contains a summary of conditions and factors in the emergence of a communication network of routes in the Northern Pontic area in the Bronze Age.

As early as in the Paleometal Age, the territory of Ukraine provided people with significant facilities and advantages for long-distance migrations. Massive but confined forests to the south of the Polissya, a vast network of rivers, and the water surfaces open and convenient for travelling, encouraged mobility as a way of life for individual local communities as well as numerous tribes and peoples. Certain shortages of resources for instance, or coloured metal ores, encouraged the populations to search for them elsewhere and to wage wars for control over rich deposits. An established and regulated movement of people and raw materials to long distances would have been too complicated without convenient and familiar communication routes. Dissemination of certain types of artifacts, technological innovations and migrations should be made easier by a system of latitudal, meridional and diagonal routes. Ukraine's geographic specificity allowed – and allows today – vast use of water routes for meridional movements, while the latitudal relocation certainly required land routes. The water resources of small rivers flowing latitudally, (the rivers Prypiat, Sejm, Ros, Samara and others) could be used only partially for movements from the east to the west and vice versa.

The history of studying communication routes in the Bronze Age context dates back over 50 years. M. Gimbutas was probably the first to draw the directions of long-distance communication routes ca. 2000 BC on the map of Ukraine, when doing research on amber transportation routes. She marked the Black Sea route from the mouth of the Prut River to the Dnieper-Bug lagoon, the Dniester route that went to the Sjan river with a branch leading to the upper Western Bug, and a diagonal route from the Bug near the Shatski Lakes, along the Prypiat and Middle

Dnieper rivers down to the Rapids and further by the Samara River and across the Donets ridge to the mouth of the Don [Gimbutas 1965].

While mapping the finds of treasures of the Late Bronze Age of the Carpathian-Transsilvanian origin, Ukrainian researchers marked a land route from the Reni crossing across the Danube, by-passing the lagoons to the north-east of the middle Southern Bug and further by the Ingul and Ingulets rivers to the Nikopol – Kamyanka-Dniprovska crossing. From there, along the Konka River (the Orikhove hoard) to the Donets ridge and the descent to the Siversky Donets floodplain to the mouth of the Aydar River, the place of discovery of the Carpathian-Transsilvanian artefacts [Subotin, Chernyakov 1982: 21, Fig. 5]. Motsya and Khalikov explored options of migration from the upper Volga Kazan area westwards, and restored a medieval trading route from town of Bulgar (capital of Volga Bulgaria) to the capital city of Kiev. Based on the direction of the westward spread of Sejm artefacts, Khalikov assumed that the use of such a route had started as early as in the Bronze Age [Motsya, Khalikov 1989: 143-149, Fig. 1-2]. In turn, J. Kobal justified the existence of a network of Transcarpathian communication routes in the Bronze Age, and located them at the Uzhotsky, Middle Veretsky and Volovets passes leading to the pre-Carpathian area [Kobal 1993: 126-128, Fig. 69]. V.I. Klochko marked the Late Bronze amber route along the Southern Bug [Klochko 1996: 129-131; 2007: 176, Fig. 11] while M. Bandarivsky [Bandarivsky 2006: 43, Fig. 5] proposed his version of a land amber route between the Bug-Bog and the Dniester. When mapping the finds of fluted stone maces, A. Kośko identified an exchange trade route along the Southern Bug leading to the Western Bug, the Ingul route towards the Middle Dnieper, the Upper Dnieper route with branches to the Nieman, Daugava, and Volga rivers, the Lower Dnieper section of the route from the Samara river mouth to the land route over the Sea of Azov, going to the Lower Don river and further to the Lower and Middle Volga as far as the Zhiguli area [Kośko 2002: 68-72, Fig. 22].

D. Anthony proposed a global approach to the issue of communication routes by formulating the concept of a "Eurasian steppe bridge" that had began operating between 2000 and 1700 BC:

> The development of the Srubnaya and Andronovo cultures opened a steppe bridge and generated significant trans-continental exchange. Cart, chariot, bronze metallurgy and a variety of weaponry technologies were among the first to emerge [Antony 1998: 94].

That bridge could not possibly function outside the territory of Ukraine. Geopolitically as Ukraine remains a kind of "bridge" between the East and the West. A number of our studies, based on mapping the chariot-warrior burial complexes that allowed drawing a specific forest-steppe route by the forest [Otroshchenko 2007: 212] looked into the routes of operation of the hypothetic "Eurasian steppe

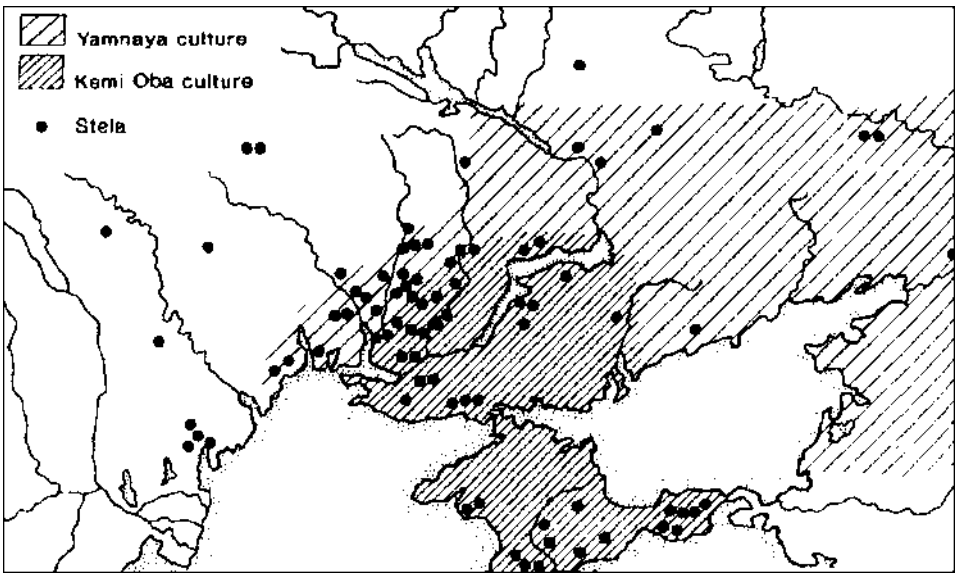

Fig. 1. Anthropomorphous stellae of Ukraine in 3000 BC [after Telegin, Potekhina 1998]

bridge". Mapping the spread of cone-bottomed riveted bronze cauldrons helped to confirm the forest-steppe route and outline the steppe (sea-shore) transcontinental routes [Otroshchenko, Tupchienko 2005: 182, Fig. 9]. S.D. Lysenko land-marked the Kiev-Fastiv sector of the northern branch of the trans-European forest-steppe route that had run by an important archaeological complex near Malopolovetske village in the Fastiv district of the Kiev region [Lysenko 2005: 114-117].

The studies quoted above and others, provide grounds for some generalization. A number of factors objectively contributed to the development of a network of Bronze Age communication routes. Among them, first of all, let us note the practice of active building of burial mounds, kurgans, from the second half of 4000 BC onwards. The burial mounds were built in places where they could be well seen, along land roads, philosophically the latter were connected with post-mortal travelling of the dead. Some of those mounds had been built for several centuries to reach over 10 metres high (e.g., the Tsareva Mohyla (Tzar's Grave) in Kryvyi Rig, the Tyahunova Mohyla in the south of the Dnipropetrovsk district, the Persha Starosilska Mohyla in the north of the Kherson region, the Vysoka Mohyla in Zaporizhya, the Kulyab-Mohyla at the Molochna river, the Pershokostyantynivska Mohyla near Perekop and others).

Generally, building the burial mounds demanded significant inputs of labour and could not be done without a network of routes leading to the construction sites.

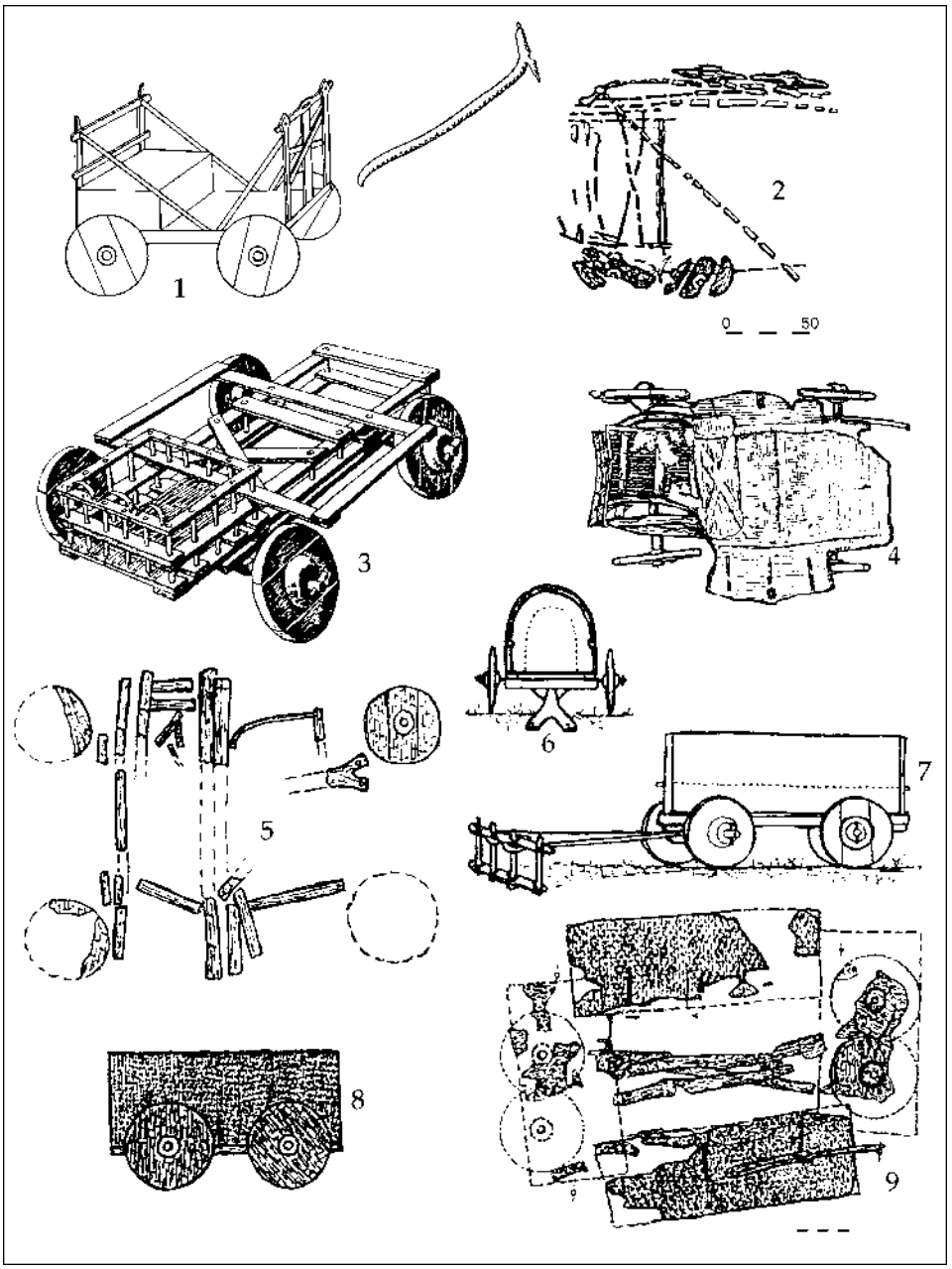

Fig. 2. Debris of wooden carts and their reconstructions from graves of the Yamnaya (3-9) and the Catacomb (1-2) communities: 1-2 – Kamyanka – Dniprovska, barrow 11, grave 9, 3-4 – Ostanniy– barrow 1, grave 150, 5-6 – Lukianivska Mohyla, grave 1, 7-8 – Pysarivka, barrow 6, grave 2 [after Kulbaka, Kachur 2000]. Reconstructions: L.A. Chernykh (1, 2), O.M. Gei (3, 4), O.O. Melnyk, I.L. Serdiukova (5-7), M.R. Potupchyk (8, 9)

