Baltic-Pontic Studies
vol. 2: 1994, 29-70
PL ISSN 1231-0344

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THE MAIN DIRECTIONS OF THE DEVELOPMENT OF EARLY PASTORAL SOCIETIES OF NORTHERN PONTIC ZONE: 4500–2450 BC (PRE-YAMNAYA CULTURES AND YAMNAYA CULTURE)

When working researchers are touching upon such topics as the economy of one or the another primitive tribe and settling down only on the given facts of archaeological excavations, then, when referring to the Black Sea steppe zones, in particular, the question is one of shepherds or nomads. Such a position acquired an almost axiomatic character due to written works and ethnological facts about the steppe tribes of the Middle Ages and the people of the 18-19th century. Also coming from elementary logical thought is the idea that development of different forms of cattle breeding had no advantageous alternative on steppe expanses. And we have to agree with the fairness of a very simplified approach — that of a growing farm production — despite the fact that the present steppe expanses, especially in the Ukraine, have been used for a long time. However, this is the result of brutal and uneducated interference from human beings, especially in the Soviet era. It wasn't excused either economically or ecologically. Even in the last decade of the 19th century, after the severe drought of 1891–1892, the famous Russian scientists, V.V. Docuchayev, A.A. Izmailski, and others, were giving warnings about the downfall of the steppes due to thoughtless economic activities. The problem of survival of the steppes is presently becoming even worse. It is now getting very difficult to find areas of natural virgin steppe. Even the reserve areas can not fill this loss completely. Therefore, we can not have the "visual aids" that would enable us to see those ecological conditions in which not only the Middle Ages, but primarily, the primitive societies of the first cattle breeders formed and existed.

In the history of developed specialized cattle breeding and its different forms, the first stages of this process have a special place, which, on the territory of the steppe zone from the Volga to the Dnieper, may be dated as a period starting from the end of the Neolithic, Eneolithic, and Bronze Age (corresponding with ca 4500–2500 BC). Most important is the end of the Neolithic and the Eneolithic in particular. This exact time is referred to the period when the first groups of mobile

people appeared; for whom the economy base became specialized cattle raising. In the Ukraine, such early cattle breeders are considered to be the tribes of a particular culture, well-known as the Sredny Stog, according to terminology by D.J. Telegin [1971, 1973]. The period of the Early Bronze Age, which coincides with the spread of people of the so-called "classical Yamnaya" culture, is already regarded by many researchers as a time of nomads or semi-nomads. This was written, for example, by researchers of Mikhailovka [Lagodovskaya, Shaposhnikova, Makarevich 1962: 173] and by N.J. Merpert, who considered such forms of cattle breeding to be an early trend in the development of an economic state between primitive Yamnaya tribes [Merpert 1974: 115]. However there are hypotheses about the presence of another trend: the existence of a settled way of life among those cattle breeders in conjunction with the semi-nomads [Merpert 1974: 115], or the existence of groups of people with a fully settled way of life, who pursued cattle breeding along with other kinds of economic activities [Lagodovskaya, Shaposhnikova, Makarevich 1962: 176--178]. The findings of several research projects initiated a more differential approach to solving the problem of developed forms of cattle breeding among the people of steppe cultures. This approach is best accomplished in the works of V.P. Shilov [1975a, 1975b], who highlighted three types of cattle breeding: 1 — settled horse breeders in the northern part of the steppes and forest-steppe; 2 — settled cattle breeders in the flood plains of river territories (Dnieper, Don), raising large horned livestock; 3 — sheep breeders — nomads in the open areas of southern zones. Shilov proposed to look at the Volga-Ural model as the first stage of nomadic cattle breeding, based on the raising of small horned livestock, i.e. on sheep breeding. In the opinion of V.P. Shilov, the Northern Caucasian model, on the other hand, is not considered to have a nomadic style of life and is characterized as a settled model, based on containment of large horned livestock and breeding of pigs. However, the researcher does not reject the idea of seasonal driving on the summer pastures.

On the whole, the works of V.P. Shilov still remain the fullest and most fundamental studies of problems of development and forms of cattle breeding in the steppe tribes. We can use them as a foundation for further research; modernizing and making them more precise on the basis of new osteological, palaeoecological, palaeoclimatical and other facts. The works of this researcher have some disadvantages, however, relative to the territory of the Ukraine, which may concern chronological disparity types of cattle breeding in the Black Sea model. The settled horse breeders of the northern zone (for example, the residents of Dereivka) are older than the so-called Yamnaya culture inhabitants of the Dnieper banks and southern zone of the steppe. But, in this case, it is not Shilov's fault, since the cultural differences, in the steppe territory and to the south of the combined forest and steppe zones of the Ukraine during the Eneolithic period, are a very difficult problem and have not yet been solved. There are two problems in addition to this one: the

presence of qualitative osteological facts for the given periods and the use of facts for reconstruction of palaeoecology of the Eneolithic and Early Bronze Age in the steppes of the Black Sea shores and the shores of Azov. We may consider these three problems to be a basis for study of the character of the steppe inhabitants' cattle breeding economy. They are interrelated and can be expanded upon with the facts of osteological research, which look for instruments of labour, planigraphical and topographical features of settlements, burial places, etc.

Therefore, we first set a task of critical analysis of resolved issues pointed out earlier in order to construct an image about excising abilities of objecting reconstruction in the character of cattle breeding during the Eneolithic and Early Bronze Age. The models of type and form of cattle breeding, and also the way of life among the first cattle breeders, are in many cases similarly modified by the achievements of ethnology.

1. CULTURAL AND CHRONOLOGICAL DEVELOPMENT OF EARLY CATTLE BREEDERS

For the majority of specialists, who have never studied the materials of the Eneolithic and Early Bronze Ages and are not familiar with the steppe Ukraine discoveries of the last decades — unpublished or insufficiently presented in published works (thesis, short incomplete publication, etc.) — it is becoming very difficult to familiarize oneself with general interpretations. This is especially true for the Eneolithic, which differs from the others with its abundance of archaeological facts and tangled system of terminology. The most famous cultures are the Sredny Stog and Yamnaya, which have been representative of one era of the Eneolithic for a long time. At the present time, they are used more out of habit and without clarification of these meanings. Right now, the Eneolithic era of the steppe and southern zones of the forest-steppe is represented by many monuments due to archaeological research in the land reclamation zones. These are mainly the burial mounds, which are divided into different cultures, cultural groups, types and variants. Along with the famous Sredny Stog and Yamnaya cultures studied at the beginning of 70's, and the monuments of the Nizhnemikhailovka type, there are distinguished the monuments of the Novodanilovka type, post-Mariupol culture, Suvorovo, Utkonosovka, Khadgider groups, etc., which were studied at the end of the 60's. Some of the terms are simply repeated and do not clarify the situation. Even Yamnaya culture is now open to some doubts in connection with the highlighting of Repin culture on the Don, Yamnaya-Berezhnovsky burials in the steppe area of the Volga (which created some

difficulties in the understanding of an early period) and also a row of independent cultures (Novotitarevskaya, Kuban, Budghak in the northwestern Black Sea area). Yamnaya culture has ceased to be an occurrence of the Eneolithic and the basic period of its existence now characterizes the Early Bronze Age.

Grasping the full picture of cultural development is getting more difficult, especially if we add all that has been said to those groups and types of burial monuments which never received a concrete name and have only numeral indication. They are known in the Dnieper area, near the Azov, Kuban, and Don. We should agree, that the full picture of development in the culture of early cattle breeders does not exist between habitually used old meanings and numerous new terms. For example, very few people can explain the differences between the Novodanilovka type of burial monuments and well-known Sredny Stog culture burials. Because of the relatively rich inventory, which included prestigious objects, we can not estimate the independence of a culture. Nor can we single out the post-Mariupol culture with its so-called "outstretched" burial mounds and not touch the basis of allocation in Sredny Stog culture? The fact is, that for the first culture the ceramics of the Kvitanska type are significant (according to D.J. Telegin, the ceramics of the Sredny Stog culture). The question of correlation between burial mounds of Eneolithic burials and synchronic settlements of Dnieper and Azov areas is not well-developed. The term "Yamnaya" is a contradiction in itself, because only the "Yamnaya" culture can be referred to on the territory of the Ukraine with the so-called "late Yamnaya" monuments. It was preceded by Eneolithic cultures completely different in time and appearance.

This way, the most important task is to order all existing materials and to create a full picture of development in different cultures. They are presented as a community of original cattle breeder tribes after the disintegration of the Mariupol cultural and historical unity (in our understanding still Neolithic). This will give the opportunity, depending on the representation and quality of the sources, to get a better idea about the dynamics of development of cattle breeding among different groups of inhabitants.

First of all, we should refuse a common meaning for the "Sredny Stog culture". This is dictated by three objective factors.

1. The settlements, Sredny Stog II (which gave its name to the culture) and Dereivka (which has become an example of this culture) are valuable because of the different monuments on their territories (steppe and border of steppe and forest--steppe zones), because of the time of existence (Sredny Stog II is a bit older than others) and because of the appearance of a material culture (ceramics, flint, etc.). Therefore, when researchers use the term "Sredny Stog" culture, it is unclear and difficult to understand what it is all about.

2. The second factor is the appearance, in the Dnieper area, of a special group of burial monuments, which is accompanied by ceramics of the "Kvitanska"-type

in the funerals. The question is one of the so-called "outstretched" burial mounds, placed by J.F. Kovaleva into a separate post-Mariupol culture [Kovaleva 1984]. But since, until the most recent time, the ceramics of the Kvitanska-type were considered to be the oldest pottery of the Sredny Stog culture [Telegin 1973: 8, 122-123; Shaposhnikova 1987: 6], the arisen contradiction can not be overcome by artificial separation of the tight group of "outstretched" burial mounds. We can not put them into different, but still traditional cultures (Sredny Stog, Nizhnemikhailovka, Yamnaya) [Telegin 1987: 26; Shaposhnikova 1987: 6]. The only solution is to look again at the basis, which highlighted these cultures, and first of all, at Sredny Stog. Actually, the ceramics of the Sredny Stog II type are not found near the burials, and in the settlement itself the Kvitanska-type pottery is absent. We can say a few words about Dereivka, where some pieces of Kvitanska-type pottery were found. They can be seen, in a complete picture, either as a distinctive import or as a remainders of another layer. It is necessary to note the absence of settlements of the "Dereivka" type in the steppe zone, and, vice versa, the absence of "Sredny Stog" type settlements in the forest--steppe zone. For example, in the settlement of Alexandria near the Oskol river, the ceramics of the Sredny Stog culture are of insignificant quantity and have the appearance of an import when placed against the background of other materials. The difference between the Sredny Stog, Dereivka and Kvitanska cultures is that Kvitanska is present both in the steppe zone and to the south of the forest-steppe zone. As an aside, there is proof to date them as later cultures, but not early cultures as was previously believed. All objects which accompanied the "outstretched" burials (polished stone hammers, statuettes of the Serezlievka type, figured bone piercing etc.) are dated according to the Tripolye scale as the period of C-II, because they correspond to the materials of Sofievka, Usatovo and Southern Bug variations of the late Tripolye.

3. The last factor is the allocation of monuments of the "Novodanilovka" or "Kasimcha-Petro-Svistunovo" types [Zbenovich 1973; Telegin 1985d] into an independent culture. This is generally unclear if we consider the two previous factors. In the end a legitimate question arises — what is "Sredny Stog culture"? Is it myth or reality?

N.S. Kotova, together with the author, made an analysis of available burial monuments and settlements. We came to a conclusion about the possibility of allocation in the Ukraine territory, instead of one united Sredny Stog culture, four groups of monuments. These four groups have even more specific groups of ancient cattle breeders and we would be able to classify them as independent archaeological cultures. But to give tribute to tradition and to consider the expansion of the term "Sredny Stog" culture, we decided that it is possible to unite the four given cultures within the framework of the Sredny Stog region.

The Skelanska culture (Fig. 1) is so named because of distinctive features in the complex of ceramics found near the settlement of Strilcha Skela, which is located

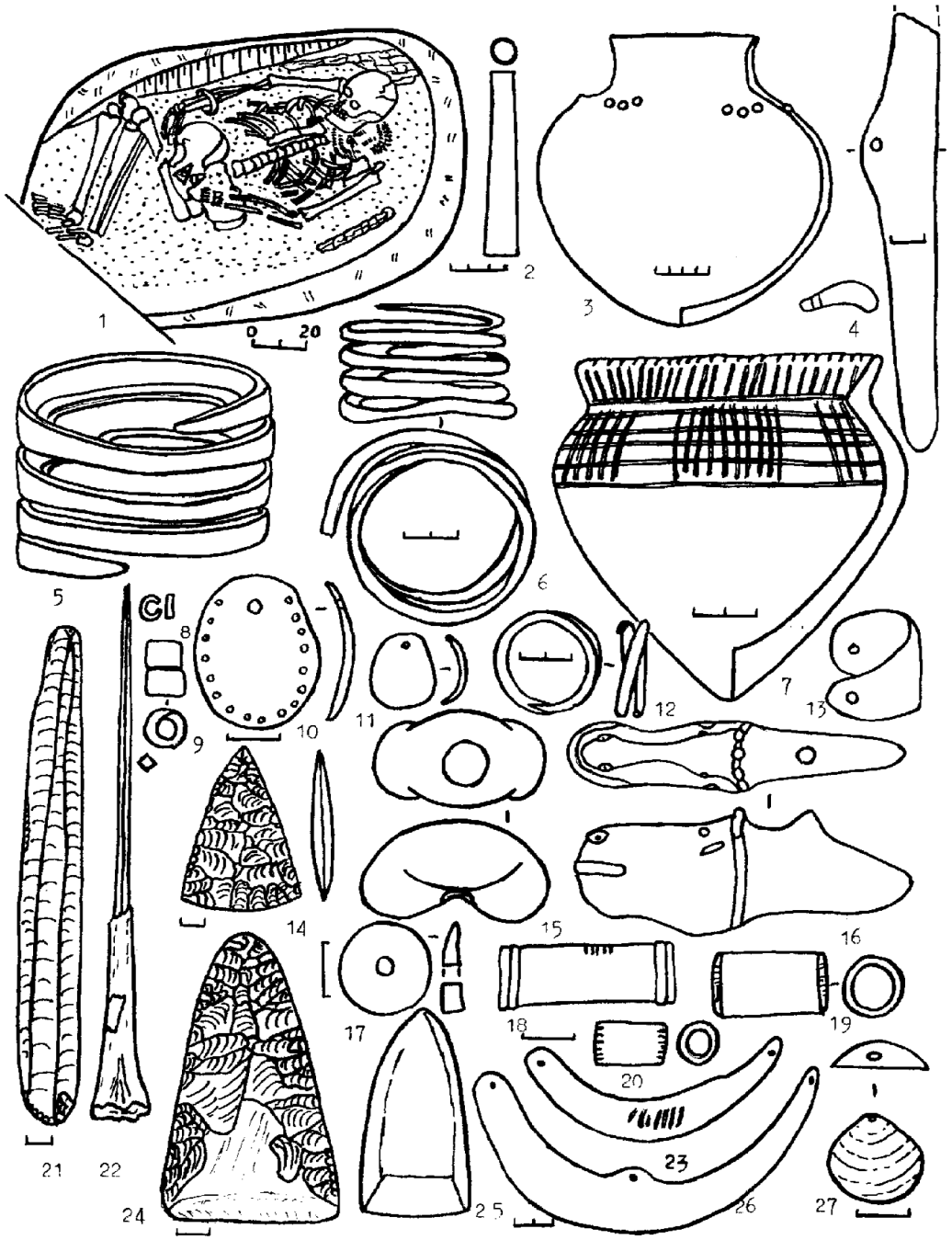

Fig. 1. Grave and the basic finds of the Skelanska culture: 1-2, 12, 22, 27 — Krivoy Rog (after Budnikov, Rassamakin); 3, 6 — Novodanilovka; 4, 9-11, 17, 19, 21 — Alexandrovsk (after Bratchenko, Konstantinescu); 5, 13 — Chapli (after Dobrovolskiy); 7, 20 — Popow Khutor, barrow 31/7, grave 4 (after Stolyar); 8, 14, 23, 24, 26 — Petro-Svistunovo (after Bodyanskiy); 15, 18 — Mariupol, grave 24 (after Makarenko); 16 — Suvorovo II, barrow 1, grave 7 (after Danilenko, Shmagliy); 25 — Voroshylovgrad. 2 — gold; 3, 7 — pottery; 4, 18-20, 23, 26 — bone; 5, 6, 8-13, 22 — copper; 14, 21, 24 — flint; 15, 16, 25 — stone; 17, 27 — shell.

