BEYOND BALKANIZATION

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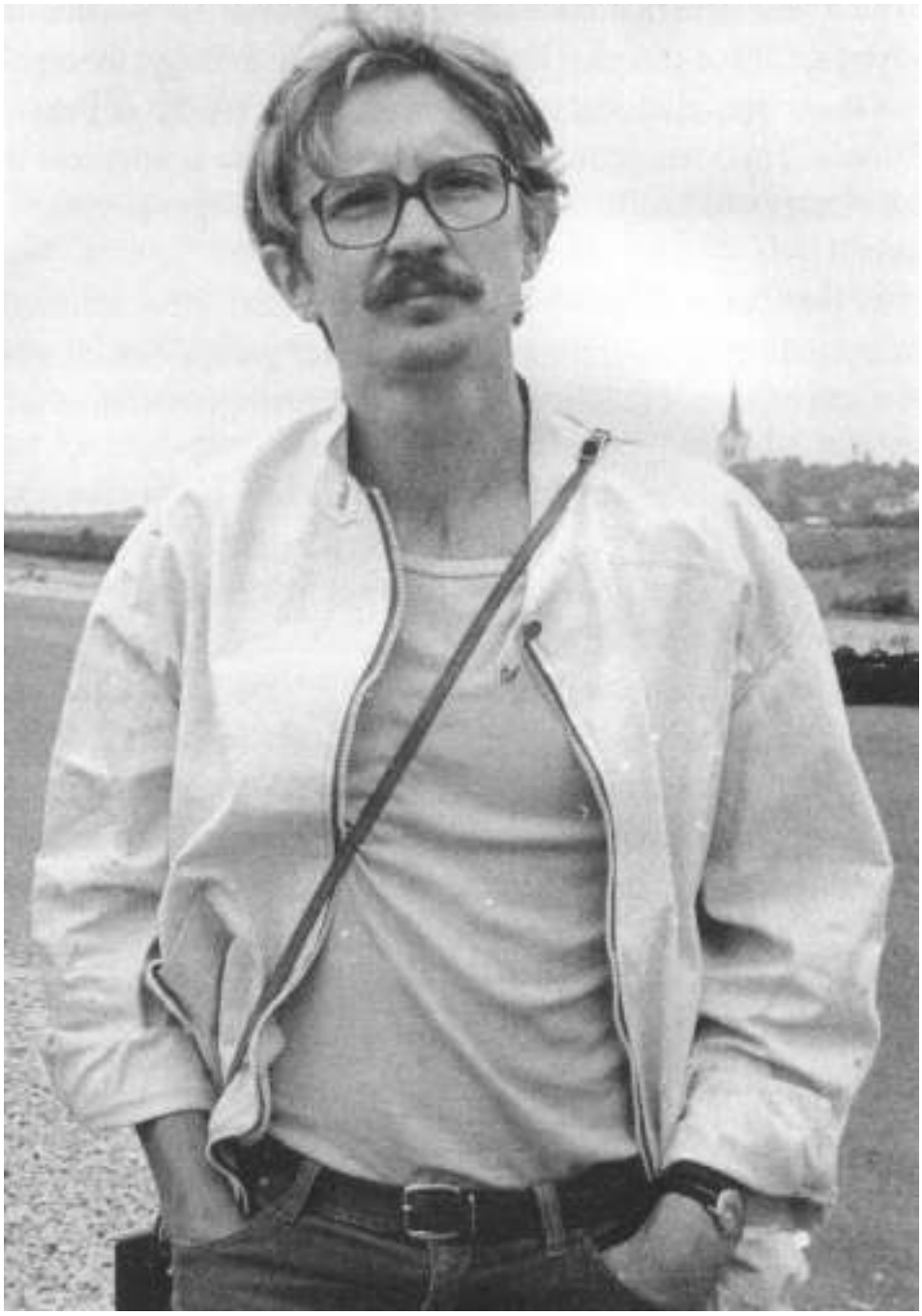

In Memoriam Priit Ligi (24 May 1958 — 28 September 1994)

CONTENTS

Editor's Foreword

This volume contains the majority of the papers presented during a conference that took place on 16th-21st May, 1997 in Łódź, Poland. The conference was organized by the Institute of Archaeology, University of Łódź and Departement d'anthropologie, Universite de Montreal (Canada). The conference was funded by the University of Łódź and by IREX (International Research & Exchanges Board), which also supported this publication. The publication was partly founded by the University of Łódź and by the Foundation of Adam Mickiewicz University, too.

The major questions of the conference were, 1) what is the current evidence for eastern or southern influences in the development of eastern European Mesolithic and Neolithic populations, and 2) to what extent are current political trends, especially the reassertion or, in some cases, the creation of ethnic and national identities, influencing our interpretations of the prehistoric data.

The idea for such a conference came into being through the co-organizers' long-term studies of the development of those prehistoric human populations which inhabited the vast region stretching north and east from the Oder river and Carpathian Mountains to the foothills of the Urals. In a tradition established in modern times by Gordon Childe, virtually all of the transformations of Eastern Europe's Neolithic Age human landscape have been assumed to be responses to prior developments in the Balkan peninsula and Danube basin. We think that a body of new evidence requires a renewed analysis of the distributions of cultural products, peoples, and ideas across Eastern Europe during the Mesolithic through the Early Metal Age within a much wider geographic context than previously has been the case. This includes giving adequate attention to the far-ranging interactions of communities between the Pontic and Baltic area with those located in both the Caucasus and the Aralo-Caspian regions.

We hope that this volume will contribute to such a redirection of future analyses.

Lucyna Domańska
Ken Jacobs

Editorial comment

1. All dates in the *B-PS* are calibrated [see: *Radiocarbon* vol.28, 1986, and the next volumes] (other versions are cited for the wish of authors). Deviations from this rule will be point out in notes.

2. The names of the archaeological cultures (especially from the territory of the Ukraine) are standarized according to the English literature on the subject (e.g. Mallory 1989). In the case of a new term, the author's original name has been retained.

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Ken Jacobs, Lucyna Domańska

"BEYOND BALKANIZATION" — AN OUTLINE PROGRAM FOR A DISCUSSION

As in all volumes, such as the one presented here, the papers speak for themselves. We will use these introductory pages to discuss in some detail and from our own point of view 1) the process whereby these papers and their authors were brought together, 2) a thematic typology of the papers, including those of authors not represented in this volume, and 3) the future of the ideas presented herein, with particular attention to the dual themes of inter-regionality and the increased recognition that our various researches have inescapable theoretical and ideological roots and implications.

These papers represent the partial proceedings of a conference entitled "The Future of the Past in Eastern Europe: New Visions of the Peoples & Societies that Formed the Present," which took place May 16-21, 1997 at the Uniwersytet Łódzki in Łódź, Poland. However, "Beyond Balkanization: Towards Integrative Perspectives on the Identities and Interactions of Human Communities during Eastern Europe's Recent Prehistory" was the title of the IREX (International Research & Exchanges Board) grant that provided the necessary funding.

These titles reflect the polygenic origin of the conference itself and, thus, of this publication. Initially, the results of our own skeletal research caused us to become intrigued by the possibility of a considerable interaction between Mesolithic and Neolithic human communities from Ukraine's Dnieper River rapids region and communities lying within, or even beyond, the corridor between the Black and Caspian Seas (Potekhina, South-eastern...). After discovery of our editors' suggestions along the same lines [e.g. Domańska 1990a, b] the idea to hold a conference addressing "the Near East Issue" germinated.

Subsequently, the nuances of and potential alternatives to the traditional "Out of the Balkans" model for both the Indo-Europeanization and the Neolithization of Eastern Europe were clarified through correspondences with James Mallory of Queen's University, Belfast and Marek Zvelebil of Sheffield University, UK. The results of their work and that of others made us acutely aware of the manner in which prehistoric cultures, tribes and/or "ethnoses" typically are created. They are in fact the result of conveniently conjoining what are often ontologically independent sets of archaeological artifacts, presumed subsistence systems, anthropological

types, and putative linguistic affinities. Sometimes, these amalgams are quite nicely mapped onto a sub-divided socio-political landscape of historical or recent origin (Dolukhanov, The Neolithic...). As a result, the necessity for an intensified inter--regional approach provided added impetus for the conference.

The notion that we, as scholars, must actively consider how we intend to construct "the future of the past in Eastern Europe" can be traced directly to the influence of the late Priit Ligi, to whom this volume is dedicated. Through personal conversations and close consideration of his latest publications [e.g. Ligi 1993; 1994; 1995] we became concerned about the need to be suspicious of and indeed to dissect vigorously all reified (pre)historic ethnic lineages in both their temporal and spatial dimensions. Special concern for this issue is imperative, especially during our current period of nationalist, ethno-geographic and general political volatility.

Thus, the term "Beyond Balkanization" came to have two meanings for the conference. The first evokes an overtly empirical inquest into inter-regional interactions and influences in Eastern European recent prehistory which are not rooted in the Balkans. The second calls for an overtly theoretical inquiry into the best way to avoid the potential pitfalls of "balkanizing" the past (Kohl, National...; Lindstrom, History...). As with a sumptuous banquet table, where appetite so often exceeds capacity, so it was with this conference. The result was a unique blend of papers, a brief typology of which we will now suggest.

A predominant theme was that of "Inter-Regional Comparison." The true significance of any archaeological or bioanthropological features that are described as being typical of any site or small set of sites can only be understood when a comparison is made to material found over a very broad geographic range. Papers in this volume that underscore this point are those of I. Loze, V.I. Timofeev, A.M. Haeussler, I. Potekhina, N.S. Kotova, D. Nuzhnyi and P.M. Dolukhanov. In addition, we would add to this group the papers presented in Łódź, but not printed here, of Y. Chistov (St. Petersburg, "Craniological data banks and the study of the early stages of European ethnic history") and of I.I. Gokhman (St. Petersburg, "Anthropological structure of East Europe's ancient population").

Linked with the previous theme was another, which emphasized the "Open Nature of Bio-Social Systems." By this was meant the idea that prehistoric communities were invariably open to cultural and biological influences from neighboring communities and regions. One implication of this is, of course, that hypotheses of purely "local" or autochthonous developments must be placed under the closest scrutiny. The papers here of P.M. Dolukhanov, L. Heapost, N.S. Kotova and D. Nuzhnyi address this issue, as did the Łódź conference papers not printed here of P. Bukhrashvili (Tbilisi, "Settlement archaeology and cultural systems of the Caucasus during the Palaeometal Epoch") and of R. Jankauskas (Vilnius, "Skeletal biological data on Neolithization in Lithuania: causes and consequences"). That autochthonous developments continue to be asserted is not to be doubted. The papers here of D. Telegin, A.A. Yanevich, and L. Zaliznyak illustrate this point.

The remaining thematic categories are less frequently represented in this volume, but were of no lesser importance. The dangers of too great a use of "Strict

Typological Constructs" were made evident in the papers of V.I. Khartanovich, P.M. Dolukhanov, L. Heapost, and R. Jankauskas. The potential importance of the "Black Sea/Caspian Sea Corridor" was discussed by I. Potekhina and A.M. Haeussler. The "Politics of the Past" was the topic of the papers here of P.L. Kohl and R.W. Lindstrom, as well as of two conference papers not reproduced in this volume: Paul Barford (Warsaw) discussed "Paradigms of the Social Past for the Present" and Ludomir Lozny (Hunter College, New York) presented ideas on "Surviving the Change: Polish archaeology in the next century."

The issue now to be discussed is: Where do we go from here? This topic, invoking both of the questions described in the Editors' Forward, was frequently discussed during the Łódź conference, both informally and in a closing session.

The importance of expanding the inter-regional comparison of archaeological and bioanthropological data over as broad a geographic scale as possible was recognized by all participants. Similarly, it was widely accepted that hypotheses about the regions and geographic directions involved in the prehistoric inter-regional interactions of Eastern Europe should not be limited to those which have received the greatest attention in the past. It was considered important to continue and to expand the comparison of materials currently housed in museums and institutes that are usually quite distantly separated. In the same fashion, it was hoped by all that more excavations in some previously understudied geographic areas might be undertaken. This alone would help immeasurably in filling in some of the gaps in our ever-expanding inter-regional maps. Given the goodwill, the energy, and the scholarly dedication of the participants, there is every reason to believe that such hopes will not go unfulfilled.

The discussion of how to confront the "political" aspects of prehistoric research in Eastern Europe was more tentative and diffuse. This very fact both reflected the changing societal contexts in which we all currently work and served to heighten the pertinence of the subject itself. However, these discussions were useful and helped to demonstrate that it would be a major error to assume that this is a new debate. For example, a familiar claim is that "ideological issues, broadly understood, (are) embedded in scientific argument" and are "inherited from the larger society('s) distinct social, philosophical, metaphysical, theological, political and aesthetic traditions." Countering such ideas, frequent pleas are made "to transcend the limits of older, naturalistic and political debates ... and [to] establish a new, internally consistent, self-referential tradition of investigation and argumentation within science." Yet, despite its current resonance, the rhetoric here derives from attempts by James Cowles Prichard (1808) and Sir Wm. Lawrence (1822) to set a new course for their "new" science [Stepan 1982].

At the same time, it was clear to all that the epistemological dilemmas arising from the fact that scientific research is conducted in a political and ideological context are not unique to the study of later Eastern European prehistory [see, e.g. Jones 1997; Scham 1998]. Indeed, it is now impossible to find a geographic area or (pre)historic period in which such problems are not actively debated from all sides of the question.

While the debate may occur everywhere, this does not provide a warrant to turn away from it. Very much the opposite is true. As much as our data are real and subject to empirical investigation, "it is hard to deny that science has both value implications and value origins. Science is as important to . . . power as to soul--searching questions of cosmology or cosmogony. Science lies close to the roots of many forms of power: power to create or destroy, to heal or harm, to feed or let hunger, to enlighten or obscure" [Proctor 1991]. We and those among whom we live have a direct, human relationship to those whose remains we study. We and those among whom we live will feel the consequences of the uses to which these remains may be put, regardless of our presumptions to objectivity. Thus, in closing, we will borrow from a kindred author: "(we) as a group also have the political responsibility to prevent the abuse of (our studies) . . . With (our) status in society there must be connected special responsibilities. It is now time for us to recognize the public price we must pay" [May 1989:901]. With this in mind, we fervently hope that we, as the scholars who are in closest contact with the prehistoric data themselves, will not turn from the debate. We trust that we will instead actively engage ourselves in it. Should such be the case, this additional goal of the conference shall be fulfilled.

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Pavel M. Dolukhanov

THE NEOLITHIC WITH A HUMAN FACE OR DIVIDING LINES IN NEOLITHIC EUROPE?

Apparently, the time may be established with great precision when Europe became split up into two fundamentally distinct parts. That may have happened between 8,000 and 6,000 BP uncal., during the Holocene Climatic Optimum, otherwise known the Atlantic period or Althitermal. By that time Europe had been populated by the groups of early modern humans for at least 40,000 years ago and remained basically uniform both culturally and economically. Local distinctions acknowledgeable in the material culture and strategies of subsistence in the Upper Palaeolithic and Mesolithic were of a secondary importance, all basic types of social behaviour and spiritual life being essentially similar from the Atlantic Europe to the Urals [Dolukhanov 1997]. Only at the time of climatic optimum a considerable part of south-eastern and central Europe became rapidly covered by the sites of 'agricultural Neolithic'. At the same time, the remaining part of Europe, in the East and North-East, remained the area of 'forest Neolithic', where the use of pottery and minor innovations in the sphere of culture did not alter the subsistence solidly based on food-gathering strategies, essentially similar to those of the preceding Mesolithic.

Division of Europe into two major Neolithic areas is explicitly shown on several maps, starting with that of S. Piggot [1965] and ending up with one recently published by M. Zvelebil [1994] (Fig. 1). If one scrutinise these maps attentively one cannot escape the feeling that the dividing line between the Neolithic areas is strikingly similar to that of the eastern frontier of the NATO after its latest expansion. The question arises whether this boundary forms a natural line of divide in Europe, which sources go down to the Neolithic? Does Archaeology provide additional arguments for the claims such as: "The newly independent Central European states, particularly Poland, Hungary, the Czech Republic and Slovakia consider themselves *part of the West*; they categorically refuse to be relegated to a Russian sphere of influence or to a no-man's land between Western Europe and Russia... They are *morally and politically partners of the West*, seeking membership in the European Union for their economic well-being and in the Atlantic Alliance for their security" [Peter Rodman in the *Washington Post*, 13 December 1994, p. A27].

The purpose of this paper is to discuss the reality of the line of divide in the European Neolithic. The core of the problem consists, first, in the understanding

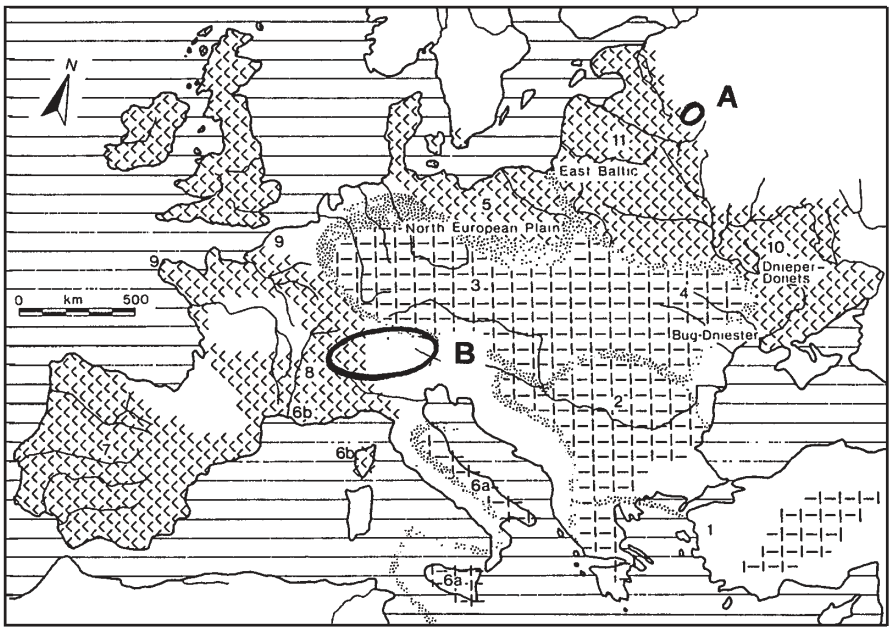


Fig. 1. Major frontiers and Neolithic cultures in Europe [after Zvelebil 1994].
A - Western Dvina; B - Alpine foreland; 1 - Early Neolithic of Anatolia and Greece; 2 - Starčevo-Criş; 3 - Linear Pottery; 4 - Cucuteni-Tripolye; 5 - Funnel Beakers; 6 a,b - Impressed Wares; 7 - Iberian Neolithic; 8 - Chassey and Cortaillod; 9 - Neolithic of Atlantic coastal area and Britain; 10 - Dnieper-Donets; 11 - Corded Ware.

of Neolithic as a socio-cultural phenomenon, and secondly, in the assessment of possible scenarios of Neolithization.

Let us start with the traditional view which sees the Neolithization as the spread of farming economies substituting the hunter-gathering which remained hitherto an only viable strategy of food-quest in Europe. There exist substantial differences of opinion even within this paradigm, particularly regarding the concrete details of Neolithic replacement. Nonetheless one may note a remarkable consensus in the acknowledgement of the fundamental distinction between the world of farmers and that of later hunter-gatherers. This distinction was highlighted in then most spectacular form by Ian Hodder [1990] as that between 'domus' and 'agros', timed and wild.

Models of agricultural expansion are deeply rooted in the processualist thought; they obviously find historical foundations in the recorded evidence of a comparatively recent colonisation of temperate forests by agricultural groups: those of northern Finland (in the 1500s) and Upper Canada (in the 1700s). 'Colonisation' or 'frontiering' are the terms which are usually used as synonyms for movement of population [Alexander 1978; Green, Perlman 1985]. Agriculture in this model is vie-

wed as subsistence strategies regulating the flow of food resources into the cultural system by means of the replacement of slow-growing communities with fast-growing ones, in accordance with the principle of 'least possible effort and risk'.

The model of colonisation as an equivalent to a direct migration is omnipresent in the works of Gordon Childe [1958]. In more recent times this took a form of a 'demic expansion' or the 'wave of advance' [Ammerman, Cavalli-Sforza 1973]. An alternative concept, which is slowly becoming popular, is that of diffusion [Dennell 1985] or, in the latest version, of a *reticulate* process [Moor 1994b]: creation of cultural, linguistic and biological units resulting from intermarriage, assimilation and borrowing. M. Zvelebil and P.A. Rowley-Conwy [1984] have suggested an intermediate model, which envisaged a gradual transition from foraging to farming and includes an 'availability phase' during which farming is known but not adopted by the groups of hunter-gatherers, while intensive exchanges in 'materials and information' take place between two 'culturally and economically' independent types of society.

Stemming from these theoretical foundations we may now embark on the analysis of two case studies, both related to the Neolithic development but in two different areas of Europe. The first area focuses on the Upper Western Dvina catchment, lying in the middle of non-agricultural Neolithic. The second case study centres on the Alpine foreland, in the heart of agricultural Neolithic Europe.

1. THE WESTERN DVINA

According to the available pollen and radiocarbon data, the climatic optimum (Atlantic period) in that area took the form of at least two warm maxima: 7500±200 uncal BP (6400-6200 BC) (AT-1) and 5000±200 (AT-3) uncal BP (3940-3870 BC) [Khotinsky, *et al.* 1991]. Investigations carried out in the Upper Western Dvina catchment [Dolukhanov, *et al.* 1989] indicated a pronounced cool interval (AT-2) which separated the two peaks in thermophilous plants. This cool interval lasted *ca.* 6,200-6,000 uncal BP (Fig. 2), and featured a reduction in thermophilous trees reflecting a drop of mean annual temperature, which yet remained above the present-day values.

During the Late Atlantic climatic optimum (6,000-4,600/4,500 uncal BP; 5300--4700 BC), mixed broad-leaved woodlands with oak, elk, lime and alder reached their maximum expansion. Computer simulations indicate that the mean annual temperature at that stage exceeded the present-day values by 2°C, with the rainfall being similar to that of today [Khotinsky, *et al.* 1991] . The subsequent Early Subboreal stage (4,600/4,500-4,200 uncal BP; 3000-2600 BC) marked a considerable decline in temperature and a large-scale reduction in broad-leaved forests.

The Usvyatian group of sites located in the upper stretches of the Western Dvina and Lovat river catchments, had been thoroughly studied by Miklyaev and

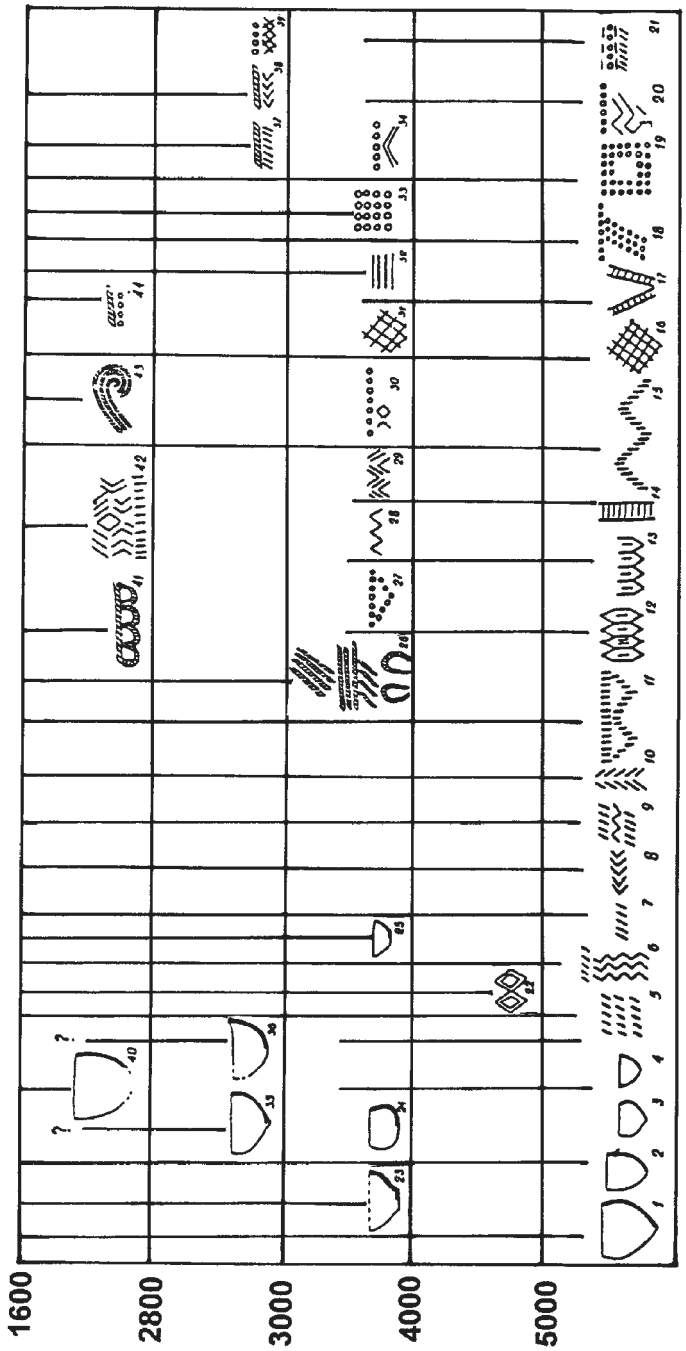


Fig. 2. Usvyatian sites. Evolution of pottery styles.

his associates [Miklyaev 1995]. The area, originally part of a huge ice-dammed lake, was abundantly rich in diversified wild-life resources. It became attractive to the groups of Epi-Palaeolithic hunters at the time of Younger Dryas (11-10 Kyr) and remained an arena of intensive settlement ever since.

Large-scale pottery-making in that area, likewise in other parts of the boreal North-Eastern Europe, started at around 6.4-6.2 Kyr ago (5500-5000 BC). The sites were usually located near large and shallow lakes — the residue of huge ice--dammed basins of the Last Ice Age, at the junction of end-morainic heights and sandy fluvioglacial plains. The faunal remains — practically identical at all the sites — included elk (which predominates), wild boar, red deer, brown bear, as well as waterfowl. Among the numerous fish remains, pike, perch, salmon and catfish were the most common. No less that 30 edible plants were identified in the archaeological deposits, among which chestnut and, especially, water chestnut were particularly numerous. One should note in that respect that water chestnut (*Trapa natans*) is an amphibious plant recently widely distributed in warm temperate Eurasia. Its fruits are rich in protein, fat and minerals. According to historic records, loafs baked from its flour were in use in ancient Egypt and Thrace. Presently water chestnut forms staple food in continental Asia, Malaysia and India and used especially in Chinese dishes. Fruits are also used in the preparation of liniments to treat elephantiasis, pestilent fevers, rheumatism, sores, sunburn and skin complaints. Used also as food for pigs and other livestock in Southeast Asia [Vankina 1970].

At about 5.2 Kyr or 4000 BC a new type of settlement emerged: pile dwellings located in the coastal areas of shallow lakes. This tradition was in place in the Upper Dvina area for no less that two millennia, and disappeared only after a prolonged catastrophic flooding which hit the area 3.6-3.5 Kyr ago (2000-1800 BC).

Basing on the analyses of the ceramics (the technology, shapes of the vessels and ornamental patterns) as well as other groups of material culture A.M. Miklyaev [1995] has identified several cultural stages in the local sequence. The earliest group (the Serteya, 6.4-6.2 Kyr; 5500-5000 BC) featuring thick-walled conic-shaped vessels and had no direct analogies in the neighbouring areas. Both the ceramics and bone--and-antler industry of the next cultural stage, the Rudnya (6.2-5.5 Kyr; 5000-4000 BC), were basically similar to the Narvian, a cultural tradition widely spread in the North-Eastern Peribaltic.

The next cultural stage is referred as 'Usvyatian' (5.2-4.0 Kyr; 4000-2500 BC). The pottery featured different ornamental patterns, some of which may be seen as derivatives of Funnel Beaker traditions. After a short-lived transitional stage, a new cultural tradition became established in the area; the North-Belorussian, which is seen as a local variant of the Corded Ware (4.0-3.6 Kyr; 2500-1900 BC). Substantial changes are observable not only in the new types of ceramics (Fig. 2), but also in the stone inventory and, particularly, in a nearly total disappearance of bone--and-antler industry. The faunal assemblage of pile-dwellings of North-Belorussian culture contain the bones of domesticates: sheep, goat, pig and cattle, yet their total number never exceeded 14% [Dolukhanov, Miklyaev 1986].

More than 100 Neolithic and Bronze Age lake settlements are known to exist in the Alpine zone of Europe: in Germany, Switzerland, France, Italy, Austria and Slovenia. They started appearing 4200-4000 BC and disappeared by 1500 BC. An increased intensity in pile-dwelling construction on the Boden Lake occurred between 3586 and 3500 BC [Schlichtherle, Wahlster 1986].

The time of the existence of pile-dwellings corresponded to the climatic optimum. According to M. Rösch [1983], thermophilous tree plants (ash, and alder) started spreading in the area at 8500 BP, beech appearing at about 7300 BP. Likewise in the North-Eastern Europe, a prolonged cool episode at 6200 BP (ca 5000 BC).

It is generally acknowledged that Neolithic lake dwellers in the Alpine foreland were essentially farmers and stock-breeders. Yet a considerable part of the faunal remains reported from these sides belonged to wild species. At the Swiss and German sites red deer was the most common, followed by brown bear and wild boar. The predominance of wild species was still greater at the sites of the French Jura [Petrequin, Petrequin 1988]. In the case of Lubljansko Barje region in Slovenia, 74% of the total amount of bones belonged to wild animals, with a prevalence of red deer (*Cervus elaphus* — 53%); brown bear (*Ursus arctos arctos*) — 11% and elk (*Alces alces*) — 8%. The prevailing domestic animals were cattle (*Bos taurus*) — 14%, with a small proportion of sheep (*Ovis aries*) — 7%. Pollen analyses shows that the immediate environment was dominated by fir and beech forests [Budja 1997]. The sites (Reshnikov kanal and Maharski prekop) are located within the lake basins, currently drained by small channels. Stratigraphic data suggest several changes in the lake-levels during the Holocene.

The geographical location of Alpine lake dwellings suggest a great importance of fishing. This was confirmed by the numerous finds of fish bones (pike being the most common) combined with frequent occurrences of harpoons, hooks and various fishing devices. The plant remains identified in the deposits of lake dwellings show a predominance of domesticates: wheat (belonging to two species: *Triticum monococcum* L. and *T. dicoccum* Sch), barley, millet. At the same time, one notes a considerable presence of wild edible plants: hazel-nut, beech, strawberry, rose, blackberry, wild pear, lime, and carnelian cherry (whose seeds constitute strata of notable thickness). It is highly significant, that like in the Upper Dvina catchment, dwellings in the Alpine area were usually located on the ancient lacustrine deposits. It is still more important that very often the area within an immediate vicinity of the sites was totally unsuitable for agriculture. H. Schlichtherle and B. Wahlster [1986:86] note the arable land in the Boden Lake area are usually found at the distance of up to 1 km from the dwelling site; often high in the mountains, or on the opposite shore of the lake.

Basing predominantly on the pottery styles, several cultural groupings are distinguishable in the sequences of Alpine pile-dwellings. In the area of Boden Lake, several cultures were identified, which age was calculated on the base of dendro-

chronological measurements: Aichbühl: 4200-4000 BC; Hornstaad : 4000 BC; Pfyn: 3843-3500 BC; Horgen: 3333-2863 BC; Corded Ware: 2690-2500 BC, as well as Early and Middle Bronze Age cultural units which lasted until ca 1500 BC.

Summing up the evidence for the two areas, one may conclude that cultural phenomena fairly similar in several respects had independently developed at the same time in two parts of Europe, both in the so-called agricultural and non-agricultural Neolithic areas (Table 1). One notes particularly remarkable similarities in the general environmental setting and in the technique of house-building. In both cases this technique included an enormous quantity of pointed posts thrust into the lacustrine silt, forming the foundation of platforms on which various structures were erected. In the both areas the settlements were occupied all year round. The living structures were often refurbished, rebuilt, moved to a higher elevation following a rise of lake-level; on several occasions major fires could be recognised. The dwellings were often surrounded by fences and palisades.

Yet in the majority of cases the pile-dwellings emerged in a different cultural environment: their inhabitants were interacting with distinct social and cultural groups. The only exception form the levels of Corded Ware, acknowledgeable in the both cases. This observation needs further elaboration, but before doing so, one needs to touch upon a sensitive theoretical issue, related to the existence (or non-existence) of larger-scale archaeological entities referred to as 'archaeological cultures'.