Fig. 3. Europe's oldest battle chariot, based on materials from the Volga – Ural area [reconstruction by Kuznetsov 2006]

While at the beginning the burial mounds were built along the existing routes, later on, new routes were positioned by the existing burial mounds. Generally, as time passed by, barrows and routes became constituents of the communication system. Therefore, major barrows became visible landmarks at the communication routes.

The tradition of placing stone idols within the sacral space of the burial mounds, also known since mid 4000 BC, brought in new elements to recognition of objects in the steppe orientation landmark system. A map of location of anthropomorphous stellae dating back to 3000 BC [Telegin, Potekhina 1998: 5, Fig. 1] prove that the stellae not only outlined the areas of the Yamnaya and Kemi-Oba cultures

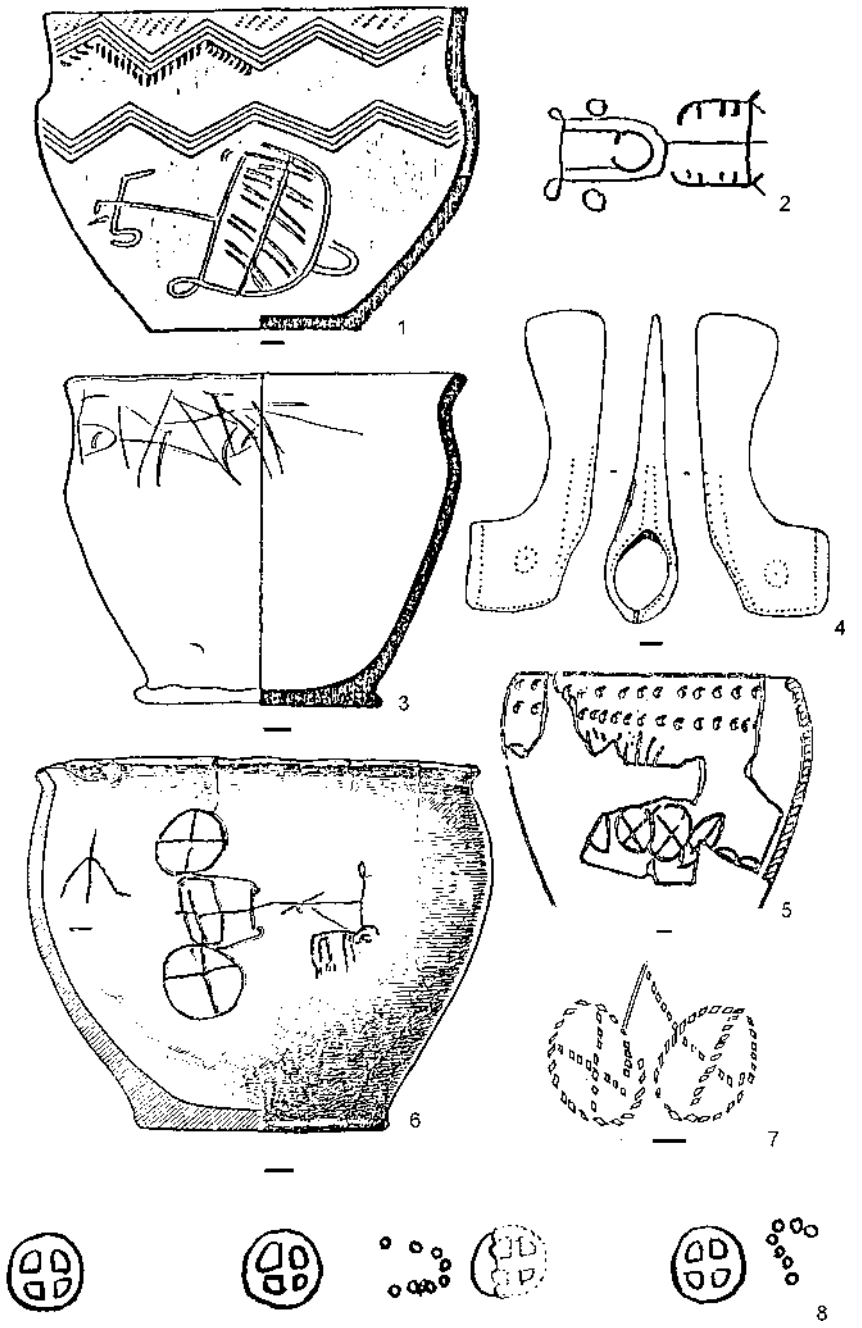

Fig. 4. Drawings of chariots: 1 – Spaske, 2 – Torrejón el Rubio (Spain), 3 – Nikolske, 4 – Baranovsky 1, 5 – Sukha Mechetka, 6 – Sukha Saratovka, 7 – Lvove, 8 – Mariupol. 1, 3, 5-8 – ceramics, 2 – stone, 4 – bronze

in the upper Black Sea region but also, in a certain way, mark the directions of communication routes (Fig. 1). Hence, a broad system of topographical milestones and landmarks developed in the course of centuries. This allowed steppe dwellers to travel with confidence in their visually endless space. Thousands of barrows built in 3000 BC made a substantial contribution to artificial and natural landmarks of the Eneolith. Since then, wandering craftsmen and merchants could travel not only by water and along rivers, but confidently move deep into the steppe, making their routes through generally dry and initially unpopulated areas between the rivers.

Polish researchers identify a trio of inventions – a horse, a cart and roads – that led to fundamental consequences in the system of transportation means and communications in the area between the Vistula and Oder rivers in the second half of 4000 – 3000 BC [Czebreszuk *et al.* 2008: 47-52]. In the territories of the Ukrainian Steppe each of the above discoveries were manifested in a more evident way. Before long, the transportation means and their individual parts became components of burial rites. Within the second half of 4000 BC, ox-drawn carts on disk wheels began to spread in the circum-Pontic area. Usually parts of disassembled carts are found during excavations of major graves, particularly noticeable in the Steppe [Shylov 1977; Kulbaka, Kachur 2000: 12-33, Fig. 1-6].

The tradition to accompany particularly prominent tribesmen with wheels or at least with their parts became popular in the Early Bronze Age among the Yamnaya culture populations (Fig. 2: 3-8). To a rather smaller extent it was also present in the graves of populations of Middle Bronze Catacomb cultures (Fig. 2: 1-2). There is evidence that means of transportation were also used in burial rites of the Babyno and Srubnaya populations, the Sabatinovka and Belozerka cultures of the Late Bronze Age [Litvinenko 1997: 5-8, Fig. 1-20]. At the turn of 3000 – 2000 BC, horse-drawn light carts on spoke wheels emerge and rather quickly spread around the Ancient World [Kuznetsov 2006: 638-645]. Such lightly-built vehicles of migration required steady routes (Fig. 3). Therefore, transportation means, as well as their elements, models of wheels and covered wagons and, after all, drawings of carts and chariots were used in burial rites (Fig. 4).

Excavation materials provide scarce but rather telling facts of fixation of fragments of routes. Sectors of wooden roads that crossed swamps and marshlands, found in the valleys of the Bachorza and Noteć rivers in the Kujawy area, are related to the Globular Amphorae culture (ca. 3050-2600 BC) [Czebreszuk *et al.* 2008: 51].

Studies of steppe barrows allow identification of other kinds of ancient routes of the Bronze Age. Ramps, leading to an altar at the top of the burial mound, made in the form of a road up to 8 meters wide, cobbled with stone slabs, crushed stone, and going further up as a soil road, were found and studied in Barrow 3 near the village of Vynohradne at the Molochna River [Pustovalov 1999: 108-111, Fig. 2].

A fragment of a double-track earth road was found under an oval burial mound 7 of the Late Bronze Age (Berezhnovka–Mayovka Srubnaya culture) at the

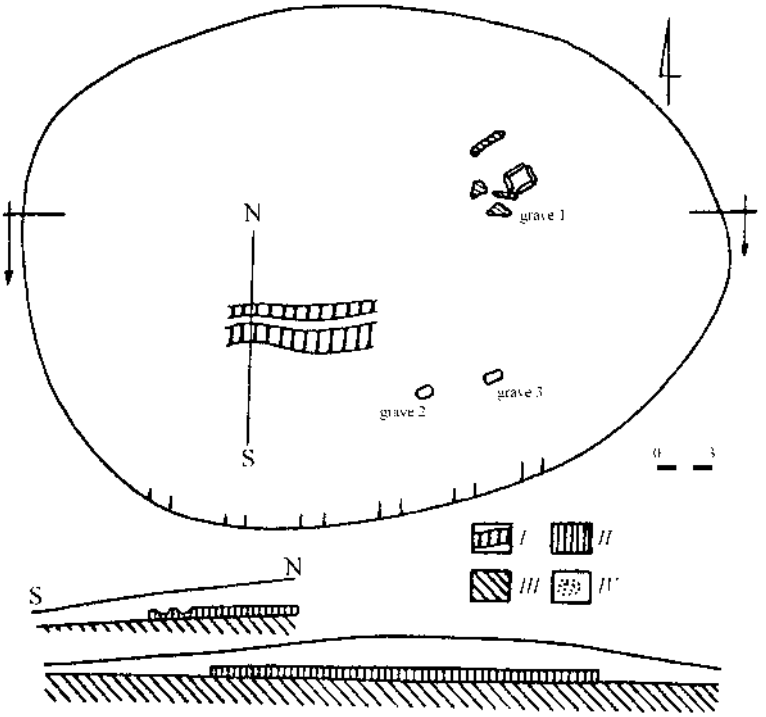

Fig. 5. Section of an earth road under the burial mound No. 7 in the Ryasni Mohyly group near village Balky, Zaporizhya district. Legend: I – track, II – level of the ancient surface under the mound, III – exit of mainland clay

ancient horizon level. The long axis of that burial mound near the village of Balky, Zaporizhya district, coincided with the direction of the road (west – east), and the graves were made along that road. The total width of the road was 2.6 meters, the distance between the "tracks" was 0.6 meters (Fig. 5) [Otroshchenko *et al.* 1977: 57, Fig. 26]. A fragment of a road of the same size was traced under the burial mound of grave 6 near the village Vysoke of the Zaporizhya district. There the mound was also oval and oriented along the road [Rassamakin 1992: 131-133, Fig. 6-7]. Hence, during the Bronze Age on the territory of Ukraine there were routinely used roads, closely connected with the system of burial monuments, the *kurgan* barrows.