near the large rapids on the Dnieper. It has some parallels on the Don and Azov: the 4th layer of Razdorsk settlement [Kiyashko 1987: 75], pieces of the 5th layer of the Samsonov settlement [Gey 1983: 16, Fig. 12:2], and separate pieces of Razdolny [Shaposhnikova 1970] on the Kalmius and Semenovka near the Molochnaya river. The area near Kamenaya Mogila is also possible. In the same cultural circle are burials of the Novodanilovka type: Chapli, Petro-Svistunovo, Novodanilovka, Mariupol, Alexandrovsk and others [Kotova, Rassamakin 1995]. To the above we can add the oldest burials of the Dnieper basin which are without an inventory of burial mounds. For example, Igren — 8 and the island of Vinogradny and a series of burials in the Don basin: Mokry Chaltir, (m.2, b.6), Popova (m.31/7, b.7) and others. We connect the appearance of burial monuments in the Dniester-Danube region with this culture. This group is known by the name of "Suvorovo" [Alexeyeva 1976; Dergachev 1986; Petrenko 1989; Manzura 1993]. They are also found in the Kuban area [Korenevsky, Nagler 1987; Trifonov 1991].

We may consider the most distinctive feature of ceramics to be the presence of round-bottomed wares with straight, relatively low necks and bellies, the maximum diameter of which is usually in the middle of its height. A plentiful mixture of shell in clay is usual, too. A particular ornamentation covers the top half of the vessel down to the shoulders and is executed in simple, drawn lines. It consists of different vertical and horizontal patterns, and zigzags. Attached figures were often added to the decoration. The ornamentation was also present at the top of the neck. Among flint artifacts, a common characteristic is double-ended arrow-heads and javelins with a straight and slightly bulging base, and long knife-like metal plates. For burial ceremonies, ground burials consisted of individual burial places with characteristic burial constructions. The buried are placed in oval pits, sometimes in boxes, in a curled position on the back. The head is slightly raised, the arms are slightly bent at the elbows and placed on the pelvis area or on the stomach. The bent legs usually keep their original position. The abundance of ocher, which covers the buried in a thick layer, is noticeable. Orientation towards the east is predominant but western orientation exists as well. Many tools, decorations and the details of the ceremonies unite the monuments of this culture with the preceding Mariupol culture.

The Skelanska culture is the oldest Eneolithic culture. The time of its existence is determined by items which allow one to make a synchronization with well-dated cultures of the Balkan-Carpathians region. And we can add Tripolye culture, from one side and from the other, the Eneolithic cultures of the Caucasus, North Caucasus and Volga area. We can discuss such findings as zoomorphic scepters, bone fasteners, boar's fang and shell decorations, import ceramic, copper and gold goods, and flint javelin and arrowheads. This question is well developed in literature, especially on the local level. We simply certify the generally accepted opinions within the framework of the suggested conception. The presented facts synchronize Skelanska

culture with cultures of Gumelniţa A2-B1, Varna, Cucuteni A and Tripolye B-I on the western and northwestern borders, with pre-Maykop culture (settlements Svobodnoye, Meskhoko, Miskhaka) on the North Caucasus [Nechayev 1990] and with Khvalynsk culture in the Volga area. Based on radiocarbon dating for monuments of the above-mentioned farming cultures, in particular Gumelniţa and Tripolye [Movsha 1984; Telegin 1985c; Subbotin 1983: 130], this time is determined to be in the range of 4500–4100 BC [Movsha 1984]. This does not coordinate with the published dates of the "Khvalynsk" burial mound [Agapov, Vasiliev, Pestrikova 1990: 85-87], which gave a much older age. But it corresponds with the dates of Yamnaya-Berezhnovsky burial mounds of the steppe Volga [Dremov, Yudin 1992: 29-30]; which reflects a process of Yamnaya culture formation in this region.

Stogovska culture (Fig. 2) can be considered to be a continuation or a second stage in the development of Skelanska near the Dnieper area. It is distinguished from the previous one, first of all, by a complex of ceramics, well represented in the settlement Sredny Stog II. Distinguishing features are becoming more common, such as sharp and round-bottomed shapes with maximum diameter in the top part of the belly, and an extended neck. They often appear with purposely bent inside rims. All vessels are decorated on the upper part, down to the shoulders. The ornamentation is fairly regular in composition and a technique of imprinting tooth-like stamps and so-called caterpillars made from woven cord is used. The predominant style is a number of rows and zigzags, imprinted with the same technique, just below the neck and also on the inside of the neck. A similarity is seen in the ornamental composition of Skelanska culture ceramics. The arrowheads from Sredny Stog II are analogical with the Skelanska culture, but the long plate-knives disappear.

The most famous and outstanding settlements of the Stogovska culture are found in the Dnieper basin: the top part of the Eneolithic layer of Strilcha Skela, Sredny Stog II, Kodachek, Zolotaya Balka, etc. From burial mounds we can distinguish Igren — 8, Vinogradny island, despite the fact that those burials already existed in the time of Skelanska culture. Basic ritual features are preserved, but they are not so unvarying. This is evident in a number of variations in placement of arms and legs, the skull, and in the use of ocher. The rich, inventory-full (especially metallic) burials, which we know from the Skelanska culture, are completely absent.

The time of Stogovska culture existence is not determined reliably enough. The border with the Skelanska culture can not be determined. And a slightly later time is fixed only by the finding of Tripolye pottery in the burial mound of Igren — 8 [Telegin, Filenko 1982]. Vessels typical of Stogovska culture settlements were also found there, but not in the same complex. Tripolye wares belong to stages B-II/C-I and C-I. It is obvious that fragments of Tripolye ceramics from the settlement of Sredny Stog II are much older, but they are unavailable for present researchers,

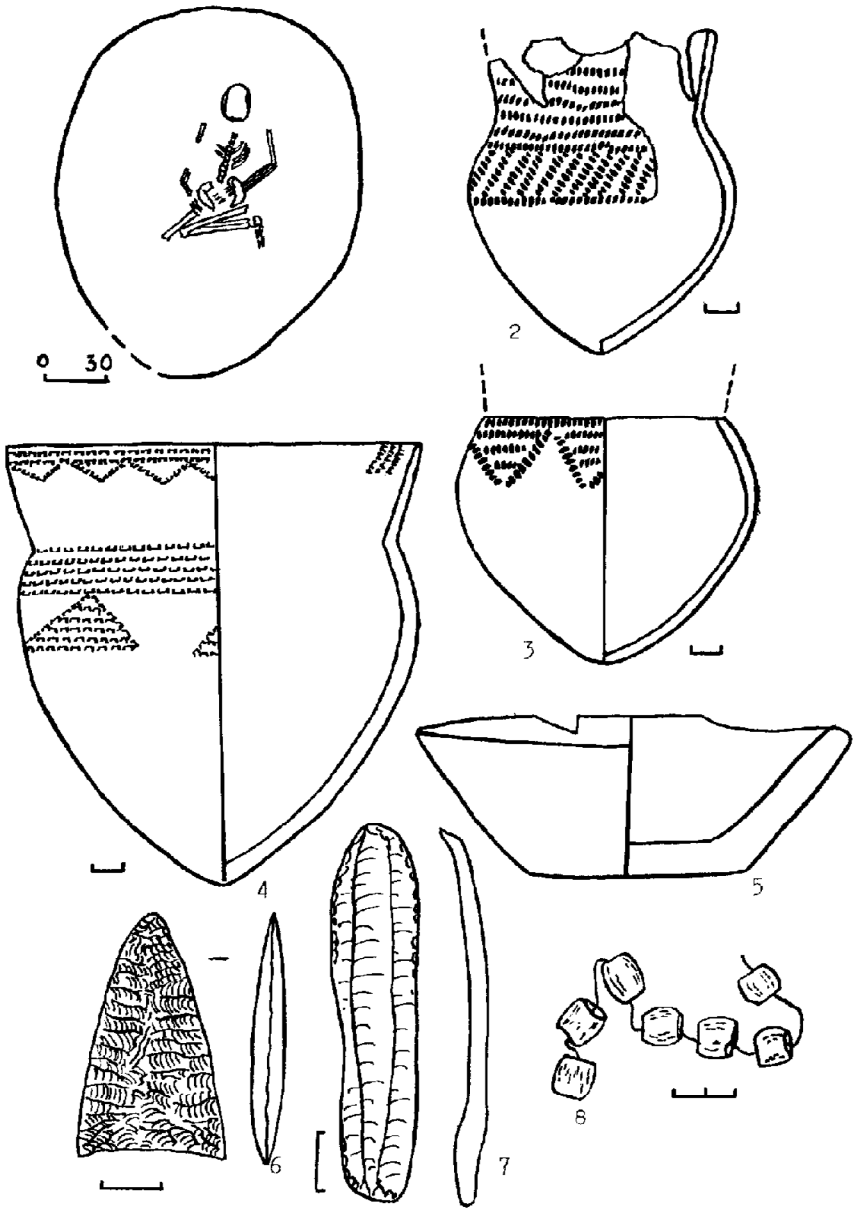

Fig. 2. Grave and the basic finds of the Stogovska culture: 1-3, 5, 8 — Igren 8, graves 13,15,10 (after Telegin, Filenko); 4 — Khortitsa; 6, 7 — Sredny Stog II. 2-4 — pottery; 6, 7 — flint; 8 — bone.

and the publication of this does not give a reason for exact dating [Dobrovolsky 1929: 2, 91n., Fig. XI]. Consequently, Stogovska culture can presumably be dated as one of 4100–3600 BC. This corresponds to the dates accepted for stages of Tripolye culture [Movsha 1984: 61-63; Chernysh 1982: 175].

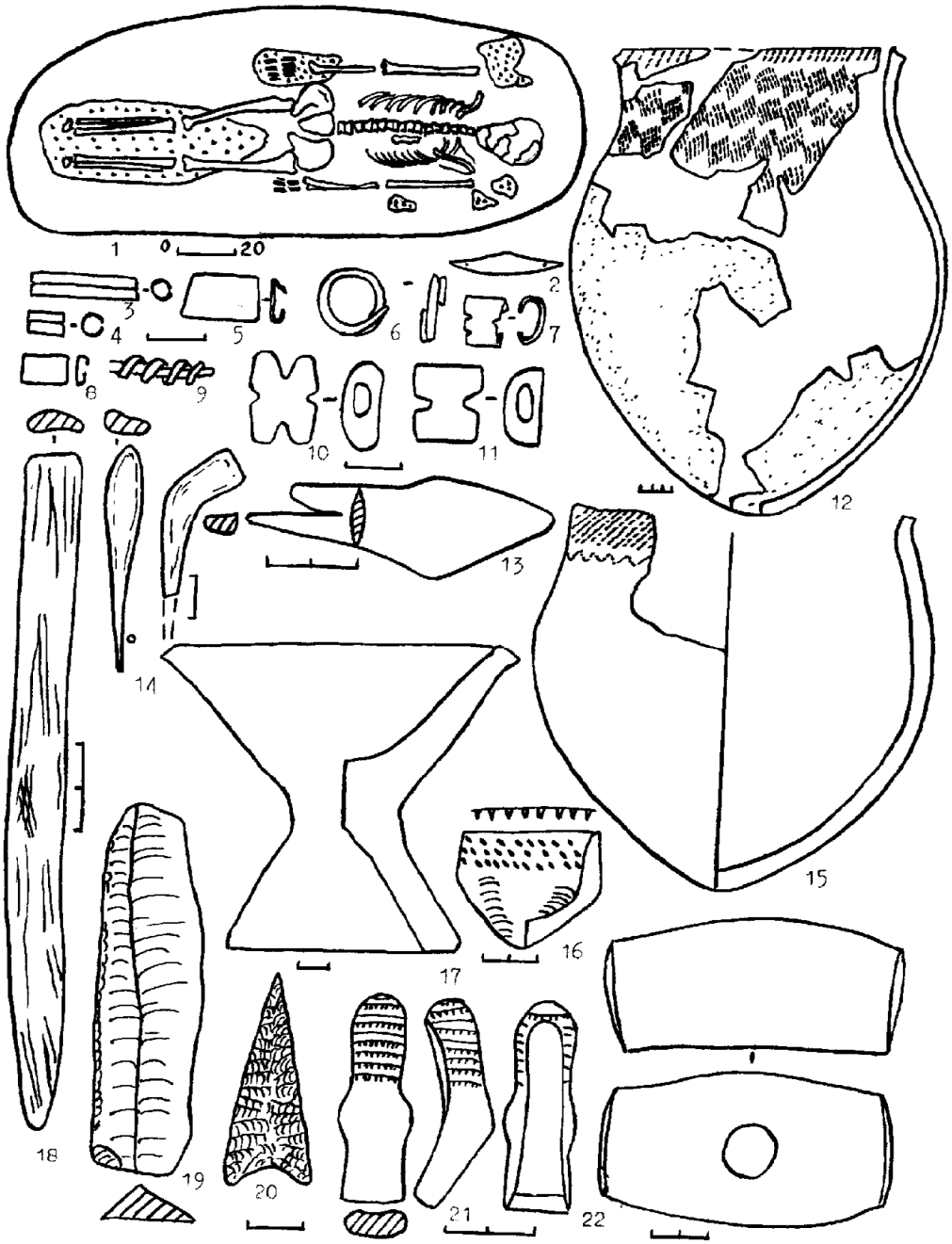

Fig. 3. Graves and the basic finds of the Kvitanska culture: 1 — Sadovoye, barrow 101, grave 12 (after Nikolova, Rassamakin); 2 — Lubimovka I, barrow 3, grave 2 (after Rassamakin); 3, 4, 19 — Bogdanovka III, barrow 1, grave 2,3,7, barrow 6, grave 3; 5, 8, 9 — Verkhnaya Mayevka XIV, barrow 1, grave 6; 6 — Terny I, barrow 9, grave 2; 7 — Orekhov, "Tarasova Mogila", grave 6 (after Samar); 10, 11, 18 — Vinogradnoye, barrow 2, grave 3 (after Rassamakin); 12 — Novoaleksandrovka, barrow 1, grave 16; 13 — Bulakhovka III, barrow 3, grave 9 (after Kovaleva); 14 — Ordzhonikidze, "Chkalovi Mogily", barrow 3, grave 10; 15 — Buzovka XXIV, barrow 1, grave 3 (after Kovaleva); 16 — Nizhnaya Khortitsa, barrow 2; 17 — Orlik, barrow 2, grave 2 (after Lugova, Rassamakin); 220 — Verbki V, barrow 1, grave 7 (after Kovaleva); 21 — Ordzhonikidze, "Dovga Mogila", grave 12 (after Nikolova, Rassamakin); 22 — Kamenka Dneprovskaya, barrow 14, grave 2 (after Rassamakin). 2-9, 13 — copper; 10, 11, 14, 18 — bone; 12, 15-17 — pottery; 19, 20 — flint; 22 — stone.