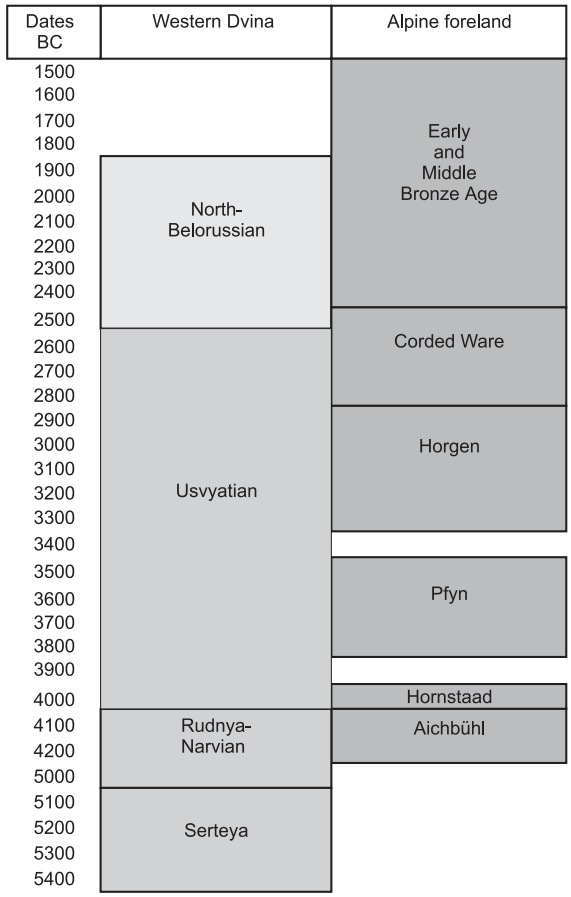
The concept of (archaeological) culture was defined in a most succinct form by D. Clarke [1968], as a *polythetic set of specific and comprehensive artefact-types which consistently recur together in assemblages within limited geographic areas*. Proponents of a 'cultural-historic paradigm' argued that *archaeological culture* corresponded to distinct social (ethnic or linguistic) units. Thus, Bordes viewed Mousterian 'facies' identified by him first in France and, later in the whole of Europe, as belonging to distinct 'tribes' of Neanderthal Man. This concept became firmly established in Central and Eastern European archaeological schools in the early 20th century, when its principles were explicitly formulated by G. Kossinna [1911:11]: 'sharply defined archaeological culture areas correspond without doubt to areas of particular peoples and tribes'. It may be shown that the principles of 'cultural-historic paradigm' were omnipresent in the Soviet archaeology, particularly after the collapse of the stadial concept of the 1930s [Dolukhanov 1995].

In contrast to that, the 'processual school', which became dominant in the Anglo-Saxon archaeology since the 1950s, tended to view archaeological culture as an extra-somatic means of adaptation, a non-genetic response to local environmental changes [Binford 1972]. Culture was further viewed as a 'general system with subsystems' [Clarke 1968]. This approach left little or no room for social, linguistic or ethnic interpretations of archaeological culture.

A further blow to the 'cultural-historic paradigm' was delivered by the scholars belonging to the post-processual school in archaeology. Basing on the observed or imagined lack of correlation between cultural styled, on the one hand, and linguistic, ethnic and religious entities, on the other, I. Hodder [1978, 1982] claims that the

Table 1

Sequences of Western Dvina and Alpine Neolithic cultures



entire concept of archaeological entities is a 'robust reactionary view'. This negative approach was shared by C. Renfrew [1977] and S.J. Shennan [1978], who consider archaeological entities, including culture, as 'constructs of our own devising' which are 'useless and misleading for analytical purposes'.

If not a migration, what else?

It is highly significant, that the 'Belorussian' cultural assemblage in the Western Dvina likewise numerous Corded Ware-related 'cultures' in the eastern Baltic area included only limited elements of Corded Ware tradition, mostly restricted to the corded ornamentation on certain types of vessels. This became particularly apparent when the entire pottery corpus from the stratified site of Naumovo was subjected to an computer analyse with the use of the multivariate technique. The principle

component analysis of pottery ornamental patterns shows a gradual intrusion of an alien tradition, absorbed at the final stages by the local one [Dolukhanov, Fonyakov 1984]. A number of 'hybrid' pottery assemblages is distinguishable at that time both in the eastern and western Peribaltic area [see Timofeev in this volume]. A suggestion was made that an infiltration of Corded Ware traditions taking form of shared styles of pots and also battle-axes may have resulted from a 'regionalised continuity' or 'open social relationships' [Whittle 1996:285-7].

Signals of sex and age groups are clearly recognisable in Corded Ware burial sites. Thus in the Fatyanovo graves the males were usually buried on the right side, the head directed to the west, while the female were found on the left side, the head towards the east. Shaft-hole axes were usually located near the head in the male's graves, and at the feet in children's graves. Female graves usually contained jewellery, predominantly pendants made of animal bones and teeth as well as amber beads [Kraynov 1972].

These observations evoke the question: to what extend the Corded Ware society was male-dominated? This rises yet another question: to what extend the gender symbolism reflects the social role of the sexes? In A. Whittle's view [Whittle 1996] the common occurrence of battle axes in male graves may be viewed rather as a message of a tradition of 'integration, participation, hospitality and generosity'.

It is true that female representations were much more common among the works of portable art in the Neolithic of South-Eastern Europe as compared to the Corded Ware-related zone further north. Yet the idea of 'Mother Goddess' as a symbol of peaceful matrifocal cultures in sharp contrast to aggressive and destructive patriarchal world of kurgans and battle axes is increasingly viewed as a pure mythology [Hurcombe 1995].

One can hardly argue, that the majority of human figurines (the 'idols') found in the Corded Ware context of forested Eastern Europe are obviously portraying men (Fig. 3). This was a male face that looked at the astonished world when a mummified body of a Neolithic 'Iceman' appeared from beneath the glacier high in the Tyrolean Alps in 1991. This man was obviously a hunter, whose base-camp, judging from the radiocarbon dates (3350-3300 BC) may well have been located far below, at one of the numerous lake-sites in the Alpine foreland. His equipment, the cloth and organic remains found on him, all that is clearly shows that his livelihood was based predominantly on hunting and food-gathering [Barfield 1994].

It had been noted long ago that the pottery, and particularly the styles in the pottery design, were closely related to female symbolism. Pots with feminine symbols or in shape of women were largely spread in Neolithic Europe [Hodder 1990:61-64; Thomas, Tilley 1993]. One can hardly doubt that the conceptual link between the woman, the house and the pottery that had been postulated by I. Hodder [1990:216] in relation to the European Neolithic was equally valid for the Corded Ware area. This observation becomes particularly significant, if one takes into account the great importance attached by Russian archaeologists (based mostly on the ethnographic observations in Siberia) to pottery styles as a powerful ethnic symbol [Tretyakov 1972]. This implies a relationship between the female and ethnic symbolism.

Fig. 3. 'Idol' from the Usvyaty IV site.

Earlier observations about the dominance of male graves among Corded Ware sites in Denmark, are probably invalid or at least partially valid in respect to the boreal forests of Eastern Europe. At the Corded Ware cemetery of Abora I (near the Lubana Lake in eastern Latvia) [Loze 1979] four out of five anatomically identifiable skeletons belonged to women. Jewellery (mostly amber) prevailing in the grave goods, one may hardly doubt that females were the dominant among 61 skeletons buried there.

When one tries to sum up the available evidence in relation to the Corded Ware/Battle-axe cultural area as a whole, several conclusions become apparent. First and foremost a considerable degree of continuity in respect to the preceding cultural units is perceptible, above all in the geographical distribution of the sites. These sites remained basically in the same areas as at the previous stage, no new terrain was colonised. In most cases the subsistence pattern did not experience a change of any dramatic proportions, only in some areas the role of nomadic stock--breeding had increased in a noticeable manner; in still other areas one may note

the appearance of elements of stock-breeding in a predominantly hunter-gathering context. At the same time one notes a considerable diversity of subsistence patterns which were dependant both on the local resource base and cultural traditions. The most spectacular changes are acknowledgeable in the pottery styles, which were directly related to female gender symbolism. Thus it is tempting to link the culture change marking the spread of the Corded Ware tradition with the modification in the mating system and related transformation in the social role of women.

One may note that a similar approach had been adopted by T. Dobzhansky [1962], who viewed human races as gene pools initially developing in endogamic tribes. This was further developed by K. Jacobs [1994b] who treated archaeological cultures in terms of social groupings forming mating networks with a large degree of closure.

The long-established scholarly tradition linked the spread of Corded Ware cultures with the proliferation of the Indo-European speech. The present writer shares the concept developed by C. Renfrew [1987] according to which the Indo-European languages had appeared in Europe much earlier, together with the first farmers. I agree with M. Zvelebil [1994] that this process involved the neighbouring groups of hunter-gatherers, who were embroiled in complex social networks with the communities of early farmers. During the Late Neolithic — early Bronze Age, there occurred an intensification of intercommunal links, probably resulting in the development of more firmly established dialects. One may argue that the total Corded Ware area corresponded to as yet undifferentiated Balto-Slavic-Germanic protolanguage, which existence was postulated by several linguists [Georgiev 1959].

Regarding the initially set questions about the 'dividing lines', I may stress that they had never existed in the reality of Neolithic Europe. The Neolithic was a multiple carriageway with both fast and slow lanes. In each particular case, the individuals and the groups of individuals had a free choice, which lane to take. Their choice was influenced by the availability of resources, their own experienceand traditions, as well by various factors which we shall never be able to grasp. But in each case the chosen strategy proved to be sufficiently successful: it guaranteed the group survival, based the constant flow and the sustainable renewal of resources.

The European Neolithic was a highly dynamic social phenomenon, the groups involved were bound together by multiple links via which both the materials, the genes, and the symbols were constantly interchanged. This was a society open to innovations and change. The observable transformations in material culture and life style were but outward reflections of deep-rooted societal changes which included the reshaping of mating networks, the mutation of gender roles and the spread of new dialects.

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HISTORY AND POLITICS IN THE DEVELOPMENT ETHNOGENETIC MODELS IN SOVIET ANTHROPOLOGY

Anthropology plays an important role in defining and promoting national character, and ethnicity is often critical in the creation of nationalism [Banks 1996]. The past, as revealed through anthropology, is used to legitimize modern political authority, as seen in Iraq where Saddam Hussein's name is inscribed in the bricks of restored walls in Babylon, linking his name to the glorious past of Mesopotamian power [Jehl 1997]. It is also used to establish (or deny) territorial rights of ethnic/national units, as seen in the ongoing conflicts in Armenia, Azerbaijan, and Georgia (as referred to by P.L. Kohl in this volume). Control of the past confers political power in the present, and is actively sought, as exemplified by Native American groups seeking control of the excavation, study and reburial of remains in the United States. Anthropologists, as recoverers and interpreters of the past, are in the uncomfortable position of providing ammunition for ethnic and political conflict, while at the same time disagreeing in most cases with popular and political interpretations of ethnicity and prehistory.

The role of anthropologists in the manipulation and control of the past is not always passive. Anthropologists are members of their contemporary ethnic and national structures, and their research and interpretations are shaped by them. This is not a situation that is new to anthropology, though it has received considerable attention in recent years. The focus of this session, the reading of politics into the past, is just one example of this interest. I have chosen to look not at a modern example of how politics are shaping anthropology (and vice versa), but rather on a historical case in which political control of anthropological research and interpretation has influenced an entire science in one country.

While preparing for a symposium at the 1996 meetings of the American Anthropological Association on "Language, Archaeology and Culture History" [Lindstrom 1996], I became familiar with a considerable and growing body of Western literature on ethnogenetic theory. J.H. Moore [1994a] and others describe ethnogenetic theory as viewing the ethnos as "fragile, permeable, or illusory" (p. 12), as contrasted to a culture-historical model where language, culture, and biology have coevolved within stable ethnic units. J.H. Moore, in promoting ethnogenetic theory, cites the example of the anthropology in the Soviet Union as an example of an an-

thropology which has embraced ethnogenetic theory. The nature of ethnicity and its role in prehistory as described by J.H. Moore's ethnogenetic theory, however, were completely at odds with what I understood of ethnogenetic theory as applied in the Former Soviet Union. As M. Banks [1996] has noted, the Soviet ethnos theorists are perhaps the most strongly 'primordialist' of any in the world, being among the few that "consistently seem to think that ethnicity really does exist and really is a fundamental aspect of the human condition"(p. 186). In Soviet ethnos theory "there has to be an observable core of stable cultural 'stuff' that persists over generations" (p. 79). I became intrigued with understanding why Soviet ethnogenetic theory differed so radically from that envisioned by Moore. What I found is that ethnogenetic theory in the Soviet Union was shaped by the political milieu of the 30s and 40s, giving it a very different form than the ethnogenetic theory developing in the West today.

In American anthropology ethnogenetic theory has recently been explored as an alternative to standard branching models of culture history. The culture-historical model has a tendency to unite biology, language and material culture within a relatively immutable ethnos [Bateman, Goddard, *et al.* 1990; Moore 1994b; Bellwood 1996]. The stability of the ethnos allows anthropologists to use material culture, physical anthropology and linguistics to trace specific ethnic groups time and space [as in Cavalli-Sforza, Minch, *et al.* 1992; Cavalli-Sforza, Menozzi, *et al.* 1994]. This leads to the projection of modern ethnic distinctions into prehistory. Ethnogenetic theory has been offered as an alternative way of understanding the associations of these variables within an ethnos. Ethnogenetic theory proposes a loose association of language, biology and material culture, and views ethnic groups as temporary units, constantly evolving, merging and splitting throughout history [Moore 1994a]. A fluid definition of ethnicity is also favored by other theorists [Banks 1996]. The tenuous nature of ethnicity makes the tracing of ethnicity into the past uncertain (indeed, ethnicity may be a relatively modern creation [Banks 1996:42]), and the loose association of material culture, language and biology makes it difficult to support hypothesized ethnic histories.

A closer look at Soviet anthropology, however, suggests that its interpretation of ethnogenetic theory is very different from that proposed by Moore. Soviet, and now Former Soviet, anthropology, though developed in a framework of ethnogenetic theory, is decidedly culture-historical in its interpretations of the past, and often associates ethnos with language, material culture and biology. Many Russian prehistorians consider an archaeological culture the reflection of one ethnos which should be characterized by a single language [Artsikhovskiy 1954:14-15; Olkhovskiy 1992:31; Kuzmina 1994:59]. While explicitly recognizing that archaeological cultures and ethnoses are not always identical [Tretyakov 1963], certain indicators or assemblages are considered to be "quite reliable ethnocultural indicators, allowing us to trace the movements of groups of peoples" [Olkhovskiy 1992:31]. The equation of archaeological culture, or more precisely, specific traits of an archaeological culture, with an ethnic group allows the archaeologist to consider the history of material culture as the ethnic history of a people. This view is also favored by Russian bio-

anthropologists who expect the grouping of races, cultures and languages within an ethnic unit [Gerasimov, Rud, *et al.* 1987:3].

In Soviet anthropology, the close association of language, biology and material culture within the ethnos allows modern ethnic groups to be traced into the past. Criteria for linking modern ethnic groups and archaeological cultures (such as those developed by E.E. Kuzmina [1981; 1994]) invariably confound these three variables. By tracing modern ethnic groups into the past, archaeological cultures are assigned to specific (often modern) ethnic groups. As an example, in Bronze Age Eurasian steppe studies, Andronovo cultural groups have been described as ethnically Indo-European, Indo-Iranian, Finno-Ugric and Indo-Aryan, with cultural, linguistic and biological identities to match [see for example Kosarev 1965; Stokolos 1972; Gening 1977; Smirnov, Kuzmina 1977; Kuzmina 1994; Kovaleva 1995]. The extent to which such attributions of ethnicity can be carried is seen in recent studies of the Sintashta and Petrov cultures. Though the differentiating material features of these two Andronovo cultures has yet to be made clear, archaeologists have gone so far as to hypothesize that the Sintashta culture was Indo-Aryan, while the Petrov was Indo-Iranian [Zdanovich 1990]. Archaeologists studying Andronovo are now virtually required to assign archaeological cultures (and even regional or temporal variants) to attested ethnolinguistic groups (e.g. many of the papers from the 1995 conference "Russia and the East" [Zdanovich, Ivanova, *et al.* 1995]). Russian archaeological studies of Andronovo should clearly be classified as culture-historical. Modern ethnic and linguistic groups are projected into the past, archaeological cultures are interpreted as ethnic units, speaking a particular language, and the members of these ethnic units are expected to differ genetically from one another. Archaeological culture change is interpreted in terms of the movement of peoples carrying with them their culture, biology and language. The culture history of the steppe zone, as reconstructed by Soviet scholars, was not developed as culture history per se, but rather is the result of an ethnogenetic theoretical framework.

It should be pointed out that this projection of ethnicity into the past, and the confounding of language, material culture and biology within the ethnos is by no means confined to Soviet anthropology. Indo-European studies in all areas frequently make this equation, though within a culture-historical rather than an ethnogenetic framework. Similar interpretations have also accompanied studies of other modern linguistic groups, such as Polynesian [Rouse 1986] and Numic [Madsen, Rhode 1994] speaking peoples. Russian studies are conducted within an ethnogenetic framework, but the results are strictly culture-historical. These interpretations are the results of explicitly ethnogenetic theory, but one that was shaped by the political and ideological conflicts of the 1930s and 40s.

Prior to and immediately following the 'Great October Revolution', Russian anthropology was on a course very similar to its counterparts in the West, with a primary focus on culture history and typology [Trigger 1989; Shnirelman 1993b]. The Revolution began a period of turmoil for all aspects of Soviet culture. In the years immediately following the Revolution, many of the pre-Revolutionary institu-

tions and academic leaders went unchanged [Bulkin, Klejn, *et al.* 1982]. In the mid 1920s, however, there was a major reorganization of scientific research in the new Soviet Union [Mongait 1959]. A new generation of young, idealistic Marxists came quickly into positions of influence in all branches of the sciences [Trigger 1989]. In anthropology, N.Ya. Marr, as the director of the newly established Russian (later State) Academy for the History of Material culture, quickly became a leading figure in Soviet anthropology [Mongait 1959; Bulkin, Klejn, *et al.* 1982; Trigger 1989; Shnirelman 1993b]. N.Ya. Marr, a Near-Eastern philologist by training, developed a 'Theory of Stages' for describing cultural development in which language, ethnicity and sometimes race were all seen as 'superstructural' phenomena that were determined more by the stage of economic development of a culture than by its history [Bulkin, Klejn, *et al.* 1982]. According to the stadial theory, as cultures moved through inevitable socio-economic stages (as defined in the writings of Engels and Marx), superstructural characteristics would change as well. Marr's theory was quickly 'blessed' by the Soviet leadership [Trigger 1989:212; Malina, Vašiček 1990:93]. It was seen as a true 'Marxist' theory that served as a necessary break from the bourgeois science of the West. By emphasizing the primacy of socio-economic development, it fit well with Marx and Engels 'histories' of human society, passing through distinct stages determined by the productive forces at each stage.

N.Ya. Marr's theory had repercussions throughout Soviet anthropology. For linguists, it denied that structural similarities in language were rooted in history [Riasanovsky 1984:583]. Marr's theory essentially denied any realm for ethnography, which was to focus specifically on ethnicity [Gellner 1977]. Under the stadial theory, the study of ethnicity was almost completely dismissed in the years before the 'Cultural Revolution' of 1934-39. Because ethnicity was essentially an 'effect' of economic development, there was no point in trying to establish the historical path and relationships of an ethnic group [Slezkin 1993]. Though N.Ya. Marr's theory was decidedly non-cladistic, in that it denied any necessary ancestral relationship between linguistic or cultural groups, it certainly reinforced notions of stability and continuity, encouraging archaeologists to interpret archaeological sequences as stages in the history of a single people [Bulkin, Klejn, *et al.* 1982:275; Trigger 1989:225]. Had N.Ya. Marr and his followers remained in power, anthropology in the Former Soviet Union would be very different today. However, in the mid to late 1930s the situation in the Soviet Union changed dramatically. The Soviet Union was faced with an increasingly belligerent neighbor in the form of fascist Germany [Riasanovsky 1984]. In responding to this threat, the Soviets relied not only on diplomacy and arms, but also on ideology and history to defend their state.

In Germany, the course of anthropological development in the beginning of this century was not interrupted by revolution, but by the First World War. Both before and after the war, archaeological cultures were thought to be the material expressions of distinct ethnic groups, but ethnicity was not traced into the past [Veit 1989]. Physical anthropology in Germany focused was on the classification of physical types. Races were seen as purely physical, they did not equal a 'people' and were not related to language or material culture [Proctor 1988]. The anthropology

of Germany before World War I was very much like that found in Russia prior to the revolution.

After Versailles, anthropology in Germany changed. Before the war, bioanthropology had been the study of 'otherness,' distinguishing between the 'kinds' of man. After the war, Germany was stripped of its colonial assets. With no external 'other' to study, the focus of anthropology generally shifted to the 'internal' other (Gypsies and Jews), and the unique qualities of the German people [Proctor 1988:139]. In the 1920s the rediscovery of mendelian genetics brought the distinction between bioanthropology and ethnology into question. Genetics seemed to bridge the gap between biology and culture that had been relatively unexplored before the war. By the 1930s, behaviors and dispositions were seen as genetic, and linked to race [Proctor 1988] (though this was by no means the first time this was done [Gould 1981; Stocking 1988]).

The link between archaeological culture and ethnos, always quietly assumed, had become tighter under the influence of nationalists like G. Kossinna before World War I. In the 1930s, the growing nationalism in Germany encouraged ethnic interpretations of the past, and was reflected in archaeological and bioanthropological research [Trigger 1989:163]. German archaeologists, now studying 'peoples' rather than material culture, were tracing the history of Germanic peoples (as a linguistic and ethnic group) as far back as the Mesolithic, and demonstrating how Germanic expansions had influenced the development of 'lesser' peoples (especially the Slavs) [Trigger 1989:166]. German archaeologists became ever bolder in their ethnic interpretations of archaeological materials, and the German state increasingly used archaeological research to support its policies. At the same time an ethnocentric fixation developed in bioanthropology, often focused on rescuing the Germanic race from 'threats' of mixing with biologically less developed races. Nazi programs of forced sterilization, denial of jobs to Jews and other peoples of 'mixed blood', and, ultimately, the incarceration and extermination of millions, all rested to some degree on a foundation of bioanthropological/racial research [Proctor 1988]. In Nazi anthropology, the ethnos became closely associated with language, culture and biology, and was seen as immutable through time.

The Soviet Union, firmly under the control of Y. Stalin by the 1930s, was not blind to the increasing nationalistic fervor in Germany, or the value of anthropological research in their propaganda. The Soviets needed to mount an intellectual counteroffensive against the growing threat of German nationalism. The role of history is vital to Soviet ideology, and it was imperative that the control of history be wrested from German anthropologists. One immediate goal was to instill a sense of nationalism among the peoples of the Soviet republics. Nationalism is often closely linked with primordial notions of ethnicity, and folk conceptions of biology [Banks 1996]. This pattern is clear in Nazi Germany, and followed quickly in the Soviet Union. Still reeling from the rapid consolidation of power, painfully fast industrialization and forced collectivization, a sense of Soviet nationalism had to be built quickly [Riasanovsky 1984:528]. Ethnogenetic research was seen as a way to establish the historical importance of modern ethnic groups, fostering a sense of national

pride [Trigger 1989:229]. V.A. Bulkin, *et al.* note that "Soviet scholarship responded vigorously to the resulting growth of national self-consciousness, the expression of national pride and the fostering of the best indigenous traditions" [Bulkin, Klejn, *et al.* 1982:276). In Russia, it legitimized historical claims to territory, and fostered nationalism by emphasizing the Slavic role in the development of European culture. Of course, this goal would not have been met without appropriate manipulation by the State and Party.

Stalin's purges in the late thirties certainly contributed to the control of research results. By selectively eliminating intellectual opposition, the political goals of research could be met. Those that were not eliminated were far more careful to produce the results required by the State. Though N.Ya. Marr's stadial theory was not officially renounced until Stalin's *'Marksizm and Voprosy Iazykoznaniya'* in 1953, it lost much of the influence it had. The key to instilling a sense of national pride was seen to be ethnic history, requiring a turn to ethnogenetic research, and Marr's theory was condemned for its rejection of studies of ethnicity. Ethnography, left in a shambles by the stadial theory, again began to have a role in anthropological research. The primary focus was now the study of ethnogenesis and dispersal of ethnic and national groups. This area, while being valuable practically from the political standpoint, was also relatively safe, in that it did not directly impinge on the territory of Marxist historians [Humphrey 1984:311]. In addition to ethnogenesis, ethnographers were also charged with studying the forms of transition of pre-capitalist society directly to socialism, bypassing capitalism, and the construction of cultures, "national in form and socialist in content" [Slezkin 1993:120]. Interestingly, these areas closely match the areas in which the formation of the Soviet Union directly contradicted the predictions of Marx and Engels. The study of these topics was thus of immense political and ideological importance to the Soviets, and was under close scrutiny and State control.

All branches of anthropology were reshaped in the struggle against fascist Germany. Ethnogenesis became important for all fields, and research results used for political purposes. In bioanthropology, 'ethnic anthropology' came to prominence, focusing on historical questions, particularly ethnogenetic [Debets 1961; Dragadze 1980]. Ethnic anthropology and racial analysis were adopted in the 'fight against racism', a response to the biological and cultural imperialism of German anthropologists. However, this application of bioanthropological research required considerable reorientation within Soviet bioanthropology. As I.I. Roginskiy and M.G. Levin [1978] optimistically portray it,

> The theoretical reworking of questions of the correspondence of anthropological types with ethnic and linguistic groups of mankind allowed the use of concrete anthropological material as a historical source for the study of problems of origins of various people (p. 36).

In this 'reworking', bioanthropology officially adopted ethnogenetic theory, adding biology to the definition of the ethnos, and at the same time becoming culture--historical in its focus. The integration of race into the definition of ethnos became, as M.M. Gerasimov, *et al.* describe it, part of "the methodological basis of Soviet

historical anthropology" [Gerasimov, Rud, *et al.* 1987:3]. Race became linked to language and culture within an ethnos in a way that mirrored its role in German bioanthropology. To fight 'racism', Soviet bioanthropologists essentially adopted the same interpretive framework as the Germans they opposed.

Though Soviet archaeologists scorned 'bourgeois archaeology' as explaining all changes in culture in terms of race, associated with migration and interaction [Artsikhovskiy 1954], Soviet archaeology began to do just this. Ethnic archaeology had been crippled by Marrists, unable to link archaeological cultures with ethnos. As the political tide changed, favoring and even requiring ethno-historic studies, archaeologists quickly put out many histories tracing origins of peoples, working rapidly to support the Soviet political agenda [Shnirelman 1993b]. The political agenda behind the emphasis on ethnogenesis was clear, as L. Malina and Z. Vašiček [1990:114] note, "attempts to project an ethnic division into the past [...] were a reaction to the pressures of German settlement archaeology.". Archaeologists were well aware of the political dimension of their work. As Bykovskiy bluntly stated "If archaeological material allows several various interpretations, then if follows to choose from them that which is more patriotic" [Shnirelman 1993b:56]. From the end of the 1930s Marrist methods were used to study ethnogenetic problems, tracing direct lines of descent from modern peoples back to archaeological cultures based on ceramic decoration or house design criteria. Archaeological cultures were interpreted in exclusively ethnic terms, with an emphasis on identifying ethno-specific cultural traits that could be used to trace and isolate ethnic groups [Trigger 1989:237; Shnirelman 1993b:60]. Stimulated by Soviet nationalism, this lead to tracing the origins of the Russian people back to various and widespread archaeological cultures (even to the Paleolithic [Derzhavin 1944; cited in Shnirelman 1993b:61]). Eventually Slavs in Soviet archaeology came to dominate the history of humanity, with Germanic peoples marginalized, presenting a mirror image of the history presented by German anthropologists [Shnirelman 1993b:63].

The shift to ethnogenetic studies in Soviet anthropology did not happen slowly. It was actively promoted and supported by the Soviet government. Ethnogenetic studies served the Soviet State as more than a response to Fascist anthropology. They were also used to provide support for various internal policies, from the aligning of internal political and ethnic boundaries to justifying the preeminence of Great Russians in the Soviet government [Humphrey 1984]. Ethnogenetic research was very culture-historical in its focus, defining an ethnic group and tracing its history based on material culture remains and the distribution of 'racial' types.

After World War II, ethnogenetic studies remained the focus of Soviet anthropology. Teams of ethnographers, linguists, archaeologists and bioanthropologists were dispatched throughout the USSR to study the ethnic histories and origins of the various ethnic groups within the Union. In part, this was a response to the need to establish administrative boundaries over newly annexed territories, and the research was often compromised by political needs [Humphrey 1984:311]. Considerable effort was devoted to providing a theoretical and methodological foundation to the ethnogenetic studies which were already in progress. Iulian Bromlei played

a major role in defining Soviet ethnography as the study of ethnicity, focusing on defining the cultural distinctiveness of various groups [Gellner 1977]. The primary unit of anthropological inquiry was the ethnos. The various Soviet definitions of ethnos almost universally included territory, material culture, often some degree of biological homogeneity [Bromlei 1974], and most importantly language [Arutiunov 1983]. As already noted, Soviet ethnos theory was 'primordial', in that it saw ethnicity as eternal and enduring.

Ethnogenetic studies are considered an integral part of Soviet physical anthropology as well. Ethnogenesis is counted as one of the three branches of physical anthropology (along with studies of human origins and human morphology), defining its main tasks as "the study of the history of nations and the fight against racism" [Debets 1961:3], but at the same time, it is also interested in "the determination of the kinship of races and anthropological types, and in ways for employing anthropological material as a source of historical information" (p. 15). To apply physical anthropological methods to historical reconstructions, physical anthropologists relied on the rough equation of an ethnos with an anthropological type. V.V. Pokshishevskiy [1974:97] asserts that understanding the time required the creation of an ethnos "would bring us close to the solution of the questions involved in the formation of races".

Ethnogenesis thus came to encompass racial classification and typology, as well as the establishing the origins of modern racial groups. G.F. Debets [1961:17] notes that such studies frequently "did not succeed in avoiding the bias toward identifying the described anthropological types with the contemporary linguistic families". While G.F. Debets intends this to be a reflection of the influence of N.Ya. Marr, he does not mean that language and biology are not connected, believing rather that "any migration of populations determined on the basis of anthropological data and any mingling of races is a product of definite historical causes and is necessarily reflected in the dissemination and interaction of languages" [Debets 1961:18]. Thus the patterns of linguistic relationship (in the form of a language phylogeny) will reflect or be a reflection of genetic events. More forcefully put by G.F. Debets *et al.* [1952] "anthropological types are never distributed without culture and language" and therefore "where anthropological data indicates the distribution of one or another type, the task falls to historians, archaeologists, ethnographers and linguists to explain the historical conditions which brought about that distribution".

In Soviet archaeology, the trend toward ethnogenetic research that began in the 1930s continued and was further elaborated, becoming one of the primary aims of archaeology [Malina, Vašiček 1990:114]. While the focus was initially on ethnic histories for groups within the Soviet Union, it came to influence archaeological studies in other areas.

The Soviet emphasis on ethnogenesis has tended to lead to the conglomeration of language, biology and material culture in the ethnos. By defining the ethnos in terms of endogamy [Bromlei 1974], material culture [Arutiunov 1983] and language, the ethnos has become a real, material object of study for archaeologists, bioanthropologists and linguists. Despite N.Ya. Moore's view emphasizing the disjunction

of material culture, biology and language, in Soviet studies these are absorbed as a unit into the concept of ethnos.

Where N.Ya. Moore focuses on the instability of ethnic boundaries, there is a real tendency in Soviet anthropology to assume that ethnic units are long lived and traceable in the past [Banks 1996]. Though the particular traits used to define the boundaries of the ethnos shift through time (and interpretation), the idea that such boundaries persist is never lost. The ethnos itself is nearly permanent, allowing the ancestors of historic ethnic groups to be traced into the past. Ethnogenetic studies of the past become recipes for the formation of modern ethnic groups, combining various cultural, linguistic and biological elements from archaeologically 'known' ethnic groups into modern ethnoses [Litvinskiy 1981]. While today ethnogenetic theory is seen as a valuable alternative to culture-historical interpretations of human history, Soviet ethnogenetic studies provide extreme examples of the unification of language, culture, and biology in the ethnos, and its projection into the past.

This outline of the origins of Soviet ethnogenetic research gives only the barest glimpse of the way in which politics and history have shaped ethnogenetic theory in the Soviet Union. The close association of ethnicity with language, race and material culture is a key point. Another is the political motivation that drove ethnogenetic theory toward specifically culture-historical interpretations. The various Soviet definitions of ethnos almost universally include territory, material culture, often some degree of biological homogeneity, and most importantly language. Such a definition of the ethnos easily lead to culture-historical interpretations of the past. It is somewhat ironic that in an attempt to develop an anthropological theory to counter the culture-historical anthropology of the Germans, Soviet anthropologists were led to the same interpretations of the past. In a chain reaction German nationalism and historical expansionism in anthropology gave birth to a responding Soviet nationalism.

It serves to bear in mind that ethnogenetic theory is not the only one that guides Former Soviet anthropologists. There are various definitions of ethnicity, and conflicting schools of thought on the association of language, material culture and biology. Ethnogenetic theory, in the form that I have traced here, remains very influential in all branches of anthropology in the Former Soviet Union. Even when ethnogenesis is not the direct subject of inquiry, a large proportion of archaeological and physical anthropological works include a discussion of the ethnicity of the past peoples being studied (though this practice has been questioned by some Soviet scholars [e.g. Korenevskiy 1992]. While my readings of the Soviet and (largely) Russian anthropological literature have focused on the Bronze age, it is not uncommon to have ethnicity discussed in papers dealing with the Neolithic and Mesolithic (linguistic affiliations are sometimes even assigned to archaeological cultures as early as the Palaeolithic [e.g. Dolukhanov 1989]). In Bronze Age Andronovo studies, ethnic attributions (practically on a site specific level) are virtually required. This is perhaps an exceptional situation, as Andronovo is the center of controversy for a migration hypothesis developed primarily to explain language distributions [Lindstrom 1994]. The weight of linguistic reconstructions seems to urge archaeologists to attribute

ethnicity and language to past peoples, a situation seen in other cases as well [Rouse 1986; Mallory 1989; Madsen, Rhode 1994]. Ethnic attribution of archaeological cultures, and the grouping of language, material culture and biology within the ethnos are, however, widespread in Soviet and Former Soviet anthropological literature.