The existence of roads and mystic perception of their special role in the system of communications led to attempts to attach sacral meaning to a road as an important connection link between the real and beyond-the-grave worlds. In this context let us note the practice of building ensembles of so-called "long

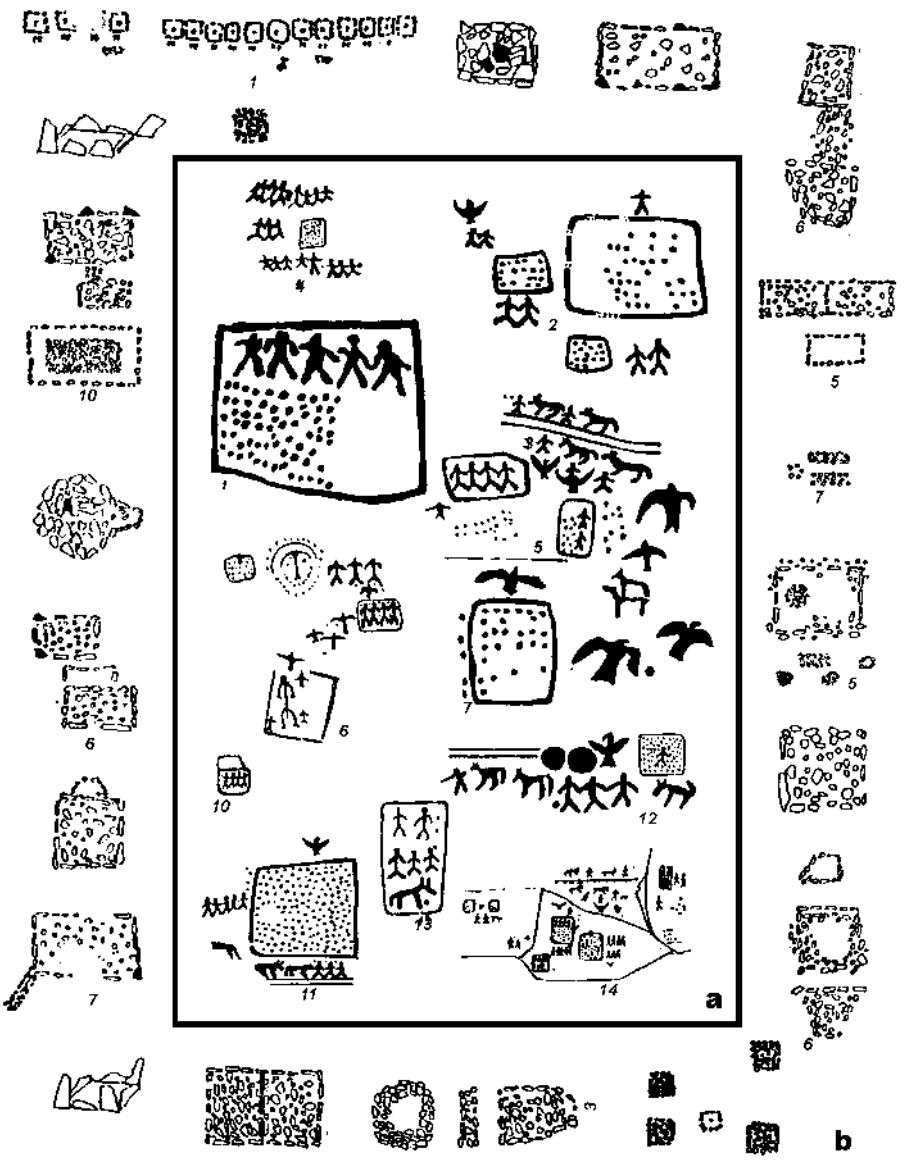

Fig. 6. Ancient routes in the context of burial constructions. Petrogliphs of Mongolia (a) and slab tiling stone burial constructions (b), which inspired the painters [after Akulov 1996]

barrows" along the roads. Particularly interesting are the long barrows of the second type (dumb-bell-shaped) that consist of two round-shaped mounds linked with a trapeze-shaped "wall" link. The ridge of the "wall" link was flattened, its slopes were fortified (decorated) with slabs of limestone or mainland clay. Therefore, a part of the sacral way that linked the graves, placed close to each other, and artificially raised above the field level could model conditions of transition of the deceased to the other world [Otroshchenko 1976: 16-18]. It was also assumed that the tombs surrounded by cromlechs and connected to each other with a stone-paved alley (route) symbolised a chariot with a wide "axis" and "wheels" in projection [Koltukhov *et al.* 1994].

While emphasising the significant role of communication routes in the Bronze Age and efforts to attach sacral meaning to roads, attention should be also paid to efforts to depict the road in art. Obvious materials of this kind can be seen in motifs of petrogliphs found in Mongolia in the area of the Slab Tomb Culture of the Late Bronze and Early Iron Age [Maydar 1981: 41, Fig. at p. 34]. Among those petrogliphs Akulov distinguished drawings of outlines of such slab-paved tombs at the sides of ancient roads, represented by one or two parallel lines (Fig. 6) [Akulov 1996: 123-126, Fig. 1]. The same versions of depicting a road were found in face urns from the slab constructions of graves of the Pomorie culture of Wielkopolska, 6th century BC [*Pradzieje Wielkopolski* 1999: 32-35]. Similar themes could be found in the Bronze Age decoration of pottery and on petrogliphs in the territory of Ukraine.

The practice of building fortified settlements at the crossings of water and land ways became an additional condition for development of hypothetical communication routes. Examples thereof include Mykhailivka and Mala Khortytsya/Baida on the Dnieper River, Leventsovka and Karatayevo in the mouth of the Don, Dykyi Sad and Skelya Kremenchuk at the Southern Bug. Such points were relatively scarce but represent certain "beacons" of the system being reconstructed. The routes, reconstructed by various researchers, lead to fortified settlements. The position of the fortified settlement of Dykyi Sad in the system of reconstructed roads is particularly impressive. Located at the merger point of the Southern Bug and Ingul rivers, Dykyi Sad linked the westward routes to the Dniester and Danube rivers, the north-westward routes along the Southern Bug (Boh) and further to the Western Bug basin, northward routes along the Ingul to the Middle Dnieper area, and eastwards, across the Dnieper lowlands towards the Don, Volga, and the Urals [Gorbenko 2007: 7-12]. While generally agreeing with the network of the routes and directions of exchange operations proposed by colleagues earlier on, I would only stress that left-bank Ukraine eastwards of the Dnieper and northwards of the Donets ridge somewhat drops out of that system.

At the same time, this area contains such important waterways as the Desna and Sejm rivers, the Sula, Psiol, Vorskla, and Orel' rivers, connecting the basins of

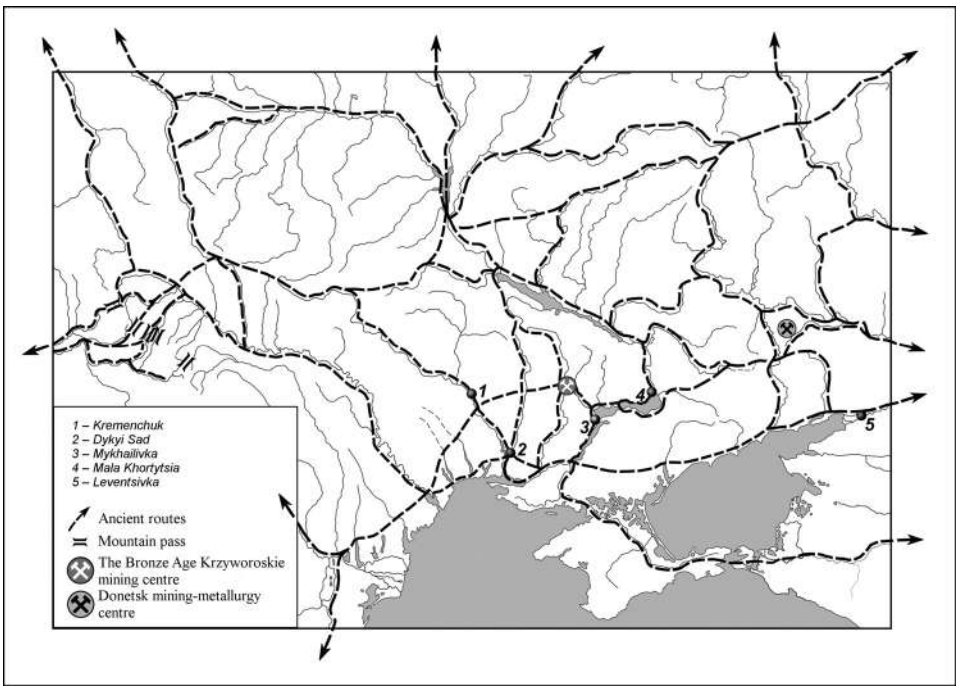

Fig. 7. Map of hypothetical communication routes during the bronze age on the territory of Ukraine

the Dnieper and Don. For some reason, such a strategic river as the Siversky Donets, a core of the western segment of the Don River basin, drops out of the researcher's view. The directions of east-bound migrations of the Yamnaya and Catacomb tribes, and west-bound migration of the Don-Volga Abashevo and Pokrovskaya Srubnaya populations, the ways of dissemination of archaic types of disk-shaped and chamfer-shaped bridle mouthpieces, Sejma bronze artefacts, and hammered pots, all allow outlining a number of important additional routes of the movement of populations, exchange operations and trade. In particular, there should have been land, as well as water communication routes along the Dnieper, Desna, and Sejm, Sula, Orel' and Samara rivers. The land route connected the Lower Dnieper valley through the Steppe Crimea and Cimmerian Bosphorus with the Kuban area. A network of routes circled the Donets mining and metallurgical centre, etc. (Fig. 7).