Kvitanska culture (Fig. 3) — this term is offered instead of post-Mariupol culture [Kovaleva 1984] because the previous term is not correct. All cultures of the Eneolithic period are post-Mariupol, in particular, the Skelanska culture. On the other hand, our term has a recognized name which more precisely reflects the character of the culture. First of all, it is seen in the famous ceramic complex from the Kvitanoy burial near the village of Fedorovka [Bodyanski 1954]. Well-studied settlements are absent, but numerous findings of Kvitanska culture ceramics in the multiple layers of settlements and also in its independent layer places are known (Leontevka, Solovinaya Roscha in the Dnieper basin, Voznesenovka in the Sivasch region etc.). In a number of settlements, with non-separated layers of different periods from Neolithic to the Late Bronze Age (Vinogradny island, Pochilom, etc.), Kvitanska pottery are predominant. The most promising forms are present in the burial complexes. The ceramics are characterized by regular and very monotonous types of vessels of different sizes: from miniature to very large. Ornamentation decorates the top part of the vessels. Predominant are imprints of "walking" comb, and the main elements of design are a number of parallel rows with slightly bent imprints under the neck and from neck to belly. In a number of compositional features, Kvitanska culture pottery is similar to the Stogovska culture's.

For the Kvitanska culture, a raised form of burial mounds with ceremonies is characteristic. Also, a recurrence of archaic traditions with several burials under one burial embankment is seen (sometimes up to 7-9 separated burials). Archaism is preserved in the ceremony itself, demonstrated in the stretched position of the dead. They are lying in narrow oval and rectangular dimples, sometimes with signs of sustenance and tied extremities. A great importance of fire in the ritual is noted. There was an uneven use of ocher. An orientation towards the east is predominant, but towards the west is also possible.

Due to discoveries in the burial places, we can add multiple copper decorations to the characteristics of the material complex of the Kvitanska culture. They have the appearance of a kind of tubular and spiral piercing. Small brackets and clips were decorations for the belts and a bone piercing tool was used for decorating the outfit in some kind of rows. The same function was determined for polished stone hammers [Kovaleva 1984]. Some tools made from animal ribs are characteristic, too. It is obvious that well-polished and hand-worked bone punctures can be recognized as specific tools of the given culture. Some of these things were used by neighboring tribes (Nizhnemikhailovka culture, some groups of late Tripolye) — copper decorations, bone tools of production, piercing, stone hammers.

The territory of extension of the Kvitanska culture, based on the placement of materials in settlements and on burial concentration, could possibly reach the northern steppe and forest-steppe spaces of the Dnieper basin, the right and left banks of the Dnieper river, and even the Northern Donets and Ingulets rivers. The

arrangement of burial places testifies that, during a period of activity, the population of the Kvitanska culture probably reached the Don and Danube basins.

The chronology of the early stage of the Kvitanska culture does not yet have reliable benchmarks. From the logical point of view, its beginning should be in the epoch of disintegration of Azov-Dnieper culture in the Mariupol unity. But when and for how long the formation process of the new culture progressed is hard to say. Obviously, it went parallel to the development and formation of, first, Skelanska and, afterwards, Stogovska cultures. This is explainable by the presence of similar features to the previous culture. But, at the present time, we have to deal with an already formed culture which is reliably dated late enough, according to synchronization with later stages of local variants of Tripolye — in particular, Sofievka and Usatovo. This is the time when Kvitanska culture itself was going through the period of disintegration. The archaism of figured piercing has become an example after the same type of product was found in the Usatovo complex [Malyukevich, Petrenko 1993: 25-30, Fig. 5]. Stone hammers are not dated earlier than the Sofievka variant, according to the similarity of the burials and the latest Tripolye monuments on the Southern Bug and according to similarities in the burial mounds of Yermolayevka with painted Tripolye ceramics [Ribalova 1964: 79-80]. In this way, Kvitanska culture, according to synchronization with Tripolye C-II, can be reliably dated to a period of 3600–3000 BC. And probably to an even earlier time, synchronic to Tripolye C-I and B-II/C-I [Movsha 1984], in other words, 3700–3600 BC.

Dereivka culture (Fig. 4) is so-named so due to a distinctive complex of Dereivka settlements and characterizes the culture of a population in the south of the forest--steppe zone. The ceramics of the "Dereivka" type are well-known on the Northern Donets and Oskol (Minevsky Yar, Alexandria), the Dnieper basin, to the north of Dereivka. The circle of comparable things is limited because of the lack of study of the Eneolithic in the forest-steppe of the Ukraine.

From burial monuments, Dereivka culture can claim a second burial mound near Dereivka and possibly some of the burials from the first burial mound. It could be that two burials of Kamennye Potoki are attributed to this culture. But studying rituals of the Dereivka culture demands a search for new, reliable sources.

Dereivka-culture pottery are characterized by a predominance of specific sharp--bottomed vessels with very high necks. Ornamentation decorates the top part of the vessels and is done by imprinted crests, brackets, different dents, notches, and the use of a string. Designs of vertical columns and also of horizontal rows are very characteristic. The form, technique, and composition in the ornamentation of the vessels differs fundamentally from the characteristics of cultures mentioned above. In conjunction with the bottom-sharpened ceramics are a large percentage of flat bottomed bowls and pots.

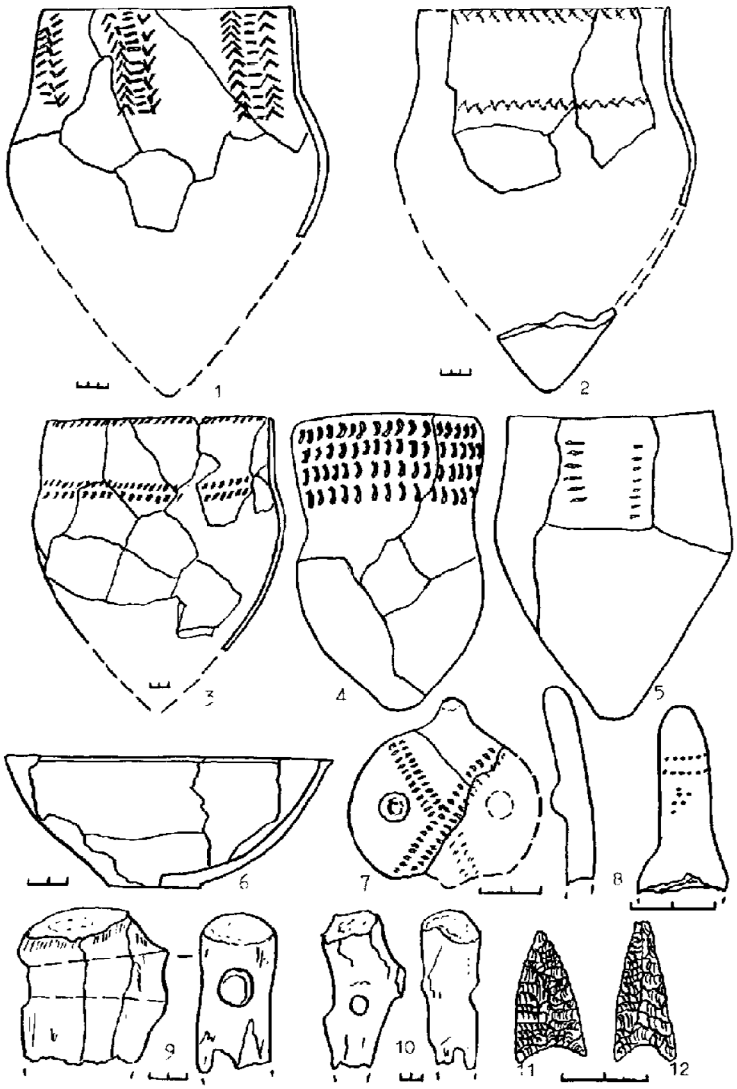

Fig. 4. Finds from Dereivka (after Telegin).

The time of existence of Dereivka culture was determined by a Tripolye bowl without painting from the second burial mound. It was dated as Tripolye B-II and B-II/C-I. The synchronization with Tripolye C-I is based on the discovery of a female figure, which is similar to the figures of Cernovoda I culture. And this is also known in such settlements as Cernovoda, Remnicheu, and Tirpeşti in Romania. On the other hand, one fragment of statue is close to the Serezlievka type, dated as Tripolye of C-II. T.G. Movsha raised a reasonable question about people living outside of the Dereivka settlement before Tripolye C-II [Movsha 1984: 77]. In this way, Dereivka

culture can be dated within the framework of 3700–3150 B.C. This dating needs to be stated more precisely, but it is impossible because of the limited sources.

A short characterization of our cultures has been given above. Until now, they comprised the unified Sredny Stog culture and we now include them into a region of the same name, which appears to be the western part of the "Sredny Stog — Khvalynsk" community [Vasiliev 1981: 34]. Their relative unity is fixed only in the period when Skelanska and Khvalynsk cultures existed, including the "Mino-Berezhnovsky" burials.

Besides the highlighted cultures, another one existed in the southern part of the Ukrainian steppes, for which we reserve the famous name of the Nizhnemikhailovka culture.

Nizhnemikhailovka culture (Fig. 5) received its name due to a specific complex of ceramics from the bottom layer in the settlement of Mikhailovka near the Dnieper, and its monuments are also known as monuments of the "Nizhnemikhailovka" type [Shaposhnikova 1971b, 1985, 1987; Telegin 1971a]. We have our own point of view on this matter, close to V.N. Danilenko's view, which distinguished a separate Azov--Black Sea line in the development of the steppe Eneolithic, actually differing from the Yamnaya.

Besides the bottom layer of Mikhailovka, and obviously, several vessels from the Novorozanovskoye settlement on the Ingul river [Shaposhnikova, Neprina 1977: 60], the rest of the monuments are presented as burials in mounds, spread from the Danube to the Don. According to our statistics, one-type burials can be added to the Nizhnemikhailovka culture. They are characterized as having a stable set of signs; oval pits, tucked position of the dead one side with one bent arm and the other outstretched along the body. Occasionally, both arms are outstretched in the direction of the knees or bent at the elbows with the hands in front of the face. The eastward orientation is predominant. The use of ocher ranges from intensive color to barely noticable zonal marking. In the construction of burial mounds the distinguishing features are ditches. In the burials and funerals, the predominant feature is ceramics with a similarity to the ceramic complex of Mikhailovka'a bottom layer. Distinctive local features exist along with absolute unity in the burial practices. For example, in the Dniester-Danube region, the burials are separated into a cultural group known as "Utkonosovska" (according to I.L. Alexeyeva), "Khadzhider" (according to V.G. Petrenko) and "proto-Usatovo" (according to I.V. Manzura). On the Don river this culture is visibly represented by the burials of the III group (according to V.Y. Kiyashko). Plentiful complexes on the Southern Bug, in the Dnieper basin, and on the Molochna also exist.

The most typical ceramics characterizing the culture are presented in the bottom level of the "eponym" settlement and in ditches of funerals in burial complexes. These are flat-bottomed vessels with rounded and spherical bellies and high or me-

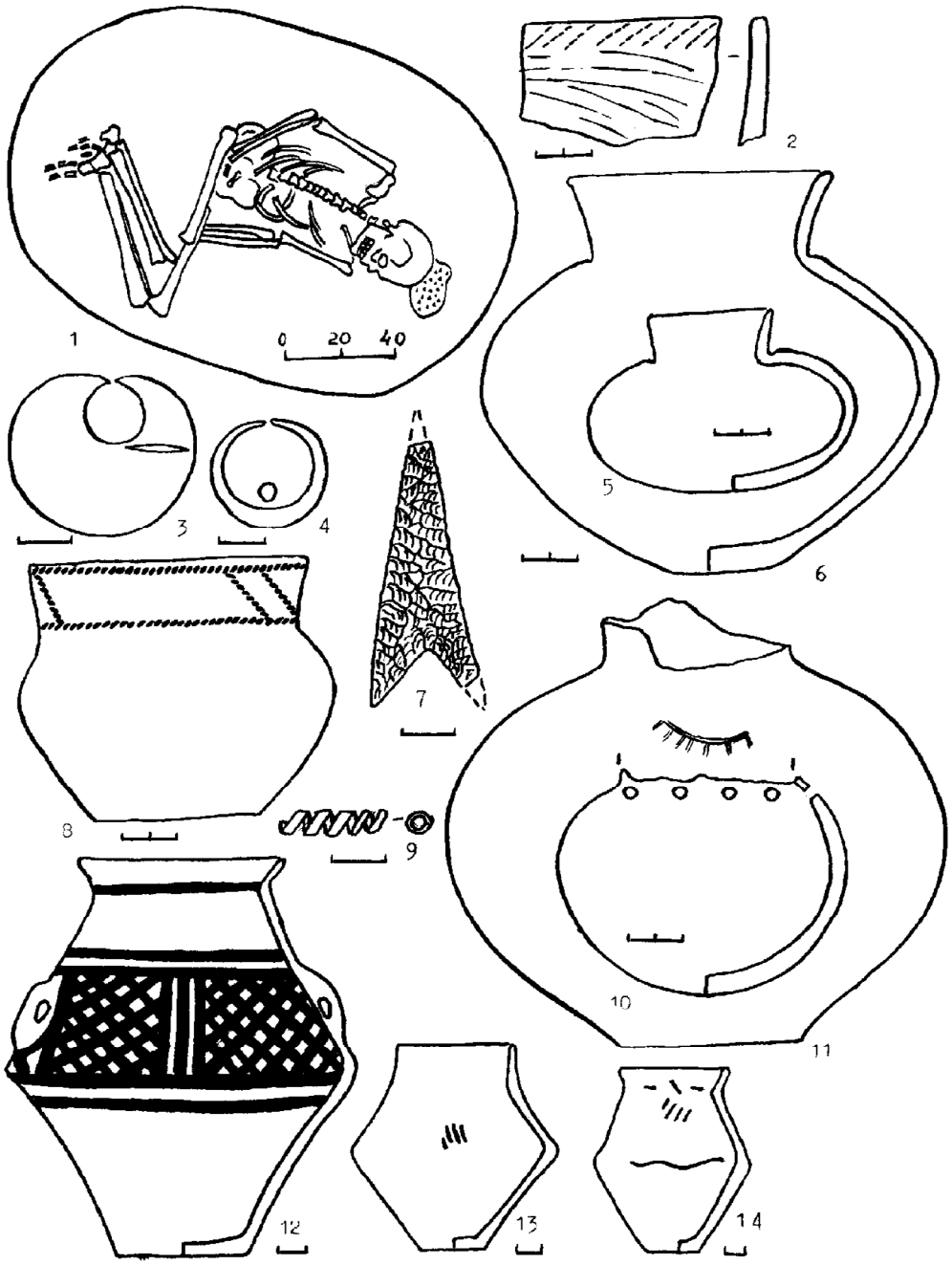

Fig. 5. Grave and the basic finds of the Nizhnemikhailovka culture: 1 — Sofievka, barrow 40, grave 7; 2, 7 — Vasilevka, barrow 1, grave 22 (after Rassamakin); 3 — Kovalevka VII, barrow 4, grave 32 (after Kovpanenko, Fomenko); 4 — Trapovka, barrow 10, grave 14 (after Petrenko); 5 — Dolinskoye, barrow 1, grave 32 (after Rassamakin); 6 — Ordzhonikidze, "Chkalovskaya", barrow 3, grave 32 (after Nikolova, Rassamakin); 8, 9 — Obloy, barrow 2, grave 4 (after Evdokimov, Rassamakin); 10 — Aleksandrovka, barrow 1, grave 17 (after Rassamakin); 11 — Mikhailovka, barrow 1 (after Evarnitskiy); 12 — Novo--Kotovsk, barrow 1, grave 9 (after Agulnikov); 13, 14 — Khadzhider and Koshary (after Patokova, Petrenko, Burdo, Polishchuk). 2, 5, 6, 8, 10-14 — pottery; 3, 4 — silver; 7 — flint; 9 — copper.

dium-height necks with well-cut rims. The surface is smooth, although on many wares, in particular well-known amphora from the settlement #2 [Lagodovskaya, Shaposhnikova, Makarevich 1963: Fig. 10], some scratches are visible: vertical on the neck and slanting on the belly. But there are many polished vessels as well. Ornamentation is seldom found. Rows of imprints of string on the neck are typical. They also have notches, pearls, and caterpillars. Small-sized, round-bottomed wares with similar distinctive technical features are also found in the burials.