The focus of this conference session, the reading of ethnic and national politics into the past, is both timely and necessary. However, the political manipulation of the past is by no means a recent innovation. For as long as antiquities have been recognized as material remains of past peoples, they have been used as political tools. Political manipulation of the past takes many forms, from the reconstruction of Babylon to the supremacist rhetoric of groups like 'Pamiat'. Anthropologists must be vigilant that the study of the past is not controlled by the politics of the present. While a post-modern, reflexive anthropology has much to offer, the past should be a more than mere reflection of present political currents. While we cannot divorce ourselves from our own ethnic and national experience, we can be aware of the biases that these impose on us, and make the conscious decision to be scientists rather than politicians.

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NATIONAL IDENTITY AND THE USE OF THE REMOTE PAST IN THE CAUCASUS[1]

1. INTRODUCTION: NATIONALITY, ETHNICITY, AND ETHNOGENESIS — THE STICKY WICKET OF UNQUESTIONED CONCEPTS

Before the collapse of the Soviet Union in 1991, I used to refer to the USSR as the world's most ethnically heterogeneous nation-state and to the Caucasus, in particular, as the most ethnically heterogeneous region of the world's most ethnically heterogeneous nation-state. Strictly speaking, however, there were some other viable contenders: India, Indonesia, and the Philippines, for example, with all their tribal/indigenous peoples. Or what about the highland peoples of Papuan New Guinea? Reduced drastically, of course, from the more than 700 peoples first encountered by whites more than sixty years ago, the peoples of New Guinea still number a few hundred and, as such, could lay legitimate claim to comprising the most ethnically heterogeneous state. Upon whom should this honor have been bestowed?

The answer depends upon one's definition of an ethnic group, or *ethnos* in the Soviet parlance, a problem sometimes associated with the practical tasks of governing peoples by classifying or subdividing them into groups, based on language, territory, religion, culture, "race" or some other presumably objective criteria; classifiers or typologists, as we know, can either be lumpers or splitters, a fact which complicates our problem. Also, the concept of *ethnos* is obviously related to an extremely important and overworked concept in Soviet archaeology and the study of remote antiquity: *ethnogenesis* or the coming into being, the formation of an *ethnos*. This article will reexamine this concept of ethnogenesis and expose its abuse/misuse in reconstructions of the remote Caucasian past. Before doing so, we can expediently distinguish nationality from ethnicity on the basis of the association of the former with a political unit, the modern nation-state, and rephrase our former assertion: the Soviet Union the most heterogeneous state in terms of its nationalities, some of whom have since received international recognition in the

[1] An earlier version of this paper will appear in Russian in the proceedings of the symposium *Sovremennoe sostoyanie i perspektivi razvitiya istoricheskoy nauki Daghestana i Severnogo Kavkaza*, Institute of History, Daghestan Scientific Center, Russian Academy of Sciences, Makhachkala, Daghestan.

United Nations and others of whom aspire to this status. Thus, also the title of this paper *"National Identity and the Use of the Remote Past in the Caucasus"*; seemingly inevitably and, in terms of the violent consequences to date, sadly, many ethnic groups in the Caucasus (*ethnoi*) are now more appropriately termed nationalities. The most egregious abuses of the remote past in the Caucasus have been associated with the political imperative to be sovereign, to rule over increasingly homogeneous, well-demarcated areas that have been ethnically cleansed of other claimants to these lands.

Ethnicity and nationality should be distinguished for at least three reasons. First, they are not synonymous, a fact which should be immediately comprehensible to citizens of multi-ethnic nations, like the United States. Secondly, associating the concept of nationality with contemporary nation-states historicizes the concept to the time of the existence of nation-states; i.e., to the modern historical era or, roughly, to the late 18^{th} century on. This point may seem trivial or pedantic, but it is important in discussions of the misuse of the remote past: nationalities should not, strictly speaking, be accorded time immemorial status. They are relatively recent forms of group identity. Moreover — and this is our third reason for distinguishing nationality from ethnicity: the concept of nationality has benefitted from a thorough critique or deconstruction by modern historians. One can choose one's favorite author and opt for one's favorite definition of a nation (e.g. B. Anderson's famous "imagined community" [Anderson 1991] or, as some wit once observed, "a group united around a common dislike for its neighbors and a common mistake about its ancestry"), but E.J. Hobsbawm's basic verdict [1992:3-6] is, I belive, incontrovertible: contemporary historians have succeeded in elucidating the concepts of nation and nationality by disassociating them so-called objective criteria (language, blood, territory, etc.) and insisting on their socially constructed character. It is far less clear that this Enlightenment is happening as nation-states and national identities are declining in importance, that — to quote E.J. Hobsbawm [1992:192]: "the owl of Minerva flies out at dusk". The recent history of the Caucasus, which, obviously, is filled with nationalist tensions and conflicts, hardly corresponds with this wishful description.

The concept of ethnicity, which actually is more relevant to our consideration of the remote past, has not benefitted to the same extent from such a rigorous re-appraisal, although it is obviously the defining concept of ethnology and has long been studied by ethnologists and social/cultural anthropologists both in the West and in the former Soviet Union. Here, a division must be noted: the Soviet study of the *ethnos*, long championed among others by Yu.V. Bromlei [1973, 1983], the former Director of the Institute of Ethnology of the Soviet Academy of Sciences in Moscow, can be characterized as "primordialist" or essentialist; i.e., attachment to an ethnic group is based on objective criteria that are durable and long-lasting, such as language, racial group, cultural traditions or time-honored ways of doing things, etc. [Shnirelman 1996:8-9; cf. also Tishkov 1997:1-114 for an extended critique of Soviet "ethnic engineering" and the entrenched academic and popular dogma of viewing ethnicities as primordial essences]; while Western anthropologists have de-

fined ethnicity in more dynamic, even psychological terms, as something situational and relational; i.e., defined in a specific situation in relationship to a perceived Other, as an "emic cateogory of ascription" [cf. Erikson 1993:10-12]. From this perspective quite simply, a group is a distinct ethnos that considers itself such and, to some extent, is considered such by other groups. The attribute of self-categorization is most important, and, since our discussion is concerned with the identification of ancient ethnoi, it must be emphasized that from this Western perspective there is no necessary material culture correlate associated with the formation of an ethnos. There may be, but there need not be. Another consequence of this latter focus is that ethnic groups are malleable and constantly changing as the historical situation in which they exist unfolds; ethnicity, like culture, is never made, but is always "in the making" or, perhaps, if times are tough "in the unmaking" or "in the disappearing". From the latter perspective, the coalescence, as well as disappearance, of some of those highland peoples of New Guinea is not surprising. The very existence of indigenous rights' advocacy groups in the West, like Cultural Survival, both presupposes and opposes the real possibility of cultural extinction. From this perspective, ethnicity and nationality are conceived similarly in that they are socially constructed phenomena in which traditions are invented and consciously manipulated for political, economic, and social reasons. Ethnicity is just a more universal form of group identity with a past that may extend back to earlier historic times, indeed, perhaps, into the mists of prehistory.

Finally, we arrive at the concept of ethnogenesis, one that was central from the mid-1930s on to the practice of many Soviet social sciences, including ethnology, archaeology, physical anthropology, historical linguistics, folklore and other related subjects [Tishkov 1997:1-15, 21-22]. Why ethnogenesis became such a pivotal concept in Soviet social science is a fascinating question, requiring its own historical investigation. It cannot be adequately discussed here; instead we simply refer you to the seminal studies of V.A. Shnirelman [e.g. 1993a; 1995] who is engaged in the monumental and important task of distentangling the complex history of its use and relation to Soviet dictates of state. In short, V.A. Shnirelman argues that the determination of ethnogenesis became one of the central tasks of Soviet archaeology from 1934 on when the discipline switched from a Marxist-inspired internationalism (or, perhaps, politically-motivated universalism) to one concerned principally with the ethnogenetic history of the early Slavs; i.e., when Great Russian chauvinism and the build-up to the Great Patriotic War replaced this internationalism. Ironically, the effect of this transformation was to have every ethnicity/nationality alike, Russian and non-Russian, engaged in this ethnogenetic mandate or search for its origins. Peoples wanted to determine when they came into being and what they could authentically claim was ther original homeland. Competition over the remote past was fueled by the ethnogenetic imperative[2]. This task was intimately tied to the very structure of the Soviet multi-etnic federal state.

[2] The intensity of the search for search for ethnic origins varied, of course, depending upon local political conditions and the perceived security/viability of the ethnic group in question. Much of the archaeology conducted during late Soviet times was deadeningly descriptive and apolitical. This condition particularly characterized its practice in the Russian heartland after the patriotic politicization of the discipline during the 1930s and 1940s. The situation, however,

Theoretically the use of the concept of ethnogenesis is tied directly to one's concept of the ethnos: something durable and well-nigh permanent, as in the Soviet perspective, or something constantly changing, as favored by most Western scholars. For the former, the determination of origins is the critical question. When did the ethnic group, conceived as a little preformed homunculus already possessing all the essentially defined characteristics of the given ethnos, come into being: during the Bronze Age, the Iron Age, with the collapse of Classical Antiquity and the ensuing Great Migrations, or after the conquests of Timur or Chingghis Khan? It is perceived as a straightforward historical question with an ascertainable answer to be provided by the archaeologist's spade or by some long-overlooked historical document. For the Western scholar, the problem is much more copmplex, indeed practically unsolvable. Ethnogenesis is only a relatively minor matter associatied with the beginnings or initial formation of a given ethnic group; more significant and more complex are the changes that group will experience over time or its *ethnomorphosis*, if you will [Kohl 1992:172]; these changes may — though not necessarily — lead to the appearnace of new ethnic groups through processes of assimilation and/or fundamental change or disappearance through various natural or human-induced processes, such as ethnocide. Even an ethnic group that exhibits considerable continuity and stability over long periods of historical time will nevertheless change in fundamental ways; thus, for example, pre-Christian Armenia of the Iron Age differs from Christian Armenia of the Middle Ages and from the newly formed Republic of Armenia today [cf. Kohl 1996].

Obviously, both perspectives have some degree of merit: continuities, as well as changes, can be documented for this Armenian experience or for many, relatively long-lived ethnic groups. Cultural traditions cannot be fabricated out of whole cloth; there are real limits to the inventions of tradition. As E.J. Hobsbawm argues, states or nationalist politicians may, in fact, make nations, but they cannot totally make them up. The Italian politician Massimo d'Azeglio's shrewd exhortation at the first meeting of the parliament of the newly united Italian kingdom illustrates this principle graphically: "We have made Italy, now we have to make Italians [cited in Hobsbawm 1992:44]." But it is also or should be obvious that one could not have constructed mid-to-late 19th century Italians out of the Chinese or New Guinean cultural traditions. Here it is useful to distinguish between strict and contextual constructionism [cf. Ben-Yehuda 1995:20-22]. The former denies any constraints imposed by past or current realities and quickly devolves into the hopelessly relativist morass of some post-modern or, in archaeology, post-processual criticisms. Contextual constructivism, the theory advocated here, on the other hand, accepts the fact that social phenomena are continuously constructed and manipulated for historically ascertainable reasons, but it does not deny an external world, a partially apprehensible objective reality, that cannot totally be reduced to invention or so-

was far different for non-Russian Soviet archaeology. Indeed, the legacy of the ethnogenetic mandate is still fluorishing throughout the former Soviet Union. To cite just one example, an upcoming conference in Nukus, Karakalpakstan (October 1998) is entitled "The Aral Root of the Ethnogenetic Process" and is devoted to a "consideration of the problems of the ethnogenesis of the Karakalpak people"

cial construction. Representations or constructed cultural perceptions are real, but reality encompasses more than representations and exists independently from them.

The contextual constructivist conception of ethnicity or nationality is preferable to the static, essentialist, neo-Platonic, and typological/classificatory perspective, which was so widely adopted by Soviet ethnographers and archaeologists. Its focus on change and development is more historical and more accurately describes the transformations that ethnic groups constantly undergo. The archaeological implications of the contextual constructivist perspective are profound: ethnogenesis, as traditionally conceived in Soviet archaeology, is a false problem. Ethnicities are not little perfectly formed homunculi or crystallized essences containing within them all the characteristics of their future development; rather, they are caught up in, even buffeted by, large historical processes capable of altering and destroying them. The identification of some archaeological culture as ancestral to a given ethnic group represents a hopeless will'-o'-the-wisp', a chimera incapable of satisfactory determination. Moreover, the quest for such identifications is not only misleading, but dangerous, as an examination of current identifications shows in attempts to reconstruct the remote Caucasian past.

2. THE CURRENT ABUSE OF THE REMOTE PAST IN THE CAUCASUS

The defining physical feature of the Caucasus as a cultlure area is, of course, the perpetually snow-capped Great Caucasian mountain range stretching c. 1200 km northwest to southeast between the Black and Caspian Seas. Mountainous areas typically are characterized by considerable ethnic diversity, a feature for which the Caucasus is renowned. Ethnic diversity in the Caucasus is not only the product of physical geography, but of history and of the constant movements of peoples from the south or the ancient Near East and from the north off the Eurasian steppes into this beautiful land. The historical record extends back for nearly three millennia, and many ethnic groups maintain a plausible historical consciousness — sometimes reinforced by early literacy — that stretches back for centuries, if not millennia. While the exact borders of the Caucasus area are hard to define, particularly as they imperceptibly merge with the ranges of the Little Caucasus mountains and the Anatolian plateau to the south, there is no debate that the Caucasus contain the greatest ethnic and today national diversity in the former Soviet Union. Most significantly all these peoples are squeezed into a relatively restricted area. The fact that so many peoples live cheek-by-jowl next to one another goes a long way in expllaining the recent rise of ethnic tensions and conflicts throughout the region. Caucasian peoples have both co-existed peacefully and fought with each other over the millennia. Ethnic enmities too should not be naturalized or essentialized but historically explained, and a partial explanation for the recent outbreak in ethnic

tensions will attribute them to the conscious manipulation of the remote past by politicians, journalists, and even reputable scholars, including archaeologists. The remainder of this paper explores some of these misuses.

K.Said's fascinating historical novel *Ali and Nino* contains a revealing, and today sadly ironic, scene [1970:44] that epitomizes one of the problems characteristic of Caucasian historical consciousness: it is 1914; the Great War to end all Wars is about to begin; and the action takes place in Karabagh. An Azeri properly reproaches an Armenian for claiming that the Christian Chuch in Shusha was five thousand years old. Nonplussed, the Armenian replies: "The Christian faith may be only two thousand years old in other countries. But to us, the people of Karabagh, the Saviour showed the light three thousand years before the others." Claims to the remote past beget other claims to the remote past, engendering ever more hyperbolic and implausible claims to land or to the cultural accomplishments of one's own people. One can refer to ethnic competition over antiquity in the Caucasus, but one should not trivialize it, since these exaggerated claims often motivate people in their bloody conflicts with their neighbors.

Numerous recent examples of grossly implausible assertions about the past can be cited for both the northern and southern Caucasus [cf. Markovin 1990, Kohl, Tstetskhladze 1995]. Very briefly, let me summarize some recent cases, whic have been collected and devastatingly critiqued by V.I. Markovin [1994; all references to other studies can be found here]: a Chechen journalist, A.Izmailov, attempts to link the Chechen/Vainakh people with ancient Pharaonic Egypt, while another, Yu. Khadzhiev, sees the Chechens as historically related to the ancient Etruscans of Italy and the Basques of norhern Spain. More plausibly but still problematically, is Kh. Bakaev's genetic connection between the Chechens and Hurrians/Urartians or Bronze and Iron Age peoples of Caucasian or east Anatolian origin, who are known both archaeologically and from ancient cuneiform sources. Here the direct link cannot be established, but the more generic relationship with peoples speaking a language of the northeast Nakh-Daghestani Caucasian group of languages is generally accepted. For northern Ossetia, which has now significantly been renamed Alaniya after the Alans, V.I. Markovin cites the work of V.L. Khamitsev who claims that Jesus Christ was an Ossetian or, at least spoke, Ossetian, and that this language spread throughout Europe all the way to the British Isles and continued to be spoken into the late Middle Ages, as it was the mother tongue of Frederick Barbarossa! According to Khamitsev, the area of Biblical Galilee was populated by ethnic Scythians, who are perceived unproblematically as ancestors of the Ossetians, and the Virgin Mary was a Scythian. V.I. Markovin [cf. also Chernykh 1995:143] also critically scrutinizes the more "scholarly" writings of I.M. Miziev who attempts to link the archaeologically defined late 4th — early 3rd millennium B.C. Maikop culture of the northern Caucasus with the ancient Sumerians of Mesopotamia and then shows how the Sumerian language is historically related to his own Karachai-Balkar Turkic dialect.

Such claims appear to be so preposterous as not to require serious rebuttal, but easy dismissal is the wrong and irresponsible reaction. The past is both competed

and fought over in the Caucasus. As this is the case, pasts are constructed that often deviate sharply from more objective efforts at understanding an always incomplete and deficient early historical or archaeological record. Tendentious, chauvinist pasts must not be embraced as alternative accounts of an infinitely malleable past; rather, they should be resisted, since they are one of the important ingredients stoking the current flames of ethnic conflict in the Caucasus. The very widespread popularity of some of these problematic readings underscores the depth of the problem. Let me cite just one additional example of which I became aware when I visited Daghestan last summer: G.A. Abduragimow's *Kavkazkaya Albaniya — Lezgistan* [1995] (this volume has received an appropriately critical review by Davudov (personal communication). This volume purportedly demonstrates that the ethnic ancestors (ethnogenesis) of the Lezgin peoples can be traced back in an unbroken, continuous line to Chalcolithic and Bronze Age times; the story, embellished by the Lezgin translation of hitherto unpublished and published Albanian texts, documents, in short, the historical basis for Lezgistan, an aspirant Caucasian nationality/nation-state. What was remarkable to me was how handsomely this book was published; set in St. Petersburg, it was officially published by the Daghestan State Pedagogical University (i.e., not pulp literature), having received what must have been a substantial subvention from the "Mavel" private firm. No current publication of the Institute of History of the Daghestan Scientific Center, which is sorely strapped for founds in the wake of the financial collapse of the Russian Academy of Sciences, is so profusely illustrated or attractively produced. Obviously, there are both markets for such tendentious publications and individuals with sufficient resources to underwrite them.

3. THE MATERIAL REMAINS OF DJAVAKHETI: ANCESTRAL CLAIMS AND STATE POLICIES — THE SHORTNESS OF HUMAN MEMORY

Ethnic competition in the Caucasus over the remote past takes certain predictable forms: preposterous land claims; dubious genetic links to famous ancient peoples; and a litany of cultural achievements that confirm the superiority of the given ethnic group over others. Needless to say, this competition seems all the more ludicrous when one adopts the more dynamic, historically sensitive conception of ethnicity argued for above. Another observation, consistent with the "contextual constructionist", non-essentialist conception of ethnicity, is the fact that time too is relative and the remote, ancestral past can be fairly recent — even in the Caucasus. This point can be documented by consideration of the material remains of Djavakheti or southern Georgia, a contested area which today is populated overwhelmingly (up to 80%) by ethnic Armenians.

Travelling across the open volcanic landscape of Djavakheti, one observes dilapidated Georgian churches with Georgian inscriptions, some of which date back to the first milllennium A.D., standing alongside functioning Armenian churches which

date to the 19th century. The famous Wardzhia cave monastery complex is located here. It contains one of the only surviving portraits of Queen Tamar, who ruled at the height of the Georgian medieval kingdom, and it is such an important symbol of Georgian nationality that it figures prominently on their new state currency — the *lari*. Despite the clear markers of an earlier Georgian *Christian* presence in the area, historical priority is still debated between the local minority Georgians and majority Armenians. The latter, who came into this depopulated area after 1828 or after the signing of the Treaty of Turkmenchai which established the international bordes between the Persian Qajar, Ottoman, and Russian empires, can still claim that the region was part of greater Armenia during the 1st century B.C. reign of Tigran the Great. Possibly so, though Tigran ruled over a multi-ethnic kingdom, and it is not clear what ethnicity occupied Djavakheti in classical times or, even earlier, during the Iron and Bronze Ages. We are only really certain of proper ethnic attribution when we find those Georgian churches with their Georgian inscriptions. Moreover as argued earlier [Kohl, Tsetskhladze 1995:161]:

> The ethnicity of the people who dominantly occupied this territory during Iron Age and Classical times... is unknown, and even the hypothetical (and improbable) discovery someday of inscriptions proving that most peoples in the area then spoke an Indo-European, Proto-Armenian or Armenian-related language would not erase the Georgian historical claim to the area. This conclusion follows directly from the ... ever-developing nature of cultures and the fact that Christianity has been an integral component of both Georgian and Armenian cultures for centuries; one simply cannot ignore those beautiful monastery complexes and churches with their Georgian inscriptions. Admitting this, however, does not provide an excuse for the current Georgian *state policy* of deliberately underdeveloping the area and hindering communications and transportation between the local Armenian populations and their ethnic relatives to the south. Surely many generations of Armenians have lived and died on this soil since arriving *en masse* after 1828, and this fact alone is obviously relevant to their just treatment and the rights that they deserve. The Bible or even Biblical archaeology may be invoked to legitimize an historical claim to the West Bank, but such a claim (however problematic in itself) cannot be used to justify an Israeli *state policy* of uprooting Palestinian orchards and olive groves or demolishing their homes. These issues must be kept separate, and any honest archaeologist should be capable of distinguishing between them.

Human memories are also constrained ultimately by human lifetimes and the length of human generations, and these latter, relative to antiquity and to the depth of historical consciousness throughout the Caucasus, are remarkably short, though nonetheless real. In 1991 I and Georgian colleague of mine were placed effectively under house for taking pictures of stone statues in a cemetery in a little Armenian village in southern Georgia not far from the Turkish border. We were suspected of being agents of the Georgian state (still then a nominal Soviet Republic of the collapsing Soviet state), possibly intriguing against the local Armenians and trying to resettle ethnic Georgians on this contested land. While our archaeological cover was checked out, we became friends — over several bottles of vodka — with our Armenian jailer/host, who was a member of a local vigilante group, minimally engaged

in protecting Armenian rights in the area. He was a sensitive artist/scupltor, who had been living in Leninakan (now Gyumri), Armenia's second largest city which is located in northwestern Armenia almost directly contiguous with Djavakheti, until December 1988 when the city was devastated by a massive earthquake. His family had survived, but his apartment had been destroyed and his sister and her family had been killed in this traumatic event. He decided to return to his ancestral home where his mother still lived and sculpt a monument over the grave of his sister whose remains had also been transported to their ancestral cemetery in this little village in southern Georgia where their forebearers had been living since arriving in 1828.

The point should be obvious. One of the tragedies about the confusion of the "remote" past with the present is that people live in the present and their attachment to their land, their culture and the like is conditioned by their own lifetime experiences. An ancestral village may be only a few hundred years old, but that is more than sufficient time for the people who live there, and it is only unscrupulous politicians or nationalist fanatics who would argue otherwise. Archaeologists and other scholars of antiquity should not provide always-problematic and dubious evidence for the latter to utilize.

4. CONCLUSION: THROWING OUT THE BABY WITH THE BATHWATER

This paper began by examining some basic, even overworked concepts for discussing identity formation and the use/abuse of the remote past: nationality; ethnicity; and ethnogenesis. It then briefly summarized some egregious misuses of archaeological and ancient historical sources that appeal to contemporary ethnicities or aspirant nationalities in the Caucasus. As noted, many of these studies have been devastatingly critiqued by V.I.Markovin [cf. Markovin 1990; 1994]. While the only comment to V.I. Markovin's critical remarks is an emphatic "right on", a heartfelt exhortation to continue this good and necessary work, one very important caveat must be mentioned in response to his directions for future responsible ethnogenetic investigations [1994:61-63]. And that is, in spite of his very frequent observations about the inability of making certain ethnic identifications or about the highly subjective character of ethnogenetic results, he refuses to draw what seems — to this Western investigator — the inescapeable conclusion: abandan the exercise. The search for long past moments of ethnic formation that are directly ancestral to contemporary ethnic groups is futile. They can almost never be made — even utilizing, as V.I. Markovin recommends, different types of evidence: historical linguistics, archaeology, ethnology, documentary, etc. The task is next to impossible because ethnicity or the ethnos, which has been mistakenly theorized at length by Y.V. Bromley and his disciples, represents a far more fluid and dynamic reality

than archaeologists, particularly in the absence of inscriptional evidence, can ever reasonably hope to define.

Prehistoric reconstructions cannot proceed without identifying and documenting archaeological cultures. The problem does not lie with the oft-discussed archaeological cultlure concept but with the assumption that one can move from the determination of archaeological cultures to the identification of past ethnoi, ancestral to modern self-ascribed ethnic groups. They are not equivalent — either as concepts or as exercises, and neither ethnogenesis nor ethnicity are amenable to archaeological analysis. As V.I. Markovin has so eloquently demonstrated, the attempt to do so is worse than misleading; it is often dangerous, providing fuel for ethnic extremists. It is time to cut the umbilical cord and abandan the concept of ethnogenesis that has saddled Soviet and now post-Soviet archaeology since the mid-1930s. The pre- and perfectly formed ethnos, which is inherent in the Soviet concept of ethnogenesis, simply does not exist. To continue the metaphor, this imaginary baby or better — homunculus, should be thrown out with its very dirty nationalist bath water.

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THE EAST — WEST RELATIONS IN THE LATE MESOLITHIC AND NEOLITHIC IN THE BALTIC REGION

The huge territory of the Baltic region includes parts of two large areas defining in a broad sense as the Western and Eastern Europe. This modern division has the historical roots but the division has not existed all the time.

I will call here the area around the Baltic as the Circumbaltic cultural space. The structure of this Circumbaltic area was different during the different periods of prehistory and was also dependent on the broader processes of Pan-European scale.

During the Mesolithic all over the area cultures with the similar economy of hunters-fishermen-gatherers existed, not uniform but of rather the same degree of development. Many typological differences depend on the natural resources, first of all the stone raw materials. The neighbouring Mesolithic cultures had been interconnected. More local differences appeared in the Late Mesolithic when a number of local cultures came into being, among them Kongemosen, groups of Oldesloe, Chojnice-Pieńki, Janisławice, Nemen, Late Kunda. At the same time the situation of integration existed probably in much more degree than we can suggest basing on the typological differences only. During the second half of the Mesolithic around the Baltic appeared a new type of the monuments — the special cemeteries with ochre-coloured graves, situated close to the settlements (Skateholm, Vedbaek, Zvejnieki, Oleneostrovskiy and some others). Most probably, the spread of these large, long-time used cemeteries reflects rather rapid spread of the similar rites over the large areas. There is a number of finds connected with the problem of distant links in the Late Mesolithic, for example the elk-head of Oleneostrovskiy type found in Denmark, at Vedbaek site, connected with the well-known cemetery (Fig. 1--3) or antler-tool of the aceramic Ertebølle type originated from the Late Kunda Tyrvala site in Sankt-Petersburg district close to the Estonian border (Fig. 1:5). The grave with Kongemosen type rhomboidal microliths was found at Spiginas, Lithuania [Butrimas 1989]. The situation of integration has been existed also during the period of the first pottery-cultures formation. The materials of the earliest Scandinavian pottery-culture — Ertebølle — in general are close to the Early Neolithic finds of the Eastern European forest zone. Some similarities are represented at Fig. 2. The pointed-bottommed pots of the Ertebølle type are very close to the vessels

of the Nemen and Narva cultures and in the Narva culture assemblages of the finds of lamps very similar to the Ertebølle ones are numerous. The traits of the distinctive Nemen Neolithic influences are recognisable, in my mind, in the pottery assemblage of the most eastern site of the Ertebølle-Ellerbek type — site Dąbki 9 in Northern Poland [Ilkiewicz 1989]. The ornamentation in form of "pearles" (Fig. 2:8, 9) represented in series in Dąbki 9 assemblage is very typical for the Nemen pottery and this type is not the oldest in the Neolithic Nemen culture. The shapes and some other details of the earliest vessels are similar in the area of the Ertebølle-Ellerbek, Nemen and Narva cultures and at the same time flint and bone-antler industries obviously have the local roots, they originated from the preceded local non-pottery industries. The same situation we have in almost all regions of the Eastern European forest zone — the Earliest Neolithic cultures of the neighbouring regions have many similarities in the oldest pottery assemblages and diffeencess in the industries. Many factual data came to light during the last decades for the explanation of the first pottery appearance in the Early Neolithic forest zone by the processes of diffusion.

The chronology of the Early Neolithic in the forest zone is rather developed now and is based on the numerous C-14 datings [Timofeev, Zaitseva 1996a, b]. The first pottery appearance is dated to the period not later than 7000-6800 BP* and in some eastern regions there are even earlier datings. The first pottery in the eastern Baltic area and in the forest zone as a whole is dated to the earlier time than in Scandinavia and the southern Baltic area. The modern data are in concordance with the idea of the south-eastern roots of the Ertebølle culture pottery expressed for the first time by the prominent researcher of the Eastern European antiquities V.N. Danilenko [1969]. Possible directions of the diffusion of the pottery-making technology to the Baltic region are represented in Fig. 3:A. The types of shapes of Ertebølle-Ellerbek culture pots have their prototypes in the Early Neolithic of the Dnieper basin (Fig. 3:B).

The real division of the Circumbaltic cultural space, a kind of the West — East demarcation, happened after the formation and the spread of the Funnel Beaker culture. The Funnel Beaker culture brought for the first time to Scandinavia the productioning economy and the new social structure of society.

The scheme of the Circumbaltic cultural space development is represented in a plate (Fig. 4). There are two different economical and cultural worlds in the Baltic region from about 5300 BP.

A kind of integration had been developed in the eastern Baltic area and adjacent forest zone regions and concerning the Middle Neolithic the system of exchange connections could be reconstructed. There are represented (Fig. 5): flint resources, finds of amber ornaments, the district where the Neolithic sites gave faunal assemblages with large amounts of fur animals bones. Concerning the flint sources the point at Selizharovka in the Upper Volga basin is of special interest. The flint originated from this point is defined at a number of sites in the eastern Baltic area [Galibin, Timofeev 1993]. This rather complicated two-stage system of exchange

* The author used an uncalibrated version of ^{14}C chronology (Editor).

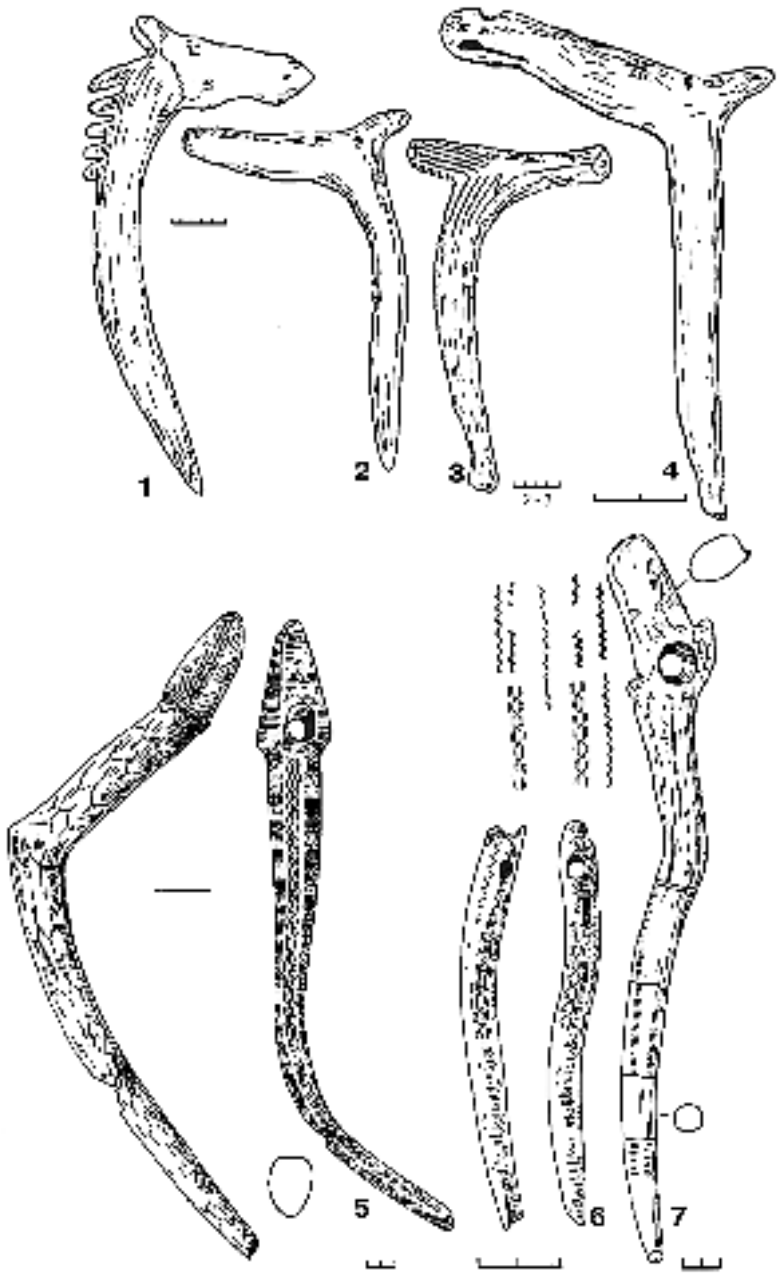

Fig. 1. Objects of art of the Eastern Europe forest zone and Scandinavia [after Timofeev 1998]. 1,4 - Oleneostrovskiy cemetery [Karelia, after N.N. Gurina 1956], 2 - Šventoji 3B [after Rimantiene 1984], 3 - Vedbaek [after Mathiassen 1948], 5 - Tyrvala [after Moora 1957], 6,7 - finds from Eastern Jutland [after Andersen 1981].