It is also worth noting the already studied mining and mining-metallurgical centres. Already in the 1970s S.J. Tatarinov, singled out the Donets Basin mining and metallurgical centre [Tatarinov 1977], and I.S. Nikitenko has recently raised the issue of operation of the Kryvyi Rig ore mining centre in the Bronze Age. Like fortified settlements, such centres attracted users of raw materials and ready-made products.

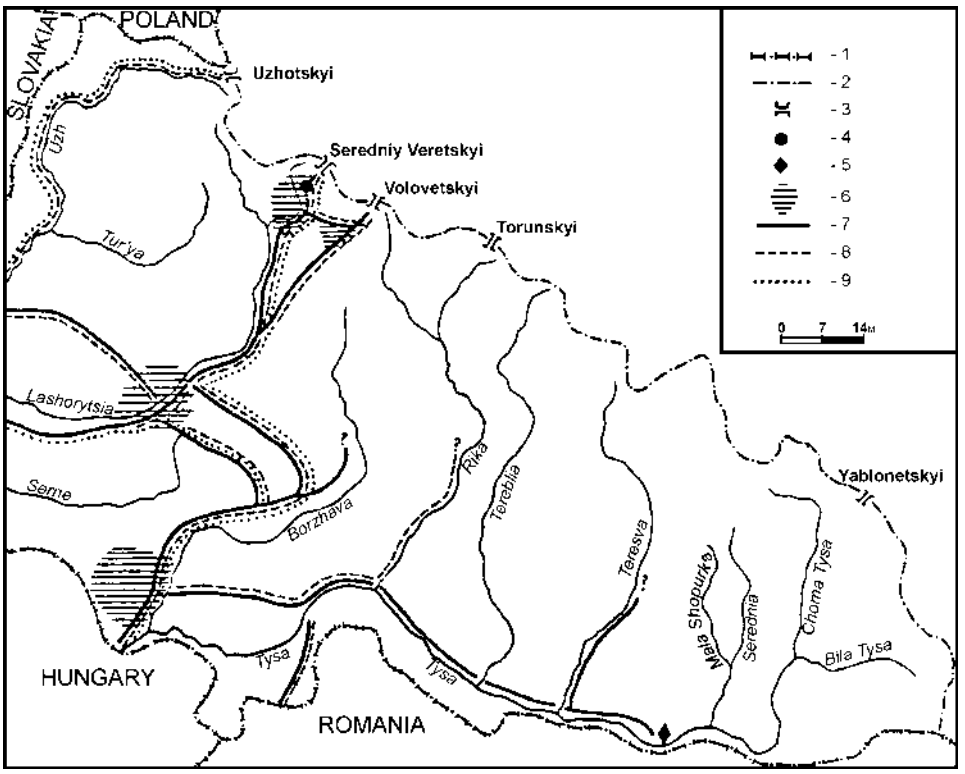

Fig. 8. Map of communication routes of the Transcarpathia in the Late Bronze Age. Legend: 1 – borders between states, 2 – boundaries of Ukraine's regions, 3 – mountain passes, 4 – Zavadka hoard, 5 – Solotvyne salt deposit, 6 – Places of concentration of hoards, communication routes: 7 – Br D period, 8 – Ha A1 period, 9 – Ha A2 period [after Kobal 1993]

They could disseminate their products exclusively bó means of well-established communication routes that were known to consumers of their resources. On the other hand, there should have been contacts between the centres themselves such as the Donets mining - metallurgical centre and the Kryvyi Rig ore mining centre. The latter's role in supplying types of stone required by consumers in different regions of Ukraine has already been clearly described [Nikytenko 2008: 10-16].

Therefore mapping of the found high-demand artifacts inevitably leads us to probable communication ways. These objects can include anthropomorphous stellae, carts, chariots, amber artifacts, ritual (festive) weapons or other "*kleynod*" insignia, welders' workshops and hoards of scrap iron or ready-made products. Hence, mapping cone-bottomed riveted bronze cauldrons other bronze artifacts of the Late Bronze Age allows us to confirm the operation of the sea-shore route from the

mouth of the Prut River along the northern shores of the Black Sea and the Azov Sea, and further from the Lower Don to Lower Volga rivers, turning to the south, towards the latter's delta. The northern chain of finds of such pots takes root from the Volhynia (Antoniny), goes eastwards along the upper current of the Southern Bug, and from there proceeds to the Ros and up to the Dnieper rivers [Otroshchenko, Tupchienko 2005: 182, Fig. 9]. From the Dnieper eastwards, the finds of the pots fit into the direction of the medieval route of Kiev-Bulgar where riveted cauldrons, probably, were spread to the east. The direction of that route from the Dnieper is marked by the Trubizh and Sula rivers. The extreme north-eastern point of finding a cauldron was the village of Bulgar in Bashkirtostan.

Importantly, the middle point on the way between Kiev and Bulgar was fixed in the Don river basin, at the Ertil town in the north of the Voronezh district of Russia. The name of the town is translated from the Turk language as "middle of the way". This fact confirms that the people during that particular period were well informed about long-distance movements. From the Southern Volhynia (Antoniny), there is a way that opens to the Carpathian passes and further to the middle part of the Danube River. A find of principal importance on that way was a treasure found in the village of Zavadka of the Transcarpathian region by the road going down from the Middle Veretsky pass to the Latorytsya River valley (the Danube Basin). The hoard contained a sword of the Sosnovaya Maza type, named after the treasure found at the Middle Volga river nor far from the Kiev–Bulgar route. Importantly, the Middle Veretsky and Volovets passes played a key role in the system of communication routes of the Late Bronze Age (BrD period) in the Transcarpathia, linking that region with the Pre-Carpathia and Greater Ukraine as a whole (Fig. 8) [Kobal 1993: 122-125, Fig. 68]. V.I. Klochko expresses his view on the swords of the Przemyśl type, to which the Volovets finds belongs, however, he recognizes their similarity, in terms of form of the haft, to the Sosnovaya Maza type [Klochko 2006: 273-274, Fig. 112].

Therefore, in 2000 BC the diverse population of the Northern Pontic area already had a certain system of communication routes within the entire Ukraine. It should be noted that the Dykyi Sad fortified settlement in Mykolayiv city was built where important ways at the edge of BrD met HaA1 and that a unique bridge across the moat was found in the settlement [Gorbenko *et al.* 2005]. Further to the south, on the Berezan island (at that time a peninsula), a bronze knife was found, dating back to the time when the building of Dykyi Sad had commenced [Nazarov, Otroshchenko 2008: 123]. Therefore, the Bug–Dniester exit to the Pont, basic for the Northern Pontic area, was controlled by the local population at least from the Late Bronze Age, opening possibilities for maritime communications (at least, the cabotage ones), with the population of the Kobyakovo culture in the Don delta.

Translated by Inna Pidluska

Baltic-Pontic Studies
vol. 14: 2009, 475-489
PL ISSN 1231-0344

Sylwester Czopek

THE ROLE OF THE DNIESTER ROUTE – THE SAN RIVER IN THE BRONZE AND EARLY IRON AGES

The Dniester-San route (perhaps channel to be more precise), using the ample and reasonably wide (40-45 km) pass between the Carpathian and Roztocze mountain ranges, referred to as the Przemyśl Gate[1] [Kondracki 2000: 299], played a significant role in the Bronze and Early Iron Ages. Only up to recently, it was believed that it was in fact the natural environment that decided its 'attractiveness'. This view needs to be definitely questioned, for it is not only the Przemyśl Gate that can be viewed as a region of intercultural contacts that runs south-east and north-west. In support of this proposition it is possible to cite the increasingly numerous finds in the east Lublin district [Kłosińska 2005; 2007a; 2007b], suggesting clearly its ties with Volhynia, understood not only as one of neighbouring relations, but also as an area of intercultural contact in its own right in the territory as a whole.

Specific Carpathian finds could also fit the above scenario, relating to in particular, the early Iron Age [Czopek, Poradyło 2008]. In the light of the most recent research it is equally difficult to maintain the existence of a Carpathian barrier in intercultural contacts. This somewhat weakens the significance of 'nature itself' as far as environmental conditions are concerned but obviously, neither does it mitigate their importance.

The functioning of the Dnieper-San route therefore has twofold significance:

– regional, as an element shaping or exclusively influencing the growth of cultural relations in the San and Dniester river basins

[1] The Przemyśl Gate is a general term. In the physical geographic sense the area between the Carpathian and Roztocze mountain ranges in this particular stretch belongs to the Tarnogród plateau and the valley of the lower San [Wład 1996: 32]. Both mezoregions are part of the Sandomierz basin. Bearing in mind the issue of communication ease, the lower San valley takes on particular significance here.

– global, as an element of a wider 'route' (perhaps direction of ties) running north-west to south-east, i.e. between the Baltic and the Black Seas.

The above points would seem to be complementary but a thorough analysis could produce conflicting results. It is not always the case that factors deciding 'the regionalism' of neighboring structures are so significant that they can be described as 'global'. As a result, there is a fundamental difficulty in determining sources in the research on routes as such.

In the professional literature in Poland this is an issue clearly relating to archaeology in the Roman period. The fundamental point is to answer the question of from what moment can we speak of a functioning route as a communicative artery. Can for example, sporadic finds of imports stand as an indicator? Naturally, the answer here is, not necessarily. Both the repetitive nature and scale are therefore important, as well as (maybe primarily) their causes.

Of no less significance is chronology here, for possible dating of particular historic sites, as also particular phenomena that can be identified as a consequence. The above mentioned example pertaining to the Roman period clearly shows that this question is fundamental [Kokowski 2005: 226-227; see also Wielowiejski 1980: 7]. The trade routes functioning at that time (exchange routes) indicate after all a varying intensity depending on the period, as well as several important political-economic conditions such as the likely role of the Marcomannic wars that brought about the end of the well functioning trade route, but at the same time brought a great wave of war bounty onto the territory of Poland, known as 'Roman imports' that were considered previously, foremost, in the trade category [Kokowski 2005: 253-256].