The time of existence of Nizhnemikhailovka culture is determined by the presence of Tripolye imports in the burials of the western type and the Dnieper basin, the stratigraphy of the burials and the bottom layer of Mikhailovka. These facts allow dating of the given culture, with its local displays, to the time of Tripolye B-II/C-I, C-I and C-II, in other words 3700–3000 BC [Movsha 1984]. But some findings in the burial mounds on the Prut river (Sarateni, m. 3 and m. 1), where sherds from the culture of Cernavoda I and Ib were found in funerals [Demchenko 1990: 63; Manzura 1993: 29], and also in the burial mounds of the Dnieper basin (Vasilievka, m. 1 b. II), where Stogovska culture ceramic was found in funerals of the Nizhnemikhailovka type [Rassamakin 1993: 10, Fig. 9:4], can move the dating to Tripolye B-II, in other words, to the first quarter of the 4th millennium BC. But early dating, like in the Kvitanska culture, needs a reliable source for additional grounds.

In this way, we highlighted five basic cultural occurrences, which characterize the Eneolithic of the steppe and south to the forest-steppe zone of the Ukraine. The first four represent the Sredny Stog region and, from the point of view of V.N. Danilenko, comprise all the stages in the development of Yamnaya culture. The fifth culture, as a rule, contrasts with the previous ones in the framework of a special, Azov-Black Sea line of development of steppe Eneolithic. As a result, we have the oldest Skelanska culture, which delimited Mariupol cultural and historical unity (in essence still a Neolithic one) and the beginning of the Eneolithic epoch. It has also served as a distinctive ignition for the succeeding cultural development. From them, synchronically and territorially adjacent cultures were formed. One is Stogovska culture, a little bit more ancient, the monuments of which are concentrated very deep in the steppe Dnieper basin, and the other is Kvitanska culture, which has a basic concentration of monuments found in the northern steppe and south of the forest-steppe zones on the right and left banks of the Dnieper with local displays near the Azov Sea, on the Donets and Ingul rivers. Synchronically with Kvitanska in the southern steppe zone, Nizhnemikhailovka culture was developing, the most plentiful monuments of which are found from the Molochna to the Danube. Only the forest-steppe zone from the left bank of the Dnieper to the Donets was occupied by the Dereivka culture, co-existing in that region with Kvitanska. The golden age of these cultures, obviously, was approximately simultaneous to Tripolye C-I, but a

decline and loss of distinguishing features corresponded in time with the downfall of Tripolye culture of C-II with similar characteristics, local delimitations and the creation of varying local syncretical occurrences, For example, on the right bank of the Dnieper [Nikolova, Rassamakin 1985] or, more stably, on the Danube and Dniester (Usatovo variant, Cernavoda I), Don (Konstantinovka culture). That is why there it is not surprising that, during this time (the end of 4th millennium BC), in the steppe zone and south of the forest-steppe, new cultural phenomena occurred which gave a basis for migrational processes. One of them, preliminarily named the Zhivotilovka-Volchansk group, is characterized by strongly displayed features of the Gordineshty or Kasperovka variants of the latest Tripolye (especially in the area from the Dniester to the Molochna and Samara rivers) on one hand, and by features of the Maykop culture type of Novosvobodnaya in the area from the Dnieper to the Don on the other [Rassamakin 1988; 1993]. The ceremonies of this group are surprisingly stable, although they do not have a reliable local steppe and genetic base: rectangular, often ledged pits; extremely curled position of the dead on one side with an orientation towards the western direction, arms bent at the elbows and placed in front of the face. This group testifies to activity of separate groups of Tripolye population in its declining years, especially in the forest-steppe, and to contact with the population of Central European cultures [Movsha 1985]. Proof was reflected in the ceramics and representative amphora-like and goblet-like vessels, different ears and loop handles, and conical sticks on ledges [Rassamakin 1993: 10, Fig. 13]. At the same time, the highest level of activity and penetration into the steppes of Maykop traditions occurred, which in its most common form is reflected on the Lower Don.

At the end of the IV millennium BC, on the left bank of the Dnieper, Donets and near the Azov Sea, monuments (settlements, burials) with ceramics of the Repin culture appear (Fig. 6), singled out on the Middle Don [Sinyuk 1981; Sinyuk, Vasiliev 1985: 49-61]. On the given territory, Repin ceramics accompanied burials in the burial mounds with fixed ceremony: rectangular pits, curled position on the back with arms outstretched along the body, facing the eastern direction. If taking into account that, for the Middle Don, it is characteristic to have an outstretched, ceremony, lacking burial mounds [Sinyuk 1981: 18], it would be obvious that, in the formation of "local" Repin culture, a big role was played by tribes of the Stogovska culture.

In fact, the appearance of the Zhivotilovka-Volchansk group (Fig. 7) and the Repin culture in the steppe zone of the Ukraine (Fig. 8, 9, 10) makes this significant because this is considered to be a transitional period from Eneolithic into Early Bronze Age. After them, multiple burials of Yamnaya culture in the burial mounds are statigraphically fixed (Fig. 11). This culture appears with already clearly highlighted local distinctions and it is principally different from cultures of the Eneolithic epoch in the appearance of tools and burial ceremony. Nevertheless, with a

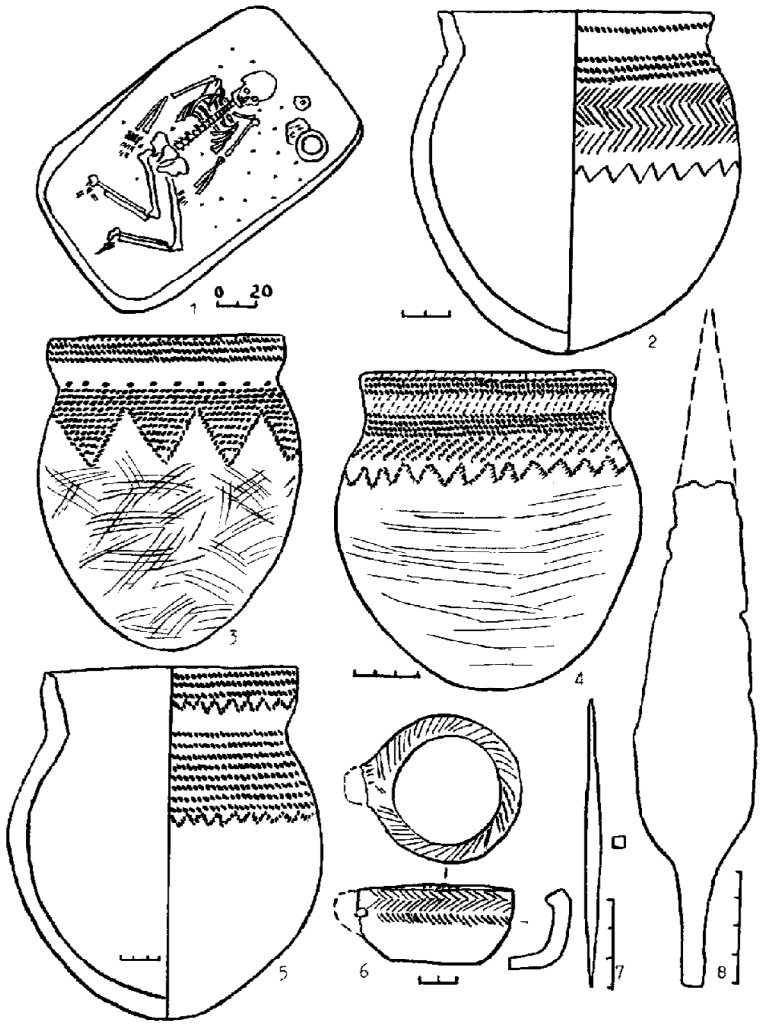

Fig. 6. Grave and the basic finds of the Repin culture: 1, 3 — Verkhnaya Mayevka XVIII, barrow 1, grave 9,7 (after Kovaleva); 2 — Ogorodnoye, barrow 3, grave 1 (after Posrednikov, Sarayskaya); 4, 6 — Kremehevka, barrow 6, grave 8 and Volonterivka, barrow 1, grave 5 (after Konstantinescu); 5, 7, 8 — Samozhne, barrow 3, grave 6 (after Bratchenko). 2-6, 7, 8 — bronze.

formal comparison, we can find common features which unify the cultures of the two epochs. A distinctive leap, still very difficult to describe on the empirical level, can be discussed which reminds us about the change of cultures on the border of the epoch in the Balkan-Carpathians region. After that leap, the whole appearance of the cultures is changed. Their material look and spiritual reflection in ceremony alters, but this does not mean a change of population by migration from the east, for example, as was pictured before. Analysis of the preceding epoch forces us to search for the root of change in one and the same territory.

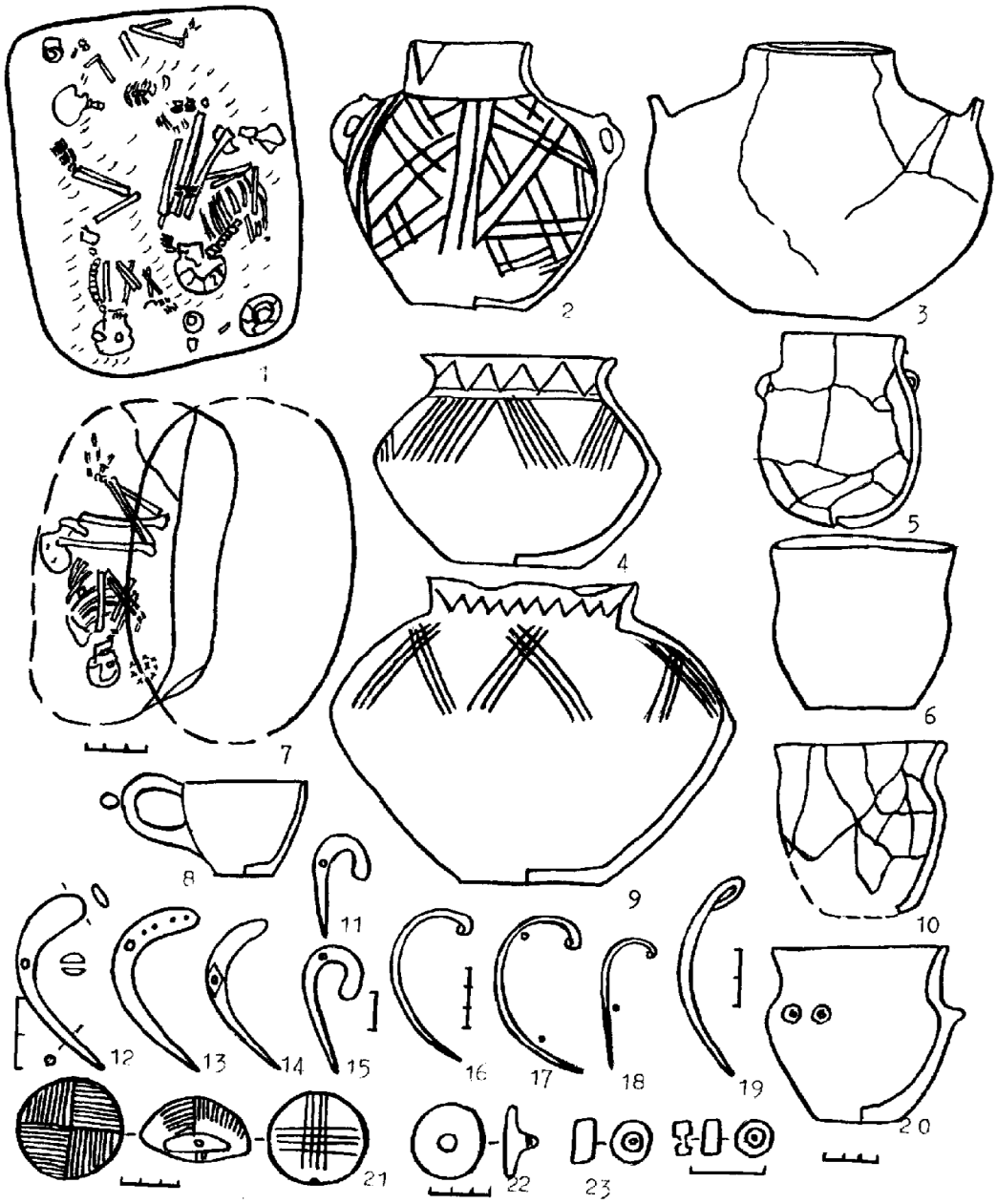

Fig. 7. Graves and the basic finds of the Zhivotilovka-Volchansk group: 1, 3, 6, 19, 23 — Volchansk I, barrow 1, grave 21 (after Rassamakin); 2, 15 — Tarakliya, barrow 10, grave 2 (after Dergachev, Manzura); 4 — Sokolovo II, barrow 6, grave 4; 5, 17 — Boguslav, barrow 23, grave 12,7 (after Androsov, Marina, Zavgorodniy); 7 — Vinogradnoye, barrow 2, grave 14; 8, 21 — Koysug, "Radutka", grave 24 (after Maksimenko); 9 — Zhivotilovka; 10, 12 — Vinogradnoye, barrow 14, grave 1 (after Rassamakin); 11 — Bolgrad, barrow 6, grave 1 (after Shmagliy, Chernyakov); 13, 22 — Podgorodnoye X, barrow 3, grave 7 (after Kovaleva); 14 — Tiraspol, barrow 3, grave 27; 16 — Kazakliya, barrow 17, grave 22 (after Dergachev, Manzura); 18 — Pavligrad, barrow 7, grave 3 (after Kovaleva); 20 — Primorskoye II, barrow 4, grave 2 (after Rassamakin). 11-15 — bone; 16-19 — bronze; 21, 22 — stone; 23 — gagat.