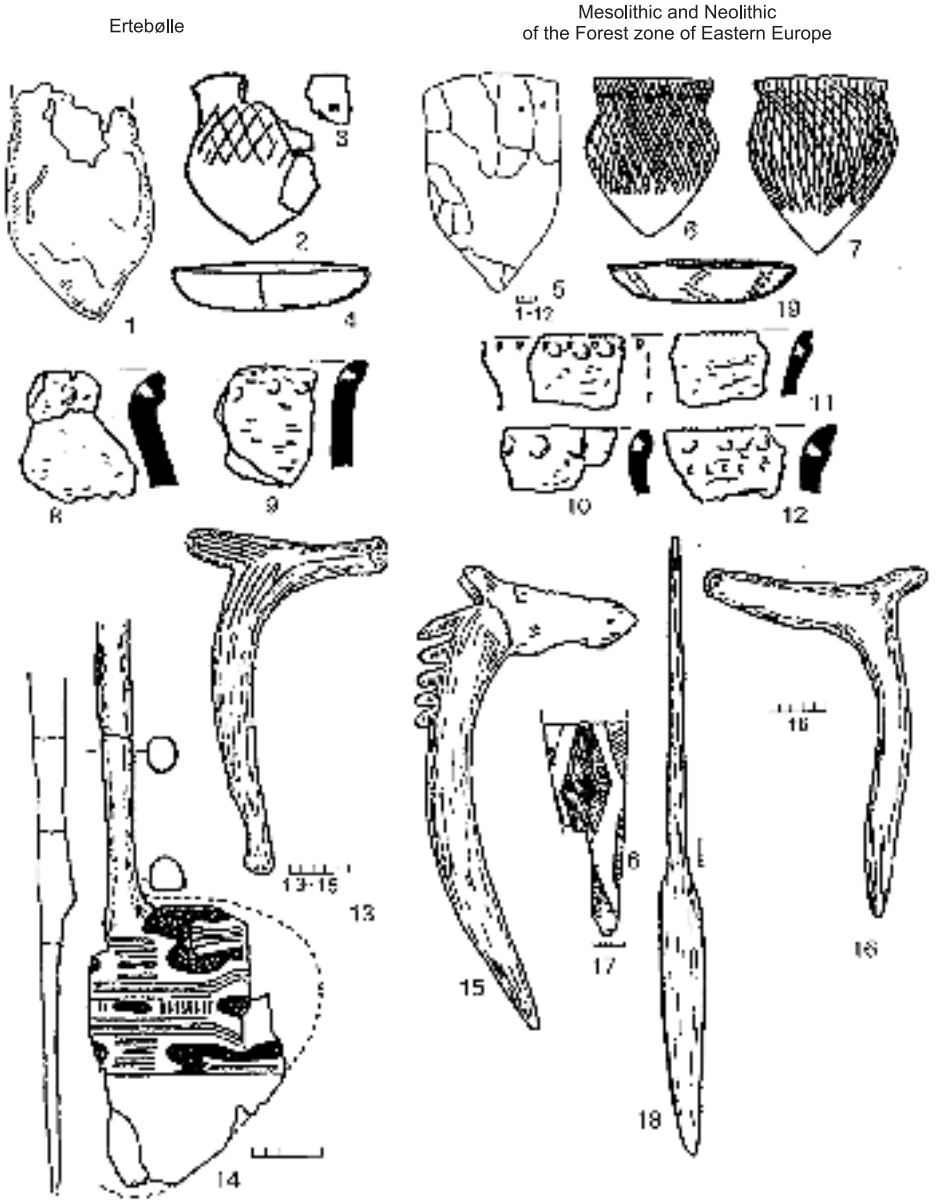

Fig. 2. The Ertebølle culture of SW Baltic area and Mesolithic-Neolithic of the forest zone of Eastern Europe: some common elements [after Timofeev 1995].

connections was used by the populations of the Comb and Pitted Ware culture, Middle Neolithic groups of Narva culture, Valdai culture of Middle-Late Neolithic and Volosovo culture.

The West-East connections during this period are reflected by a number of the cases of inreraction between the Funnel Beaker culture and the Neolithic cultures of the forest zone that are known nowadays.

Certain types of the Neolithic "hybrid" ware appeared in the Baltic region. They are combining the features of Funnel Beaker culture pottery and traits of the Eastern European origin. At the first time examples of such "hybridization" were determined by A. Europeus-Ayräpää in his excellent studies on the Finnish and Baltic Neolithic chronology done in 1920s-1950s [Europeus 1930; 1955].

The first determination of the "hybrid" type of the Neolithic pottery connected with the problem in question, was done by E. Kempisty, when she defined the pottery of the Linin type, which combineding the traits of wares of Funnel Beaker culture and the Nemen Neolithic culture [Kempisty 1986]. The large group of sites with the Linin type pottery is known from Eastern Poland. The sites of the Linin type (in my mind, the Linin variant of the Nemen culture) reflects the long-time coexistence of Funnel Beaker culture and the Nemen Neolithic culture.

The other type of the "hybrid" ware was defined by S. Kukawka at the sites of Funnel Beaker culture in Chełmno Land [Kukawka 1987; 1991]. This Neolithic ware, judging by technology and some elements of ornamentation, appeared as a result of the eastern influences from areas of the Narva culture and Comb and Pitted Ware culture. This type of Neolithic pottery (probably it could be called "Wełcz Wielki type", after the most representative collection) appeared in frames of Funnel Beaker culture and reflects probably mixed character of the population of N-E group of the culture. One of the earliest cases of the eastern links of Funnel Beaker culture was connected with a formation of the Zedmar Neolithic culture. Four peat--bog sites of this culture were excavated, three of them in Kaliningrad district of Russia by the author [Timofeev 1990; 1997] and one in North-Eastern Poland by W. Gumiński and J. Fiedorczuk [1988; 1990]. The culture has a number of features which are common with the other forest zone Neolithic cultures, first of all the Narva and Nemen cultures. At the same time some elements appeared as results of the influences from the west or south-west are recognisable. The flat-bottommed vessels are characteristic for the culture. It is the earliest type of flat-bottommed pottery in the east Baltic area. The flat-bottoms, some details of the profile and ornamentation, the mineral tempering of the part of Zedmar type vessels as well as some types of the antler tools could be considered as features which appeared because of the influences from the Funnel Beaker culture area. The chronology of the Zedmar culture is now worked out rather well by the numerous C-14 determinations as 5500--4800 BP uncalibrated [Timofeev, *et al.* 1994]. The culture could be synchronised with the early stages of Funnel Beaker culture of Kujavia and even with the late Lengyel assemblages (Fig. 6).

In spite of the appearance of some Central European elements in the material culture, the economy of Zedmar culture sites remained conservative and was

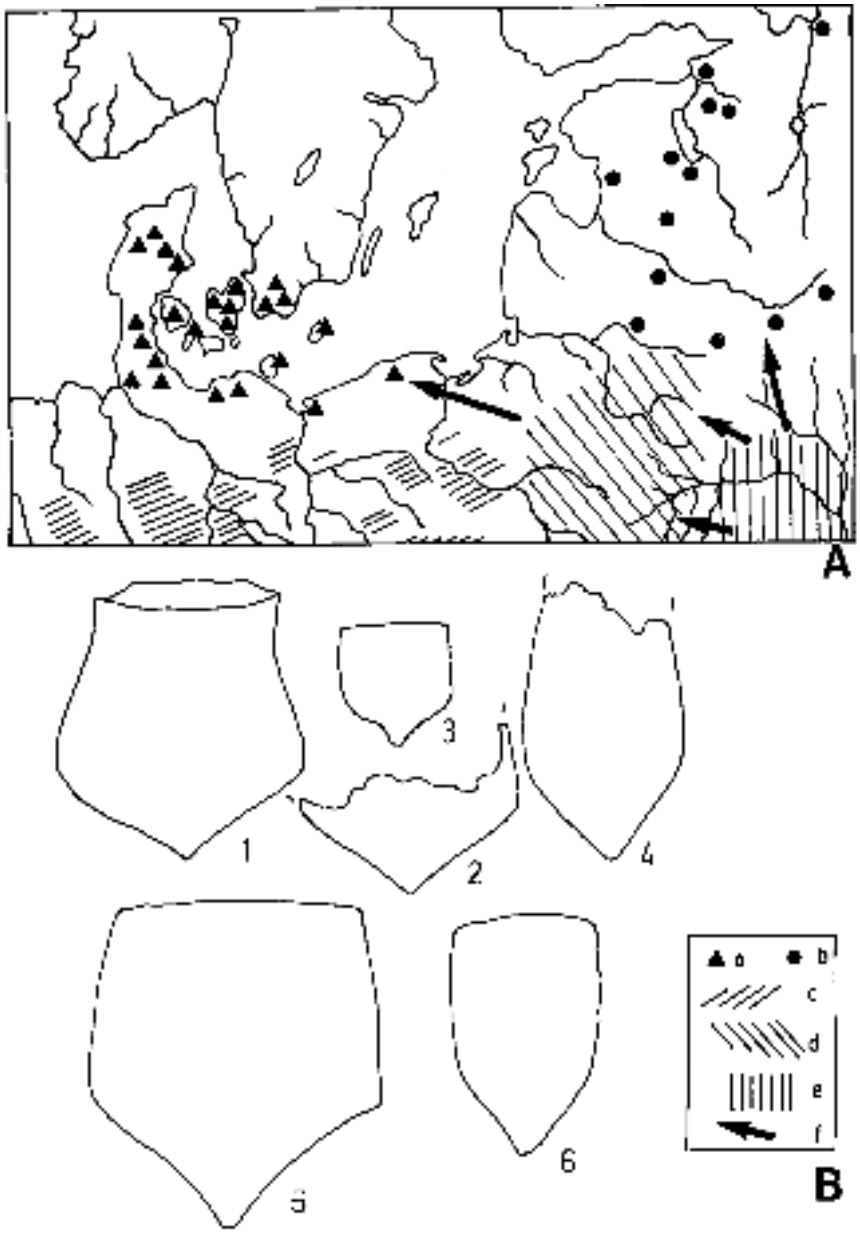

Fig. 3. [After Timofeev 1997]. A - Possible directions of the diffusion of the pottery-making technology to the Baltic region. (a - the Ertebølle sites; b - the Narva culture sites; c - area of the Linear Band Pottery culture; d - the Nemen culture; e - the Dnieper-Donets culture; f - possible directions of the diffusion of pottery-making technology). B - The types of shapes of the Ertebølle-Ellerbek culture pots and their prototypes in the assemblages of the Early Neolithic of the Dnieper river basin.

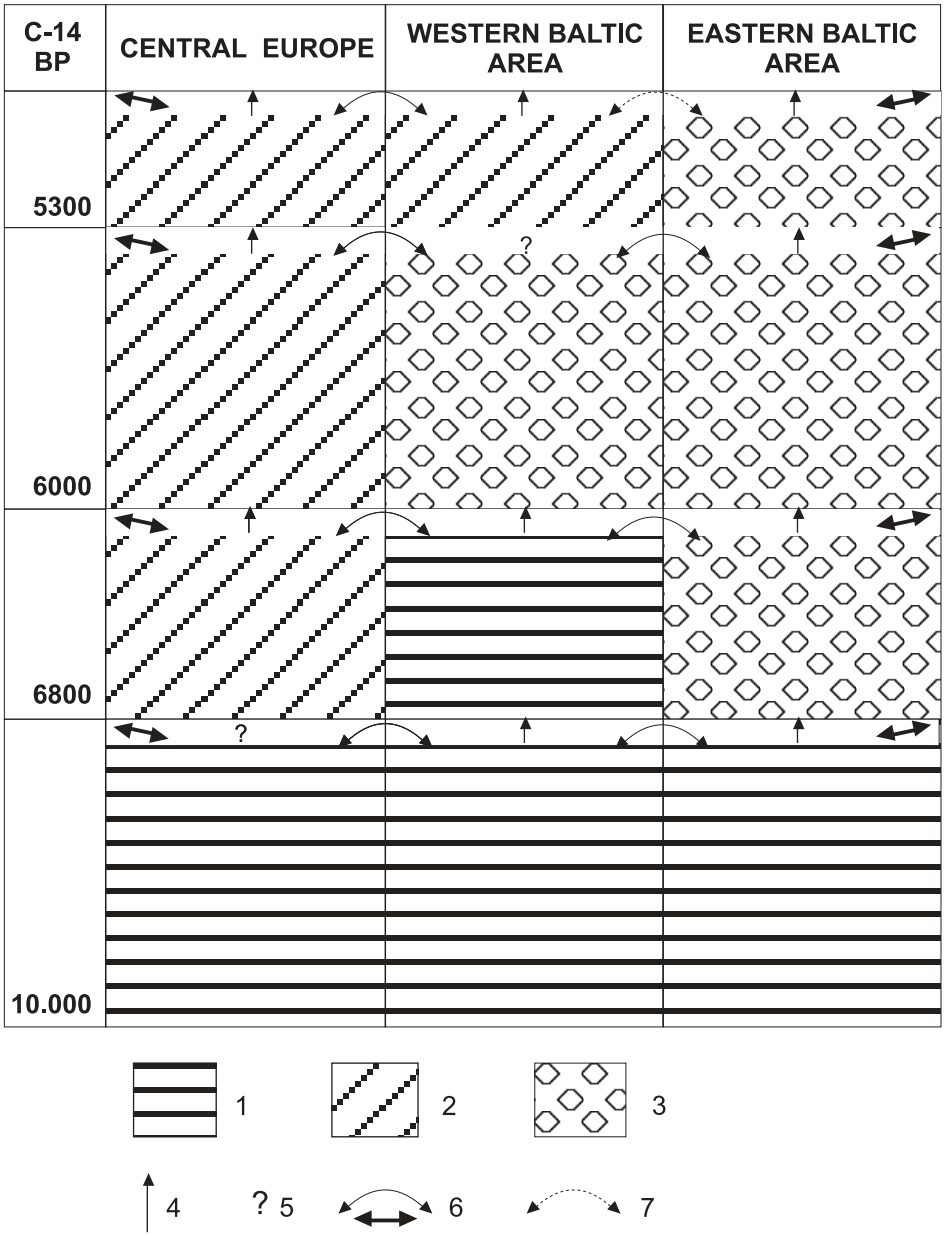

Fig. 4. The scheme of the Circumbaltic cultural space development during the Mesolithic and the Neolithic [After Timofeev 1997]. 1 - Mesolithic, 2 - Neolithic with food - producing economy, 3 - Neolithic with food - gathering economy, 4 - cultural genetical continuity, 5 - absence of distinct cultural - genetical continuitg, 6 - links of regions occupied by populations of similar levels of economical development, 7 - links of regions occupied by populations of different levels of economical development.

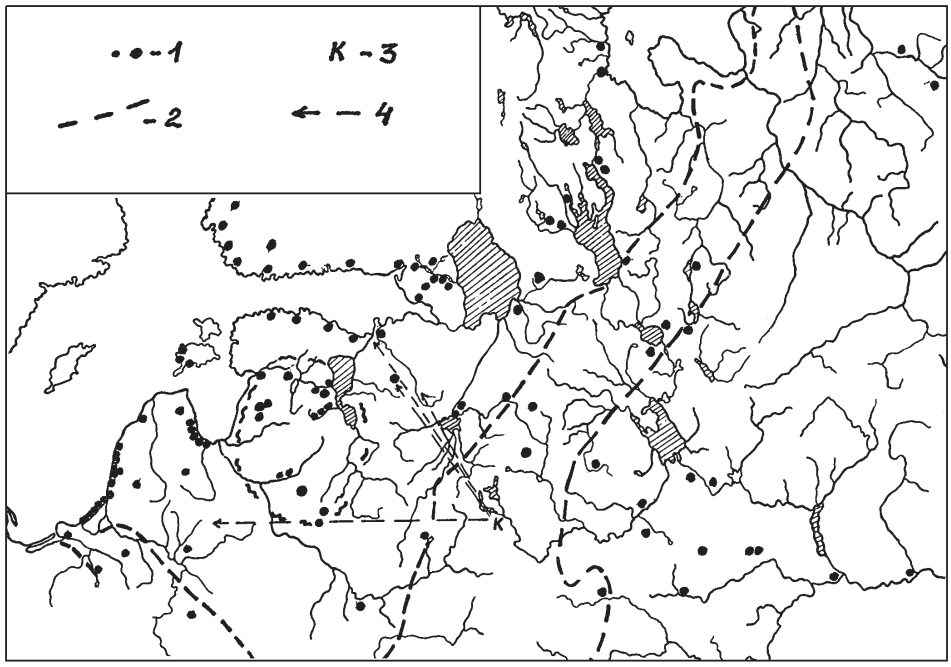

Fig. 5. The exchange connections in the Middle-Late Neolithic of the eastern Baltic area and the adjacent territories [Timofeev 1994]. 1 - finds of amber ornaments at Neolithic-Early Metal Age sites [after Loze 1980], 2 - area of flint deposits [after Kovnurko 1963], 3 - point of flint deposits at Selizharovka, Valdai area, 4 - directions of spread of flint raw-material from Selizharovka (after the data of spectral analysis done by V.A. Galibin).

based on hunting activity combined with fishing and gathering. The amount of domesticated animals bones (sheep/goat and cattle) in faunal collections is very small (less than 5%). The food-producing economy was not borrowed together with the elements recognisable in the material culture. The situation most probably is corresponding to the cooperation of the foraging society with the area inhabited by the food-producing populations at the availability phase of the "agricultural frontier" development using the scheme suggested by M. Zvelebil and P. Rowley-Conwy [1986].

The special case of the appearance of Funnel Beaker culture elements is known in North-Western Russia in Pskov and Smolensk districts. The local Usvyaty Neolithic culture of the Middle Neolithic (dated to about 5-4.5 mill. BP) was discovered there in 1960s-1970s by A.M. Miklyaev [1995]. The assemblages of the culture have a number of features derived from the preceded Narva Early Neolithic culture. At the same time the motifs of the pottery decoration unfamiliar to the Neolithic of the forest zone and similar to the Funnel Beaker culture ornamentation are known

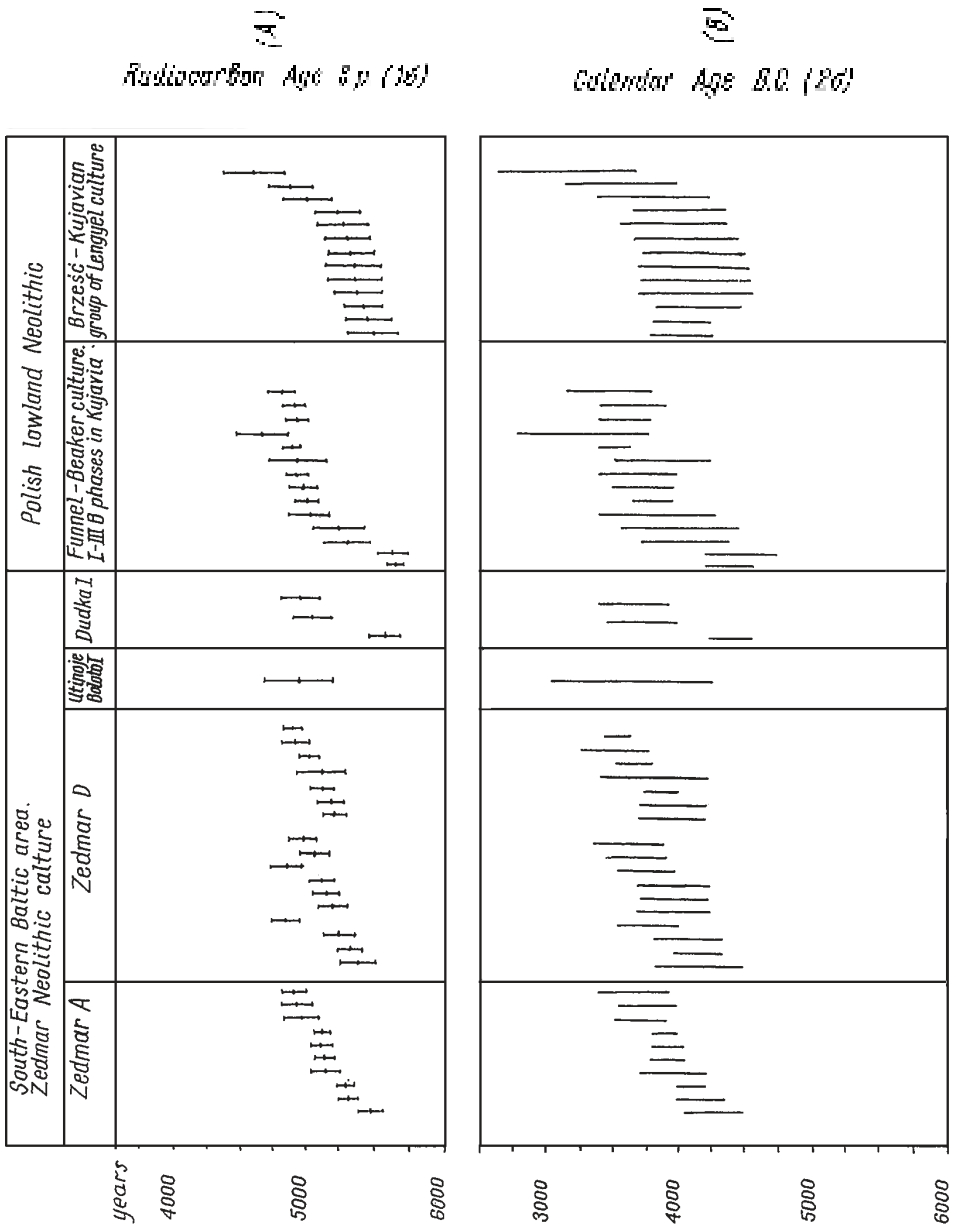

Fig. 6. The radiocarbon datings of the Zedmar culture, the Late Lengyel and the Early Funnel Beaker culture of Polish Lowland [after Timofeev, *et al.* 1994].

from the beginning of the Usvyaty culture (Fig. 7). The Usvyaty culture shows a distant (for about 500 km at least) penetration of the Funnel Beaker culture elements into the forest zone. The find at the Zvidze Neolithic site in South-Eastern Latvia, not far from the area of the Usvyaty culture, must also be mentioned in this connection. Sherds of the two funnel beakers of Wiórek style ornamentation were found in the Middle Neolithic layer [Loze 1988a]. It is the only case of such an import in the Neolithic of the eastern Baltic area. These data reflect a long-distance connections which had happened about 5000 BP (uncalibrated).

We considered the situation on the eastern border of the Funnel Beaker culture, but the similar manifestations of the "hybrid" pottery could be recognised also on the northern border. The formation of the Pitted Ware culture of Scandinavian Neolithic could be considered, in my opinion, in frames of the similar process, too.

The problem of the Scandinavian Pitted Ware culture origin has been discussed for a long time. C-J. Becker [1950] expressed the idea of the eastern roots of the culture. He based it on the finds of tanged points, which are unusual for the other Danish Neolithic cultures but have certain eastern parallels. According to opinion of M.P. Malmer [1969] the formation of the culture in question had happened on the basis of the Mesolithic cultures in particular Ertebølle and also Fosna and Nøstvet groups. After M.P. Malmer idea the Mesolithic groups survived during the Neolithic in some ecological niches and the process of Pitted Ware culture formation had been under Funnel Beaker culture influences. J. Skaarup [1973] raised a question of more substantial contribution of Funnel Beaker culture to this process. On the other side B. Wyszomirska [1984] marks the elements of the spiritual culture and of the economy common for the Pitted Ware culture and for the Neolithic of the Eastern Europe forest zone. The links of the late developed populations of the Pitted Ware culture of Gotland with the Late Neolithic of the eastern Baltic area were shown by M. Stenberger [1960] and especially by L. Jaanits [1985]. From my point of view the problem of the astern elements participation in the process of Pitted Ware culture formation needs special investigation.

I wish to touch the problem basing on the research I had an opportunity to do in the Museums of Sweden, Denmark, the Eastern Baltic States and in some degree Finland in 1980s-1990s.

The materials of the Pitted Ware culture of the northenmost Swedish sites are peculiar by the traits absent in the collections from the other parts of the Pitted Ware culture area. The finds from Martsbo site, Gostrikland district are especially remarcable. There is the great collection reached by excavations of A. Ernquist, M. Lindquist, L. Eriksson, J. Norrman [Jonsson 1958], storeds in Stockholm (Statens Historiska Museum, NN 18784, 32113) and in the Uppsala University. The mineral tempering is characteristic for Pitted Ware culture of the site. The traits untypical for the classical pitted-ware and for the whole style of Funnel Beaker culture tradition but common for the Comb and Pitted Ware culture of Finland, Eastern Baltic and Karelia occur rather often in ornamentation. Among them are specific deep pits placed in "chess" manner, crude comb-like imprints forming diagonal rows, rhomboidal figures and some others. These elements occur in the vessels

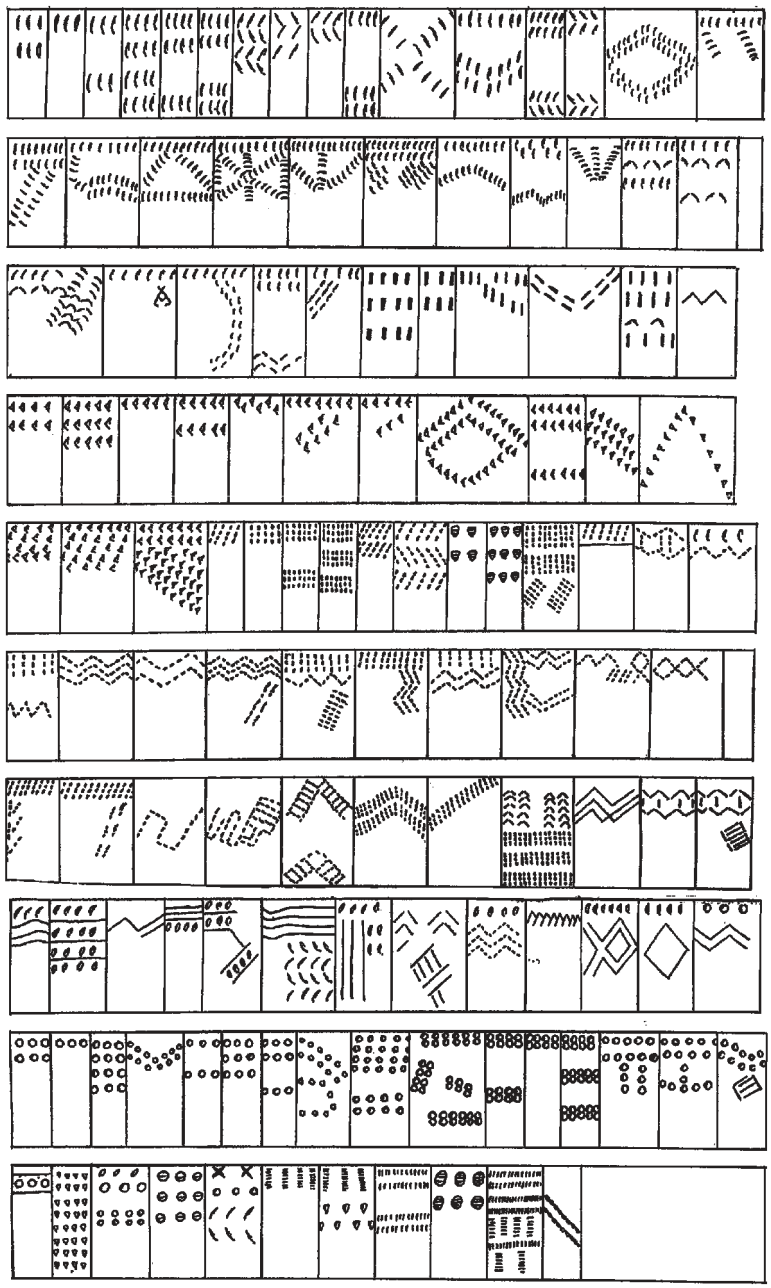

Fig. 7. Ornamentation of Usvyaty 4 site Neolithic pottery (classification prepared by the author).

decoration together with the typical elements of the Funnel Beaker culture ornamental tradition. The details of rim's profile are of particular interest. The rims with the thickened edge bevelled inside the vessel prevail, they consist more than 50 %. This profile of the rim's edge is uncharacteristic for the "normal" pitted ware and funnel beaker culture also and it is very typical for the vessels of Comb and Pitted Ware culture. I suggest that, the Martsbo pottery shows clearly the introduction of Comb and Pitted Ware stylistical elements into the area of Pitted Ware culture.

The acquitance with the pitted ware collections in number of museums gave an opportunity to define the similar pottery in some assemblages including Sotmyra, Sater group, Overada, Fagervik, Aleppo and some others. All these sites are situated in the northern part of Pitted Ware culture area in Middle Eastern Sweden. In the collections of pitted ware from more southern areas of Sweden, also from Gotland, western coast and Denmark we did not find the rims of above-mentioned type or found clearly occassional isolated examples.

When did the eastern traits appear in the Neolithic of the Middle Eastern Sweden?

The materials of Fagervik are of special importance for the problem. Since 1950s [Bagge 1951] it has been the key-assemblage for the chronological division of the Middle Eastern Sweden Neolithic and for Pitted Ware culture as a whole. A. Bagge defined the classical division into periods. The pottery with mineral tempering (Feste Pottery) is characteristic for the earlier stages of Pitted Ware culture and is the most important for the problem in consideration. This group of ware has been studied (collection in Statens Historiska Museum, Stockholm, NN 21049, 21526). A. Bagge [1951] used for his classification features typical for the Funnel Beaker culture pottery and features typical for the classical pitted ware. Four types of vessels profiles were defined [Bagge 1951:Fig. 8]. It was a very important classification, but some more detailed division could be suggested if use also the peculiarities of the upper part of the rim and include features typical for Comb and Pitted Ware culture. No less than 16 types of rim's edge could be defined (Fig. 8:A). The types 5-7 are of "eastern" comb and pitted style : 5) staight rim with the edge thickened and beveled inside the vessel; 6) the same, but the thickened part of the rim has a kind of projected cornice inside the vessel; 7) the same, but the edge is massive and the cornice is projected sharply. Following the distribution of the rims types 5-7 with reference to sea level marked by A. Bagge [1951] the "eastern" features appeared in series in frames of the Fagervik-I stage (the earliest) from the level of 29,5 m — the mid stage. Then the amount of them is increasing and reaching the maximum (about 25% of all rims pieces) at level of 28 m — the Early Fagervik-II stage (Fig. 8:B,C). In the small collections of the earliest (the highest) Fagervik-I, levels 31-30 m almost all rims are represented by types which are characteristic for the Funnel Beaker culture assemblages. An ornamentation of the Fagervik-I vessels could be considered as a kind of admixture of the elements typical for Funnel Beaker culture and Comb and Pitted Ware culture elements. The last group consists of the same elements as were marked in the Martsbo collection (Fig. 8:D). The biggest part of the "eastern" elements in Fagervik-I is connected with the second

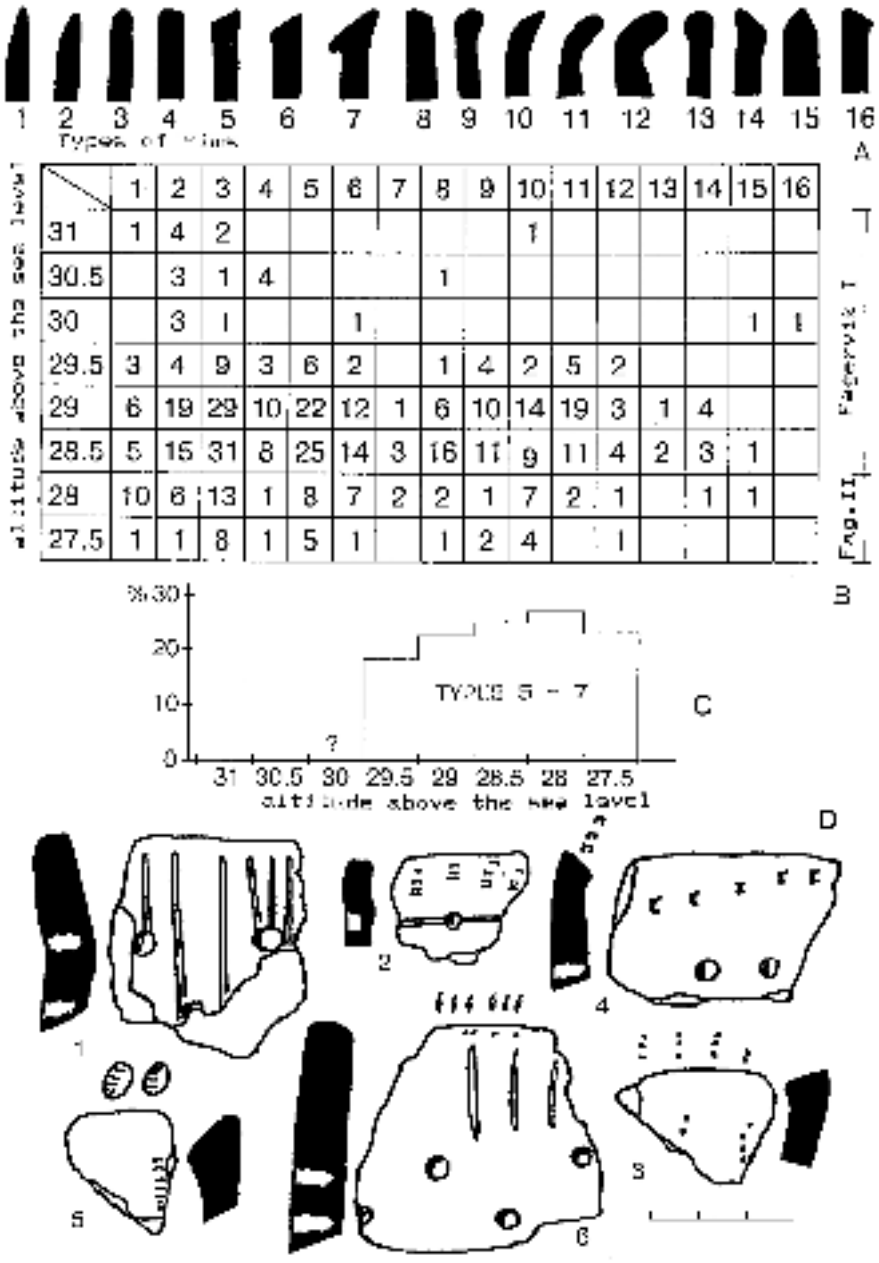

Fig. 8. A - Typology of Fagervik Neolithic ware rims (Feste Keramik). B, C - Distribution of the rims of different types following the niveaus above sea level marked by A. Bagge [1951]. B - amount of examples, C - percentage of rims types 5-7. D - Examples of Fagervik Neolithic ware with "eastern" (comb and pitted) elements in ornamentation and profile of vessels.