It is therefore difficult to expect that in the Bronze Age with a significantly lower level of finds and lesser opportunities for contextual studies, to find a precise answer to issues relating to such routes. In essence, it is perhaps possible to eliminate understanding this period of a channel as one where 'merchants' travel, exchanging material goods. Rather, the route in this case is a communication zone that allows (facilitates) relations between groups of peoples living in particular regions. Such a definition in fact fits the vast Przemyśl Gate. It is therefore a great deal easier to research the importance of communication channels so understood for neighbouring regions, than to view their function as part of a wider system.

By way of introduction we should also draw attention to the limitations of sources, namely that our extant knowledge of archaeological materials (all of pre-history and early Middle Ages) from the San basin is significantly greater than that of the Dniester.

This can be observed for that matter in the findings of collaborative Polish-Ukrainian expeditions in this region [Machnik *et al.* 2003; Machnik *et al.* 2005a; 2005b; Machnik *et al.* 2006; Machnik *et al.* 2007], which are discovering materials from pre-history and the Early Middle Ages in the area widely understood as the up-

per Dniester. The artefacts from these periods therefore do not constitute any significant breakthroughs, which means that the well established picture of cultural relations in fact does not change [Gedl 2004: 84]. It is this imbalance in the store of archaeological sources that ought to be borne in mind.

In essence, in all the cultures of the Bronze and Early Iron Ages flourishing in the basins of the San and upper Dniester, mutual contact can be observed. The earliest signs of this (in the Bronze Age) can be understood as the import of copper axes from the San basin (Munina, Rudna Mała)[2], dated to the 3rd millennium BC [Gedl 2000: 4-6]. A south-east direction of influence is suggested, on the outer side of the Carpathian Arch and certainly along the Dniester route where the Mierzanowice culture (MiC) functioned. This culture similar to the Trzciniec, is present in the basin of the upper Dniester [Machnik *et al.* 2005b: 28], demonstrating in this context ties to Małopolska. At the same time, already in this period we can observe Danube-Balkan traits (amphorae derivative of a kantharos vessel, made in the Mierzanowice tradition). The integration (infiltration) of 'northern' and 'southern' traits takes place still earlier in even more defined forms in Podolia (further south-east). J. Machnik and S. Kadrow [Machnik, Kadrow 1997] in this context point to the presence of cultural elements matching those of the Carpathian basin.

This situation continues into the Later Bronze Age, when the Trzciniec-Komarów groups dominated. In the upper basin of the Dniester, the Trzciniec culture (TrC) can be identified, in very similar form to that known from Małopolska, in particular from the San basin. The Komarów culture (KoC), however, (if indeed interpreted correctly) is characterised by the presence of numerous trans-Carpathian ties, even Danube ones. The basic direction of ties in this respect is therefore the same. Here it is important to note the possibility and need for research into the mutual nature of Trzciniec-Komarów relations. In some of the corresponding traits of historical materials the differences are clearly visible, for instance in burial rites or grave inventories. One of the reasons for this can be said to be vessels from the Trzciniec cemetery complex in lower Grodzisk on the middle San [Czopek 2007a: Table. VI, 11], bearing rather precise analogies to one of the barrows in Komarów.

There has been previous mention of general ties of style in other forms (beakers and richly ornamented vase-bowls and goblets) [Dąbrowski 1972: 185; Czopek 2007a: 59; Górski, Makarowicz 2007b: 159]. In this context the natural area of cultural contact is the Dniester-San route, clearly resulting from the territorial range of the Komarów culture [Svieshnikov 1967: Fig. 1]. Further, the finds unearthed by the Polish-Ukrainian expedition in the basin of the upper Dniester definitely point to the Trzciniec culture (Figs. 1-2) [Machnik *et al.* 2005a; 2005b; 2006: 222], which

[2] An important addition to these finds is an intact casting form (for production of similar axes that have ties with the 'east', most likely the Ciscaucasia) found during excavation by Monika Bober recently in Przemyśl, for which we are extremely grateful.

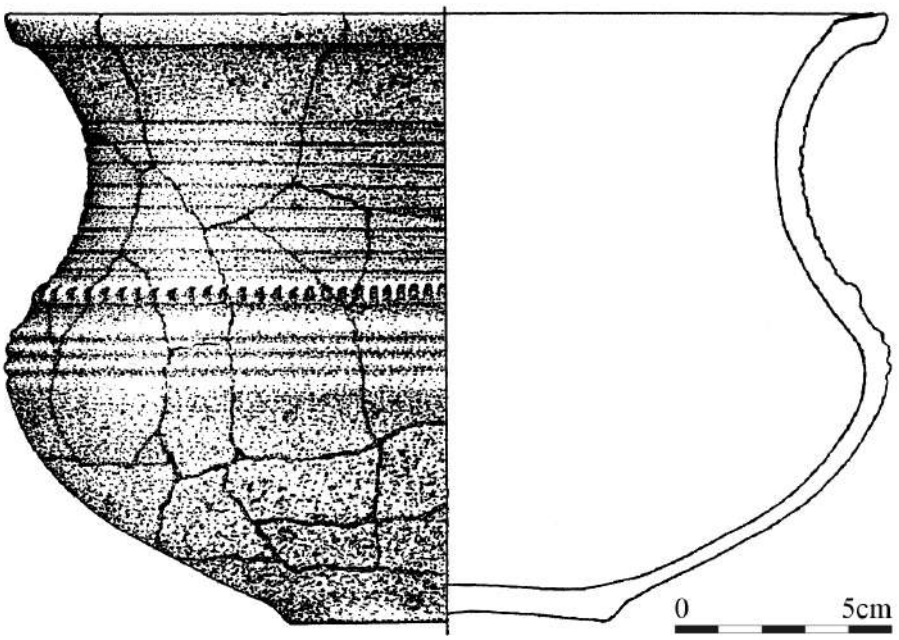

Fig. 1. Byków, Drohobych district, "Bihiivka" site. Funary vessels from the Trzciniec culture [Machnik *et al.* 2007]

is a continuation of the vibrant Trzciniec settlement in the San basin [Dąbrowski 2004: map 1].

If the proposition is accepted that Trzciniec cultural precepts made their way towards the east-west [Górski, Makarowicz 2007b: 148], this relatively early radiocarbon dating (3360±90 BP=1700 BC) gained for the site in Byków near Drohobych [Machnik *et al.* 2006: 222], would seem to indicate the synchronicity of this process in regard to the entire south-east of Poland. It should, however, be noted that the upper Dniester is also considered part of the KoC area [Svieshnikov 1967: 45; Artemenko 1987c: 113). This point naturally requires further research, foremost in respect to field studies.

Moreover, we should note the relatively high homogeneity of materials (especially those not representative of surface research) and main distinctive traits of the KoC and TrC [Dąbrowski 1972: 85; Górski, Makarowicz 2007b: 155-156], reflected for example, in some site specifications and cartograms of Ukrainian researchers who combine these into one, the Komarów-Trzciniec culture (TrC) [Balaguri *et al.* 1990: 60, Fig. 117], which naturally does lend itself to detailed study of their mutual relations.

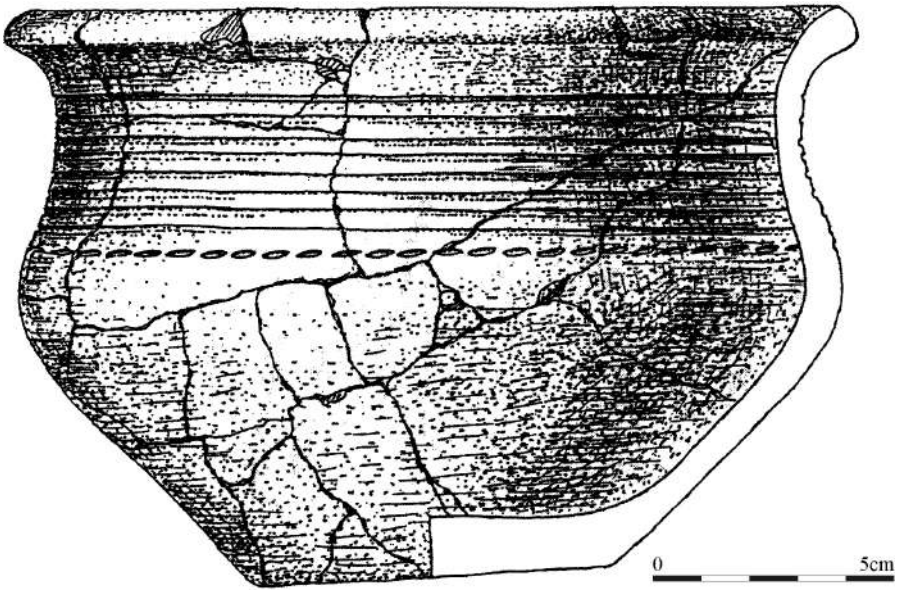

Fig. 2. Byków, Drohobych district, the "Koło Figury" forest retreat. Trzciniec culture vessels from excavations in 2003 [Machnik *et al.* 2005a]

It is possible to maintain therefore that in the period of the TrC the Dniester-San route played an important role and thus to speak of these Trzciniec traits (patterns) filtering through along this route from the north-west towards south-east and southern Komarów in the opposite direction. This could signify the need for an important change in hitherto assumed byways of these cultural influences, in the main, emphasising the Bug route that led towards the Dniester [Górski, Makarowicz 2007b: 163]. Secondly, this route could represent an area of exchange between two independent cultural spheres – that of a Trzciniec and the Komarów.

In the context of the Middle Bronze Age the influence of culture from south-east Poland, recognised as coming from the Noua circle or indirectly from the Noua culture (NoC) [Bukowski 1978], would appear varied in nature. Bronze artefacts are mentioned as standard: 3 small swords from the upper and middle San in Przemyśl, Rożubowice, Jarosław [Bukowski 1976: 21-23, 36-37, 38; 1978; Krushelnytska 1985: 30-39; 2006: 141-143), 2 "daggers" from Ślipcze near Hrubieszów and Ruda Różaniecka near Narol [Czopek 1996: 115; Kłosińska 2009] and an axe from Stary Machnów near Tomaszów Lubelski [Kłosińska 2009].

Their eastern (south-eastern) origin is not disputed but ought to be viewed in the light of ceramic finds. Here, the inventory from grave 180 in Paluchy (TLuC), to be precise, two NoC vases that appear alongside traditional early Tarnobrzeg

materials. The appearance of ceramics [Czopek 2003: 217-219], as confirmed at other sites (Grodzisko Dolne, Lipnik, Machów, Podlodów), has an entirely different significance than individual finds of bronze objects.