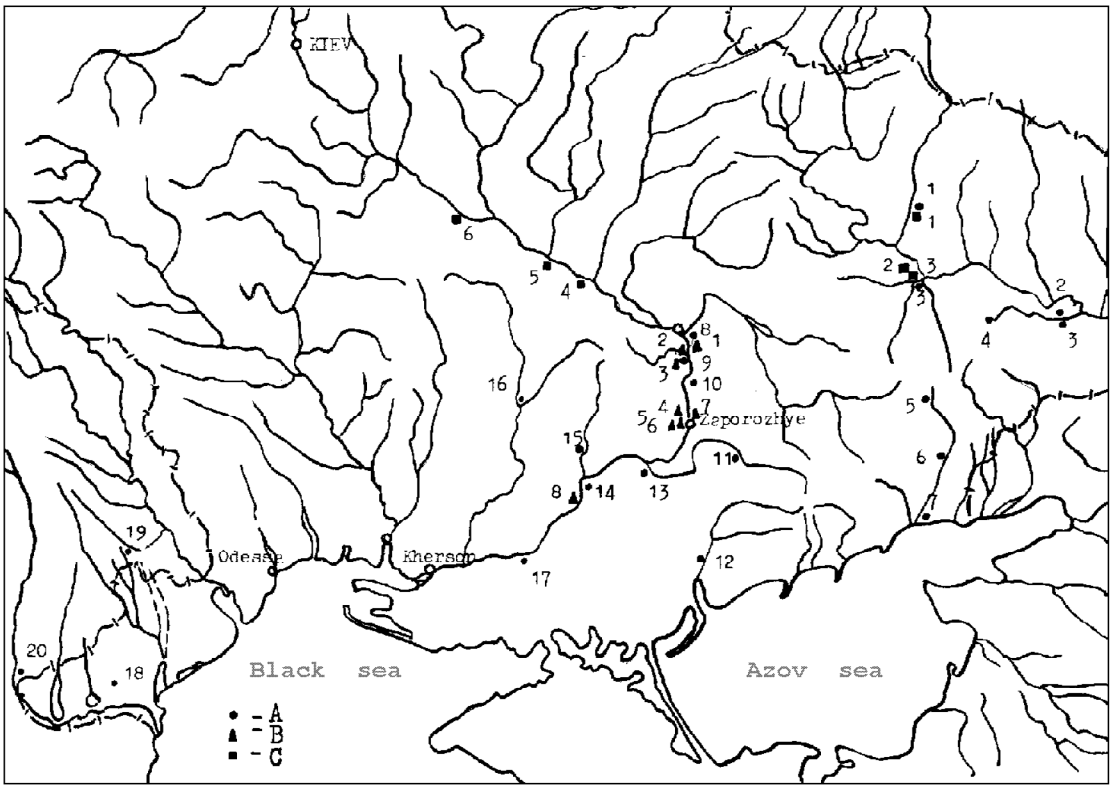

Fig. 8. Map of major sites of the Skelanska (A), Stogovska (B) and Dereivka (C) cultures: (A) 1 — Aleksandria; 2 — Aleksandrovsk; 3 — Voroshilovgrad; 4 — Olkhovatka; 5 — Donetsk; 6 — Razdolnoye; 7 — Mariupol; 8 — Chapli; 9 — Strilcha Skela; 10 — Petro-Svistunovo; 11 — Novodanilovka; 12 — Kamennaya Mogila; 13 — Blagoveshchenka; 14 — Nizhniy Rogachik; 15 — Kut; 16 — Krivoy Rog; 17 — Lubimovka; 18 — Suvorovo; 19 — Kaynary; 20 — Dzhurdzhuleshti. (B) 1 — Igren; 2 — Strilcha Skela; 3 — Kodachok; 4 — Durna Skela; 5 — Sredny Stog; 6 — Naumova Balka; 7 — Khortitsa; 8 — Zolotaya Balka. (C) 1 — Aleksandria; 2 — Minevskiy Yar; 3 — Zlivki; 4 — Dereivka; 5 — Kamenniye Potoki; 6 — Molyukhov Bugor.

2. THE SOURCES FOR RECONSTRUCTION OF ECONOMIC ACTIVITIES

Cultural and chronological assumptions, described in the preceding part, allow us to examine the sources more specifically. These are sources usually used by archaeologists for study of the economy of prehistoric populations. Such sources include osteological materials, separate categories of manufactured inventory (the material for production and traseological researches, functional belonging), and

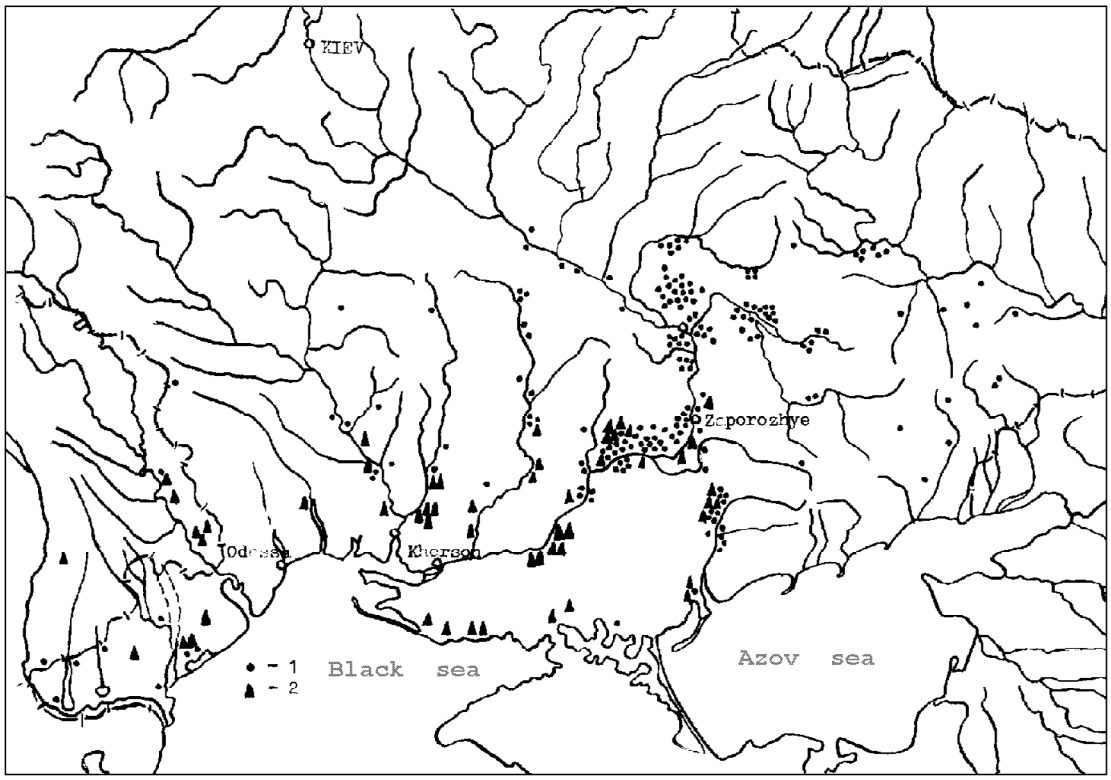

Fig. 9. Map of major sites of the Kvitanska (1) and Nizhnemikhailovka (2) cultures.

information about the topography of settlements and burials. Consequently, we will try to state the present condition of those sources.

For the Skelanska culture we have very little information. Definitions of osteological materials from the settlement of Strelcha Skela are made for all cultural layers, from Neolithic to Bronze Age, and are published in this way by I.G. Pidoplichko [1956: 14-15]. Therefore, these facts can not be used for reconstruction of the herd's structure. The only thing that can be referred to is a minimal number of bones and pig specimens for these periods. It is impossible to distribute between cultures, ages of bones and specimens of cattle, goat, sheep, and horse. A similar picture, in our opinion, is in the case of Alexandria, considering disagreements in stratighaphical division of the monument by D.J. Telegin and B.N. Danilenko [Telegin 1973: 15-23; Danilenko 1974: 49-56]. Additionally, even the layer itself is divided by the excavator (Sredny Stog by D.J. Telegin), who is highlighting materials of only 14 specimens of osteological definition [Telegin 1973: 132-133]. It makes them even less expressive and less defined. Information from the Lower Don settlements is also absent.

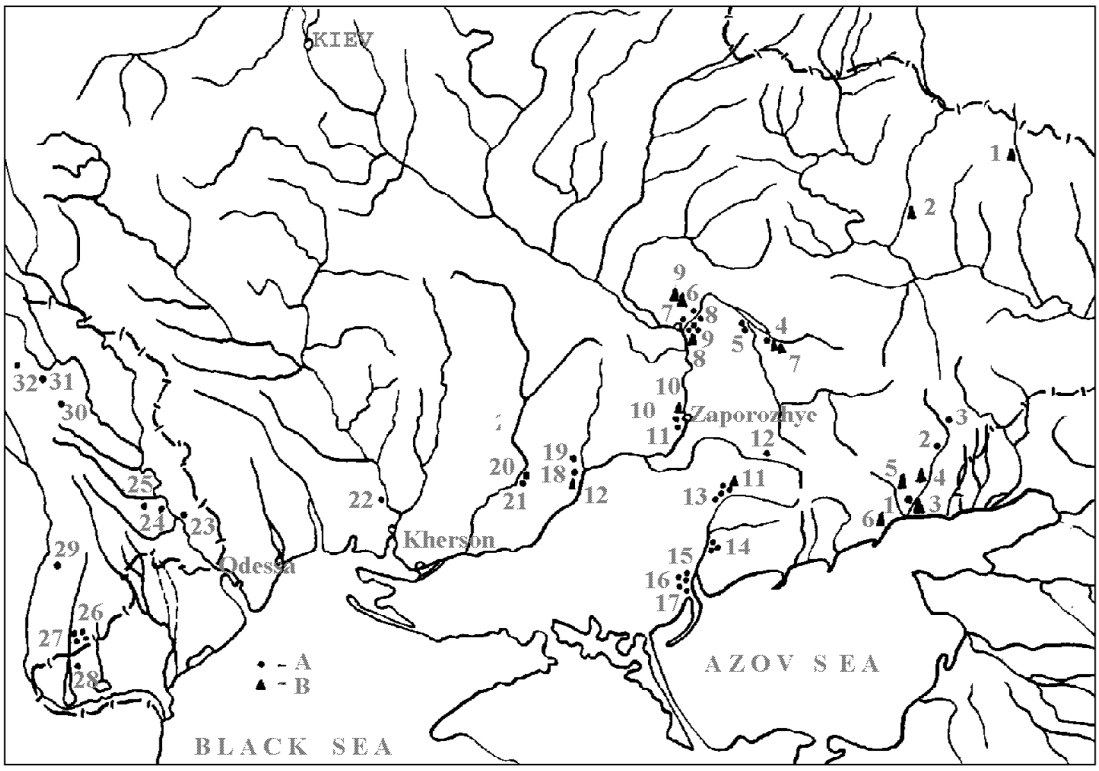

Fig. 10. Map of major sites of the Zhivotilovka-Volchansk group (A) amd Repin culture (B). (A) 1 — Primorskoye; 2 — Vasilevka; 3 — Aleksandrovka; 4 — Boguslav; 5 — Pavlograd; 6 — Zhivotilovka; 7 — Podgorodnoye; 8 — Novomoskovsk; 9 — Sokolovo; 10 — Dneprelstan; 11 — Razumovka; 12 — Pologi; 13 — Vinogradnoye; 14 — Novo-Filipovka; 15 — Volchansk; 16 — Yuryevka; 17 — Davydovka; 18 — Novovorontsovka; 19 — Ust-Kamenka; 20 — Staroselye; 21 — Velikaya Aleksandrovka; 22 — Kovalevka; 23 — Tiraspol; 24 — Cura-Bykuluy; 25 — Roshkany; 26 — Tarakliya; 27 — Kazakliya; 28 — Bolgrad; 29 — Sarateny; 30 — Bursucheny; 31 — Novye Duruitory; 232 — Kosteshty. (B) 1 — Podgorovka; 2 — Aleksandria; 3 — Volonterovka; 4 — Zamozhnoye; 5 — Kremenevka; 6 — Ogorodnoye; 7 — Boguslav; 8 — Aleksandrovka; 9 — Verkhnaya Mayevka; 10 — Durna Skela; 11 — Zamozhnoye; 12 — Mikhailovka II.

The osteology from burial monuments is not at all impressive. In the filling material of four burials near Chapli (b. Ia-3a, 5a) the teeth of a sheep/goat were found in three cases and the pelvis bone of a bull in one (according to I.G. Pidoplichko). In the same material of burials I and II, in a recently researched burial mound near Krivoy Rog, some bones of animals were also recorded. They probably belonged to large horned livestock, but the conclusion of experts is lacking [Rassamakin, Budnikov 1993: 116-117]. An analogical situation occurred in the burial of Dzhurdzhuleshti [Haheu, Kurchatov 1993: 101, Fig.I,3;3]. That is why using only given materials to describe the organization and character of the Skelanska culture

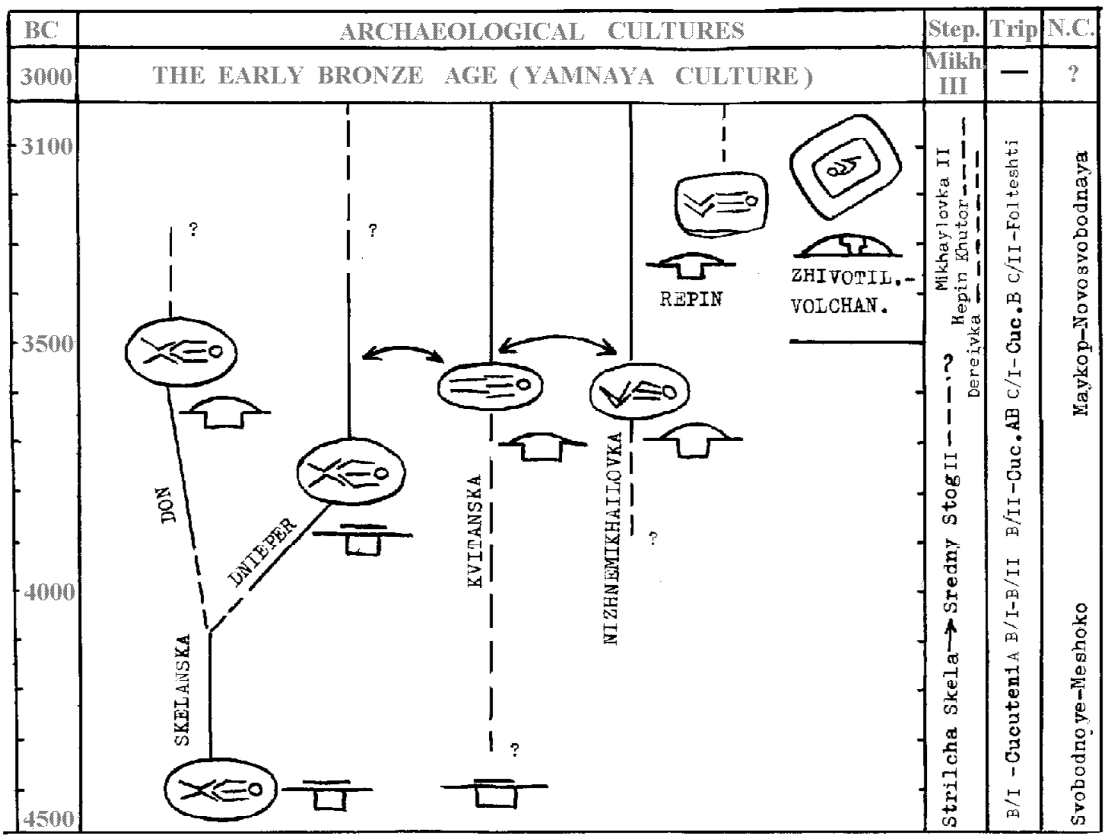

Fig. 11. Chronological position of the graves and settlements.

herd, with its local displays, is very difficult. Even different categories of inventory do not add any information because trace identifications are absent. The majority of tools and decorations were made from the bones of wild animals, especially deer and wild boar. The handle of a copper awl from burial I of the burial mound in Krivoy Rog was made from the bone of a sheep/goat, but the tool itself is more likely to be an import [Rassamakin, Budnikov 1993: 116, Fig. I,5].