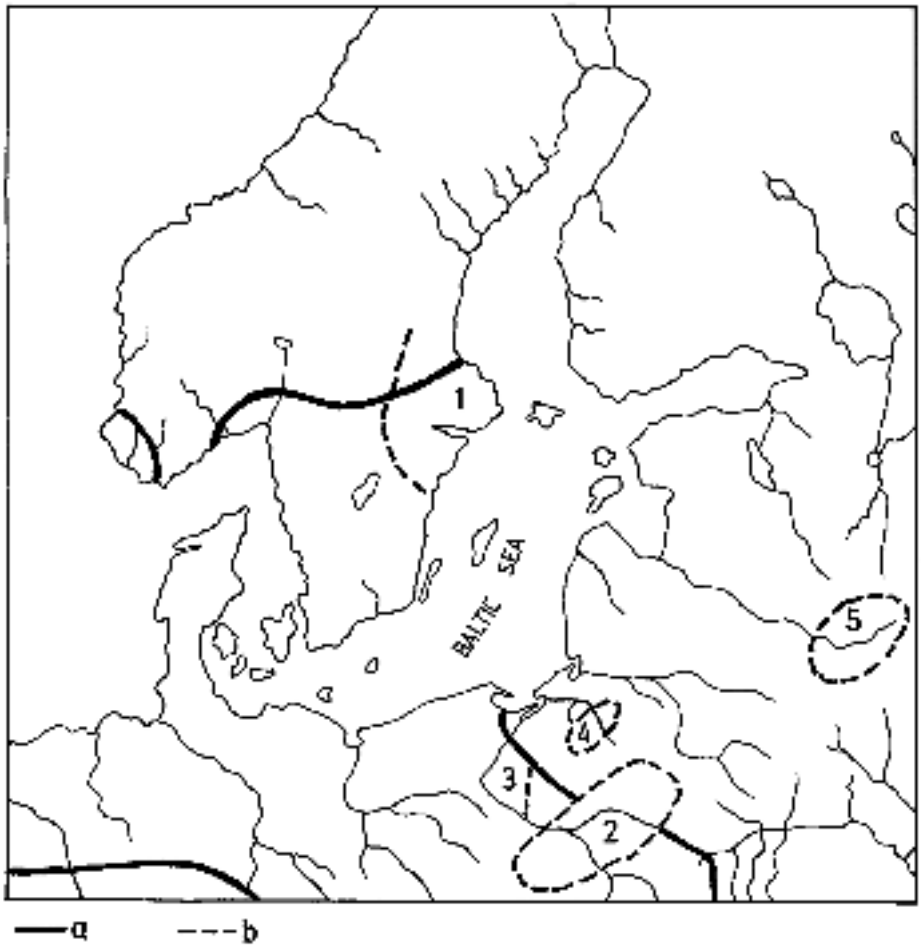

Fig. 9. The areas of "hybrid" types of Neolithic ware combining the features of the Funnel Beaker culture and Forest Neolithic cultures [after Timofeev 1997]. 1 - zone of the Early Pitted Ware culture formation, 2 - area of sites with the Linin type of the pottery, 3 - area of distribution of the Wełcz Wielki type of the pottery, 4 - area of the Zedmar culture, 5 - area of the Usvyaty culture, a - borders of the Funnel Beaker culture, b - borders of the areas descrited in 1-5 items.

half of the stage. Probably this trait could be considered as a foundation for the division of the Fagervik-I stage into two periods (F I/1 and F I/2). The carlier period is represented by the Early Neolithic Funnel Beaker culture assemblage with some elements of comb and pitted ornamentation and later one — by the pottery combining Funnel Beaker culture — and comb and pitted ware elements of profile and ornamentation. The late part of Fagervik-I materials looks like "pre-pitted ware"

assemblage connected strictly with succeeded Fagervik-II materials — the early pitted ware with some recognisable elements of Comb and Pitted Ware culture origin. The Sater-II site pottery assemblage, following rims classification, shows a picture similar to the Fagervik-II collection with some small peculiarities. The early part of the Fagervik-I stage (F1/1) judging by this classification is comparable with the other assemblages of what was termed as the Vro culture by S. Florin [1958]. The rims of "eastern" profiles are absent in these collections or represented by isolated and most probably occassional pieces. We can conclude that the elements of the eastern origin are clearly represented in the late Fagervik-I and the amount of them is increasing to the Fagervik-II stage, when the Early Pitted Ware culture appeared, with a style of ornamentation combining elements of Funnel Beaker culture style and "eastern" ones. The situation corresponds most probably to the process of the pitted-ware style formation. This process could be considered as an appearance of "hybrid" type of Neolithic ware. The materials of the Late Stone Age of the Baltic region show the variety of concrete connections between the populations of the western and eastern parts of the area. The interactions of Funnel Beaker culture with the Forest Neolithic cultures gave life to the new types of the Neolithic pottery and the new Neolithic cultures (Fig. 9).

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THE ADOPTION OF AGRICULTURE IN THE AREA OF PRESENT-DAY LATVIA (THE LAKE LUBANA BASIN)

The process involved in the initial adoption of agriculture and the various aspects of research on this subject represent one of the most discussed questions in the literature devoted to European prehistory.

The adoption of agriculture has been discussed against the general background of plant cultivation and animal domestication. Such origins are viewed only as a part of the much wider process of domestication [Hodder 1990:20-41]. The latter includes not only the acquiring of the plant cultivation skills and keeping of domestic animals, but also, most importantly, social domestication even before the domestication of plants and animals [Chapman 1994:133].

The origins of agriculture are seen not only as an aspect of the economy or as a means of obtaining the production, but as a part of a much wider process of domestication, carried out by social groups with an outlook based on the importance of social status.

The aim of this paper is to sketch in the origins and beginnings of agriculture in the area of present-day Latvia, utilising the accumulated archaeological, fossil seeds and palynological material, as well as to indicate the possible character of the early agriculture.

Use is made of material obtained through archaeological excavation in a special micro-region of Neolithic sites: the Lake Lubana depression and its environs which has so far not been discussed in archaeological literature.

The location of Neolithic settlement sites in wetland areas of the Lake Lubana basin has ensured the preservation of organic remains, which is very important for identification and analysis of indications of agriculture.

1. THE SETTLEMENTS OF THE FIRST FARMERS

The settlements of the first farmers in the Lake Lubana depression are sites with long-term occupation on isolated headlands or areas of higher ground in the vicinity of the lake or major rivers, with substantial post-built dwellings, hearths

of round stones and areas suitable for agriculture in the vicinity. Such sites must also provide sufficient evidence of the skills involved in the early agriculture and the practice of this economic activity. There are four such settlement sites: Abora I and Lagaza [Loze 1979:11-38], Ica [Loze 1993a:21] and Zvidze [Loze 1988a:18-74], which are considered not only permanent sites, but also central places during one particular period of the Neolithic or even during several periods (Zvidze) (Fig. 1). These settlements also stand out in terms of the character of the occupation layer, its thickness and density of finds, and in having a tightly bounded, possibly enclosed space.

Building construction at these sites utilised posts and stakes of elm, spruce, alder and aspen, as well as alder planks (wood samples from Zvidze, 1982 excavations)[1]. Pines and birches were also felled (wood samples from Lagaza, 1968, and Abora, 1970)[2], and these species were used for structural elements of buildings.

These are settlements with closely spaced buildings, between and within which the deceased members of the community were buried (Abora I, Ica, Lagaza and Zvidze) [Loze 1979:43-60; 1988a:21-23].

The structures were considerably elaborated. The buildings had a ridged roof with overhanging eaves, an annex at one end or the other, one room (at Zvidze) or several rooms (at Lagaza), and a specially constructed entrance at the end of the building (at Zvidze). An unusual building was also constructed, consisting of two wings laid out at a wide angle to each other. The building had a double wall facing the side of the settlement that had no natural protection (at Lagaza) [Loze 1978; 1998b]. The massive timbers of deciduous wood supporting the roof at the settlement of Lagaza, as well as the six metres long ridge-pole (?) and splitted planks, and the perfectly sharpened ends of posts and stakes at this site testify to developed skills in building and shaping of structural elements of dwellings.

There was a large concentration of material remains at these settlements, found within buildings and in special areas for working particular materials. A fairly chaotic distribution of implements and pottery can be seen in the upper part of the occupation layer.

The everyday utensils, hunting and fishing equipment of the inhabitants number in the thousands. The mass finds of pottery and their density as well as their presence in numerical terms between the centre and periphery of the settlements points to the intensive use of pottery and storage of products.

A developed system of exchange of amber for flint from the Upper and Middle Volga and the Dnieper basin, and amber for slate from Karelia testifies to intensive activity by the inhabitants of the Lake Lubana depression for subsistence needs, creating a strategically advantageous system of communications between their own area and those of their neighbours to the east, south-east and north [Loze 1998a].

The inhabitants of all of the sites mentioned were familiar with domesticated animals: cattle, sheep/goats and pigs [Loze 1995b:13-15]. The minimal number of

[1] Wood samples identified by dr M. Buss.

[2] Wood samples identified by dr M. Buss, and by A. Rozens.

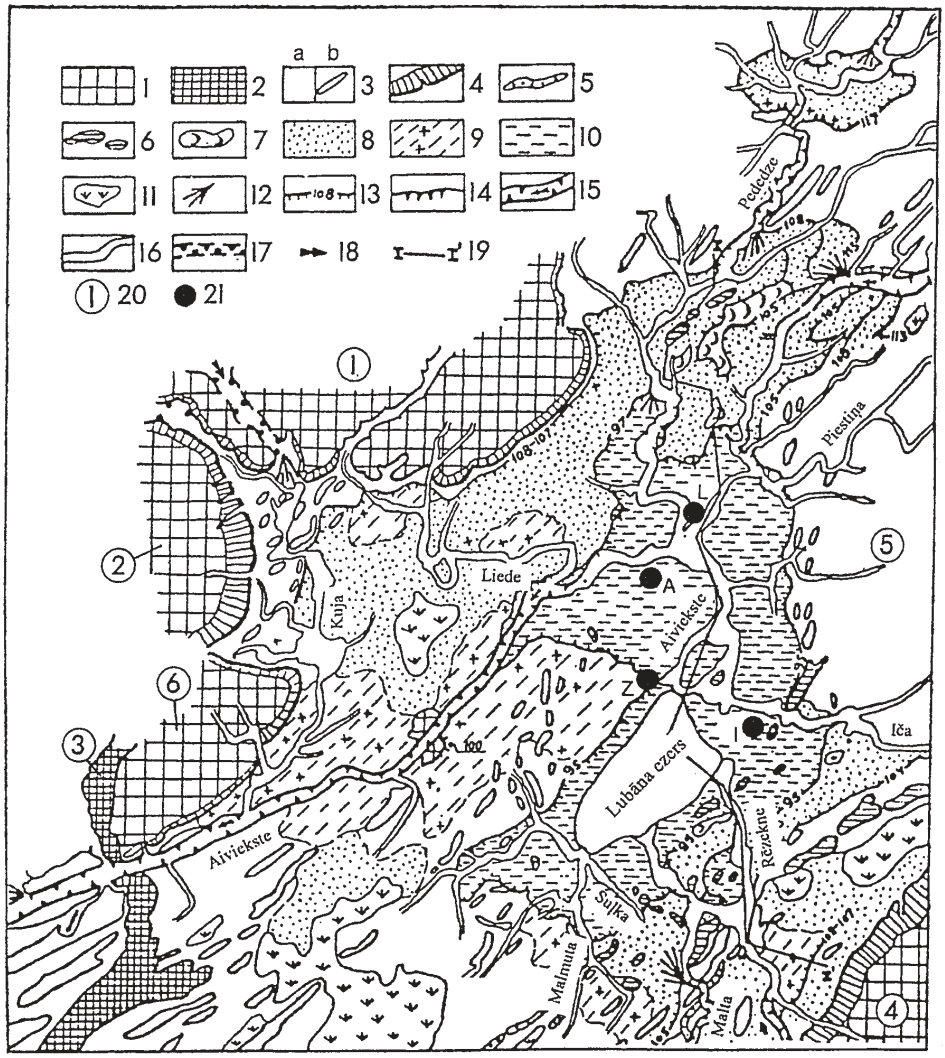

Fig. 1. The distribution of settlements of the first farmers in the Lake Lubana depression in relation to the geomorphology of the region [Eberhards 1972]. 1 - till and kame relief, 2 - range of glaciofluvial hills, 3a - undulating and gently sloping moraine plain, 3b - undulating moraine plain with pronounced moraine uvals and moraine ridges, 4 - slopes of uplands, 5 - eskers, 6 - isolated glaciolacustrine hills, 7 - eolian relief, 8 - sandy late-glacial basin plain, 9 - abraded moraine plains with intermittent thin covering of sand and boulders, 10 - the Lake Lubana and wetland depression, 11 - wetland plains, 12 - deltas, 13 - shorelines of late-glacial and post-glacial water-bodies and their height above sea-level, 14 - abraded hollows, 15 - outflow valleys of late-glacial basins, 16 - small, poorly distinct post-glacial flood-plain valleys and river flood-plains of the Lake Lubana depression, 17 - valley-like hollows, 18 - direction of meltwater flow, 19 - geological sections, 20 - geomorphological regions (1 - Gulbene Ridge, 2 - Vidzeme Central Uplands, 3 - Madona-Trepe Ridge, 4 - Latgale Uplands, 5 - North Latgale Plateau, 6 - Prauliene Hills), 21 - Neolithic sites (Z - Zvidze, A - Abora I, L - Lagaza, I - Ica).

individuals of domestic animals is not great: 25 at Zvidze, 34 at Abora and 9 at Lagaza [Loze 1979:Tables 12, 13; 1988a:Table 22]. However, not all of the animals were necessarily slaughtered: animals were possibly also kept for milk and wool. The rich hunted fauna in the Lake Lubana depression, including birds and fish, could have created special conditions for supplying food resources and stabilising the subsistence strategy.

The social organisation, as seen from the burials at Abora I settlement (61 individuals) [Loze 1979:43-52], was oriented towards recognition of social status.

Only one male grave (no. 3) was furnished with rich grave goods (including a string of 27 technically well-made button-shaped beads) [Loze 1979:Fig. 40]. The deceased was laid in a grave together with three other individuals, including two women, and a piece of wood (a plank?) was found in this grave, resembling box-wood (*Buxus sempervirens*) [Loze 1995a:35], a characteristic central European species considered exotic to the eastern Baltic.

Burial no. 3 can be considered an individual of high status, which is confirmed by the fact that one of the children (burial 18) was buried with a particularly rich and fine array of grave goods (2 bulging and 2 snake-like pendants) [Loze 1979: Table 5], indicating that high status could be inherited. Possibly, this is a reflection of a social structure based on a a simple form of chiefdom, at a time when patrilineal organisation had already become dominant.

2. CHRONOLOGY AND THE SEQUENCE OF NEOLITHIC CULTURES

The earliest Neolithic culture in the Lake Lubana depression with pottery, exhibiting a considerable number of anthropogenic indicators (factors indicating human intervention in the environment), is described as the Narva culture, dated to the period 4585-4100 BC* [Liiva, Loze 1988].

In this case the datings from the multi-layered settlement of Zvidze, including nine inter-laboratory comparison datings, have been used [Veksler, Punning 1988:16, 17]. Since they correspond only partially with the radiocarbon datings from Osa, the other Early Neolithic settlement in the Lake Lubana basin [Liiva, Loze 1988:Table 4], we must assume that they reflect the original and thus the earliest stage of development of the Narva culture, which was in existence up to 3780±50 BC.

The next culture in the Lake Lubana depression was the Comb-and-Pitted Pottery culture. This culture is dated differently, since at both Zvidze and Osa the respective layers occur above the layers with Narva pottery, and its chronological boundaries are set considerably later: 3370-2800 BC.

This culture is followed by the Post-Narva culture (represented in the central part of the eastern Baltic by a pottery ware known from the sites of Piestina and

* The author used an uncalibrated version of ^{14}C chronology (Editor).

especially Zvidze in the Lake Lubana depression). Compared with the Pit-and--Comb Pottery culture, its upper and lower chronological boundaries are set later: 2800-2480 BC [Loze 1988a:Table 16, Fig. 74].

On the basis of radiocarbon dates from Abora I, Ica and Lagaza, the age of the Late Neolithic complex, including the Corded Ware culture is between 2540 (?) / 2300 and 1910 / 1820 BC [Loze 1991]. According to radiocarbon dates from Lagaza settlement, Lubana Ware of the Early Bronze Age was being made 1690-1390 BC [Loze 1979:121, 122].

3. ECOLOGICAL ZONES

Several different ecological zones can be distinguished in the Lake Lubana depression and the surrounding area. Settlements were usually sited at the transition between different environments. The Zvidze site, of particular interest here, is on the very edge of an abraded moraine plain at the transition to the former bed of Lake Lubana, which in the Neolithic was already filled with deposits of gyttja and peat (Figs 1, 2).

The edge of the moraine plain in particular, covered with mixed forest and scrub, was in terms of soil character the place that provided the opportunity for clearing the forest at some stage for fields.

However, other ecological niches, too: the nearshore and shore zones (with shoreline and aquatic vegetation) and wetlands with their soils, particularly during the dry Subboreal Period, provided favourable conditions for general development of the economy of the people inhabiting the site. Such zones offered considerable economic potential, providing the opportunity to utilise particular ecological zones in particular seasons.

It is considered that an area within a 1 km radius of a site is intensively utilised for agriculture, and this is often described as the "site catchment area", where trees were felled and the first fields laid out.

On the other hand, the Abora I settlement was on small isolated rise on the right bank of the 60-70 m wide Aiviekste River, consisting of deposits of clay loam within the Lake Lubana depression (a low area of lakes and bogs). Different ecological zones can be distinguished here, too. These are also reflected in a floral analysis of vegetation represented by seeds of 40 different species [Loze, Yakubovskaya 1984:Table 3].

Tree and scrub floras, together with those of forest grasses and shrubs, make up 12%, with 27% consisting of bog and wet meadow floras and 58% representing the dominant shore and open water floras.

The rising proportion of aquatic plants is possible evidence of changes in the hydrological regime: a rise in the water level in the Aiviekste River and in the

whole of the continental water system. This is also shown by research on fossil seeds at this site [Loze, Yakubovskaya 1984:Table 3]. Also, a study of *Pediastrum* algae as indicators of hydrological conditions and ecological changes in water-bodies has shown that the Lake Lubana was originally a warm, eutrophic basin. These eutrophic conditions were still in existence in the Sub-boreal Period when the water temperature gradually fell and a transition began to a cold, oligotrophic type basin [Yakubovskaya 1996].

However, this fact has not affected the utilisation by the inhabitants of the site of the economic potential of the various ecological zones during different seasons, although the changes in water level eventually led the inhabitants of the Neolithic — Bronze Age site to abandon the Lake Lubana depression entirely.

The following ecological zones were found within a 1 km radius around the Abora site: forest and scrub (i.e. suitable for agriculture), bog and wet meadows (suitable for pasture), and a shore and open water zone.

The environs of the settlements at Ica and Lagaza can be similarly classified, the geographical situation no doubt having been chosen in order to facilitate utilisation of different ecological niches.

4. THE DISTRIBUTION OF SOIL TYPES

The Lake Lubana depression is filled with fen and transitional bog peats (Tza and Tzh, so-called hydromorphic soils), covering quite a considerable area: 55% [Nomals 1943:223-225, 257-261; Zarins 1974] (Fig. 2). These soils have been formed in depressions and in the lowest parts of the plain, where the depression has gradually bogged-up through the long-term effect of flooding and high groundwater level. There is no doubt that during the dry Subboreal Period at least a proportion of this area could have been used for small fields or pasture and hay-meadows. The conditions under which these wet soils were formed were dependent on the climate. A dry climate had a favourable effect on the development of wetland soils (mineralisation of organic matter increases, aeration improves). At the present day sod-gley and gley soils (Glg and Glv, so-called semi-hydromorphic soils) cover less than one quarter of the previously mentioned area: 12%. These are formed under very wet conditions over carbonaceous substrates, as well as on sand and loam under the influence of mineral-rich groundwaters.

Sod-podsolic gleysolic and sod-podsolic gley soils formed on higher ground (Pgg and Pgv, so called automorphic soils) over loam and sand in coniferous forest.

Table 1 gives a scheme of soil type distributions for the environs of Zvidze Neolithic site [Karklins 1995], which clearly shows that during the Sub-boreal period in the vicinity of the site forest clearance was possible on the till, as well on the fen peat soils of the former bed of the Lake Lubana (Fig. 2).

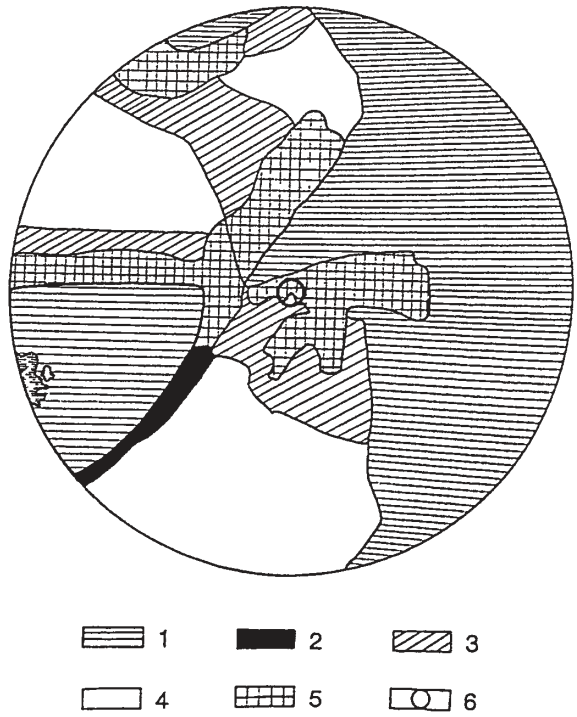

Fig. 2. Soil map of the environs of the Zvidze site 1 - lowland bog humus soil, 2 - sod-podsolic gleysolic soil, 3 - sod-gleysolic soil, 4 - sod-gley soil, 5 - lowland bog mucky-humus gley soil, 6 - the Zvidze site. Drawing by Daiga Pjatkovska.

Possibly the peat layer in such soils already exceeded a thickness of 0.50 m and could also have been used for pastureland and meadows.

The distribution of soil types in the Lake Lubana depression would not be complete without mentioning alluvial soils (Type 09, according to the Latvian soil classification), which formed in periodically flooded river valleys on alluvium consisting of clay and loam. These occur over deposits of gleyed clay or clay loam.

There is a low degree of soil improvement in the Lake Lubana depression and the lake basin [Mezals, *et al.* 1970:443], but the large-scale land improvement work and the cultivation of meadows and wetlands has presently altered this view [Rubenis 1964].

Evidently, in the dry Sub-Boreal period, when the former bed of the Lake Lubana had already become bogged-over, covered by a soil characteristic of transitional bog, the conditions were different, since, as recent research shows, such soils can be tilled if they are not subject to flooding.

Table 1

The distribution of soil types in the vicinity of the Zvidze site

Symbol*	Soil sub-types**	Sub-type numbers	Soil types***
PGg	sod-podsolic gleysolic soil	8.1	0.8 podsolic gleysolic soil
PGv	sod-podsolic gley soil	8.4	
GLg	sod-gleysolic soil	7.1	07.
GLv	sod-gley soil	7.4	gley soils
TZa	lowland bog mucky humus gley soil	10.2	10. lowland bog peat soil
TZh	lowland bog humus soil	10.3	

* After the FAO classification.
** After a soil map compiled by the Land Use Planning Institute for the 'Aiviekste' State Farm, Madona Region, No. 419/3, 1990.
*** After the classification of soil types in Latvia [Karklins 1995:167-168].

5. THE NEOLITHIC LANDSCAPE

Reconstruction of the particular features of vegetation development in the Lake Lubana depression and the surrounding area has involved pollen analysis and the study of fossil seeds, as well as radiocarbon datings of the boundaries between pollen zones. This has permitted characterisation of the landscape in various phases of the Neolithic.

In the initial phase of the Neolithic (second half of the Atlantic Period) the landscape in the vicinity of the Lake Lubana depression was characterised by mixed forest with deciduous trees, particularly elm and oak, with pine and hazel stands declining at this time. This period coincides with the climatic optimum, when aspen stands were dominant, with a high proportion of oak, lime, elm and hazel. The landscape of this time was characterised by hemp, plantain, buttercup, groundsel and primulas, all reflecting human activity [Yakubovskaya 1997]. The amount of birch increased in the middle of the Atlantic Period. Herbacaeous plants of the time included hemp and plantain, and especially mugwort and goose-foot. The presence of aquatic plants and water-chestnut is indicative of the early stages of lake transgression.

At the transition from the Early to the Middle Neolithic the landscape was characterised by an increase in spruce and pine, with aspen and birch decreasing. The presence of oak and lime was high in the Middle Neolithic, but the amount of elm decreased. The elm decline is seen as one of the first indications of human intervention in the environment, or else is taken to reflect elm disease on a global

scale. The decline of the elm (Sb_{1a}) in the Lake Lubana basin is dated to the period 4750±60 – 4430±50 BP.

At the end of the first half of the Subboreal Period (Sb_{1b}), with an increase in the amount of hazel, elm and aspen, there was a decline in spruce. In the second half of the Sub-boreal the amount of spruce and pine increased once again, pollen diagrams showed a decrease in the curves for birch, aspen and mixed forest.

That people were active in shaping the open landscape of that time it is reflected by the presence of mugwort, buttercup and groundsel. Ruderal, as well as forest and wet meadow, components consist of nettles and grasses, while plants of fallow-land include spurry, sheep's sorrel, ribwort and *Polygonum* [Yakubovskaya 1997].

Thus, indicators of early farming activities appear in pollen diagrams. Of these indicators, pollen analysts stress plantain in particular as being very hardy in pasture land in comparison with other plants [Andersen 1993:74].

According to palynologists, communities with these and other plants are linked to forest clearance and the creation of an open landscape, not only for plant cultivation, which interests us here, but also for pasture.

In the Middle Neolithic an open landscape was formed, and it was precisely at this time, as seen from pollen data, that the first small fields appeared. The area of forest decreased, the amount of oak and aspen fell, but an increase is seen in the amount of pine.

6. ARCHAEOLOGICAL INDICATIONS

Archaeological evidence for characterising the first farming in the environs of the Lake Lubana includes possible farming implements. These can be divided as follows: tools for forest clearance, tools for land tillage, tools for harvesting cereals, grain processing tools and tools for working hemp and flax.

Forest clearance tools. The required wood felling tools for forest clearance are represented by good quality flint axes (celts) which were fixed in a wooden shaft. These are the straight thin-butted axes (Jaunsvirlauka in Zemgale and Lejasciems in the Vidzeme uplands) and thick butted axes (Nigrande and Ramtas in Kurzeme) (Fig. 3). These have been carefully polished. Rarer are examples with additional facets on the sides. This technique of flint knapping — grinding and polishing — is known in Europe, including southern Scandinavia, from the time of the Funnel Beaker culture. Such axes were in use for over 500 years [Nielsen 1977:69, 70]. Their age in southern Scandinavia is attested by over 50 radiocarbon dates. The pointed--butt and thin-butted forms are considered to be earliest, while the thick-butted axes are taken to be later. The latter are characteristic both of the Funnel Beaker culture and the Corded Ware culture during the period 2500-1800 BC [Nielsen 1977:6].

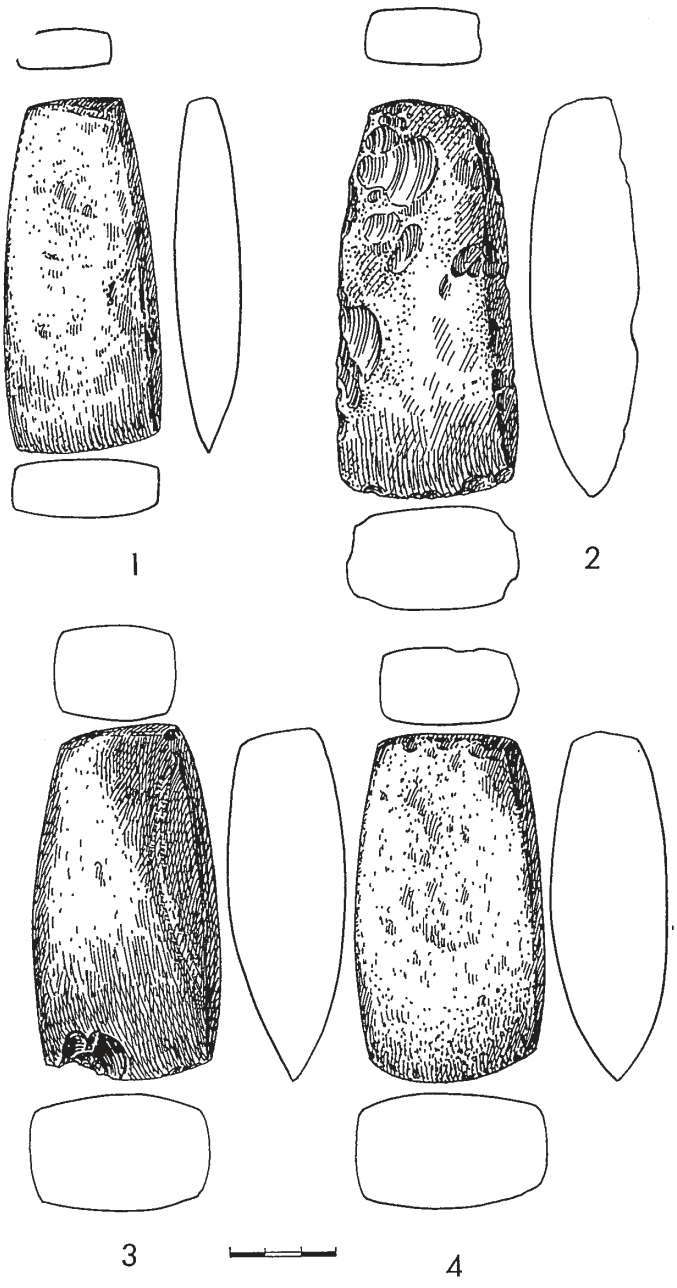

Fig. 3. Flint axes in the area of present-day Latvia (Collections of the History Museum of Latvia, Department of Archaeology, nos. A 10670, CVVM 59026, A 9841, A 3530): 1 - Jaunsvirlauka, Jelgava Region, 2 - Vecsaules Sili, Bauska Region, 3 - Nigrandes Mezlauzi, Liepaja Region, 4 - Upmales Pavari, Kuldiga Region. Drawing by Marta Jankalnina.

Thus, the flint working technique mentioned, grinding and polishing, could have appeared in the Lake Lubana depression already at the time of the Funnel Beaker culture. This was not impossible, in view of the character of flint technology at this time and the character of the spread of innovations in this field. Experiments in Denmark have reproduced the technique of manufacturing such axes [Madsen 1984; Hansen & Madsen 1983]. It may already have been employed in the Middle Neolithic in the eastern part of present-day Latvia, since high quality pointed-butt and thin-butted axes have been obtained at Lejasciems in Gulbene Region, Jaunsvirlauka in Jelgava Region, Vecsaule in Bauska Region etc.