It would appear therefore that in this case we have an example of very intensive impact from the south-east, perhaps even that of migratory peoples, which would be indicated by the use of stylistically 'foreign' ceramic ware in burial rites at cemetery complexes of the TLuC. A precise chronology allows for dating between BrD and HaA1. The agglomeration of these finds on the Przemyśl Gate Foreland (San and Roztocze basins), clearly suggests the important role of the San-Dniester, though not entirely, as very suggestively shown by the map in the latest monograph on the Noua culture [Krushelnycka 2006: 4].

There is relatively more data for research into the mutual regional relations in regard to the Middle Bronze Age up to the Early Iron Age. As established thus far, it is during this period that both the TLuC and Wysocko cultures (WyC) are forming. The startling similarity of materials from the middle San and early Wysocko cemetery complex in Petryków near Tarnopol [Bandrivsky 2002] indicates a similar process, to be precise, testifies probably to cultural transformations taking place in a similar context (or the same Trzciniec substratum) [Czopek *et al.* 2005: 76-78; Godlewski 2005; Czopek 2007b: 214-216].

These similarities can be found also in the traits of burial rites (known from the earlier phase of TLuC skeletal graves), as well as similar inventories (pot-like vessels derivative of Trzciniec prototypes, angular cups, bronze artefacts). Among the sites around the San there should also mention be made foremost of the monastery complexes in Paluchy, Manasterz, Chodaczów, Grodzisko Dolne and Wierzawice, which provide a very good analogy for many such materials from cemeteries in Petryków [Czopek *et al.* 2005: Figs. 9-10], which cannot be found in Wysocko sites dated later such as Wysocko and Czechy [Sulimirski 1931].

Apart from formulating a so called 'genetic community' thesis for these peoples, naturally one cannot exclude the existence of mutual ties – but they were rather not cause-effect in nature. The later tempo of development in the WyC as well as TLuC took a sharp turn, which manifested itself most vividly in the form of the San area style evolving further (San vases and Zbydniów bowls) that were so typical for the TLuC at the end of the Bronze and start of the Early Iron Ages. The differences in burial rites are also significant with cremation only, around the San and the so called mixed interment ritual around the WyC.

The stabilisation of cultures in the Late Bronze Age, with the small number of Bronze artefacts and evolution of local stylistic traits in ceramics, is not conducive to examining intercultural contacts along the south-east to north-west axis. In addition, it is difficult to assess to what extent this is simply an apparent hiatus in the relevant sources or to what extent it is in fact a reflection of culture, especially since the field information from the Tarnobrzeg-Wysocko areas is unclear [Gedl 2004: 83-84].

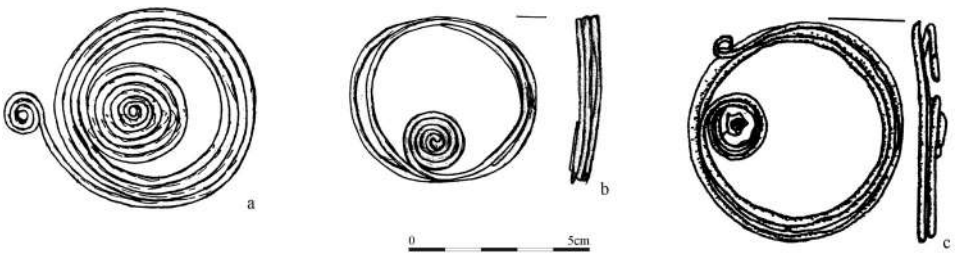

Fig. 3. Wysocko culture (a – Bełżec; Goncharivka) and Tarnobrzeg-Lusatian bronze bracelets (b – Pysznica; c – Wierzawice) [Sulimirski 1931; Czopek 2001b]

It is worth noting, however, the Lusatian impact in the eastern direction (even areas around the Dnieper!) mentioned in older literature [see Sulimirski 1936], which today ought to be treated as an anachronism. It is also difficult to define the real border between earlier phases of the Tarnobrzeg-Lusatian as well as Wysocko cultures. This is influenced in large part by the weak state of identification in field studies in the immediate environs of the Przemyśl Gate from the east. It is possible, however, to indicate certain analogies among the materials of both cultures from their earlier phases that could testify to contacts existing[3].

A brief examination of such artefacts shows small clay ornithomorphic figures, some ornamentation on ceramic ware such as linear and stamp motifs [Gawlik, Przybyła 2005: 331-332], similar small types of bronze decoration (fibulae with a hammered out head folded ear-shape, fibulae with a scroll disc, double disc pendants, single scroll disc pendants, small ring and turned jewellery) or even some flint products from the 'Kosiński' workshop, for example sickle-like knives [Libera 2005: 140] and small hammers and stone axes known from the settlement in Zawada [Chomentowska 1989: Table. I].

It is obvious that this list does not point only to Wysocko analogies, for the majority of materials mentioned and their corresponding traits may have far wider implications. On a more specific note, it is possible to refer to two types of artefacts in particular, the first are multi-spiral bracelets made out of fine bronze wire, finished in the form of a scroll spiral (Fig. 3).

These are known from the TLuC cemetery complexes around the San in Pysznica [Czopek 2001: Table. XLI, 36] and Wierzawice[4], as well as from the WyC in Bełżec (Gonczarivka; [Sulimirski 1931: Table. XXV: 21]) and Poczapy [Bandrivsky, Krushelnytska 1998: Fig. 4: 25][5]. The second illustration in this context concerns the

[3] This is in relation to materials from the end of the Bronze Age and early Iron Age

[4] Oral relation of this site's researcher, Dr K. Ormian, whom we would like to thank for making the material available for publication.

[5] It is very significant in this case that these materials correspond to the style of small wire ornaments turned

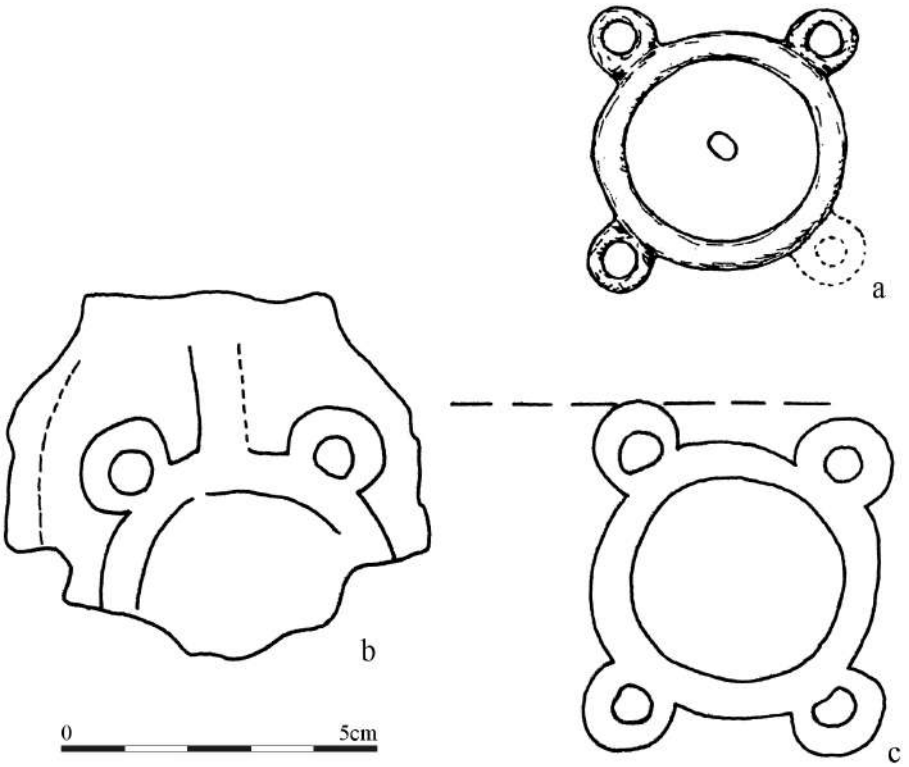

Fig. 4. Bronze ring from a horse harness: a – Czechy (Wysocko culture), b-c – Zawada (copy of casting form and "reconstruction" of cast) [Sulimirski 1931; Chomentowska 1989]

bronze ring for the horse harness from the cemetery in Czechy [Sulimirski 1931: Table XXV: 45]. A good analogy (Fig. 4) here can be found in the casting workshop in Zawada near Połaniec, where the casting form for the production of such objects was found [Chomentowska 1989: Table I: 4].

In the context of the discussion on the evolution of the LuC it is appropriate to note the somewhat different rhythm of cultural changes in the basin of the Dniester and upper Bug, where there are very clear Lusatian references and even an autochthonous cultural community. A good illustration in this context is the range of Ulwówek beakers [Pavliv 2008: 69: Fig. 1, 17] that do not appear in the

into a spiral disc as in the aforementioned fibulae and pendants. In the Tarnobrzeg-Lusatian area this may even be considered a particular phase at the end of the Bronze and early Iron Ages, where this style dominates and in some sites remains the only one, as in Pysznica. This issue no doubt is much wider than the suggested Tarnobrzeg-Wysocko ties above. The simplicity of producing such ornaments and the rather small demand for raw materials can be seen as a local response to a crisis in trans-Carpathian metallurgical resources, which up to this point in time decided the range of bronze objects both in the basin of the Dniester and in the San.

WyC, and very rarely occur in the TLuC (in the Lublin area). The other element worth noting in this regard is the mixed burial rite [Pavliv 1993; Kłosińska 2005].

The context of cultures and their growth in central-eastern Europe changes dramatically in the Early Iron Age. The causes, as widely known, are various and for this discussion, the major importance here was the crystalisation of settlements tied to so called eastern European nomadic peoples. Further, there is no basis to consider the area under discussion to be significant in the dissemination of possible Cimmerian influences.

Of significance also is their relatively large presence in the lower and middle Dniester and their decidedly smaller functioning in its upper basin, as well as lack of presence in the San area [Chochorowski 1993: map 1]. The Scythians, to be precise Scythian culture, ought to be recognised as playing a greater role in this context. Thus the appearance of this new level of ethnic culture on eastern European steppes can be said to be the source of a far- reaching destabilisation of settlement cultures in all of central-eastern Europe.

At this time the eastern region of the LuC, in particular Tarnobrzeg-Lusatian, was clearly changing. The entire sphere of material culture and some elements of burial rites are in the process of changing, as well as the system of settlement. Hitherto unknown types of vessels appear (pots with a relief strip), bronze and iron artefacts (nail ear-rings, triangular arrowheads, weapons, riding equipment and some types of small ornamentation), as well as other objects such as glass beads. It would appear that these changes were caused by more than cultural influences per se.