The same picture can be drawn of the Stogovska culture. Some osteological definitions for the Eneolithic layer exist for the Sredny Stog settlement [Pidoplichko 1938: 159], but they are based on a very insignificant number of materials. Domestic types of animals, including dog, are represented in only 15 specimens (225 bones), and wild in 6 specimens (25 bones). The indicators of types of domestic animals are really poor: only two specimens of bull and horse, one of goat and pig, and eight specimens of sheep or goat. Naturally, it is impossible to tell the character of cattle breeding among Stogovska tribes using just those facts. The settlement itself is just a part-time, obviously summer-time residence of a separate group of

the Stogovska culture population, adjacent not to the native shores of the Dnieper, but to Khortitsa island.

The inventory of burial monuments do not add anything to the general picture. Those burials that can be related to Stogovska culture on Vinogradny island, Igren — 8, do not usually have any inventory at all and no remains of funerals or sacrificial food are recorded. The only distinguishing feature of the burials that allows judgement of the settled population is the presence of their bones in probably long-existing ground burials.

Manufacturing inventory is also unplentiful. In settlements, very few tools are discovered. In Sredny Stog — 2, flint goods are found, the majority of which are pieces or manufacturing waste [339 out of 423 according to A. Dobrovolski 1929: 123]. But, out of 84 restored objects only 42 are undamaged. Scrapers, knives, and tips are also found, but their trace analysis was not done and their functional belonging is unclear.

The topography of the Skelanska and Stogovska culture settlements is close to that of the Dnieper basin (Fig. 8). The settlements were located either in places with easy approaches to the river banks or on mountain ledges with niches, which protected these part-time refuges from bad weather. There is a possibility of their using them during war conflicts, too. We have evidence that the epoch of Skelanska, and to a lesser degree the Stogovska cultures, was characterized by increased opposition of different groups among the population. Multiple flint arrow- and javelin-heads, were found both in the settlements and in the burial complexes as well.

Kvitanska culture, unfortunately, is not represented either with osteological facts or with manufacturing sets from settlements because neither were researched. In those cases where Kvitanska ceramics were a predominant factor in settlements, it is impossible to single out materials belonging to the given culture because of the thick layers. Therefore, basic sources are burial monuments, so-called "outstretched" burials under embankments of burial mounds. But even these sources are very limited. For example, from funeral remains of full Kvitanska culture burials in one region between the Orel and Samara rivers, I.F. Kovaleva mentions only two cases with buried sacrifical animals (the skull of a bull and a skullless skeleton of a young large horned livestock specimen) [Kovaleva 1984: 14]. But these facts have to be checked. Of bone goods, the puncture tools from horse bones are mentioned [Kovaleva 1984: 34]. Despite completely identical punctures from Ordzhonikidze and Vasilievka [Nikolova, Rassamakin 1985: 45, Fig. 10:2; Rassamakin 1993: Fig. 11:9], archaeozoologist O.N. Zhuravlev did not risk giving a final definition. A definition of domestic animal type, whose bones were used to make other things, is absent. Some findings of animal ribs are also mentioned, but this is the limit of the facts. A trace analysis of different categories of tools made from of flint, stone, and bone is also absent. From our excavations (Vinogradnoye,

m.2 b. 2) [Rassamakin 1987: 33, Fig. I,8] one piece of an animal's rib cage, with multiple usage tracks, was defined by G.F. Korobkova as "kochedik", used for weaving.

The topography of settlements and burial mounds of the Kvitanska culture points to a complete and close connection of life with the river valleys (Fig. 9). This gave a basis for the thoughts of I.F. Kovaleva. She points out a connection with the population which left "outstretched" burials (or according to her terminology post-Mariupol culture) in the deep steppe regions, which lay outside of its sphere of influence [Kovaleva 1984: 10].

Dereivka culture differs favorably from all the above described cultures of the Sredny Stog region due to perennial permanent research in the Dereivka settlement. It is, in fact, the only one that provides materials for reconstruction of the entire culture's economy. We mentioned the Alexandria settlement before. The settlement of Molukhov Bugor, after insignificant excavations by V.N. Danilenko, was represented only by 8 species (80 bones): 3 — cattle, 3 — horse, and 2 — pig [Telegin 1973: 132, diagram VI]. Naturally, it can not serve as a full-fledged source. Moreover, the author of this research was highlighting two horizons of a settlement and the distribution of domestic animal bones, according to this, has remained unknown [Danilenko 1959].

A study, made by V.I. Bibikova, of osteologic materials from Dereivka revealed a tremendous predominance of horse bones and specimens over other types of domestic animals. According to her results, the horse comprised 55.7%, the cattle — 20.6%, small horned livestock — 14.4%, and the pig — 9.3% [Bibikova 1975: 85]. V.I. Bibikova also records approximately 2255 horse bones with the minimal number of specimens at 44, but D.J. Telegin has evidence of 2412 horse bones 52 specimens [Bibikova 1969: 64; Telegin 1973: 132, diagram VI]. It is obvious that the last facts are the most complete, but all the works of V.I. Bibikova are based on the previous facts [Bibikova 1963: 134, addition 6]. It does not make a big difference in the general distribution of domestic animals and it does not influence the general characteristics given by V.I. Bibikova. Osteological study of horse bones (distribution of sex and age of specimens and detailed comparison — studying of the horse skull and lower jaw from the ceremony place, and also separate extremity bones), which was compared with existing facts about wild horses (tarpan and Przevalski horse) and known facts of horse domestication, led V.I. Bibikova to the conclusion that horse bones of Dereivka belonged to an early domesticated type [Bibikova 1967, 1970, 1975, 1969]. The same point of view is held by the majority of researchers, both archaeozoologists [Tsalkin 1970: 198-204; Bökönyi 1984: 10-11] and archaeologists [Danilenko, Shmagliy 1972; Danilenko 1974; Telegin 1973: 131-134]. In Bibikova's opinion, the horse was an addition to the meat ration of settlements' populations. According to these facts, which are automatically spread to the whole Sredny Stog

culture (in the interpretation of D.J. Telegin), the people of the Dereivka settlement are seen as horse breeders and even as nomadic horse breeders.

A series of antler items were singled out from the settlement inventory for the support of a horse breeding economy of its inhabitants. They have become "psalii" (cheekpieces) in interpretation [Telegin 1973: 137-139] and used to describe Dereivka riders or Sredny Stog riders (who are one and the same). They represented fearsome combat forces, armed with spears, bows, combat hammers and maces made from antler [Telegin 1970: 19, 1971: 230]. By no means do all researchers support the idea of horsemen among the Dereivka population, dispute over the existence of antler cheekpieces arises. This issue was often discussed in the literature, having its supporters, who were trying to find reliable arguments [Anthony 1986; Anthony, Brown 1991], and its opponents [Haüsler 1994; Ditz 1992], who bring some arguments against it. At the present time, this discussion continues, but new sources, which would allow a breakthrough in this problem, are absent.

The inventory presented in Dereivka does not support a mobile or even any nomadic way of life for its inhabitants. The seasoned character of accumulation of the cultural layer, as was suggested by V.I. Bibikova, is based on the age of slaughtered animals — a year and a half and older with an absence of the very young, before half a year [Bibikova 1975: 85]. Numerous antler hoes testify to the great role of farming. Some pieces of these hoes can not be combat hammers. Despite the absence of traseological research, it is hard to believe that so many powerful combat weapons were scattered in the settlement. Even D.J. Telegin notes the difficulties in discerning the difference between combat hammers and hoes [Telegin 1973: 74]. Indirectly, the similarity of the Tripolye population and its influence, as well as the presence of imprints of cereals on Molukhov Bugor ceramics, point to the farming function of these goods [Pashkevich 1992: 185]. In the Dereivka settlement, some stone grinders and grain graters are mentioned [Telegin 1973: 71]. But, traseological analysis can not establish the function of these goods and weapons yet.

Ground burials and topography (Fig. 8), which point to an area comfortable for long residence, confirm that the settlements of the Dereivka culture were permanent.

In the character of sources, the Nizhnemikhailovka culture is reminiscent of Stogovska culture. On one hand, because the lower layer existed in the Mikhailovka settlement with osteological definitions, and on the other, because Kvitanska has few funerals with animal bones in underground burial monuments. But neither one nor the other provide enough materials for reconstruction of the character of the cattle breeding population of the whole culture. For example, the lower layer of Mikhailovka, according to the information from V.I. Bibikova and A.I. Shevchenko, is represented by only 1106 domestic animal bones, of which the minimal specimen number is 55 [Bibikova, Shevchenko 1962: 207, diagram I]. The largest number of

bones and specimens is among small horned livestock — 760 and 36 respectively, after that is cattle — 217 and 9, horse — 104 and 4, pig — 20 and 4, and dog — 5 and 2.

Burial monuments provide only minimal information. Bones from the funerals in two cases were defined — from complexes on the Molochna (Vinogradnoye, m. 24, b. 30) and Dnieper basin (Vasilevka, m. 1, b. 22). They belonged to a bull, a cow, a goat and a sheep (definitions of E.I. Sekerskaya and O.N. Zhuravlev). These facts supplement those found in settlements insignificantly. Besides, researchers point out the insignificant number of bones, which were given away for measurement and detailed characterization, except for a few parameters of some bones [Bibikova, Shevchenko 1962: 209, 227-228, 233], especially for cattle and horse.

The manufacturing inventory is represented by an insignificant number of flint and bone tools in the settlement (scrapers, arrow-heads, puncture tools), which were never given away for traseologic study. Quite poorly represented are the tools of production and burial complexes, where ceramics and decorations are predominant.

The topography of the Mikhailovka settlement, which is located on a high hill comfortable for long residence and with an approach to the river Pidpilna, is the most optimum for this region, for which a high shore line is characteristic. The burial mounds of the Nizhnemikhailovka culture are connected with the river basins and were located, as a rule, along high and low shores. They are not known in the open steppe. Due to observations on the right shore of the Molochna, Nizhnemikhailovka burial mounds and burial mounds of the Kvitanska culture were located closer to the end of the plateau and even continued towards an already descending hill (Fig. 9).

Thus, we briefly characterize the sources relating to the highlighted cultures, which were obtained as the result of archaeological research in the epoch of the Eneolithic. It is necessary to state the limited collection of facts, available to clarify the character of the cattle breeding economy among natives of the described cultures. We can speak about the organization of the herd, which was already stable in the Neolithic time, but not about the predominance of one or the other type of domestic animal and the character of their support. The information we have is insufficient. The same can be said about the related domestic production. To a certain degree, an exception could be the Dereivka culture, but even its characteristics are based on a single monument and still raise many challenging questions, for which the solution requires new qualitative sources.

The monuments of the changing period (Repin culture and Zhivotilovka--Volchansk group) provide practically no information. Repin culture is usually referred to by researchers as a horse breeding culture, based on the facts of osteology from the settlement of Repin. But we can not find the original information in which a amount of 80% of horse bones and specimens are mentioned. The facts about the Repin settlement are presented by V.P. Shilov [Shilov 1975a: 67], without referring

to literature, but with reference to the definition of V.I. Tsalkin about the 1958 excavations of the settlement. According to these facts, such things as 150 horse bones from 5-6 specimens, 20 cattle bones from 2 species, and a number of bones from 1 specimen of small horned livestock and a pig were found. Furthermore, the researcher alludes to the statement of the excavator, I.V. Sinitsin, that the horses, according to the precise facts, comprised 80%. But such insignificant facts do not allow a reliable and thorough characterization of the economy of inhabitants of the Repin culture. Besides, detailed research of archaeozoologists are absent, for example, in Dereivka. Burial complexes with Repin ceramics do not reveal any facts yet.

The population of the Zhivotilovka-Volchansk group left only burial monuments, through which we may judge only the great mobility of this group (Fig. 10). The usual findings of bones in the burials testify to the presence of sheep, but the skull of a bull and a bison in one burial (Volchansk, b.1, p.16) were not described by specialists.

Yamnaya culture, which replaced the Eneolithic cultures in the Dnieper-Danube region (Fig. 11) and standardized them outside, is represented both in the settlements in the Dnieper basin and in the burials, the number of which is more than one thousand. They also supplied very limited facts for the reconstruction of the cattle breeding economy. The fundamental source with osteological definitions is the middle and upper layers of Mikhailovka settlement. Besides this, the definitions for two more settlements are published — Durna Skela and Perun [Bibikova, Shevchenko 1962; Pidoplichko 1956: 44,51]. The difficulties in using the facts about these settlements are illustrated in the definition from Mikhailovka which is given for two layers together, despite the fact that different times and even other culture materials are highlighted among them. For example, the lower horizon of the middle layer was singled out by O.G. Shaposhnikova due to a distinctive ceramic of the Rogachik type of monument. Also present are materials of the Repin culture. In the top horizons, the materials from the time of Catacomb culture are present. At the settlement of Durna Skela, the materials of Sredny Stog and Repin cultures exist, and perhaps the materials of the Middle Bronze [Yakubenko 1982]. The settlement of Perun also needs additional analysis and a new chronological definition. Nevertheless, these facts are used for definition of the herd organization and for the characteristics of cattle breeding among the tribes of the Yamnaya culture of the Dnieper basin. Therefore, we will bring in the basic facts about previously discussed settlements. In Mikhailovka, two upper layers yielded 51 541 bones, from which 3679 specimens of domestic animal were defined. Of these, the cattle was predominant — 1627 specimens, small horned livestock totaled 1202 specimens, horse — 656 specimens, pig — 82 and dog — 112. Perun is represented by 1037 bones of domestic animals, which comprise 53 specimens: 22 of cattle, 24 — of sheep or goat, 2 — of horse, 1 — both of goat and pig, and 3 — of dog [Pidoplichko 1956:

51]. The settlement of Durna Skela produced 25 specimens of domestic animal: 10 — cattle, 6 — goat or sheep, 1 — sheep, 5 — horse and 3 — dog [Pidoplichko 1956: 44]. These are the facts from the settlements. The materials of Mikhailovka have an advantage, not only because the quantitative indicators were published, but necessary measurements of bones were made, as well. Also, a comparative analysis of results with archaeozoologistic and facts available in the 60's was made [Bibikova, Shevchenko 1962].