On the other hand, as indicated by stray finds from Ramtas in Tukums Region, Pampali in Kuldiga Region, Milzkalne District in Tukums Region, Nigrande in Liepaja Region and Vecsaules Seli in Bauska Region, thick-butted, wedge-shaped flint axes belonged to the people of the Corded Ware culture (Fig. 3:3, 4).

The hafts into which flint axes were fixed have been found mainly at settlement sites and in hoards in Denmark and Switzerland. These have been made of ash, only one being hewn from beechwood.

Experiments conducted by the Danish researcher Svend Jorgensen in southern Jutland relating to preparation, length and working of the haft, tree felling, traces of use on the axe blades, blade breakage, sharpening and grinding, the use-life of the axe etc. all indicate that special skills were required for hafting flint axes, and that the right balance was required between the weight of the axe and the length of the shaft [Jorgensen 1985:25-51].

Lime and oak (hard woods) were easily felled, which was not the case with birch, alder and ash (soft woods). Elm (having very resistant wood) was even more difficult to fell, while beech sometimes presented difficulties and sometimes was easy to fell.

The flint axes of Denmark and Switzerland were hafted in the same fashion [Wyss 1988:41, 42]. The ratio of the length of the shaft to the hafting place was 5.5:1.5. The shaft was slightly bent, its thickened hafting place being spoon-shaped in profile. The hole was cut out in the middle of the shaft, adjusted for the thickness of the axe to be hafted.

Another type of hafting is found in the Lake Lubana depression, at the Abora site. Only part of this haft has survived, and judging by the dimensions of the hole, it held a 2.5 cm thick and 3.2 cm wide stone pick (Inventory no. 76:3855; Fig. 8:1). An unfinished 56 cm long haft for a flint axe (?) (Zvidze site, no. 118:1371) is an evidence of a different form of hafting (Fig. 5:1).

Soil tillage tools. Digging, hoeing and soil loosening tools are represented by a wooden spade, wooden, antler and stone mattocks, wooden sticks and antler implements with a hole for attachment to a haft.

A slightly rounded *wooden spade* with a partially preserved haft from the site of Zvidze (Fig. 4:2) did not have its surface exposed to fire [Loze 1988b:Fig. 4]. It is very primitive in form in comparison with those from the Swiss Neolithic sites, in particular that found at Egolzwil 3 [Wyss 1988:45]. The blade of the spade was 16.5 cm wide and 12.5 cm high, the shaft having broken off in antiquity.

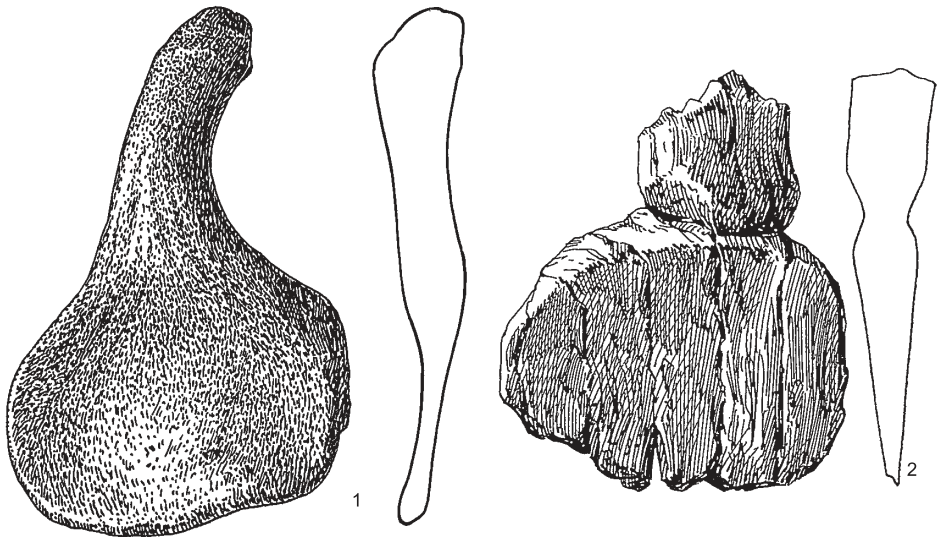

Fig. 4. Spades made of elk antler (1) and wood (2) from the Neolithic sites of Abora and Zvidze (Collections of the Institute of History of the University of Latvia, Department of Archaeology, nos. 76:3685, 188, collection of wooden artefacts no. 8). Drawings by Marta Jankalnina (1) and Vilnis Zabers (2).

Possibly also spade-like tools made of the base of an elk antler were used for digging (Abora, no. 76:654 and 1080). They could be hafted in the same way as stone spade-like tools (Fig. 4:1) [Loze 1979:Fig. 5:5].

Wooden mattocks were made of one piece of deciduous wood (Fig. 5:2). These had a pointed oval blade carefully worked from both faces (dimensions: 18 x 9 cm and 14.7 x 6.5 cm) and a slightly bent shaft [Loze 1988b:Fig. 5:5]. This type of mattock, also known from the wetland dwellings of Sarnate [Vankina 1970:Fig. XIX:1-3] and Šventoji lagoon sites 1B, 2B, 3B and 23 [Rimantiene 1979:Fig. 23], was a widespread form of hoeing tool in Neolithic Europe [Wyss 1988:45, Fig. 7].

In contrast to the wooden mattocks from Sarnate and Šventoji, the examples from Zvidze do not have a thickening of the shaft where it joins the blade.

Hoe-like stone tools, which could be hafted, are characteristic of the Late Neolithic sites in the Lake Lubana depression. Their form is not pronounced, since stone-working (apart from flint and slate) did not develop fully in the Stone Age. These thick-butted mattocks with a heavy body and narrowed in the lower part were very suitable for tilling the earth [Loze 1979:Fig. XXII:2].

Tools for loosening soil include *red deer antlers with a drilled hole in the base* (Fig. 6). Such loosening tools, consisting of a wooden shaft and attached antler, have been reconstructed by Mats Malmer, after finds in Skane (Beding etc.) and Gotland

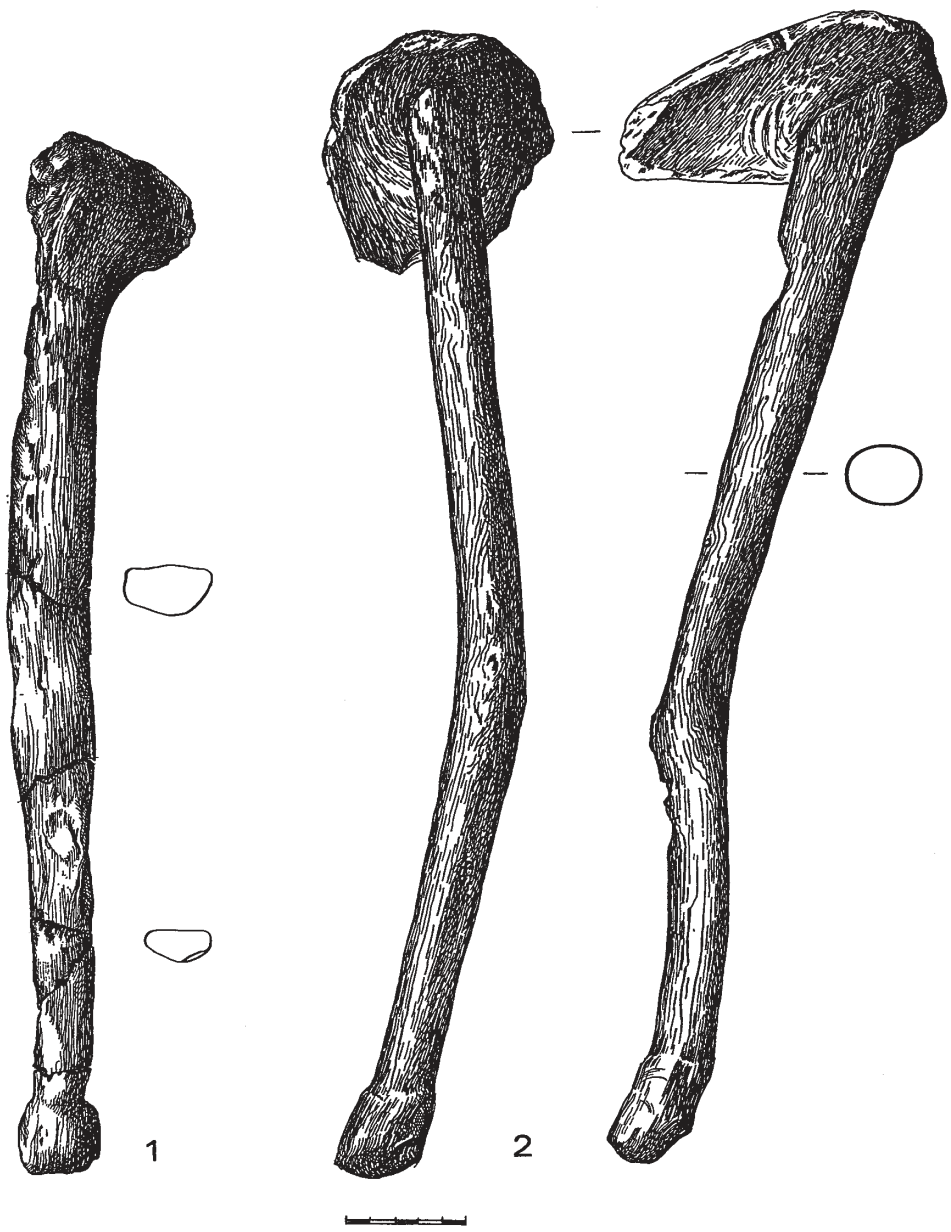

Fig. 5. Possible semi-manufactured shaft for a flint axe (1) and wooden mattock (2). Zvidze site (Collections of the Institute of History of the University of Latvia, Department of Archaeology, nos. 188:1371, 437). Drawings by Marta Jankalnina (1) and Baiba Vaska (2).

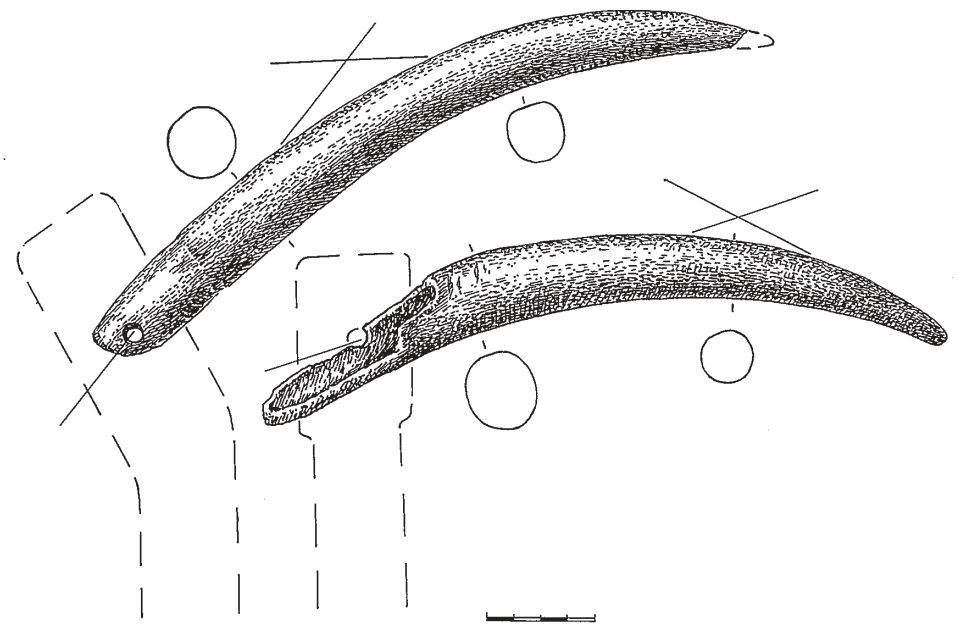

Fig. 6. Tools for loosening soil made of red deer antler. Abora site (Collections of the Institute of History of the University of Latvia, Department of Archaeology, nos. 76:3104, 3699).

(Visby etc.), where they have generally been obtained as grave goods [Malmer 1962:313-321, Figs. 66, 77; Janzon 1974:Plate 30].

Cereal harvesting tools. Knife-shaped flint sickles, one of the tool forms for harvesting cereals, were possibly known to the inhabitants of the Late Neolithic sites in the Lake Lubana depression, such as Abora I [Loze 1979:Fig. VIII:11, 12] (secure identification requires use-wear analysis). As seen from reconstructions, flint sickles were fixed in sickle-shaped or differently formed wooden handles so that they could easily be gripped [Wiślański 1979:216; Korobkova 1987:Fig. 31].

Grain processing tools. For grinding, the people of the Lake Lubana depression used grindstones and pestles.

So-called *single-handed grindstones* were used for separating the grain from the husks and for grinding the grain after it was separated from the chaff.

The earliest grindstones (round river pebbles with one working face) are 8.5-9 cm in diameter and could easily be gripped in one hand. Such grindstones are already present in the Middle Neolithic dwellings of the Zvidze site (no. 188:1639, 1787).

Among Late Neolithic grindstones from Abora I, Lagaza and Kvapani II sites, there are, in addition to round forms, also oval examples (Fig. 7:2), what possibly indicates that they were used as two-handed upper grindstones at the time when the large lower grindstone came into use.

Table 2

Dimensions of grindstones from the settlements of the Lake Lubana depression (cm)

Site	Form	Inventory no.	Diameter	Thickness	Length	Width
Abora I	oval	76:66	-	5.2	9.85	8.2
		76:3518	-	3.8	11.4	7.8
		76:3519	-	3.1	8.4	7.6
	round	76:3585	6.4	5.5	-	-
	oval	76:3663	-	4.4	14.9	9.8
Eini	oval	119:344	-	3.8	8	5
	round	119:345	6.5	3.39	-	-
Ica	oval	303:139	-	4.2	10.1	7.6
		303:156	-	0.51	8.1	6.5
Lagaza	oval	118:597	-	4.75	11	9.9
	round	118:595	7.7	5.4	-	-
		118:594	7.2	5.65	-	-

There are among the examples obtained at the Lagaza site some grindstones whose lateral edges have been used for grinding (nos. 118:596; Fig. 7:2), and traces of use are also seen on both opposite faces of the other examples (no. 118:594) (Table 2).

As established through excavation, grindstones are concentrated in large numbers around the hearths of the dwellings. Thus, for example in the dwellings uncovered in Area F (covering an area of 240 m^2) 74 grindstones were found, the majority of which came from the immediate vicinity of the hearth of one particular dwelling [Loze 1979:Fig. 12].

A large lower grindstone made of fine-grained stone, was found in excavations at the Lagaza site in the late 1960's [Loze 1979:Fig. XXV:7] (dimensions: 29.6 x 24 cm; Fig. 7:3). This was very suitable for grinding grain. Evidence of long and intensive use is a 3.5-4 cm wide groove around the slightly oval projection in the middle.

Stone pestles were present as a tool for grinding grain in the area of present-day Latvia already from the Middle Neolithic. A part of such a tool was obtained at the Zvidze site (no. 188:2454). Worthy of mention is the particular form of pestle: a 17.35 cm long pebble with a completely smoothed surface and round section

Table 3

The measurements of the pulley sheave of weawing spindle

Pottery ware	Site	Inventory no.	Diameter	Thickness	Remarks
Post-Narva	Zvidze	188:2366	6.8	0.8	
		188:708	6.5	0.95	semi-manufactured
Textile impressed	Eini	119:319	6.4	1	fragment
Post-Narva	Lagaza	118:547	6.5	0.7	semi-manufac-tured
		118:264	6	1.3	
		118:191	3.1	0.9	much used
Lubana	Late Neolithic and Early Bronze Age site at the mouth of the r.Malmuta	101:24	3	0.7	much used
	Abora	76:1342	4.7		

(3 cm in diameter) [Loze 1988a:Fig. XXIII:1]. Archaeological parallels indicate that precisely this form of tool was used together with 'saddle querns' for grinding grain in the Neolithic of Asia [Wang Xing-guang 1995:Figs. 15-17].

There is other evidence of agriculture, too: spinning and weaving tools and possible elements thereof.

Spinning implements. Among spinning utensils are the spindle whorls obtained in archaeological excavations. The earliest of these are discoidal forms made from flat sherds of pottery, with the edges rounded and a hole drilled in the centre for fixing to a spindle. Often these spindle whorls still show pottery decoration.

Spindle whorls have been made from pot-sherds with completely smooth surfaces (Lagaza, no. 118:547), with decoration of wrapped cord impressions (Lagaza, no. 118:264) and textile impressions (Eini, no. 119:319). One example has also been found of a spindle whorl with a linear design (Zvidze, no. 188:354, 2366; Table 3).

The mean diameter of spindle whorls is 6.5 cm, and 0.5 cm for the hole. The thickness of the spindle whorls is the same as for the respective pottery forms.

Weaving implements. Weaving equipment and elements of such utensils obtained in archaeological excavations can be considered indirect evidence of the presence of early farming. In this case, use can be made of archaeological evidence

of fabric making. This includes *textile impressions on pot-sherds*, as well as *wooden shuttles*. Fragmentary shuttles obtained in the Middle Neolithic layers at the site of Zvidze are rectangular in form with a hole in the middle and symmetrically or asymmetrically worked ends [Loze 1988a:Fig. XXXVI:10, 12], reminiscent of a perforated shuttle according to the classification given in ethnographic literature [Alsupe 1982:Fig. 32:5]. (Fig. 8:2, 4). It is possible that already in the Middle Neolithic the *vertical loom* was used for joining plant fibres. It is difficult to connect the many finds of wooden elements (rods, poles, thin rods etc.) with a definite type of vertical loom.

They resemble warp poles, discussed in ethnographic literature [Alsupe 1982: Fig. 23:1]. They consisted of two 1.9-2.3 m high vertical poles with pegs (of pine or birch) and two horizontal rods joining them. It is mentioned that in terms of construction they resemble a vertical loom and could be used for arranging the warp. They are classified as portable warp poles, whose function was to prevent the weaver from tangling up the warp. The pegs are more closely spaced than those of ordinary looms.

Tools for processing hemp, nettles and flax. The earliest hemp, nettle and flax processing tools in the Lake Lubana depression are represented only by *swingles*, because among the wooden artefacts from the Zvidze site there are some which closely resemble ethnographic examples in terms of form and cross-section. Ethnographers distinguish knife-like and rectangular single-sided and double-sided swingles [Istoriko-etnograficheskiy atlas, 1985:Fig. 159], often made of birch [Ligers 1952:123].

According to finds from Zvidze, *single-sided swingles* were of rounded triangular section, 18 cm long, with a 5.5 cm wide blade [Loze 1988a:Fig. XXXVI:13] (Fig. 8:5, 6). It is possible that single-sided swingles were also considerably wider. This is shown by heavily worked examples with a broad blade and a broken handle [Loze 1988a:Fig. XXXVII:1, 3]. Judging from ethnographic material, the blades of single--sided swingles may have been flat or segmental in section, the handle being round or rounded rectangular in section [Istoriko-etnograficheskiy atlas, 1985:Fig. 139].

It is possible that a *wooden comb* (Fig. 8:3) also relates to processing, i.e. combing, of hemp and flax fibres [Loze 1988a:Fig. XLI:1; 1988b:Fig. 2:1;]. Bits of wooden boards found at Zvidze, Abora and Lagaza could be evidence of so-called tablets, or smooth supports, used when processing hemp and flax fibres with a swingle.

Hemp fibres were used for making rope and fabrics. Mention should be made of a specific features of hemp processing, for hemp is a dioecious plant [Ligers 1952:127]. The male plants were plucked first (immediately after flowering) and provided finer fibres.

Hemp seeds were also used as food, being heated and then crushed in a mortar. Hemp flour mixed with fats has been used as food.

The nettle is the oldest fibre plant in Latvia. It could be used for spinning thread and weaving cloth. It is possible that tools like the ones described above were also used for processing these fibres.

7. FARMING AS REFLECTED IN POLLEN SPECTRA

The results of pollen analyses represent one of the main classes of evidence in the study of initial farming systems, as well as later ones.

In the Lake Lubana depression too, pollen of cultivated plants, together with their accompanying synanthropic plants (weeds) serves to characterise the cultivation of cereal crops during the respective periods of the Neolithic habitation.

Hemp (*Cannabis sativa*) appears sporadically in the pollen spectra of the Lake Lubana depression (at Zvidze) already in the Early Neolithic layers, and can be traced without interruption from the Middle Neolithic onwards [Yakubovskaya 1997].

Along the Lithuanian coast hemp fibres were used in everyday life, as shown by finds of seeds and a piece of string from a Middle Neolithic site in the Šventoji lagoon (no. 32) [Rimantiene 1979:75, 168], as well as hemp pollen in the Late Neolithic sites at Šventoji (nos. 1A and 9).

There is little data relating to the use of hemp fibre in the Neolithic of present-day Poland. Its possible presence is only noted in the territory of the Linear Pottery culture (around 4000-4200 BC) in north-western Poland [Wiślański 1979:179].

Barley (*Hordeum vulgare*) has been found in a different area — on the shore of the Greater Lake Ludzas, where a half of a seed was found in the vicinity of a hearth at the Kreici Neolithic settlement [Rasins, Taurina 1983:154].

In the vicinity of the Lake Lubana, barley pollen appears in the lower and upper sections of the Middle Neolithic layer of pollen spectra [Yakubovskaya 1997:157]. This is possible evidence of a hiatus in the cultivation of barley. The presence of this pollen is low in percentage terms. Previously it was the cereals, including barley, from Kivutkalns along the lower Daugava (Late Bronze Age) that served to characterise early the farming [Graudonis 1989:72]. Barley pollen has been found in the Middle Neolithic occupation layer, whose age, as indicated above, has been determined through radiocarbon dating [Loze 1988a:Table 19]. This means that the initial process of cereal cultivation, including that of barley, started two thousand years earlier.

Of cereal crops, barley and millet have been found in the Neolithic sites along the Lithuanian coast at Šventoji [Rimantiene 1979:168; 1994:129]. Also, Gaerte [Gaerte 1929:32] mentions a find of a husk of two-row barley at a site on the Couronian Spit.

Barley was known at the Linear Pottery culture and the Funnel Beaker culture sites in Poland [Wiślański 1979:Fig. XLVI], as well as the Tripolye culture, the Globular Amphorae culture and the Corded Ware culture sites in central Europe [Wiślański 1979:Fig. L]. It has also been found at the Funnel Beaker culture settlements in the south-western part of Skane [Larsson 1985:56], and it is thought that barley was much easier to cultivate than einkorn or emmer wheat [Larsson 1985:89]. There are also indications that barley is less sensitive to cold.

8. THE INITIAL DEVELOPMENT OF AGRICULTURAL SKILLS

Archaeological and palynological indications of elements of farming in the Lake Lubana depression and the vicinity lead to the conclusion that the people living in this area had possibly begun to practice shifting cultivation.

Shifting cultivation is a small-scale form of agriculture, interpreted as a land--extensive and labour-intensive subsistence system, because the cleared areas, no larger than 4 ha, provided a good return for only a short period (one to three years). At the same time, the process of forest clearance, cultivation and harvesting requires intensive human activity, with the use of tools such as axes, knives, mattocks and digging sticks [Harris 1972]. This form of small scale agriculture is usually associated with a low population density or sparsely distributed settlements with a population below 250.

Shifting cultivation is considered particularly suitable for forest ecosystems, since the vegetation of the fields cleared in forest contains a higher potential of nutrients to be used for production than fields established in scrub or grassland. A grain crop, rich in proteins, constitutes a larger reserve of food, when it is cultivated in ash and soil, than does a root crop grown under the same conditions. It is the cereals that require a change in the site of cultivation, and for this reason the fields are shifted often, with a large territory used by each community.

The development of farming skills in the Lake Lubana basin can be discussed not only on the basis of the specific body of evidence described here, but also against a much broader background.

As mentioned above, the origin of agriculture is seen as part of a broad process of domestication of the landscape by social groups [Chapman 1994:113].

One of the most important details related to this question is the modelling of the initial farming over large regions, confirming or refuting hypotheses of indigenous origin or diffusion.

Without attempting to produce a model of the first farming, which should doubtless be conducted at a larger scale, covering the eastern Baltic region, some of the basic principles will be sketched in which should be taken into account when interpreting this question as it applies to the Lake Lubana depression.

First, attention should be given to the long-term settlement of this region. This is indicated by the succession of occupation layers at the Zvidze site, showing uninterrupted settlement in the Mesolithic and Neolithic [Loze 1988a:18-23]. Archaeological excavations here show the succession from Mesolithic to the Neolithic occupation layers and the character of artefact assemblages, and provide evidence of the characteristics of the flora and fauna of particular phases of settlement.

Long-term settlement at Zvidze possibly indicates that the local community associated the choice of this settlement site with the regular utilisation of the Lake Lubana and its shore zone, as well as initial use of pasture land and fields. This is shown by seed samples from the Zvidze site. Dominant are aquatic grasses (40%) and grasses of the lakeshore (24%). Wetland and wet meadow plants (19%) and

trees and shrubs (10%) are worse represented in the ecological structure of seed floras [Loze, Yakubovskaya 1984:90, 91].

Zvidze is one of the very rare sites on the eastern shore of the Baltic Sea with an occupation layer *in situ*, recording the beginnings of the change in subsistence strategy, marked by the transition from a hunting and gathering subsistence strategy to agriculture. It is possible that long-term settlement reflects a definite world view of the inhabitants, involving the long-term use of a certain chosen settlement, to the extent that it was also adapted to a different subsistence strategy.

Second, it should be noted that there are no indications in the Lake Lubana basin of the arrival of a new culture, which could have brought with it the skills related to agriculture. However, at the Zvidze site, a small amount of the Funnel Beaker pottery has been found [Loze 1988a:Fig. LVIII:1-3] indicating contacts between the people of the Lake Lubana depression and the people of this culture.

Thus we can exclude the possibility of a culture-bearing migration, which could have induced changes in the economic structure of the local tribes prior to the Corded Ware culture.

The pointed-butt and thin-butted flint axes for tree-felling and forest clearance, which have been recovered as stray finds in the area of present-day Latvia, do not, with rare exceptions, replicate characteristic western, i.e. central European and Scandinavian, forms of flint axes of the Funnel Beaker culture.

Third, is should be borne in mind that agriculture in the Lake Lubana depression was being adopted in an area very rich in natural resources. This is indicated by the thick Neolithic occupation layers at the Zvidze site which have produced remains of a large number of species of forest fauna (wild boar, elk, roe deer, red deer and aurochs), as well as wide-ranging information about Neolithic diet, since the recorded data provides evidence of intensive everyday use of birds and fish, as well as water chestnut, hazelnut, chick-weed, reed, stinging nettle etc. [Loze, Yakubovskaya 1984:88, 89].

Fourth, it should be noted that it was precisely in the Middle Neolithic that the Lake Lubana depression, which continued to become bogged up, was densely packed with new settlement sites, which doubtless indicates a sudden change in the demographic situation. On the other hand, the Mesolithic settlements, including the Osa site, excavated by Zagorskis [Zagorskis 1978:660-662] were located only on the shore of the former bed of the Lake Lubana at a height of 94-95 m above sea level. An increase in the population and the siting of settlements in the immediate vicinity of the new, considerably lower, shoreline of the Lake Lubana (Sulka and Kvapani II in the Middle Neolithic, Asne I and Malmuta II in the Late Neolithic), as well as in the major Aiviekste system of watercourses (Dzedziekste, Nainiekste, Piestina etc.) indicates that newly bogged over areas were being settled and that people were entering a new environment which initially had not been utilised — with all of the consequences that this entails. At the same time, intensive Neolithic settlement at the Zvidze site, on the shore of the former bed of the Lake Lubana (on the edge of the undulating till) at a height of 94-95 m above sea level, was experiencing its most intensive period of activity.

It is possible that the inhabitants of these new settlements, who made their homes in a different environment from that found at Zvidze, kept to the same economic regime, but were no longer bound by the view of their predecessors that it was necessary to continue to live at the "specially chosen place".

The settlement of new areas was of great significance. It is thought that this stabilised the economic regime and broadened the sphere of activities conducted by the people of the region: they began to herd domestic animals and cultivate cereals. However, it should be noted that the bogged-over areas were subject to changes in the water conditions both during the Atlantic and the Subboreal Periods, which forced the inhabitants to move to higher ground — islands and headlands — in the wetlands on at least a few occasions at certain times in the Neolithic. It is generally agreed that hunter-gatherers used natural resources within a radius of a two hour's walk, while for farmers and stock-keepers this radius was one hour's.

It is of course difficult to judge, to what extent the uninterrupted occupation of the Zvidze site was influenced by social aspects such as the links to the past and the ancestors, but the social value of this site together with its function of providing natural protection and its economic aspects, could no doubt have served to maintain uninterrupted settlement.

Fifth, the sedentary community that inhabited the Zvidze settlement was not the last to make use of this area. Late Neolithic sites have also been excavated, and there are indications that Early and Late Bronze Age, as well as the Iron Age settlements, discovered during archaeological survey work between 1961 and 1990 were also sited here.

Also, the medieval village at Smaudi was located only a few hundred metres to the west of Zvidze Neolithic site on the shore of a relict lake — an overgrown bay of the former bed of the Lake Lubana [Loze 1974:41-44]. An Early to Late Iron Age cemetery was sited immediately adjacent [Loze 1974:42-44]. These facts indicate that settlement was uninterrupted and clearly point to productive utilisation of this area over the course of millennia.

Sixth, indications of intensive farming (with mass finds of grindstones — an average of 40 per 100 m^2) in the central part of the Late Neolithic site of Abora I indicate a concentration of settlement by another sedentary community. Intensification of agriculture is evidence of active development of this subsistence strategy, with the use of an assemblage of grindstones of the hand quern type and pestles and mortars (Fig. 7), possibly at the same time handling a small herd of livestock. Hunting, fishing and gathering still provided most subsistence needs. However, this site, unlike the site of Zvidze, was in later times, in the Middle and Late Iron Age, utilised only on a seasonal basis, because of the geographical situation: the rapid bogging-up of this area did not permit habitation after the Bronze Age.

Seventh, it is thought that the further adoption of agriculture was fostered by the infiltration of small groups from the Corded Ware culture into the Late Neolithic cultural environment [Loze 1979:40, 41]. The people at the Abora I site,

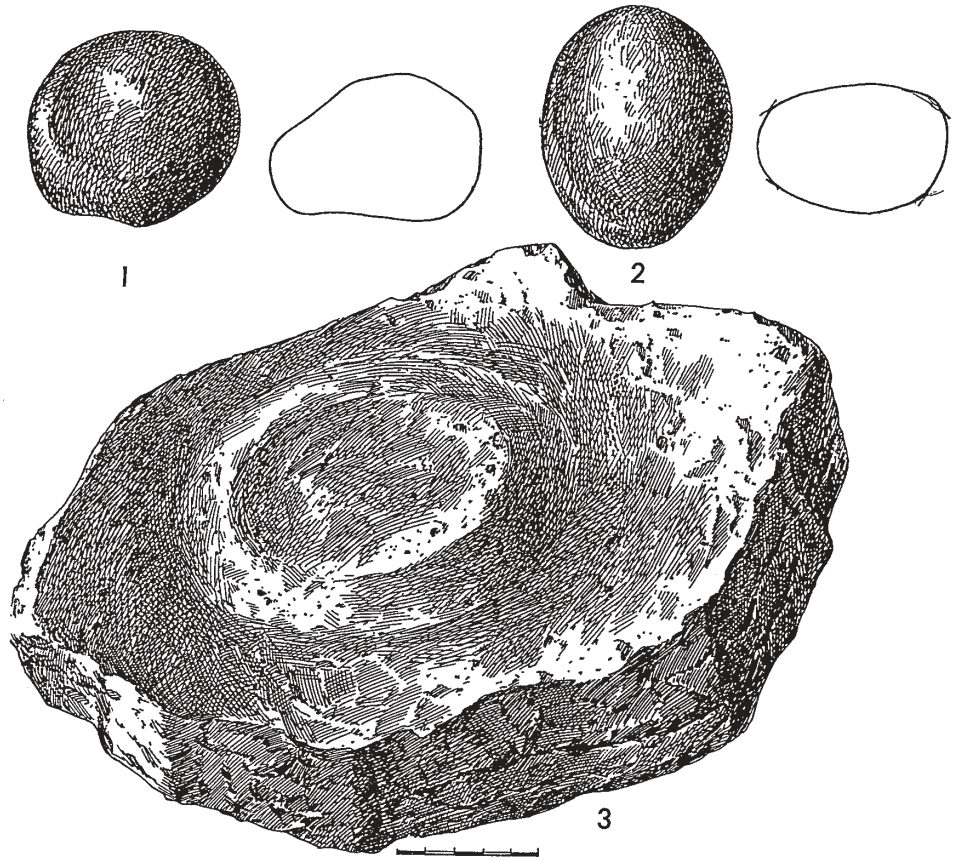

Fig. 7. Upper grindstones from the Kvapani II (1) and Lagaza (2) sites, lower grindstone from the Lagaza site (3). (Collections of the Institute of History of the University of Latvia, Department of Archaeology, nos. 194:693; 118:596, 290). Drawing by Marta Jankalnina.

who represented a new cultural environment, also started to adopt pastoralism*. They buried their dead in special chambers (?) between buildings or within an enclosed area in the settlement itself, rather than at special burial sites, providing the dead with the possibility of being permanently among the living. There might be reserved the far end of the house or the area between houses, depending on whether the hearth was in the middle or the front of the dwelling.