In addition, there are many indications of migration (distinct growth in demographic potential of peoples from east Lusatia, ritual ash piles from the settlement in Białobrzegi near Łańcut or the casting workshop using 'bronze' from the east in Zawada, near Połaniec). These naturally, not only related to the LuC but also that of the WyC. The similarity here of some materials is again, particularly striking, and the same type of artefact appears in inventories.s

As far as the cemetery complexes in the San area and Tarnobrzeg-Lusatian settlements are concerned, the above is clearly identifiable in so far as traits (technology, ornament, taxonomy) that are exogenous to local pottery traditions. In the recent past these have been rather well defined [Czopek 2003; Gawlik, Przybyła 2005] and mainly can be said to be the cultures of Bassarabi (BaC), Cozia-Sacharna (CSaC) and the ChC. The host acculturation to models from the last two groups of the Dniester-San should not raise any doubts [Gawlik, Przybyła 2005: 322].

The expansion of traits from the BeC, however, (N.B. increasingly identified at many Małopolska and Silesia sites) is possible either from the south and south-east with the aid of the ChC. Here, it is worth noting that not all the groups mentioned in this context had direct contact with the TLuC, which was separated from their native territories (basin of the middle and lower Dniester and Prut rivers) by the WyC, which could have mediated in such contacts, unless we accept its right bank and left

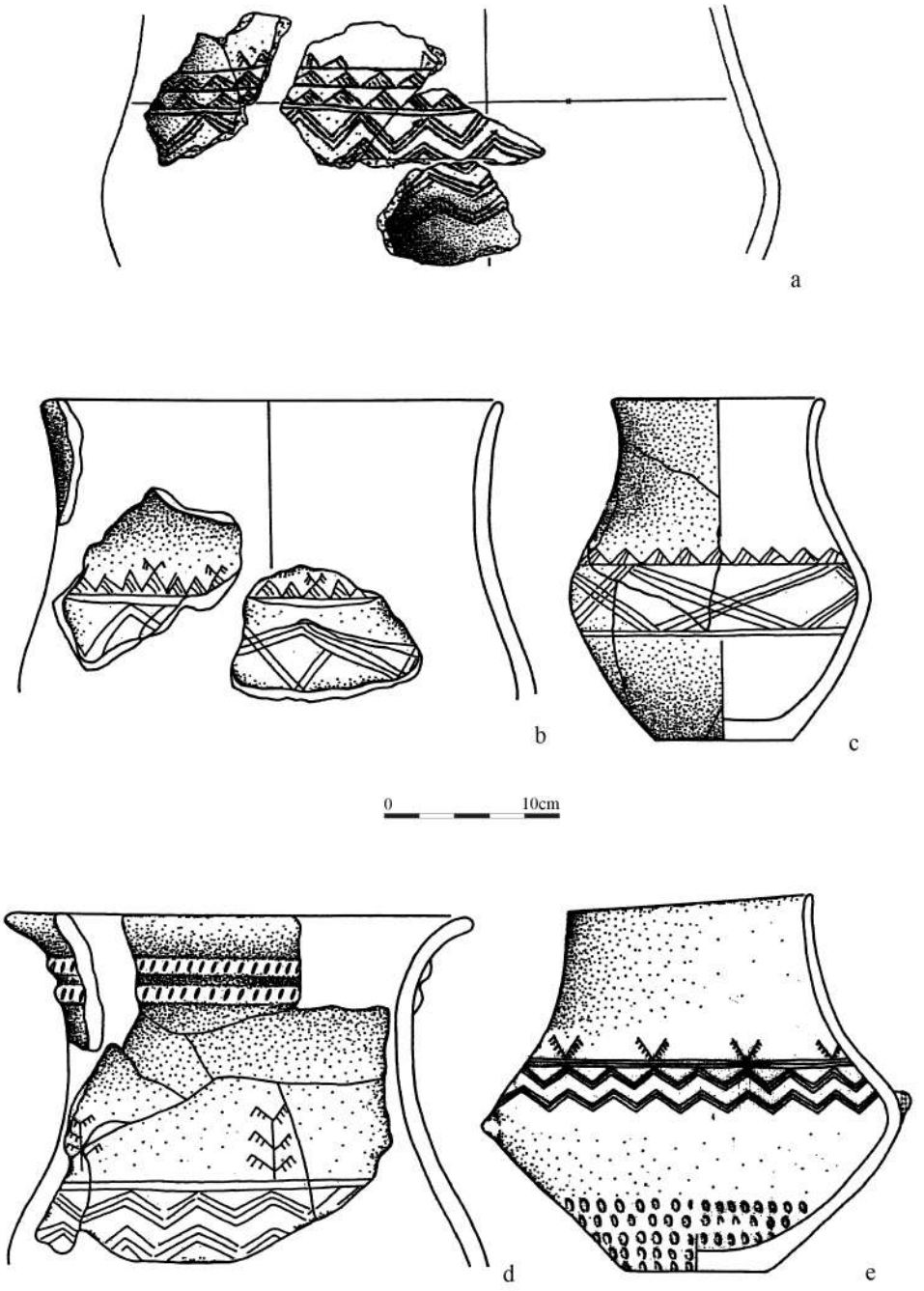

Fig. 5. Ceramic ware with "Chornoles" references: a – Siedliska, Rzeszów district, site 20; b-e, Kłyżów, Stalowa Wola district, site 2

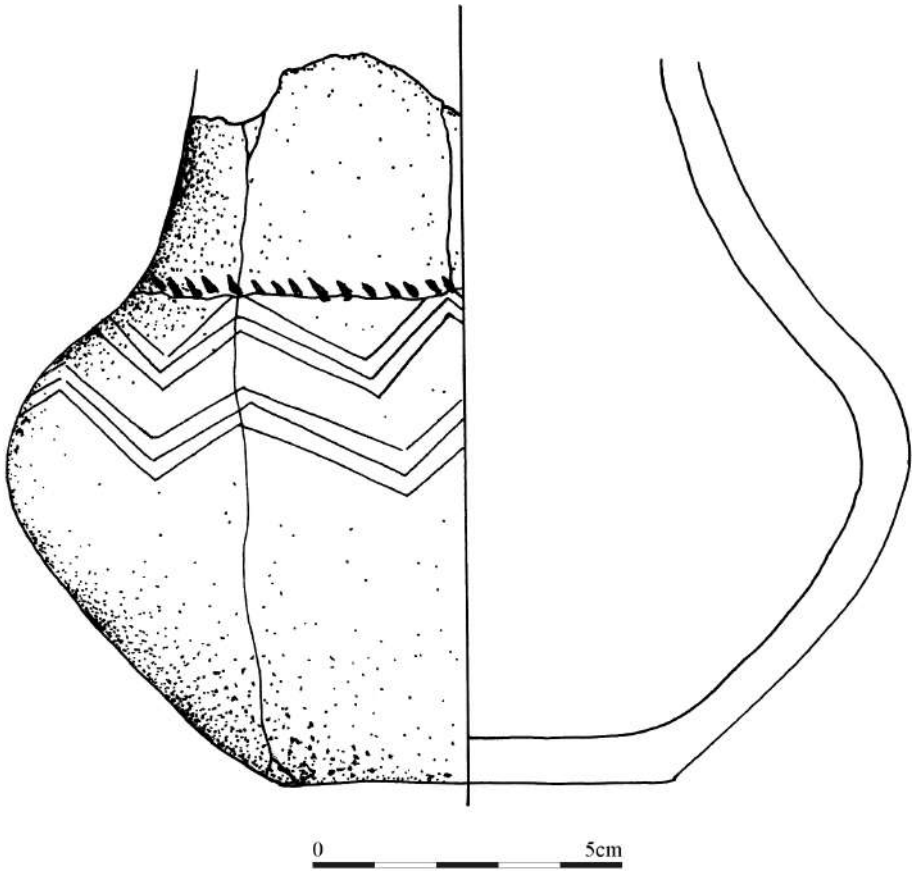

Fig. 6. Łąka, Rzeszów district, site 11-16, clay urn

bank groupings of the Dniester region as being separate cultures, as suggested by the geographical diversities of the WyC [Hozer 2005: Fig. 1]. The emergence in the San area of elements hitherto not encountered (at least not typical) for the upper Dniester basin is evidence of the extra-regional role of this route at the end of the Bronze and start of the early Iron Ages.

In the best identified Tarnobrzeg materials, of great significance are analogies to the ChC, to be precise, the Dniester area Nieporotowo group [Krushelnytska 1998]. Some examples are vase-like vessels that are weak in profile, with a rich relief (incised) and complex themes such as multiple zig zags, small triangles, little branches and pine cones [Krushelnytska 1998: 154-163]. These are best exemplified in the cemetery complex in Kłyżów (Fig. 5: b-e). Similar vessels are also known from

settlements around Rzeszów [Czopek 2003: Fig. 9], with the most recent discoveries in Siedlisko (Fig. 5: a) and Łąka (Fig. 6). This last example is especially important for it relates to one of two cremation graves discovered in a large settlement[6], which is definitely not a feature of the TLuC where separation of cemetery and settlement was observed.

The appearance of the Nieporotowo group in the middle Dniester is the effect of complex processes that have many interpretations. Most researchers [see Gawlik, Przybyła 2005: 337-338] assign a decisive role here to migration over the Dnieper, which can be said to be a very important argument in that it may suggest a significantly more widespread shifts of peoples, including those over the San [Czopek 2007c: 219]. In this light it would be possible even to speak at the same time either about this same migration phenomenon (though certainly less numerous) in relation to the middle Dniester and San, or only of a secondary role of these elements (with the aid of the Nieporotow group that formed strong settlements).

The appearance of the west Podolia forest steppe group of the Scythian culture in 700 BC completely changes the cultural context in the Dniester region [Sulimirski 1936a]. The impact of its main traits (even migration) along the Dniester has been proven, an excellent illustration of which is the recently discovered kurgan in Byków near Drohobych [Machnik *et al.* 2003], situated in the centre of the upper Dniester basin. This find can possibly point to the existence of a west Podolia group settlement in the immediate foreland of the Przemyśl Gate, much further north-east than previously thought. This site therefore could be said to change our views of the so called 'Scythianisation' of east Lusatia and the WyC, which could be said to be influenced in the main by the west Podolia group [Gedl 2004: 84-85; Gawlik 2005: 215].

It should also be noted that increasingly, 'Scythian' artefacts are being identified both in south-east Poland and the Lublin region. In this respect the role of the Dniester-San route is highly significant, especially since the gamut of known materials ought to be greatly increased, at least for some types of glass beads and foremost, ceramic ware [Czopek 2007a: 186-187].