Some information exists about the presence of domestic animal bones in the burial complexes of the Yamnaya culture. They are found in filled burial mines, on the ledges of burial pits and near the buried. At the end of 60's, N.J. Merpert, in his doctoral thesis, was bringing together the facts then available, which fit into certain regions of Yamnaya cultural-historical unity. They were also used by V.P. Shilov in his work [Shilov 1975a: diagram 8]. According to the diagram, which was discussed in the work, the limit of the given source could be seen, because complexes with animal bones, especially those examined by specialists, are less common than those with researched pit burials. This tendency has its support even now, after the time when thousands of pit burials were excavated on the site of new buildings. The last has become the object of a whole series of regional research in the Dniester--Danube region, on the Southern Bug, on the right bank of the Dnieper, between the Orel and Samara rivers and on the Molochna river, at the north-eastern Azov coast [Yarovoy 1985; Dergachev 1986; Kovaleva 1984; Sanzharov 1991 and others]. Usually very little information is brought up about the character of osteologic material, sometimes limited by the establishment of its presence or by a short list of domestic animals to which those materials belonged. Most often, cattle and sheep belong to such groups. The horse is rarely mentioned and pigs not at all. Dogs also exist. But it is difficult to produce any numerical indicators. For example, on the north-western Azov coast, out of 589 pit burials, only 32 (5.4%) have any animal remains at all. In addition, in not all cases were these bones examined by specialists [Rassamakin 1992: 12]. On the right bank of the Dnieper, from an excavated series of 197 burials, the bones of animals were found only in 10 [Samoylenko 1988: 77]. Goat/sheep, cattle and horses are mentioned. The first two specimens are mentioned for the Southern Bug variant of Yamnaya culture without any quantitative facts [Shaposhnikova, Fomenko, Dovzhenko 1986: 21]. On the whole, up to the present time, any total summary of osteologic materials from dimple burials is lacking. It is thought to reflect the present level of research on the whole culture. This is also concerns the simple quantitative indicators, and even more, the differences between animal types not only in general, but regionally as well.

The state of the osteological base for reconstruction of the cattle breeding economy of the Yamnaya culture in the Pontic and Azov areas must be and is desired to be improved.

Traseological research revealed that, despite the abundance of different productive complexes, tools of production also were not available in a proper range. Separate research is available about grounddigging tools, which were made from animal bones and antler [Androsov 1987], about the study of metal treatment [Berezanskaya 1979] and other things, but complex purposeful research was never done. In recent years, the production complexes of Mikhailovka were exposed to traseological analysis within the framework of developing scientific topics in the Archaeologic Institute of the Academy of Sciences in Ukraine. But the results of work are not yet published. In the last decade, some discoveries appeared which some researchers treat as cheekpieces; maintaining with this definition the existence of bridled horses among Yamnaya tribes, usable for horseback riding [Shmagliy, Chernyakov 1983; Kovaleva 1993].

The topography of burial mounds with pit burials in Azov-Black Sea steppes is highly demonstrative. In all regional research, the link between burial mounds and river valleys is clearly outlined. On the watersheds, the burial mounds are placed along the shoreline, pressed to the brink of the plateau or moving slightly away from it. This picture, which was presented by V.P. Shilov for the Volga area, for example, does not exist. I.F. Kovaleva points out a number of pit burials in "high, in relation to the native shore or plateau, groups" with maximal distance of the burial mounds from the river valleys being 25-30 km [Kovaleva 1984: 68]. But this is an exception because the described territory of the northern zone has a highly developed hydrosystem.

The territory between the Dnieper and Molochna rivers is also very illustrative in this reference. For many years, research has been made there among burial mounds and in river bank areas, as well as in the open steppe, which is characterized by very brutal conditions since it is one of the lowest regions of the steppe zone. An account made according to observations from the excavations showed that pit burial mounds are located nearest to the shore of the Dnieper and Molochna zones or by the embankments. In the open steppe, they are practically non-existent [Otroshchenko, Boltrik 1982; Otroshchenko 1987]. Nearly the same picture of location of pit burial mounds can be seen practically everywhere, in all regions of the Azov-Black Sea line. To this point we can add the completion and size of pit burial mounds in the regions. They show a long period of usage of the same burial mounds for additional burials and underburials. This also testifies to the permanent presence of Yamnaya tribes near the burial mounds. The height of pit burials reaches 3-5m, but sometimes even higher and they have from 3-4 to 7-8 different additions. Even small burial mounds, without any signs of additions, usually present a so-called "mogilnik" in the burial mounds' embankments, with well-planned circular or center entrance burials. Such a picture testifies to the preference of the Yamnaya population to live in certain places, which are shown to be closely

connected with the river basin areas and the river bank line of small and large rivers.

As a closing summary to this section, we are forced to note a weak base of sources for the solution of such a difficult problem of the Eneolithic period, as well as the Early Bronze. Such problems include the reconstruction of the type of cattle breeding economy among the populations of different cultures and their way of life. The herd organization is outlined well enough according to the bone remains, but for future research this is only half of what is needed. Things are going a little bit better with studies of Dereivka and Mikhailovka, but even here we have some problems, as will be discussed in the following paragraphs.

3. THE QUESTIONS OF PALAEOECOLOGY

The reconstruction of the ecological situation in the northern Pontic steppes and to the south of the forest-steppe zone, during the period of formation and early stages in development of the specialized cattle breeding economy, is one of the most important complications in reconstructing the way of life among early cattle breeders. Since the last two decades, great success was achieved in this field due to study of natural sediments, but also due to active research by specialists (palaeobotanists, palaeoclimatologists and palaeopedologists) in archaeological sites — settlements and burial mounds. Along with summarized research [Khotinski 1977; Veklich 1987] some work is sent out directly regarding the region that we are examining. From only the last decade, we can name a number of important research [Artyushenko et al. 1982; Artyushenko et al. 1984; Ivanov 1984, 1985; Alexandrovski 1983; Spiridonova 1990, 1991; Kremenetski 1991; Gerasimenko 1993 and others] which allow us to work out common views on the natural situation and climate of the steppe and forest-steppe of the Ukraine. We can do this despite disagreement about dates and natural-climatic characteristics of certain periods and subperiods. Naturally, we are interested in those works which were executed on the basis of studying the archaeological monuments, as they have a direct connection to our topic and to the cultures mentioned above. We will note the monograph of K.V. Kremenetski [1991], the conclusions of whom are based on a large amount of factual material from archaeological monuments of the Northern Pontic zone from the Don to the Prut river. To the west, these monuments are represented by Tripolye and Gumelniţa culture settlements, synchronic with Skelanska and later cultures of the Eneolithic epoch. To the east, pollen analysis from multiple

layers of settlements on the Don river were studied with clear eneolithic layers: Razdorskoye, Samsonovskoye, and also Konstantinovskoye. These facts were supplemented by the study of swamp sediments, from which it is important to single out Kardashinskoye in the lower reaches of the Dnieper, because it gives basic palinological facts for this part of the Northern Pontic zone. We are also interested in the conclusions of palaeopedologists, who researched the burial mounds of Eneolithic and Yamnaya times. V.P. Zolotin was conducting research in the burial mounds of the Northern Pontic in the late 60's [Zolotin 1970]. The researcher came across those burial mounds which were designed during Usatovo and Yamnaya culture times. New research was made by I.V. Ivanov in the burial mounds of the northern steppe zone of the Dnieper basin, between the Orel and Samara rivers, which were erected above the burials of Kvitanska and Yamnaya cultures [Ivanov 1983, 1985].

The facts for reconstruction of the natural situation and climate of the North Pontic area are supplemented by research which indicates changes in the level of the Black Sea [Fedorov 1973; Gozhyk, Karpov 1985]. The progression and regression of the sea is accordingly tied up with the warming or cooling of the climate, also influencing the natural situation of the Northern Pontic region. The facts about the rhythms of the Black Sea, the conclusions of palaeopedologists and palinological materials are used by archaeologists when studying a number of basic problems in the development of archaeological cultures: their formation and disappearance, economic aspects, migrations, etc. These trends have become very popular lately. Archaeologists started to pay special attention to the synchronization of cycles of natural-climatic changes with the alteration of the cultural-historical situation in the steppe zone of the Northern Pontic area. Lectures were delivered on this subject by, for example, C. Todorova, V.G. Petrenko, N.S. Kotova. The climactic change and the swamping of the preferred living sites (valleys) of the eneolithic tribes of the Varna and Kodzhadermen-Gumelniţa-Karanovo VI cultures destroyed, according to Todorova's point of view, their ecological inheritance base and led to havoc in the stable situations of Thracia and the Lower Danube. All Bulgarian settlements of the late Eneolithic were deserted, the Balkan-Carpathians metallurgical field was soon abandoned and a temporary hiatus was created until the beginning of the Early Bronze age [Todorova 1989: 25-26, 1993: 79]. The researcher does not exclude the influence of the climate on the decline of Lengyel and Polgar cultures in Central Europe and on the creation of favorable conditions for invasion of the early steppe tribes to the Balkans.

N.S. Kotova tried to combine natural-climatic changes in the Don-Dnieper steppe zone with the appearance and development of a number of neolithic cultures in Mariupol cultural-historical region, in this way synchronizing certain cultures of their periods with the rhythms of climactic changes (aridization and moistening).

The researcher states that either migrations of any culture's population into another region (as a rule, from south to north), or their peak, the increase of population, etc. were dependent on the above-mentioned conditions [Kotova 1993: 22-31]. The beginning of the Eneolithic epoch, connected with the appearance of Skelanska culture, coincides with a favorable natural-climatic situation of the moistening period [Kotova 1993: 29].

V.G. Petrenko worked out, in detail, the stages of Tripolye culture development and changes of the Black Sea level. He came to the conclusion that the Tripolye phenomenon "was moving towards the limit of its formation in the same rhythm as the climatic changes" [Patokova et al. 1989: 117], and that the end of the Eneolithic, to the north of Black Sea, and the end of the Atlantic period of the Holocene are synchronized. We consider the researcher's conclusion about worsening of natural-climatic conditions during the late period of development of Tripolye culture to be very important. The development of Usatovo culture coincides with a cold snap, and to the time for the Khadzhibey regression of the Black Sea on the transition between the Atlantic and Subboreal periods. On the whole, it is possible that the existence of the late Tripolye culture could be spread over the transitional phase from humid to dry climate [Patokova et al. 1989: 117].

The conclusions of V.G. Petrenko coincide with the observations of palaeopedologist I.V. Ivanov, who studied ancient soils in the burial mounds of the Kvitanska culture, according to our terminology (the "outstretched" burials). He determined that the erection of burial mounds was taking place under the conditions of transition from Atlantic to Subboreal, and is characterized by a worsening of climate [Ivanov 1985: 30]. This conclusion coincides with the dating of "outstretched" burials according to found items in Usatovo, of later Tripolye affiliation.

Summarizing the existing facts and taking as a basis the works of K.V. Kremenetski and V.G. Petrenko, we may correlate the development of steppe cultures and the changes in natural-climatic conditions in the following way.

The beginning of the steppe Eneolithic and the appearance of Skelanska culture coincide with the beginning of the second half of the Atlantic period, which is characterized by favorable living conditions due to the oceanic climate. This time of so-called optimal climate is characterized by milder summers and winters than now, but the quantity of rainfall dropped to 120-130 mm. Broad-foliage areas are extended, the grass coverage of the steppe is also improved, and the vegetation becomes more diverse [Kremenetski 1991: 150-160, 174-175]. Considering the disagreements in dating, we took archaeological sites, where studies of soil and pollen analyses were made, as a basis. The early Eneolithic coincides with Tripolye B-I and, using the dates mentioned in the first part of this work, this time can be determined to be 4500–4150 BC.

The late Eneolithic of the steppe falls in the time of the beginning of aridization of the climate, the worsening of the natural-climatic situation, which foreshadows the beginning of the Subboreal period of the Holocene. Obviously, this process, as suggested by V.G. Petrenko, could extend not only to the final phase of Tripolye C-II, but to the whole late Tripolye period of development, especially in the southern steppe zone. In any case, Tripolye C-I is synchronized with spread of the same well-outlined burial mound cultures like Nizhnemikhailovka and Kvitanska, which are evidence themselves of change in the economic structure among culture bearers. For the Dereivka forest-steppe and Stogovska steppe cultures, such a process has not yet been observed. Judging from the dating of Tripolye monuments on the stage of C-I and consequently, Kvitanska and Nizhnemikhailovka cultures, the time of these changes falls in the period of 3700–3150/3000 BC. More drastic changes in cultures occurred during the period of 3600–3000 BC. During this precise time, common processes of decline are observed in the Tripolye environment, and in the steppe as well. Culture-migrants appear, a type of Repin and Zhivotilovka-Volchansk group.

The epoch of the Early Bronze Age is completely connected with the extension of Yamnaya culture. This process fully coincides with the beginning of the Subboreal period, which is characterized by the establishment of a drought-afflicted climate. Valley forests were decreased, the grass coverage was changed resulting in, according to I.V. Ivanov, less productive pastures (50-60% lower) in comparison to the preceding Atlantic period [Ivanov 1985: 30]. A decrease of water in river flood plains was also seen, the quality of water suddenly dropped. These changes could be ignored by the steppe population and influenced its economic activities in a variety of ways. In particular, specialized cattle breeding demanded a transition to a more mobile form, in comparison with Eneolithic times. This was reflected in the whole appearance of the steppe population's culture, which we record in a semi-detailed, uneven change of material culture and ceremony among the Yamnaya population. This is reminiscent of the process of transition from the Eneolithic to Early Bronze Age in Balkan-Carpathians region.

Considering the fact that monuments of the Yamnaya culture in the burial mounds of Northern Pontic area cover all previous burials of eneolithic cultures (Nizhnemikhailovka, Kvitanska, Usatovo), the time of Subboreal coincides with the period no earlier than 3000–2900 BC and continued for about 500 years.

The attempts to correlate the natural-climatic changes with the change or transformation of different cultures provides the foundation for connecting these changes with the changes in the economic activities of the ancient population of cattle breeders and farmers, either in the steppe or forest-steppe, as well. Naturally, the biggest influence, because of the change in ecological conditions, was in steppe zone in the are of the population. The only way to survive became improvement in

forms of breeding and maintenance of cattle. Therefore, reaction to the worsened natural-climatic situation was always cause and effect one.

Naturally, there is a large quantity of still existing problems in studying the influence of natural-climatic factors on the development of Eneolithic and Early Bronze Age cultures. It is first necessary to improve and more distinctly correlate the chronology, palaeoecological and archaeological, for the purpose of improving and combining both scales. Until the present time, some disagreements exist in dating, even within the framework of certain scientific disciplines.

The research done by specialists is necessary in the steppes of the Northern Pontic area, because archaeological monuments here, from the point of view of natural-climatic reconstructions, are poorly researched. On the Dnieper and near the Azov sea they were not adequately studied. The facts about the settlement near Kamenaya Mogila on the Molochna river are not published (the research of G.A. Pashkevich). Of special interest is the burial mounds with multiple additions during the Eneolithic and Early Bronze Age, on the surface of which a thin turf layer formed of dirt accumulation is usually found. The researches of such monuments would allow us to build a reliable time-ecology scale well connected to the archaeological cultures and their chronology. But so far, the steppes of the Northern Pontic and Azov areas are "surrounded" by facts about the farming type of Tripolye culture to the west and northwest. To the north there have been studies of soil in the burial mounds of Kvitanska and Yamnaya cultures and on the Northern Donets and Middle Don. But to the east there is only the materials from the settlements of the Lower Don. Therefore, the conclusion of K.V. Kremenetski about synchronization and homogeneous changes in the climate and vegetation of the steppe zone in the southern Russian Plain is very relevant and vital [Kremenetski 1991: 147-148].