This fact is given particular attention in interpretations of the domestication process, and is considered a sign of the domestication of society [Hodder 1990:29].

* Palynologists have considerable evidence permitting characterisation of pasture-land in the Lake Lubana depression and the environs.

Eighth, changes in Neolithic symbolism can also be accepted, which, like social changes, could have occurred in advance of economic changes. These changes took place concomitantly and were a reflection of the world view and social structure of the respective period. With the integration of the people of the earliest Corded Ware culture into the local environment and the creation of a new cultural environment, agricultural symbols were introduced: solar and lunar signs (in the form of pendants and ornaments) [Loze 1994a; 1994b].

Also a hypothesis has been put forward linking the constellation Taurus with the ancient agricultural calendar, specifically the time of spring sowing and the advent of summer [Chmykhov 1990:276-288].

The Taurus constellation is seen in disc pendants which are widespread in Europe and which in the Lake Lubana depression were made of amber and worn by women, accompanying them to the world beyond the grave [Loze 1993b; 1993c].

Changes in world view and socio-economic developments are also reflected in the Late Neolithic art, such as a bull's head representation as a flint sculpture (from Lagaza), which surprises the viewer with the superbly executed curved horns characteristic of this particular animal and the stylised proportions of the head.

This symbol, like those of the sun and moon, are associated with the changing seasons, one of the main determinants of the agricultural cycle. Observing the calendar was one of the main pre-conditions for obtaining a successful — though as yet small — harvest, which was perhaps not insignificant, bearing in mind the possibilities of the early farming.

It is possible that the role of the bull in the adoption of the new economic regime was much greater than hitherto considered [Graudonis 1967:118; 1989:76, 77]. This is also shown by a model of a yoke for oxen found at a Late Neolithic site at Šventoji (no. 4A) on the north-west coast of Lithuania [Rimantiene 1994: Fig. 53].

It seems that the use of the horse in the Late Neolithic was linked to transport requirements, i.e. riding, as shown by part of a bridle bit found in the Lake Lubana depression (Abora; collections of the Latvian Institute of History at the University of Latvia, no. 76:3441). Establishing whether the horse was domesticated does, however, depend very much on the degree of wear of the pre-molars.

The first farming in the Lake Lubana basin indicates the beginnings of the adoption of agriculture (Zvidze), and the intensification of farming skills in the later part of the Stone Age in this same region (Abora I) shows the gradual development of this economic activity, along with changes in symbols and social structure.

That this economic system was gradually developing is shown by the siting of Bronze and Iron Age settlements and medieval villages in the vicinity of the Lake Lubana beyond the bounds of bogged-up areas, maintaining some of the previous settlement sites in the Lubana wet meadows for seasonal activities.

Finds of *Striated Pottery* show that Late Bronze and Early Iron Age farmers (1300 BC to the second or third century AD) made use of higher ground along the banks of the Rezekne (Ideni and Zoseri), Malta (Kupci and Zvejsalas) and Sulka (Sulagals) rivers, also establishing settlements on the shores of the Lake Zvidzes

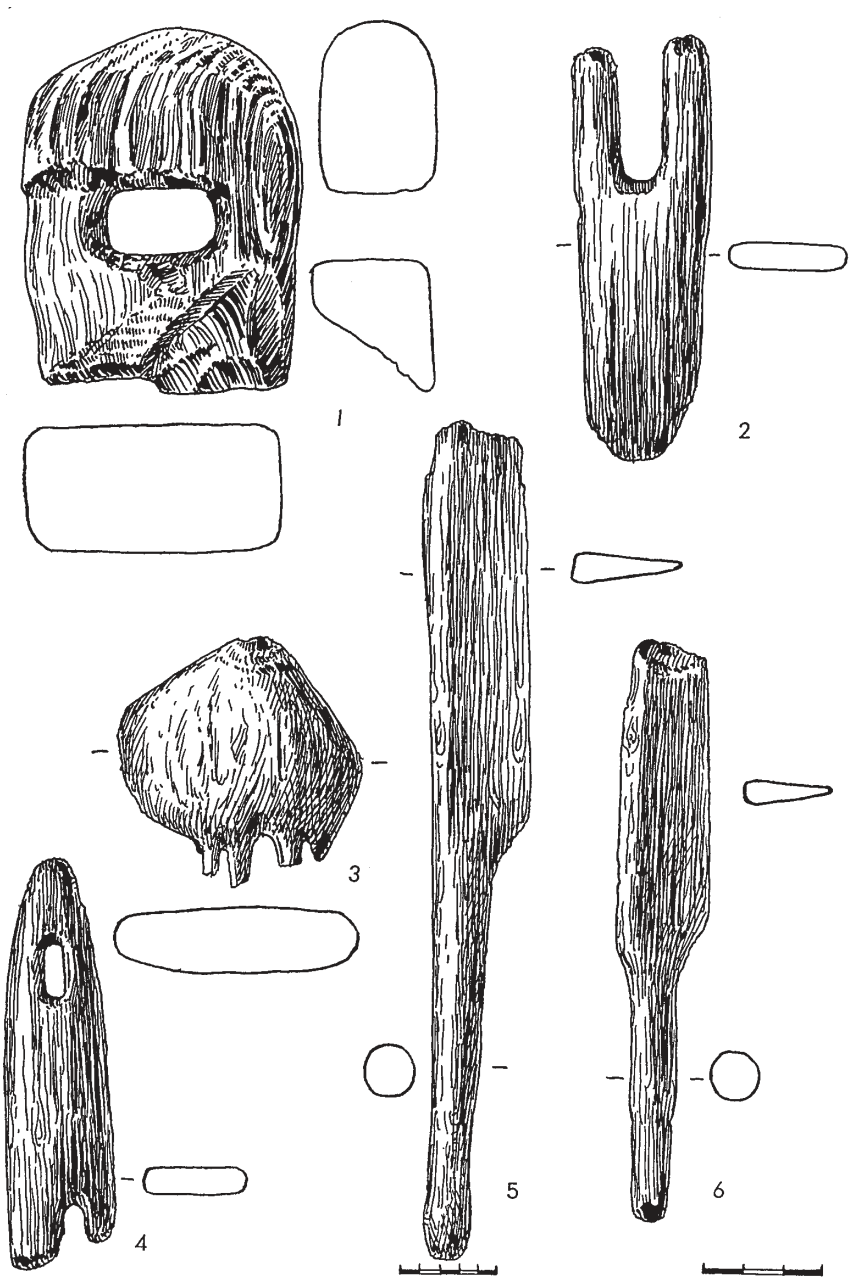

Fig. 8. Fragment of a handle of a stone mattock (1), fragments of shuttles (2,4), comb (3) and swingles (5,6) from Abora (1) and Zvidze (2-6) (Collections of the Institute of History of the University of Latvia, Department of Archaeology, nos. 76:3855, 188:477, 484, 116, 433, 476). Drawing by Marta Jankalnina.

(Smaudzi and Zvidze). This is a period when the first fortified settlement appeared at the south-east end of Ideni ridge [Loze, Vasks 1974:48-50; Vasks 1994:65-73]. This is also a time of cardinal changes in social structure, with the beginnings of the so-called period of tribal society. The system of fortifications discovered here (defensive ditches and wooden palisades) served to protect not only the people living at this site, but also those of the open settlements discovered in the immediate vicinity, also securing the products of farming labour (grain and other seeds of cultivated plants).

Evidence of farming in this period comes in the form of seasonal activities in the area of the present wet meadows, possibly involving haymaking and pasture along the banks of the Aiviekste (Abora I and Lagaza), Malta (Jasubova) and Rezekne (Kvapani II) rivers.

The people making Early Iron Age textile impressed pottery after the second or third century AD cultivated fields on higher ground along the lower course of the Rezekne River (Kvapani Laivu Baze, Mikuli, Zoseri and Lielie Idini), on the Ideni hill (Brikuli) and on higher ground along the lower course of the Malta River (Kupci and Zvejsalas), along the middle course of the Sulka (Sulagals) and on rises secure from flooding in the basin of the Malmuta River (Adumeni I and II), as well as on the present shore of the Lake Zvidzes (Smaudzi and Zvidze).

There is considerable evidence of seasonal activities of the people producing textile impressed pottery in the bogged-up depression of the Lake Lubana along the lower courses of the rivers: Aiviekste (Abora I and Lagaza), Malmuta (Malmuta I and II) and Rezekne (Kvapani I and III).

On the other hand, the farming people making plastered pottery in the Middle and Late Iron Age (fifth to tenth centuries AD) utilised areas of fertile alluvium on the banks of the rivers: Piestina (Maza Osa, Liela Osa and Galeji), Ica (Sala), Rezekne (Kvapanu Laivu Baze, Mikuli, Pasloka, Zoseri and Ideni), Malta (Kupci and Zvejsalas), Malmuta (Adumeni I and II) and Aiviekste (Naglini). They also continued to cultivate fields on the shore of the Lake Zvidzes (Smaudzi and Zvidziena).

Like many previous generations, the makers of plastered pottery made seasonal camps on the banks of the Aiviekste (Abora I), Ica (Ica and Upesgala Licis), Rezekne (Kvapani II and III) and the lower course of the Malmuta (Malmutas Grva).

That areas of higher ground with mineral soil within the present area of the Lubana wet meadows were used for growing summer cereal crops during certain periods is shown by the use of the Abora site for agriculture in the 1920's and 30 s.

Thus, the Lake Lubana depression with the Stone Age sites in the presently bogged-over areas and sixty newly discovered settlements and village sites (Bronze and Iron Age, Middle Ages) outside of this zone, constitutes a special micro-region. This is an area very well suited for large-scale interdisciplinary research not only concerning early and developed shifting cultivation, but also cultivation of permanent fields.

9. MODELLING THE PROCESS OF ADOPTION OF AGRICULTURE

Modelling of the process of the adoption of agriculture is not possible without research on a specific body of data. For this reason, an understanding of this process in the Lake Lubana basin needs to utilise the above described body of evidence gathered over the course of decades, including studies of the palaeogeographical situation and environment of the first farming settlements, requiring a considerable amount of work, which needs to be seen against the general cultural background [Eberhards 1969:59-63; 1981; 1989; Dolukhanov, Levkovskaya 1971; Loze, Eberhards 1983:116, 117; Loze, *et al.* 1984]. Modelling of the adoption of the first farming in the Lake Lubana basin could be conducted as follows:

1. A continuous line of cultural development is confirmed (Mesolithic to Middle Neolithic), envisioning a process of local, peaceful adoption of agriculture within a particular social environment (without the participation of immigrants) as a result of diffusion (the time of the Funnel Beaker culture);
2. A certain influx of socially organised people is admitted (infiltration of small groups of the earliest Corded Ware culture) in the Late Neolithic, already familiar with agriculture, furthering the process of the introduction of this activity into the local cultural environment;
3. Intensification of the process of the adoption of agriculture in the Late Neolithic and the transition to the Bronze Age, with pronounced changes in symbolism and social structure, marked the possibility of gradual stabilisation of the introduction of this farming activity, which was interrupted by catastrophic change (changes in the water regime in the Lake Lubana basin, which led to rapid paludification) and forced the people living in the region to settle outside of the area of the present-day wet meadows.

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MESOLITHIC CULTURAL-ETHNOGRAPHIC ENTITIES IN THE SOUTHERN UKRAINE: GENESIS AND ROLE IN NEOLITHIZATION OF THE REGION

As the reader may know, it has been a long time since the practice of making use of archaeological materials for the purpose of dividing relics into typological groups, cultures, ethno-cultural (culture-ethnographic) entities, etc., developed two methodological trends. According to the first of them, when analysing materials, researchers operate statistical data about all, without exception, finds in complexes, while in the second case only selected, the most distinctive artefacts are taken into account. Experience has proved that both of these methodological tendencies deserve to be applied in practice.

While undertaking culture-territorial division of the Mesolithic materials in the Ukraine, the author took the first trend, i.e., full statistical elaborating of the whole series of finds in complexes [Telegin 1982]. However, nowadays, we believe that the second research method will be more appropriate for defining culture-ethnographic entities in the southern Ukraine, with the following definition of lines (cycles) of the culture-historic developments within three contiguous periods Late Palaeolithic, Mesolithic and Early Neolithic. In such a case mainly geometric microliths, inserts of the Kukrek type and notched blades etc. should be considered.

You, dear reader, will be able to judge whether we have succeeded in that undertaking.

The issue of culture-territorial division of the Ukrainian Mesolithic relics has been a matter of substantial research efforts. Here we should mention, for instance, the works of P.P. Efimenko [1924], I.G. Rudinskiy [1928; 1931], M.V. Voevodskiy [1950], A.P. Chernysh [1975], A.A. Formozov [1959] and others. Those data, as well as recent research results, obtained by V.N. Stanko [1972], L.G. Matskevoy [1977], L.L. Zaliznyak [1991; 1995], S.P. Smolyaninova [1990], A.A. Yanevich and others, create rather sophisticated structure of culture-based classification of relics in different regions. First of all, two major culture-geographical zones or regions of remains are distinguished: (a) the northern forest-forest-steppe zone with micro- and macrolithic inventory, and (b) southern steppe or the Azov-Pontic zone. Within the latter complexes contain remarkable collections of microlithic artefacts but there are no samples of large double-edged macrolithic tools, like axes, hatchets, etc. The cultures of those zones differ in a number of other features [Telegin 1982].

Within the two regions, researchers distinguish a lot of Mesolithic cultures and types of relics.

In general, the Ukrainian Mesolithic cultures are dated to X-VI/V millennia BC* (by stratigraphical, typological, radiocarbon and other methods), although some early monuments (Shan-Koba, Osokorovka, Leontyevka, and others) have their roots in the Late Palaeolithic — Dryas 3, Allerød (see below).

Hereinafter, we will discuss only cultures of the steppe Azov-Pontic zone.

Generally recognised group of cultures of the steppe zone in Southern Ukraine and Crimea includes the Mountain-Crimean culture, Grebeniki and Kukrek cultures, as well as several separate types of relics, like Belyi Les, Syuren, Osokorovka-Rogalik, Mospino, Nenasytets and others [Telegin 1982]. In new research on the Late Palaeolithic-Mesolithic period in Crimea and the Azov region, the authors suggested somewhat different interpretation of the relics. For instance, they distinguished two or three cultures within materials of the Mountain-Crimean culture, i.e., the Shan-Koba, the Shan-Koba 4, and the Mountain-Crimean [Bibikov, *et al.* 1994], and of the Zimovniki type within the south Donets relics [Gorelik 1984]. The Osokorovka-Rogalik group — the Tsarinka type, the Rogalik-Tsarinka culture, the Osokorovka-Rogalik culture — distinguished by us, have also been regarded in different ways [Stanko 1982; Gorelik 1987; Olenkovskiy 1992; Zaliznyak 1995].

Due to uneven historical development and, primarily, obvious genetic differences in the composition of individual groups of ancient populations, a level of similarity of these cultures materials and types of relics is manifested to a different degree. Therefore, basing on analysis of typological composition of flint items (to be discussed below) we can distinguish three main entities or cultural development cycles which we call the Crimean-Belyi Les with segments, the Rogalik-Grebeniki with trapezes, and the Kukrek with special inserts of the Kukrek type [Telegin 1982, 1990]. These entities usually occupy separate territories (Fig. 1).

As follows from further description, the main attention in such a division is paid to analyses of geometric tools and some other specific items (inserts, notched blades), which, in such cases are the most informative sources. Other tools, including retouched blades, scrapers, etc., are far less helpful in terms of their typology and quantity. As follows from Table 1, these items comprise about the same percentage of relics of all three entities. That is 30% to 35% of retouched blades (in the south), 22% to 38% of scrapers, 10% to 12% of burins, 1% to 2% of backed bladelets, and 1% to 5% of other types of items. However, this is not true for quantities of segments, trapezes, notched blades, inserts of the Kukrek type, and truncated bladelets, which may substantially vary from 0.1 to 12.4% (Table 1).

Let us briefly discuss the composition of flint artefacts in the three groups.

The Crimean-Belyi Les entity includes monuments of the Mountain-Crimean culture of the early Shan-Koba type (Buran-Kaya, Shan-Koba, layers 6-5; Fatma-Koba, 6-5; Zamil-Koba, etc) and the late Murzak-Koba (Murzak-Koba, Fatma-Koba, layers 2-4, Laspi, etc.) [Voevodskiy 1950], as well as materials of the Belyi Les type of the North-Western Pontic region [Stanko 1976]. Among the main features of

* The author used an uncalibrated version of 14C chronology (Editor).

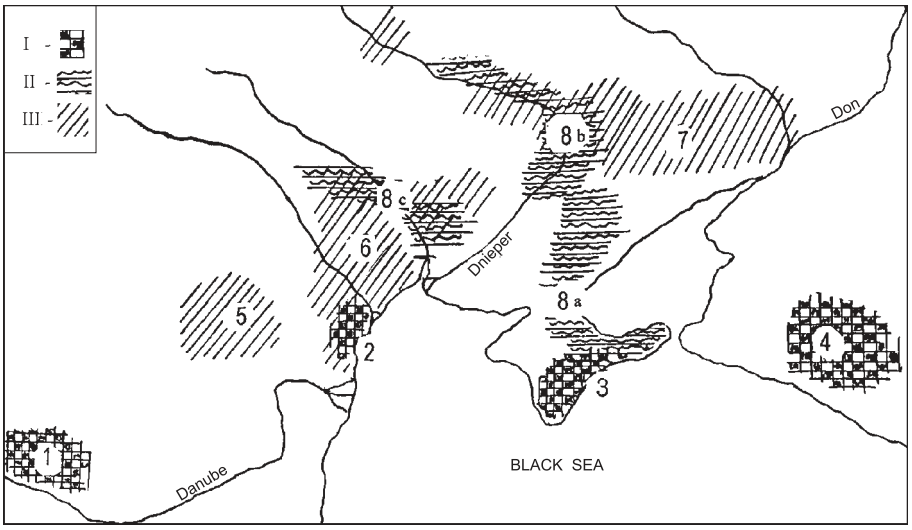

Fig. 1. Mesolithic cultural-ethnographic entities in the southern Ukraine and some neighbouring territories: (I) Crimean-Belyi Les, (II) Kukrek, and (III) Rogalik-Grebeniki. 1. Cuina-Turcului, 2. Belyi Les, 3. The Mountain-Crimean culture, 4. Sosruko, 5. Gilma, 6. Grebeniki, 7. Rogalik, 8. Kukrek and its local versions: (8a) Kukrek-Azov, (8b) Dnieper or Igren, (8c) Northern Pontic or Zanetovo.

this entity one should mention, first of all, substantial majority of segments among geometric microliths, particularly in the Late Palaeolithic and Early Mesolithic. The proportion of trapezes in the Crimean-Belyi Les entity is much smaller, with the exception of the Crimean Late Mesolithic artefacts (Murzak-Koba). For instance, in the lower (VI) layer of Shan-Koba segments constitute about 30% of all flint tools, and trapezes only 6%. If low symmetric triangles — a version of the segments — are counted among segments, the total proportion of this kind of artefacts will be much higher [Bibikov, *et al.* 1994].

Another peculiarity of these complexes is the presence of notched blades; in two other Mesolithic entities in the Ukraine they are represented to substantially less extent or are absent (Table 1; Fig. 2; 3).

Outside the Ukraine, the Crimean-Belyi Les culture extends further to the east (in the area of so-called Gubska and the Northern Caucasus groups [Bader 1965], and to the west (found among Epigravettian sites in Romania) [Paunescu 1970]. According to Paunescu's estimates, the Cuina-Turkului complex contains over 100 segment items, and only 5 trapezes. Segments also occur in materials of the Gubska group, particularly, at the Sosruko site, where segments and segment-shaped backed blades are the main kinds of microliths. [Formozov 1965; Zamyatnin, Akritas 1957].

Substantial similarity between materials of the Crimean-Belyi Les entity and finds of the Gubska group has been mentioned also by other researchers (N.O. Bader, S.N. Bibikov). However one should see noticeable differences between them,

Table 1

Composition of Flint Tools in the Crimean-Belyi Les, the Rogalik-Grebeniki and the Kukrek entities

Tools	Entities cycles (lines) of development											
	Crimean-Belyi Les				Rogalik-Grebeniki				Kukrek			
	Mountain-Crimean culture		Belyi Les group	Average	Rogalik culture		Grebeniki	Average	Crimea	Dnieper	Northern Pontic region	Average
	Shan-Koba	Murzak-Koba			early	late						
	(6)	(4)*	(1)	(11)	(3)	(5)	(4)	(10)	(1)	(3)	(3)	(7)
Retouched blades and flakes	32.3	45.2	16.6	31.3	26.6	32.0	28.2	30.6	38.3	48.4	17.0	30.2
Notched blades	3.0	20.8	1.8	8.5	2.8	7.2	2.6	3	14.0	2.5	1	5.8
Inserts of the Kukrek type	-	0.9	-	0.3	-	0.5	-	1.1	13.7	5.5	8	9.1
Scrapers	10.8	10.6	45.4	22.3	38.1	32.5	50.6	38.7	7.7	27.3	54.8	30.3
Burins	17.9	7.9	8.6	11.5	21.8	13.5	0.6	12.3	18.2	7.1	7.3	10.3
Trapezes	3.9	6.0	1.1	3.7	4.6	10.5	15.6	10.2	0.3	1.4	1.0	0.9
Segments	25.6	0.6	10.9	12.4	-	1	-	0.3	-	-	0.1	0.4
Truncated bladelets	2.6	1.6	2.3	2.2	2.5	1.5	0.5	1.5	5.4	0.4	0.6	6.1
Backed bladelets	1.3	2.2	2.9	2.1	1.6	0.5	1.2	1.1	0.2	0.9	2.8	1.3
Other types	2.6	4.2	10.4	5.7	2.0	0.8	0.7	1.2	2.2	6.5	7.4	5.4
Total:	100	100	100	100	100	100	100	100	100	100	100	100

* the number of complexes analysed is given in the parenthesis

including the occurrence of so-called Natufian retouch in the Caucasus, as well as an obviously more significant role of backed blades here than in Crimea.

The majority of the Crimean-Belyi Les materials dates back to the Early Mesolithic, although its development is to be observed in late stages of the Mesolithic as well (Murzak-Koba in Crimea, Sosruko in the Caucasus).

Lately, A.A. Yanevich [1990] described the phenomenon of close culture-genetic links between the Mountain-Crimean culture, the Belyi Les type, and the Epigravettian monuments.

The Rogalik-Grebeniki entity occupies territories of the Ukrainian steppe zone further to the north. It includes relics of the Grebeniki culture and the Tsarinka type

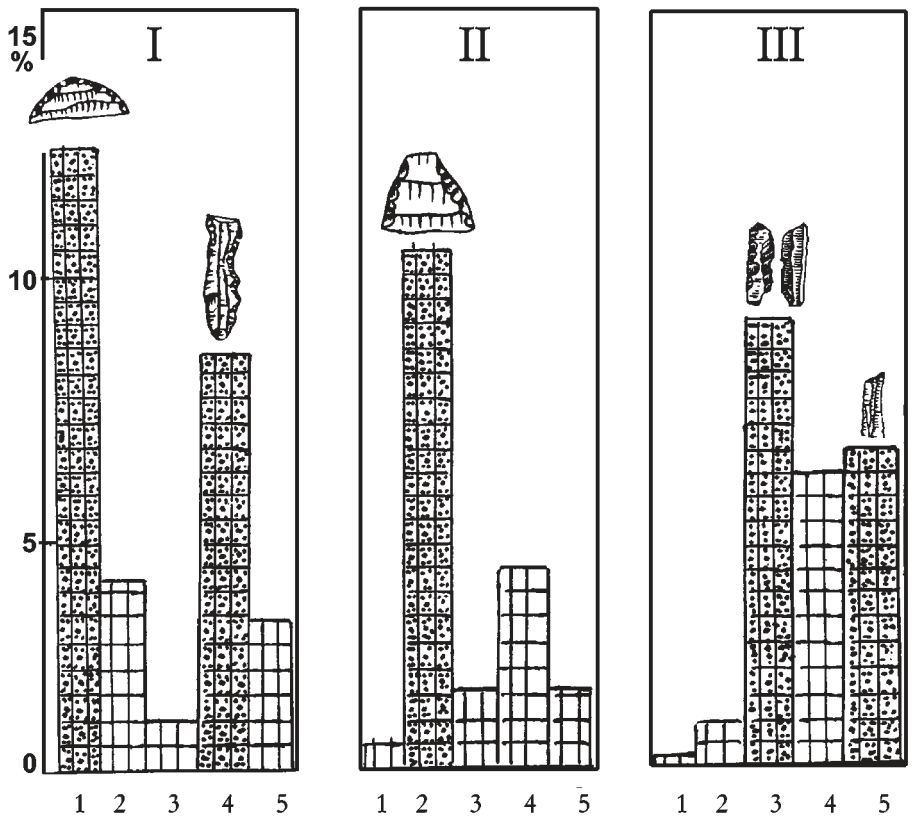

Fig. 2. Percentage of flint artefacts in the complexes of the Crimean-Belyi Les (I), Rogalik-Grebeniki (II) and Kukrek (III) entities: 1. Segments, 2. Trapezes, 3. Inserts of the Kukrek type, 4. Notched blades, 5. Truncated bladelets.

in the Northern Pontic area, as well as the Osokorovka, Leontyevka, the Surskoy island V, and the Nenasytets on the Dnieper, the Rogalik, the Mospino, the Zimovniki types in the Don and the Northern Donets area, which contain similar types of flint items. Flint complexes of these cultures and types of relics noticeably differ from materials found in contiguous groups, the Azov-Pontic region, in particular, the Crimean-Belyi Les and Kukrek.

The flint industry of the Rogalik-Grebeniki entity is characterised by the domination of trapezes among geometric microliths, usually of medium height or of elongated form. The occurrence of segments is practically unknown here (Table 1; Fig. 2; 4) or only individual items have been found (Vasilyevka-Progon). An exception from this rule is the Zimovniki site in the north-western Azov region, where A.F. Gorelik [1984] found several segment-shaped trapezes.

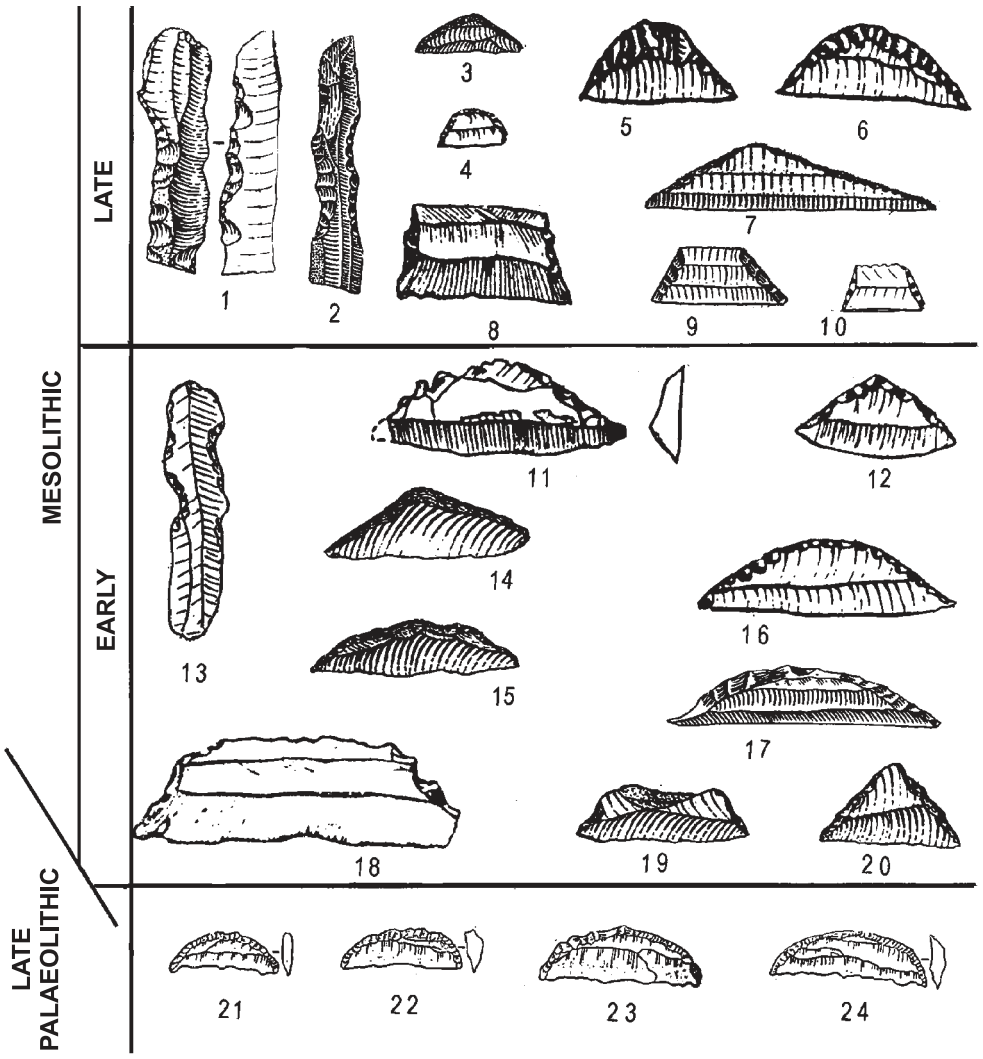

Fig. 3. Flint artefacts of the Crimean-Belyi Les entity (1-20) and the Late Palaeolithic of the north--western Pontic region (21-24). 1,9 - Laspi; 2,10,13,17 - Murzak-Koba; 3,7,14,15,19,20 - Fatma-Koba; 4 - Ala-Chuk; 8, 18 - Zamil-Koba; 2,5,6,16 - Alimovskiy Naves; 11, 12 - Belyi Les; 21-24 - Korpach.

There is a high percentage (10.2%) of trapezes in complexes of the Rogalik--Grebeniki entity, especially in Late Mesolithic complexes of Grebeniki, Nenasytets and Mospino. They are almost as common as segments in Crimea. Notched blades practically never occur in the Rogalik-Grebeniki complexes, as well as inserts of the Kukrek type.

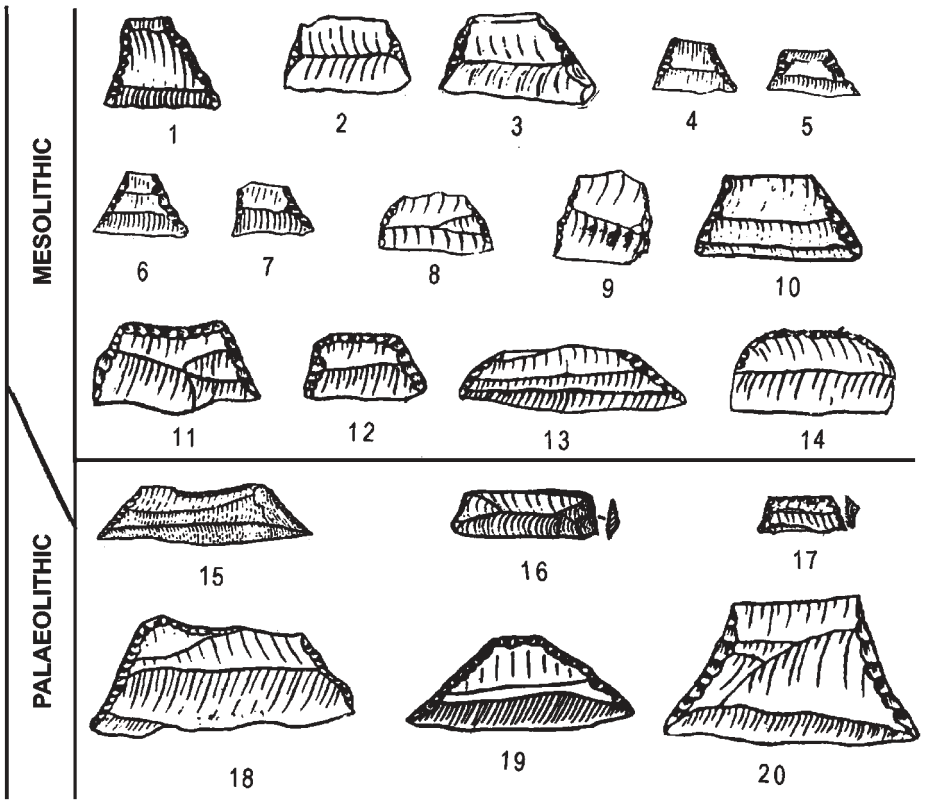

Fig. 4. Flint artefacts of the Rogalik-Grebeniki entity (1-14) and the Late Palaeolithic complexes of the Dnieper and the Donets areas (15-20). 1 - Rogalik 1; 2,3 - Mospino; 4-7 - Grebeniki; 8-9 - Lokhanska; 10- Mirnoe; 11-12 - Tsarinka; 13 - Kantserka; 14 - Teplaya; 15,18 - Osokorovka; 16 - Rogalik 2; 17 - Leontyevka; 19 - Yamburg; 20 - Surskoy.

Therefore, the main artefacts among geometric microliths in complexes of the Rogalik-Grebeniki type are trapezes that differ substantially depending on the absolute age. In earlier complexes (Osokorovka III-c, Surskoy V, Tsarinka) they are usually bigger, elongated in shape, and often bear traces of retouch on the upper base (Fig. 4:11-14). In the later periods, trapezes become noticeably smaller and get the medium wide form, "standard" for this region; some tall trapezes also occur (Fig. 4:1-10).