The chronology and cultural grouping of materials identified by fellow researchers from Ukraine as Leżnicka, in particular the Czerepińsko-Łagodowska culture (CŁaC) [Krushelnytska 1976; 1993], ought to be viewed as yet to be clarified. Identical forms of pot-like vessels, featuring similar ornamentation, some bowls and cups – all clearly point to an analogous cultural context and even beg the question of whether it is appropriate to separate some groups in this manner. An excellent illustration here is ceramic ware (with the most typical pots featuring openings under the rim and ornamented with relief strips from the Lwów-Winniki site [Bandrivsky

[6] Research undertaken by J. Okoński, who I would like to sincerely thank for making possible the publication in respect to the urn. This site, investigated over a large area (pre-investment highway surveys), possibly suggests a chronological divisibility in regard to the settlement and two open graves. No further conclusions can be reached until the research is completed and results analysed.

2003], identified to the CŁaC with ties to the late Wysocko (identical in form to late Tarnobrzeg culture), known from the Grodzisko Dolne settlement [Czopek 2007a] and many others in the San region. In a comparative analysis of relevant sources, their true context ought to be borne in mind, one of a comp- arison of purely settlement materials (not burial ones in addition, as fellow researchers from Ukraine are wont to do).

From the eastern European context the presence of many cultural elements in areas hitherto not noted from the east, ought to be clearly indicated. In Poland this relates to the graves from Gustorzyn in the Kujawy region [Grygiel 1995] and even Wielkopolska [Malinowski 2009]. Recently, [Ignaczak 2008] these have been identified as belonging to the Brześć Kujawski type (BKuT). In agreeing with their eastern origin we should at the same time not underestimate their role in the development of the Noteć – Wisła – Bug – Boh route.

This becomes all the more debatable if our knowledge of Małopolska is taken into consideration, in particular the San basin, together with the neighbouring Czerepińsko-Łagodowska group from the east. Moreover, as mentioned earlier, the rhythm of changes and growth of culture in the basin of the upper Bug was somewhat different. It may be a great deal easier to explain this context through 'latitudinal differentiation' than 'meridional influences'. Thus it is not possible to understand groupings such as Brześć Kujawski in isolation from the geo-cultural context of Małopolska, and in particular, the context of the TLuC.

At times the above issue is incorrectly interpreted as a consequence of internal Lusatian factors resulting from the TLuC. This, however, ought to be viewed as an effect of the very same cultural processes, which importantly are primary and not secondary in nature (through the TLuC). It is therefore highly probable the Dniester-San route played a significant role (though not exclusive) in the workings of such processes. In this context therefore its extra-regional importance can be said to be established.

In attempting an interpretation of the increasingly confirmed imports and so called copies of particular categories of materials in east Poland as well as other cultural traits present in Poland in the early Iron Age, two interpretations are possible. The first relates to a traditional view of concepts such as 'import' or 'cultural influence', thus the functioning of such elements as a whole is seen within a localised context (Lusatian in this case). The second, however, places emphasis on human migration. The territorial vastness of changes and their extent therefore, considering significant cultural differences (burial rites) together with the suggested increasing growth of population, could be the basis for considering these as an effect of the migration of the Neuri as related by Herodotus [Czopek 2007b; Kłosińska 2007b: 240].

Without delving into the minutiae of the above written source it will suffice to cite the fact that the sources of the Tyrs (Dniester) are mentioned as the bor-

der of Scythian and Neuri territory, and the fact that the latter peoples represent a powerful force, extending over a rather large area. Naturally, in the context of contemporary methodology it is not possible to formulate a cohesive and logical theory that would link these peoples with one specific cultural group according to archaeological theory. The numerous contradictions in interpretation can only be explained through accepting a thesis allowing for the existence of a broad territorial Neuri community of interacting peoples [Czopek 2007b]. This would account for the appearance of numerous elements and 'eastern' traits, ranging from Małopolska to Wielkopolska and Kujawy, not necessarily as traces of a unilateral migration pattern but one that is broader (diachronically multiple). The San-Dniester route in this context was certainly one such communication channel, but not the only one.

The Early Iron Age also concerns the functioning of the Pomeranian culture (PoC). Its gradual move south-east has been long documented [Czopek 2007b], with the furthest sites reaching the Tarnopol area. In this situation, we should note recent discoveries around Lwów of a 'classical' cist grave (multi-urn) with a storied utensil derivative of west Lusatian[7], which places into a completely different light the sometimes questioned find of a face urn from the Drohobych area [Czopek 1992: 163].

The situation in the San basin where the PoC appears only incidentally and at that in Tarnobrzeg contexts, would suggest in this particular case the existence of another contact channel than the San-Dniester route itself. Perhaps one important barrier here was the continuing hermetically inclined TLuC and its neighbour to the east, the Czerepińsko-Łagodowska groups. The geography of Pomeranian sites in the east Lublin district and in Volhynia would seem to suggest such a communication route. The complete difference in both the cultural model as well as the particular materials produced, also clearly indicates in this context the phenomenon of human migrations than cultural influence per se.

In the Bronze Age and Early Iron Age, mutual relations between the basin of the upper Dniester and that of the San are therefore very clear. There are periods such as the above where so called intense traffic can be observed and ones where this intensity of interaction weakens (Late Bronze). It ought to be clearly emphasised that the basin of the upper Dniester (even to Seret-Zbrucz) is more inclined to Central European culture, a good example being the range of the WyC that was previously considered as a local variant of the Lusatian [Bukowski 1966] and the Czerepińsko-Łagodowska groups that follow.

In contrast to this area, the middle and lower Dniester region (Seret-Zbrucz to south-east) developed in another rhythm, closer to the forest steppe cultures, starting from the lower Danube through to the Prut basin in the direction of the Dnieper. This is well illustrated in turn by the range of such groups as the Cozia-Sacharna,

[7] Oral relation of Dmytro Pavliv, for which we are sincerely grateful.

Nieporotowo (near Chornoles) or the west Podolia. At the same time, this region was more open to influences from the Carpathian Basin. The basin of the middle Dniester therefore is characterised by a difference in culture, marked by the presence of trans-Carpathian traits (Gava-Holihrady) with relatively few from Central Europe. The region of the lower Dniester, however, is a completely different area in this regard.

This area is witness to an intensive acculturation of Balkan and east European (even Asian) elements to the north and further to the east, as well as to the west towards the lower Danube. These types of elements, according to present knowledge of the available sources, did not reach the basin of the upper Dniester, though this is an important context for the fundamental significance of the Dniester-San route. In a broader light, we can also underline the fact that for the Bronze and Early Iron Ages in central Europe of greater importance were north-south links that decided the main tempo of cultural changes such as the Tumulus Culture (TC), the Semi-urn Culture Circle (SuCC) and the process of 'Halstattisation'. It can be said therefore that only in relation to the Early Iron Age did the Dniester-San route play a greater role. In the remaining periods this particular channel had primarily a regional significance.

In conclusion, it is worth putting forward the thesis (now present in the professional literature) of intense migrational traffic at the end of the Bronze and Early Iron Ages, in particular in the Podolia and Volhynia areas [Krushelnytska 1985: 86], which can explain perhaps the great dynamism of changes and occurrence of far-reaching cultural ties. These have been only touched upon in this study and could well serve as a clearly defined research project in future years. In this regard, an attempt to better define the geography of the upper and middle Dniester basin through a surface study will no doubt play an important part.

Translated by Ryszard J. Reisner

ABBREVIATIONS

AA	–	Archäologischer Anzeiger. Berlin
ActaArch	–	Acta Archaeologica. Copenhagen
ActaArchHung	–	Acta Archeologica Academiae Scientiarum Hungaricae. Budapest
AAS	–	Anatolian Archaeological Studies. Tokio
AJA	–	American Journal of Archaeology. New York
AoF	–	Altorientalische Forschungen. Berlin
AnSt	–	Anatolian Studies. London
APŚ	–	Archeologia Polski Środkowowschodniej. Lublin
ARM 4	–	Dossin G., Lettres. Textes cunéiformes, vol XXV. Musée du Louvre, Départment des Antiquités Orientales, 1951. Paris
AVL	–	Arkheologia Vostochno-Evropeiskoi Lesostepi. Voronezh
BAR IS	–	British Archeological Raports. International Series. Oxford
BICS	–	Bulletin of the Institute of Classical Studies of the University of London. London
BPS	–	Baltic-Pontic Studies. Poznań
BSA	–	The Annual of the British School at Athens. London
CAD	–	Assyrian Dictionary of the Oriental Institute of the University of Chicago, I.J. Gelb, B. Landsberger, A.L. Oppenheim, E. Reiner (Eds), 1964 - . Chicago
JBS	–	Journal of Baltic Studies. Abingdon
JCH	–	Journal of Cultural Heritage. Amsterdam
JCS	–	Journal of Cuneiform Studies. Chicago
JESHO	–	Journal of the Economic and Social History of the Orient. Leiden
JIES	–	The Journal of Indo-Europpean Studies. Waschington D.C.
JRAI	–	Journal of the Royal Anthropological Institute. London
JRGZM	–	Jahrbuch der Römisch-Germanischen Zentralmuseums Mainz. Mayence
KSIA	–	Kratkiye soobscheniya Instituta Arkheologii. Moskva
KSIIMK	–	Kratkiye soobscheniya Instituta Materialnoy Kultury. Moskva
MDP 22	–	Scheil V., Actes juridiques susiens. Mémoires de la mission archéologique de Perse, Vol XXII, 1930. Paris
MIA	–	Materialy i issledovaniya po Arkheologii SSSR. Moskva-Leningrad
NA IA NANU	–	Nauchniy Arkhiv Instytuta Arkheologii Natsionalnoy Akademii Nauk Ukrainy. Kiev

NHMU – National History Museum of Ukraine. Kiev
OJA – Oxford Journal of Archaeology. Oxford
PBS 8/2 – E. Chiera, Old Babylonian Contracts, 1922. Philadelphia
Posiedzenia P.I.G. – Posiedzenia Państwowego Instytutu Geologii. Warszawa
PPS – Proceedings of the Prehistoric Society. London
PZ – Prähistorische Zeitschrift. Berlin
RA – Rossiyska Arkheologiya. Moskva
RA 36 – Revue d'Assyriologie et d'Archeologie orientale, 1938. Paris
Riftin – A.P. Riftin, Staro-vavilonskie iuriducheskie i administrativnye dokumenty v sobraniiakh SSSR, 1937. Moskva
SA – Sovetska (Sovetskaja) Arkheologyia. Moskva
UET V – H.H. Figulla, Martin W.J., Letters and Documents of the Old Babylonian Period. Ur Excavation Texts, 1953. London
VDI – Viestnik Drevniey Istorii. Moskva
WA – Wiadomości Archeologiczne. Warszawa
ZA – Zeitschrift für Assyriologie. München

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