4. THE PROBLEMS OF PALAEODEMOGRAPHY

Palaeodemographic development on the territories of the Northern Pontic and Azov areas during the period of Eneolithic and early Bronze culture development is practically non-existent. In the topic we examine, one thing from general regularities is very important and connected with demographic research: with a population increase, a rise in productivity is necessary because consumption also increases. Or there may be a transition to another economic system or a fundamental transformation of the old one within the possible ecological bounds. The importance of such research and, at the same time, their complexity and controversiality show

researchers' achievements in the field of Tripolye culture study. The last provides extensive materials for palaeodemographic calculations except for from one source — cemeteries, which appear on the stage of development among separate local variants of culture and can not already be "native Tripolye". According to the facts from burial monuments, for the steppe zone, the only tendency is an increase of population from the Eneolithic to the Bronze Age. This is also proved by simple quantitative indicators of researched monuments and other calculations with the use of indicators showing age and sex, which contain their basis in the work of A.E.Kisliy [Kisliy 1989]. The calculations of S.Z. Pustovalov suffer from the large quantity of conventional assumptions and admissions. It is hard to perceive them objectively [Pustovalov, Stepanova 1994]. The limitation of sources, in the framework of burial monuments, is also seen in the research of remains in the burials. These studies usually do not take place and anthropologists are at fault. The settlements of the observed period are limited, essentially, to two monuments: Dereivka and Mikhailovka, where the remnants of dwellings and buildings were recorded. But even those unique monuments have not had a serious demographic analysis until the present time. Therefore, the conclusions about the increase of population in the Early Bronze Age are abstract and based, in many cases, on the nature of archaeological research of the last 25 years. Due to circumstances, were mass excavations of burial mounds. They have become the fundamental and predominant source of ceremony study among the population of the Yamnaya culture. As for the Eneolithic, along with the appearance of early burial mounds, we may obviously suppose the presence of a significant percentage of ground cemeteries, which are occasionally discovered by accident and researched by archaeologists. This is particularly visible in the examples of the Skelanska, Stogovska, and Dereivka cultures.

At the same time, for studying the distinctive economic features of one or the other population, it is more important, in our opinion, not so much to indicate the general increase of population, but to find out the density of population in different regions and at different times. The possibilities exist to single out certain fixed or limited territory groups of population using the following calculations of their productivity potential and level of consumption. Unfortunately, the absence of facts concerning settlements does not permit observation of all aspects of cattle breeding within the framework of certain economic complexes, as demonstrated by S.N. Bibikova using the example of Tripolye culture [Bibikova 1965]. Additionally, the solution to this problem is significantly difficult because of the weak development of social structure among the steppe communities of the Eneolithic, as well as in the Early Bronze Age. The presence of patriarchal relations and the appearance of a large patriarchal family as a basis of society [Lagodovska, Shaposhnikova, Makarevich 1962: 181-182; Merpert 1974: 129-134] can serve as a starting place for research in the framework of certain limited zones. For the Eneolithic and Early

Bronze Age these zones coincide with river valleys and adjacent coastal territories. Graphically, such principle are confirmed by the highlighted local variants of Yamnaya culture, which with more detailed dividing, territorially coincide with the basins of large rivers and their inflows.

5. THE PROBLEMS IN RECONSTRUCTING CATTLE BREEDING TYPES AND THE WAY OF LIFE AMONG THE STEPPE POPULATION DURING THE ENEOLITHIC-EARLY BRONZE AGE

Summarizing all that we said in the preceding parts, we have been introduced to a very problematic objective solution of the given problem, especially for the epoch of the Eneolithic. The question is not one of the herd's organization and which domestic animals formed these early cattle breeders' herds. It was formed among the population of the Mariupol cultural-historic unity, maybe even including the horse. The heart of the problem lies in the correlation of different types of animals in the herd and forms of its maintenance, about which simple calculations of bones and specimens do not provide single-digit information. We are not talking about burial monuments with their ritual specifications. The base of information consists of materials from settlements, the quality of which was mentioned above. It would be possible to name the ideal facts which would allow calculation, during a set period of time, of the quantity of a settlement's inhabitants who could use meat production from the domestic animals represented in that settlement. Not on the basis of the number of specimens, but according to the recalculation of living weight. The last one usually changes the relationship of the herd, especially in those cases where the bones of small horned livestock are predominant. With that, it would also be necessary to count the living weight of wild animals (deer, aurochs, wild boar, miniature horse "kulan" and others). Obviously, the count of possible dairy cattle is needed, and draft and pack cattle, too. The development of such a study, with reference to the steppe zone of the Ukraine, is absent. Therefore, it is impossible to objectively estimate the character of the cattle breeding economy of one or another population. As a result, all suggestions about the way of life among the Eneolithic and Early Bronze steppe tribes are based on indirect evidence. In a summarized form, the conclusion could sound like this: considering the tendency towards population increase from the Eneolithic to the Early Bronze Age, the worsening of the natural-climatic situation from the Atlantic to the Subboreal and in the beginning of the Subboreal, the steppe population transformed to a mobile method of cattle breeding, possibly including semi-nomadism, based initially on sheep breeding. But even with all of this, some settlements should be preserved in the river valleys, which

offered winter housing and possibly even tribe centers with a dependance on their permanent establishment. In fact, the same conclusion was reached by researchers after the excavation of Mikhailovka, as we pointed out in the introduction. This opinion is also held by V.O. Shilov (if for the Early Bronze Age, a type of settled horse breeders of the forest-steppe would be removed, which the researcher placed at Dereivka, in other words, in the Eneolithic period of time).

But this is just a superficial section of the problem dealing with reconstruction of cattle breeding, which is aggravated by general methodological difficulties in classification and typology, fully outlined in anthropological literature. In the 80's, the discussion on the pages of "Sovetskaya Etnographiya" did not bring significant change because researchers preferred to have their own opinions [Andrianov 1982; Markov 1981, 1982; Semenov 1982; Shamiladze 1982; Simakov 1982]. The areas of the largest disagreement remain. These are problems of identification and characteristics of different forms of mobile or unbranded cattle breeding. The critical analysis of this methodological dispute and a list of the latest researchers addressing this topic were made by E.P. Bunyatyan, who has principles of approach we agree with [Bunyatyan 1989, 1994]. The principles reflect the method of cattle maintenance and reproduction and were put into the basis of cattle breeding classification. This gives, in Bunyatyan's opinion, an idea of the essence of cattle breeding as a branch of activity. The methods of maintenance of cattle are observed within the bounds of their extreme manifestations: between stable — stalled, as a form of intensive cattle breeding and mobile — driven, as a form of the most extensive cattle breeding. Depending on a combination of different ways (driving, driving to pasture), four main types of cattle breeding are highlighted: stall-pastured, driven-stall-pastured or driven, driving of cattle and stalled [Bunyatyan 1994: 97-98]. These types of cattle breeding, as determined by other types of economy, primarily with the level of farm development and, in our opinion, the hunt for meat animals, can appear as a criterion for characteristics of the steppe population's way of life: from settled with stalled and stall-pastured, to nomad with driving type, including different intermediate or mixed variants [Bunyatyan 1995]. But this is just a theoretical development, based primarily on anthropological (ethnological) materials, the combination of which with archaeological facts is a necessity. This task for the observed epoch is a very difficult one and almost impossible to complete, unlike, for example, the Middle Ages or Scythian times, because it creates difficulties in finding a corresponding analogy. The facts about completely nomadic societies or those tranformed into a settled way of life are often not identical to the period of formation and development of the specialized cattle breeding economy in the Eneolithic — Early Bronze Age.

Drawing a conclusion from what has been stated in parts of our work and guided more by indirect facts, and to a considerable extent, by logic and intuition,

we can suggest the following model of development of separate groups among the population. If our conclusion about the residence of Skelanska culture tribes in favorable climate conditions is correct, then the only significant cause for migration could be a demographic one. We are talking about a possible surplus of population in the basins of large rivers (Don, Dnieper) and adjacent territories on the of the Neolithic — Eneolithic. Then, a part of the population could have been forced to resettle into other zones. The given cause is possible, though very improbable. First of all, for such resettlement there was no need to move to the Danube or even further. Neighboring territories with favorable conditions could have solved the arising problems. Secondly, we do not have the appropriate demographic research. Multiple burials of the Mariupol type in the Dnieper basin were erected over a long period of time, and some of them are ones of a different time. They testify to permanent and long-lasting settlement of a territory, but do not give any evidence of a demographic crisis. Another possibility exists concerning early Eneolithic migrations of Skelanska culture tribes and, in our opinion, is more realistic. The appearance of burials belonging to the Skelanska culture in the Carpathians-Danube region coincides with the development of the Balkan-Carpathians metallurgical province. The metal was a stimulus and a purpose for movement. This period in the life of the steppe population could have been called an epoch of prestigious exchange, the importance of which is well-known, according to demographic facts. Rich burial complexes appear, in which the dead were always accompanied by prestigious belongings: copper goods, golden decorations, high quality flint tools, belt sets made of shells, imported ceramics and sceptres or maces. Separate groups of Skelanska culture population were possibly engaged in prestigious exchange, being mediators between the steppe and farming worlds. Due to that, not only completed artifacts were found in the steppes, but independent metallurgical complexes were created in the Dnieper and Volga basins as well [Ryndina 1993]. A parallel can be made between the steppe "rich" burials and Varna's burial. The prestigious exchange, first of all, stimulated social shifts in the Skelanska culture society, which was reflected in the appearance of individual burials (maybe with burial marks on the top) and later, in burial mound construction.

In this way, the appearance of burial mounds was primordially conditioned by social reasons, which were later consolidated into a certain cult-ceremonial and mythological form. As for the economic aspect, we know that domestic cattle were undoubtedly included into a sphere of exchange. It was mainly a certain, atypical for farming, type of pedigreed animal. Consequently, we can talk about certain forms of cattle driving, stimulated by exchange, and simplified by favorable climate conditions. A separate part in this problem is taken by the horse, which could appear as the most "exotic" and prestigious animal. In any case, the appearance of scepters resembling horse heads confirms this suggestion. The horse became a socially presti-

gious symbol in the surroundings of steppe-mediators and maybe, among certain segments of farmers as well. This stimulated the taming and domestication of the horse.

But we can not say how far this process has gone among the Skelanska culture population, whether groups of mediators owned several specimens or if they supported a small herd. We think, the forest variant is more realistic. The psychology of people from this period could reflect not only and not so much the practicality of the action, but the irrationality which appears during those moments when the prestige of owning a certain object or good is significally predominant over practical and economic necessity. In the given case, this can be considered the "rich" segment of the Skelanska population and the farming segment as well. With this idea, the cult meaning of an animal increases, as is easily seen in findings in the Volga basin in the early monuments of the Samara culture (Syezhinsk cemetery, for example). There skulls and legs were recorded on the sacrificial square, and figures of horses made from wild boar fang [Vasilyev 1981: 67]. There are also synchronic monuments of the Khvalynsk culture (Khvalynsk cemetery), where horse bones were recorded in altars [Agapov, Vasilyev, Pestrikova 1990: 65, diagram 2].

In our opinion, for the lifetime of Skelanska culture in the Don-Dnieper steppes, the necessity of wide settlement concerned with settling and extension of pastures or development of mobile, semi-nomadic forms was absent. Especially with nomadic cattle breeding, local resources provided the needed level of lifestyle. This is confirmed by the following period, when the Balkan-Carpathians metallurgical province disappeared. At the same time, "rich" burial complexes disappeared, and the movements of the population's groups are not recorded archaeologically. In the the Dnieper basin, Stogovska culture is formed. The materials of this culture are still limited by steppe-adjacent Dnieper basin zones, and burials are represented by ground cemeteries and small in number "ordinary" inventories. The life of the Stogovska population was probably fully tied up with the Dnieper basin, and it is hard to calculate the importance and predominance of cattle breeding over other types of economy. Most probable is the presence of stall pastured support of domestic cattle during a settled life.

The Kvitanska and Nizhnemikhailovka cultures, with their clearly outlined burial mound ceremonies expanded during that period, when, in V.G. Petrenko's opinion, a moderately humid climate phase starts. In combination with the wide extension of monuments, this can already be evaluated as the development of mobile forms of cattle breeding under the conditions of a gradually worsening climate. In addition, the primary place belonged to the population of the Nizhnemikhailovka culture, which settled in the more southerly steppe zone and influenced the development of mobile forms of cattle breeding among the Kvitanska-culture population. The rigid connection of monuments of both cultures with river valleys does not permit explanation of any forms of long-lasting driven cattle breeding, espe-

cially among the Kvitanska population. We can not speak more concretely about the cattle breeding economy of Nizhnemikhailovka and Kvitanska cultures.

An uneven picture of economic activity is given by the materials of the forest--steppe Dereivka culture, represented by settlement of Dereivka. Basic facts were outlined above. How much of is this economy characterized by horse breeding? Doubts appear that horses presented only the domesticated type. With a very high importance of hunting, the suggestion about the origins of the majority of horse teeth from the settlement confirms this [Levine 1991: 738-739]. Consequently, D. Anthony and D. Brown do not bring in any evidence of horse domestication, except for the famous skull and lower jaw of a horse from a "cult place". These researchers were able to determine the use of bits from tracks in effaced teeth [Anthony, Brown 1991], but other objects did not give any further confirmation. Thus, the statistical confirmation is absent, not only of the presence of horseback riding on a bridled horse, but its domestication as well. The fact that horses are determined to be either domestic or wild in accordance with bone remnants from settlements confirms the absence of reliable criterion for both forms of division. Moreover, the observations of A. Haüsler are a confirmation that "cult places" are remnants of late destruction of Middle Ages times. We can add that a layer of the Late Bronze Age existed in Dereivka, and is connected to the Byelozerka culture [Sharafutdinova 1982: 15]. The finding of real bone cheekpieces of the Late Bronze Age near a fire-place deep in the shell layer, is notable. It lay on the same level as the fire-place. The "cult place" was placed outside of the shell layer, near the end of the late Perekop, and considering all this, the skull of the horse lay above the bones of dogs. Around the square of the "cult place", D. Telegin also noted down the mixture of layers above the shell horizon. It can be seen that an additional exacting analysis of materials from the settlement is necessary. There is no doubt that part of bones, and also some stone constructions could belong to the Byelozerka culture (Late Bronze Age).

If our thoughts are correct, then the economy of Dereivka's inhabitants can already be characterized not as horse breeding, but as complex, with a significant specific importance of farming and hunting. This situation is found in the farming settlements of Tripolye and Gumelniţa, especially in the early stages, and is supplemented by a relatively high representation of cattle and even pigs. The picture of Dereivka as a farming-cattle breeding settlement is not as clear as in Tripolye settlements, but this is quite explainable by the absence of deep traditions and the perception of Tripolye influence on a local "barbarian" basis.

The population of the Yamnaya culture of the Early Bronze Age can possibly be named as the first semi-nomadic tribes. Their high level of mobility was determined by the arrival of a drought-afflicted climate, which initiated a transition to more extensive forms of cattle breeding. Wide distribution was obtained by wheeled transport. Nevertheless, the Yamnaya population kept certain, obviously assigned

to tribe or family, cattle grazing places, adjacent to river basins, where settlements and burial mounds were located. The support of cattle was based, obviously, on a developed driving-away system, not excluding driving of cattle in places bounded by rivers. But with such characteristics, a different approach is necessary for revealing them as really semi-nomadic groups or as groups of "cow-grazers", according to the analogy of Nuers and others.

CONCLUSIONS

In conclusion, we will note that the given work is considered to be at an initial stage of a difficult and important theme. Its critical purpose should be considered to be an attempt to call researchers' attention to existing problems in the field of reconstructing the economy of the steppe population during the formative period and during initial stages in development of specialized forms of cattle breeding on the territory of the Northern Pontic zone.

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