Gilma in Romania is a site similar to Rogalik-Grebeniki that occurred outside the Ukraine.

It took the Rogalik-Grebeniki materials a long time to be developed, just like in cases of the Crimean-Belyi Les cycle. They emerged in the Late Palaeolithic (Osokorovka III-c, Rogalik 2), and they are well-represented both in the Early

Mesolithic (Tsarinka, Rogalik 1) and the Late Mesolithic (Grebeniki, Nenasytets, Mospino).

Complexes of the Crimean-Belyi Les and the Rogalik-Grebeniki cycles differ not only in main types of geometric microliths, but also in other features, for instance, in their formation techniques. In Crimea, segments and trapezes with retouched base are well represented, but not in Rogalik and Grebeniki. Meanwhile, the Osokorovka-type trapezes with retouched base are practically unknown in Crimea and Belyi Les.

Territorially, monuments of the Kukrek entity occupy a place between the Crimean-Belyi Les and the Rogalik-Grebeniki monuments, though the division between them cannot be defined clearly. In the Northern Pontic region, for instance, the populations of the Kukrek culture and the Grebeniki culture settled in the same area (Mirnoe). A similar phenomenon may be observed in the Lower Dnieper region

The Kukrek flint industry differs radically from both the Crimean-Belyi Les and the Rogalik-Grebeniki. The Kukrek complexes, unlike the other ones, contain practically no geometric microliths. Meanwhile, original flint items, like inserts of the Kukrek type occurred; they did not appear in other cultures (Table 1; Fig. 5).

Hence, on the grounds of the above data, we may state the fact of existence of three major entities of the Mesolithic period in the Azov-Pontic area: the Crimean--Belyi Les, Rogalik-Grebeniki, and Kukrek. These entities, living in the same period in practically the same environmental conditions of the steppe zone of the Ukraine and Crimea represent, due to differences in materials, three groups of tribes. This conclusion becomes even more obvious if we consider the issue from the perspective of origins of the culture of these entities, and then, the reflection of each of them in the Neolithic cultures.

The issue of origins of cultures with segments of the Crimean-Belyi Les entity and, in particular, the Shan-Koba stage of the Mountain-Crimean culture is hardly a new one. It was the research topic in a number of works [Bonch-Osmolovskiy 1934; Bibikov 1966; Vekilova 1971; Yanevich 1990, and others]. Recently, this issue has been analysed in a separate chapter of a book by S.N. Bibikov, V.N. Stanko and V.Y. Koen [1994], which makes it unnecessary for us to be considered here in full.

Summing up the analyses of the data, including the most recent ones, we may argue that the principle factor in the formation of both the Shan-Koba and the Belyi Les industries was predominantly autochthonous development of the local Late Palaeolithic monuments of Crimea, the Dniester region and the Northern Caucasus. Above, we argued that the main diagnostic feature of monuments of the Crimean--Belyi Les entity was the occurrence of segments and low segment-shaped triangles. Therefore, when investigating the issue of genesis of the Mesolithic flint production technology, one should study the earliest stages of emergence of such tools. In this context, we should note that elongated segment-shaped backed blades with sharp retouch on the curved edge are rather broadly represented in the Late Palaeolithic cultures of Europe — the Epigravettian, etc. Sometimes they were found in large numbers in the Late Palaeolithic complexes of the area that was later inhabited

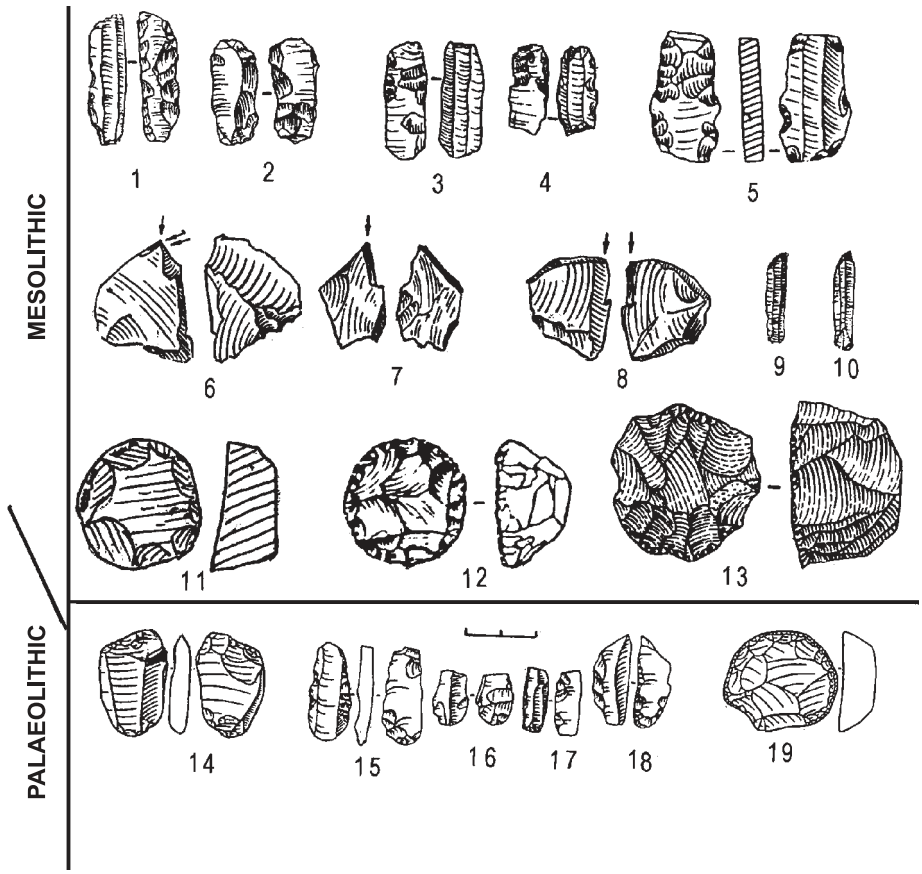

Fig. 5. Flint artefacts of the Kukrek entity (1-13) and the Late Palaeolithic complexes of the northern Pontic region (14-19). 1-4, 6-11 - Kukrek; 12 - Kizlevyi; 13 - Anetovka 1; 14, 19 - Dmitrievka; 15-18 - Anetovka 2.

by the population of the Crimean-Belyi Les entity. In this sense, it is important to point out the occurrence of segments that are typologically identical to the Shan--Koba ones, for instance, in the Syuren 1 complex, which allowed E.A. Vekilova [1971] to make a suggestion about autochthonous way of formation of the Crimean Mesolithic. Other renowned researchers of the Crimean Stone Age (G.A. Bonch--Osmolovskiy, O.N. Bader, D.O. Kraynov, and others) expressed similar views.

As excavations at the Korpach site in Moldavia have shown, the segments, typical for cultures of the Crimean-Belyi Les entity, first appeared in the Dniester region in the Late Palaeolithic. The site is dated by radiocarbon method to 25 thousand years ago [Grigoriev 1983]. The whole series of such items were found there (Fig. 3:21-24).

According to G.V. Grigoriev, similar materials are characteristic of other territories of Europe as well, particularly Poland and Italy. The data that cannot be ignored suggest that genealogical roots of the Crimean-Belyi Les monuments, with segment as a distinguishing kind of microliths, go deep into the local Palaeolithic cultures, represented here by artefacts of Syuren 1 in Crimea or Korpach in Moldavia.

The occurrence of the whole series of segment-like geometric microliths allows looking at the question about the time of appearance of the first trapezes in the Azov-Black Sea region from a new point of view. The focus is, primarily, on so-called Osokorovka trapezes which have been represented at a number of sites, including Osokorovka 3 b, Rogalik 2, Leontyevka, Ivashkov, Tsarinka, etc. These artefacts bear some resemblance to rectangular and trapezes knives of the Magdalenian and the Hamburg cultures of Western Europe [Schwabedissen 1944] where they are referred to the Late Palaeolithic. However, researchers did not have a single opinion about dating complexes containing such trapezes. Some authors, like, for instance, P.I. Boriskovskiy, A.P. Chernysh, D.Y. Telegin regarded them as belonging to the Early Mesolithic, while others, including I.F. Levitskiy, V.N. Stanko, S.A. Dvoryaninov, L.L. Zaliznyak. N.P. Olenkovskiy, I.V. Saposhnikov and others argued that these finds belonged to the Palaeolithic. Taking into account the above material, and considering stratigraphical conditions where some complexes with the Osokorovka trapezes are found in rather early layers of loess, it is possible to suggest that trapezes emerged in the Late Palaeolithic period. In such terms the most representative are the conditions of cultural horizons occurrence at the Osokorovka site [Levitskiy 1949], where a layer with trapezes (III-c) was found in about 3 meters deep deluvial loams on the depth of about 3 meters. Remarkably, above the III-c horizon, also in deluvial loams (2 meters deep) a researcher found two more poor Mesolithic horizons (1, II), and above that there was an almost 1.5 meter layer under a fine layer of humus (Fig. 6). According to geologists, the Osokorovka loess loam belongs to the level of so-called Black Sea loess [Veklych 1968], the emergence of which is dated back to the Late Palaeolithic, which is probably directly linked to defining dates and archaeological horizons in those layers. A similar situation of the occurrence of a culture layer containing Osokorovka trapezes in the loam over 4 meters deep has been described by N.P. Olenkovskiy [1991:163] and in Leontevka. Due to these observations their author dates the monument to the Allerod.

Therefore, the beginning of formation of early cultures of the Rogalik-Grebeniki entity, as well as of the Crimean-Belyi Les entity, may be also dated back to the Late Palaeolithic.

Monuments of the Kukrek entity also have ancient roots going deeply to the Palaeolithic.

Concerning this issue, we have already suggested that the process of formation of the Kukrek monuments could be substantially influenced by traditions of the Late Palaeolithic Europe [Telegin 1982]. Later on, this hypothesis has been fully supported and developed in the works of V.N. Stanko [1982] and S.P. Smolyaninova [1990]. Apparently, nowadays it should be argued that the Kukrek (Anetovka)

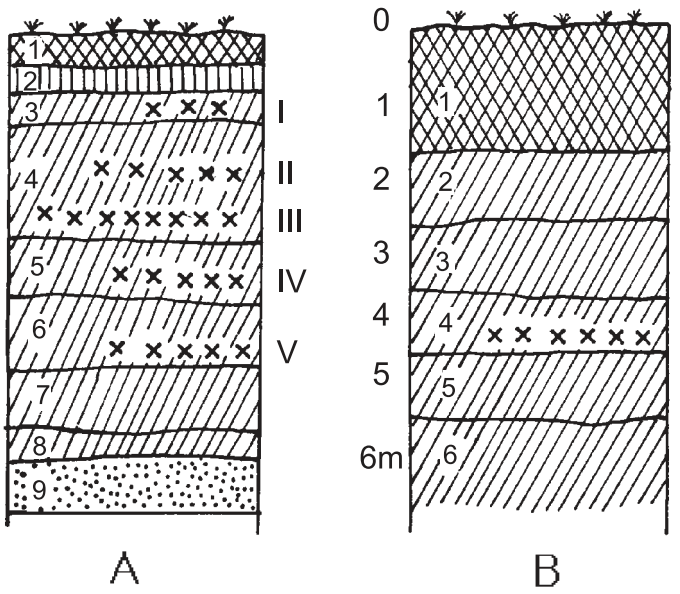

Fig. 6. Stratigraphic conditions of the occurrence of the Late Palaeolithic layers at the sites of Osokorovka (A) and Leontyevka (B). 1. Soil, 2. Loess. 3-8. Layer of loess-like loam, 9. Sand, I-V - archaeological layers.

monuments in the Southern Bug region developed mainly on the basis of the local Late Palaeolithic monuments, where S.P. Smolyaninova [1990: 94] outlines their following genetic line: Sakhaidak 1 — Anetovka 1 — Abuzova Balka — Konetspol. Meanwhile, the Sakhaidak cultural layer is dated to over 20,000 years ago by the radiocarbon method, while Abuzova Balka and the Konetspol belong to the Late Mesolithic. The adequacy of such a genetic line of development from the Palaeolithic (Sakhaidak — Anetovka) to the Kukrek culture is supported by a number of common features. They include the occurrence of typical round scrapers, blades with flat retouch on the bottom face and, in particular, the so-called chisel tools among their flint inventories.

These artefacts — the purpose of which is not totally clear — are related to the inserts of the Kukrek type in terms of technology of their manufacturing with a help of flat retouch. Typologically similar types of bone points with grooves for inserts also may follow more or less direct line of genetic development from the Late Palaeolithic monuments to the Kukrek culture.

However, this does not bring us to conclusion that the genesis of the Kukrek culture should be also searched for in the Southern Bug region. Obviously, the issue is far more complex, as the Southern Bug is not the only area where the Palaeolithic sites close to Sakhaidak have been found. They have also been found

in the Azov region: for instance, Muralovka, Zolotovka [Praslov 1972; Krotova 1985]. The Muralovka layer is dated by radiocarbon method to 18,000 years ago. In addition, N.P. Olenkovskiy [1989] studied a number of the Palaeolithic sites in the Lower Dnieper region: Novovladimirovka, Pervomayevka, Lyubimovka III and others, characterised by the occurrence of up to 18.5% of chisel-shaped tools with flat retouch on the bottom face and round scrapers (defined by the author as "nucleus scrapers").

A site containing chisel-shaped artefacts, the Siyuren 2, was discovered in Crimea a long time ago.

Therefore, the above may bring us to at least two conclusions: the first, the area of formation of the Kukrek culture could include almost the whole Northern Pontic region and Crimea, and, the second, genetic roots of this cultural phenomenon, as well as of both of the afore-mentioned cultural-territorial entities, originate from the Late Palaeolithic.

In order to complete the study of the three Mesolithic cultural-ethnographic entities described above, we still have to consider briefly the role of population of these cultural phenomena in the Neolithization of the region. According to established experts' views, the principle features of the Neolithic cultures of Eastern Europe that make them distinct from the local Mesolithic is the occurrence of ceramics in the complexes and the emergence of food-production. Meanwhile, the Early Neolithic tools made of flint, stone and other materials often retain Mesolithic or close forms. This factor, as well as some other features of continuity in cultures of the transitional period from the Mesolithic to the Neolithic allows us to follow genetic development lines of cultures of the Mountain-Crimean-Belyi Les, the Rogalik-Grebeniki and the Kukrek entities into the local Neolithic.

Obviously, the effort to trace genetic connections between cultures of different epochs is a difficult task, and positive results are by now not obtainable in all cases. Hence, for instance, from a number of cultures and entities considered above, we can trace features of genetic continuity in the transition from the Mesolithic to the Neolithic only in some cases, including transitions between:

(a) flint industries of the late stage of the Mountain-Crimean culture (the Murzak-Koba stage) and the local Crimean Neolithic culture of the Tash-Air type;

(b) industry of the latest monuments of the Rogalik-Grebeniki entity (Nenasytets) and the oldest sites of the Dnieper-Donets culture, and

(c) complexes of the Dnieper version of the Kukrek culture (Igren) and the Surska culture.

In Crimea, an evident example of a clear tradition in the development of the flint technique in the course of transition from the Late Mesolithic to the Neolithic may be observed in materials of the multilayer site of the Tash-Air, excavated by D.A. Kraynov [1969]. There, in reliable stratigraphical conditions under a shelter the researcher separated ten cultural horizons, including three lower (IX-VII) pre-ceramic layers, and five upper layers that contained pottery. In this particular case we may be interested, first of all, in the late Mesolithic layer VII that contains no ceramics, and in the successive layers VI and Va where it appears for the first

time. The finds represent pottery fragments of the Early Neolithic vessels with sharp bottoms and impressed ornament. Similar ceramics has been found in Crimea in many other places, including Zamil-Koba 2, Ost-Bash, Kaya-Arasy (lower layer), Shan-Koba (upper layer) and others.

Although the sixth layer of Tash-Air contains only 11 fragments of such vessels, in layer Va their number grows to about 300.

As it was mentioned before, in the study of the process of transformation of the Late Mesolithic culture into the Neolithic culture, the prime importance is given to flint artefacts that occur in the Mesolithic as well as in the Neolithic layers of the site. Remarkably, in many cases the types of artefacts and technologies of their manufacturing are very similar in the Mesolithic and the Neolithic layers. As an example, we will compare geometric microliths — trapezes, segments and triangles that were found in about the same quantity in all three adjacent layers of Tash-Air: 12 in layer VII, 9 in layer VI, and 11 in layer Va. The direct typological and technological continuity in development of those tools from the Mesolithic (layer VII) to the Neolithic (layers VI-Va) is evident, particularly in types of segments and segment-like triangles (Fig. 7), as D.A. Kraynov pointed out. The trapezes in all three layers are typologically identical as well, although some changes may be observed in their development, including the occurrence of trapezes with a flat retouch of edges layer VI (Fig. 7). For Crimea one may refer to other examples of direct succession in development of geometric microliths that accompanied the transition from the Mesolithic to the Neolithic. We mean here materials of another multilayer site, Zamil-Koba 2, where the lower horizon 7 and 8 contained the Mesolithic finds, while above (horizon 6-5) the Neolithic pottery of the Tash-Air type was found [Kraynov 1938].

In our view, the above observations of continuity in the development of the flint industry that accompanied the transition from the Mesolithic to the Neolithic clearly prove the important role of the Mesolithic of the Mountain-Crimean culture population in the formation of a local Neolithic culture of the Tash-Air type in Crimea.

The analysis of relevant materials from the steppe Ukraine points to the fact that similar processes of autochthonous development of cultures during the transition from the Mesolithic to the Neolithic also occurred on the north, in the areas populated by the Mesolithic tribes of the Rogalik-Grebeniki and the Kukrek entities. The early Neolithic is represented here by monuments of three cultures: Surska, Dnieper-Donets and Bug-Dniester.

The richest materials for the solution of the issue of transformation of the Late Mesolithic cultures in the Neolithic ones may be found on the Lower Dnieper. In this area investigated Mesolithic monuments include the Igren settlements of the Dnieper version of the Kukrek culture, and a number of settlements from the latest stage of the Rogalik-Grebeniki entity of the Nenasytets type, including Vasilyevka and the Lokhanska island. Other well-represented Neolithic settlements of the Surska culture in the Dnieper region include the Surskoy island, the Shulayev island, Strilchaya Skelya, and settlements of the Dnieper-Donets culture, including the Volchek, the Sabachki, and the Vovnigi.

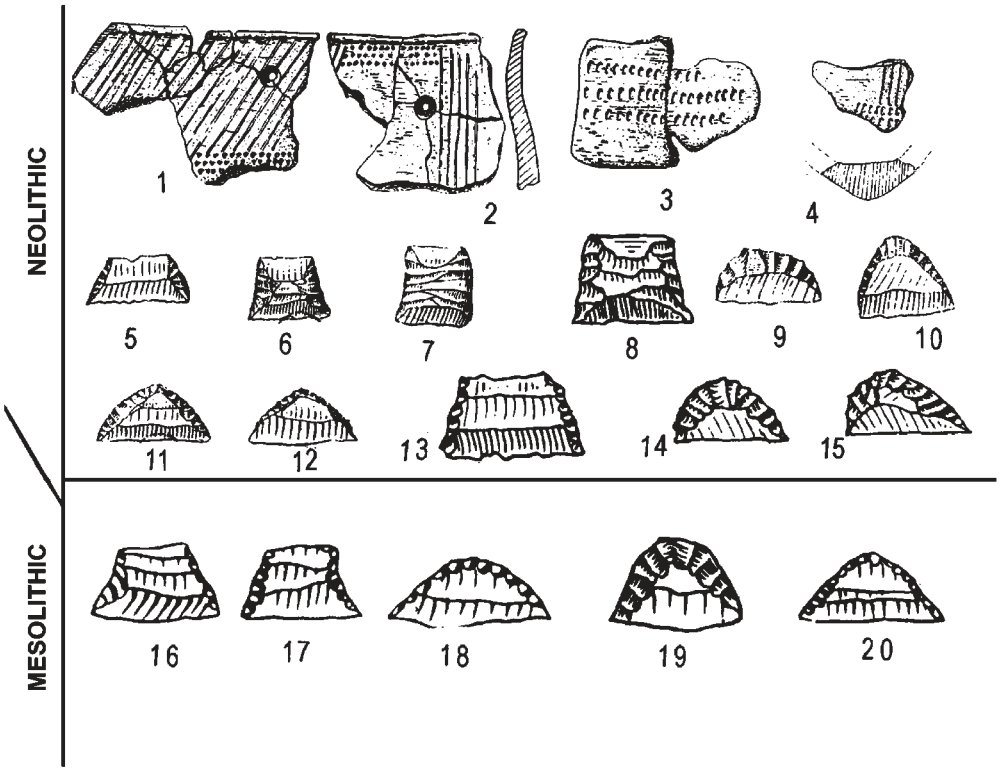

Fig. 7. Comparative table of geometric microliths from the Late Mesolithic (16-20), Neolithic (5-15) and from the Crimean Early Neolithic asemmblages with pottery (1-4). 1,2,8,13-15 - Kaya-Arasy; 3 - Zamil-Koba 2; 4,7,9,10 - Tash-Air, layer Va; 5 - At-Bash; 6,11,12 - Tash-Air, layer VI; 16-20 - Tash-Air, layer VII-VIII.

Let us try to determine genetic links between the Mesolithic and the Neolithic cultures relying on samples of flint materials of the Surska culture compared with artefacts from the Igren settlement.

In general, the Surska culture is represented by microlithic cores and small blades. Retouched blades occupy an important place among tools. According to all these indicators, flint artefacts of the Surska settlements, in particular, of the Shulayev and the Surskoy islands display considerable similarity to materials of the Kukrek culture site Igren, in respect of quantity and typology. The same is true about other kinds of artefacts: scrapers, knives, etc. In particular, it is important to stress the occurrence of tall scrapers in the Igren and the Surska series of the Lower Dnieper region — a form that is not typical for any other culture type in the region (Fig. 8). Monuments of the Igren and the Surska types are genetically linked also by the occurrence of the inserts of the Kukrek type that are practically absent

in all other Mesolithic and Neolithic cultures. On the other hand, both the Kukrek and the Surska cultures are characterised by almost total absence of trapezes and other geometric microliths — that is a fact that may also point out to identical ways of development of these cultures and their genetic similarity.

Important data for the solution of the problem of historic development of the Kukrek culture are also obtained through comparative analyses of bone items, well represented both in the Igren complexes and among the Surska artefacts. Typologically they are rather similar. They represent similar types of axes-hatchets made of bone, and hoes-hammers made of deer horn, chisels of boar fangs, bone points, knives, awls, sewing needles, etc. At least two of three types of dart points found at the Igren site have direct analogies in the Surskoy complex. Many common features are found between fishing tools of the complexes under consideration (Fig. 8). The technology of bone processing in the Igren was close to that of the Surska culture.

In our view, all the above data indisputably point out to genetic relation between the Dnieper version of the Kukrek culture and the Early Neolithic monuments of the Surska culture which together form a common line (cycle) of cultural development of two immediate epochs: the Mesolithic and the Neolithic, the line that originates from the Late Palaeolithic age.

Apparently, this line of direct transformation of the Kukrek culture into the Neolithic one in the steppe Ukraine was not unique. Similar features are observed in the course of comparative analyses of flint materials found at sites of the Nenasytets type and settlements of the Dnieper-Donets culture. They are linked by two features: firstly, both contain significant numbers of typologically identical trapezes and, secondly both contain no inserts of the Kukrek type. However, other — rather similar — collection of flint artefacts does not contradict the conclusion about genetic relations between late monuments of the Rogalik-Grebeniki community and the Dnieper-Donets culture.

In fact, we raised the issue of an important role of the Late Mesolithic monuments like the Nenasytets, the Donets and the Dnieper-Pripets (Rudoy Ostrov) cultures several times before [Telegin 1966; 1968:28], therefore, it is hardly appropriate to discuss this question here again.

Summing up the study of the Mesolithic monuments of the Azov-Black Sea region of Eastern Europe, one may ascertain — as it was mentioned above — the occurrence of three main culture-ethnographic groups of population: the Crimean — Belyi Les with segments, the Rogalik-Grebeniki with trapezes and the Kukrek with inserts, burins and scrapers of the Kukrek type. Origins of formation of all those entities bring us to the Palaeolithic. In our opinion, the analysis of flint artefacts allows to follow further developments of Late Mesolithic cultures of the region that created the basis for the Neolithic cultures, including the Tash-Air type in Crimea, the Surska on the Lower Dnieper and the Dnieper-Donets culture in the steppe and forest-steppe parts of the Ukraine.

Finally, we would like to suggest that the above picture of the occurrence of three genetic lines (cycles) of cultural development during the transition from the Palaeolithic to the Mesolithic and the Neolithic represents just a general scheme

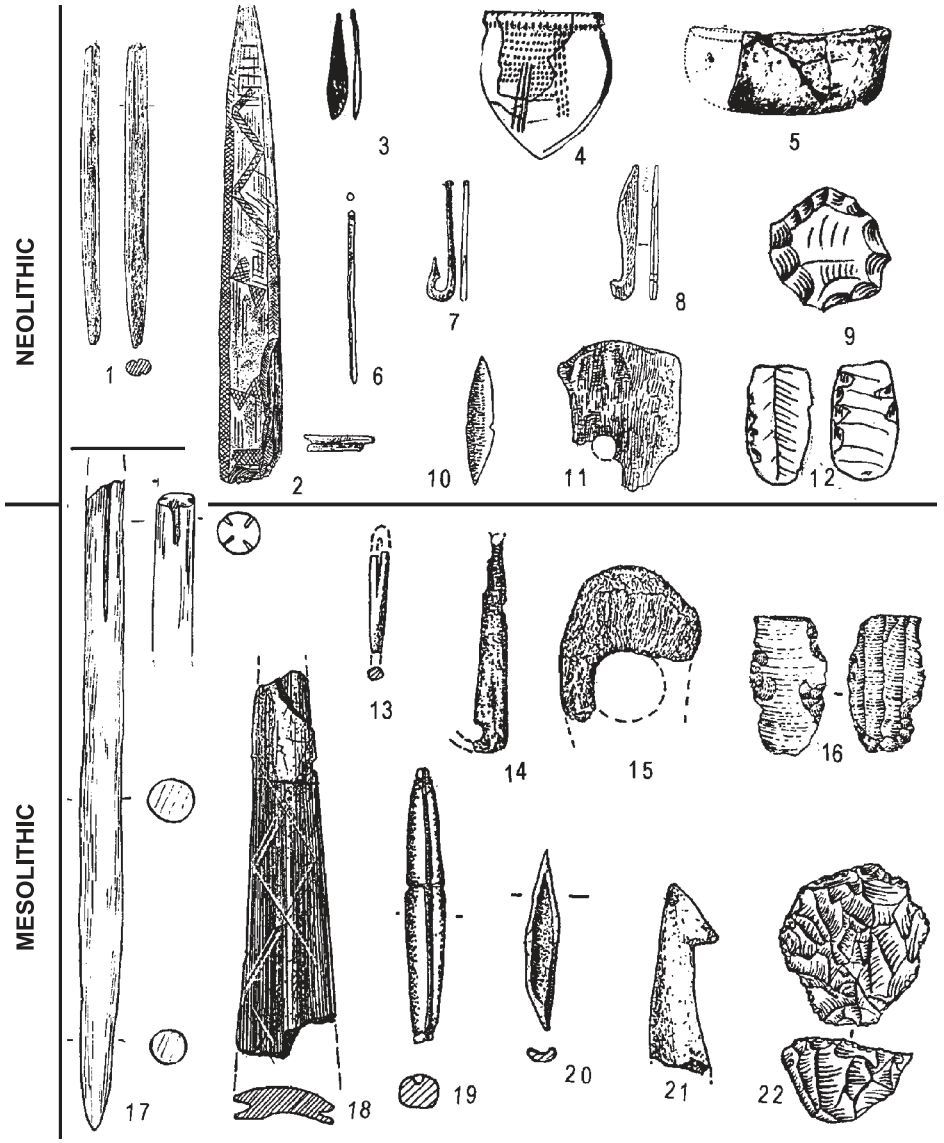

Fig. 8. Comperative table of bone, horn and flint artefacts of the Kukrek cultlure (13-22) and the Surska culture (1-3, 6-12); vessels (4,5). 1-3, 5-8, 12 - Surskoy; 4 - Strilchaya Skelya; 9-11 - Shulayev; 15-22 - Igren 8.

which, regretfully, offers no answer to many other questions. So far, the problem of culture-genetic relations of the Grebeniki culture and the Bug-Dniester culture found at the same territory remains unclear. This study did not raise the issue of external influences on the processes of Neolithization of the Azov-Black Sea region, including the impact of the Criş-Starčevo culture from the Balkans on the southern Bug-Dniester culture formation. It did not raise a problem of the latter's role in the emergence of the Dnieper-Donets culture either. Apparently, the appearance of the Surska and the Mountain-Crimean cultures also involved external impulses. It is not unlikely that the impulse went from a common centre, which would explain the relative similarity of ceramics of these cultures, although no such similarity is observed in flint materials.

The solution of these issues is still open to further research.

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THE UKRAINIAN STEPPE AS A REGION OF INTERCULTURAL CONTACTS BETWEEN ATLANTIC AND MEDITERRANEAN ZONES OF EUROPEAN MESOLITHIC

1. THE STEPPE ZONE OF THE UKRAINE AS A REGION OF INTERRACTION OF TWO CULTURAL AREAS OF THE EUROPEAN MESOLITHIC

The territory of the Southern Ukraine since the Final Pleistocene was an area of intensive cultural contacts between the Northern European (or "Atlantic") and Mediterranian areas of the Old World. The western coast of the Black Sea during the Early Holocene was a possible way of spreading of some Mediterranean cultures with a new pressure technology of blade processing and with trapezes as infiltration of agricultural economy in to the Central and Eastern Europe [Clark 1958:37-40].

All Mesolithic cultures of the Northern Ukraine belonged to the Atlantic area or zone of European Mesolithic, which was spread over the Northern European lowlands of Poland, Germany and Great Britain [Zaliznyak 1984a; 1989; 1991]. At the same time, according to the S.N. Zamyatnin's point of view the cultures of the Crimean Mountains were connected with a special "Mediterranean historical--cultural zone" of the Upper Palaeolithic and the Mesolithic of Southern Europe, the Near East and Northern Africa [Zamyatnin 1951:120-145].

The specific Mesolithic cultures of the Northern Crimea and other steppe regions of the Southern Ukraine were situated between these two zones (e.g. Zimovniki, Grebeniki, Donets and various cultures of Kukrek tradition). This territory both in the Final Pleistocene and in the Early Holocene was a steppe terrain with sufficiently stable preservation of open landscape conditions.

However during the Pleistocene-Holocene boundary, the bison (*Bison priscus*) as a main object of Final Palaeolithic mass drive hunting was substituted in Mesolithic assemblages by auroch (*Bos primigenius*). The latter probably came from the West Europe where closed mountainous landscapes were better preserved during the Late Pleistocene [Bibikova 1975:67-72]. At the same time the Pleistocene horse (*Equus latipes*) was substituted by the tarpan-horses (*Equus gmelini*) which existed in

Ukrainian steppe until the recent time [Stanko 1982:151-154]. Other species typical for Pleistocene steppe (*Saiga tatarica, Asinus hydruntinus*) coexisted inthe Holocene with certain forest and semi-steppe hoofed game (*Cervus elaphus, Sus scrofa, Capreolus capreolus* and even *Alces alces*). The latter group of hunting prey indicates the presence of some closed forest and bush landscapes in the river valleys and ravines during the Early Holocene.

Therefore some technological traditions of local Upper Palaeolithic industries (viz. Osokorovka and Anetovka I cultures) of steppe area were sometimes preserved and even continued in the Mesolithic assemblages of the Grebeniki and Kukrek cultures [Stanko 1982:114-117; Telegin 1982:117-127]. This situation was quite different from that in the forest zone of the Northern Ukraine where the Mesolithic cultures of Atlantic zone (viz. Komornica and Janisławice) practically had no connections with the previous local Final Palaeolithic ones [Zaliznyak 1991:137]. The further development of local Final Palaeolithic technological tradition of hunting weapons manufacturing in the Mesolithic cultures of steppe zone (especially in cultures of Kukrek tradition) was connected with the preservation in Early Holocene of open landscapes and probably some similar elements of bison hunting strategy but adapted for auroch [Nuzhnyi, Yanevich 1987:40].

Unfortunately at present we have no reliable reconstructions of auroch's (*Bos primigenius*) models of behaviour and seasonal adaptation in open steppe zone because during historic times it has been preserved only in closed forest terrain. The dental system of auroch was more connected with the meadow vegetation and semi-closed landscape or meadow conditions of river valleys contrary to the bison's one more adapted to dry steppe grass of plateau. However both these species were preserved recently in similar forest conditions of Poland, Belorussia and the Ukraine.

The same Mesolithic assemblages both of faunal remains of clear dry steppe species (e.g. *Saiga tatarica, Equus gmelini, Asinus hydrintinus* etc.) and auroch were found; the latter probably was adapted to open landscapes, too. At all points the common biological model of hoofed animals behaviour demonstrates the global tendency of herd growth in condition of more open terrain and their reduction in more closed one [Formozov 1969:70-71]. On the other hand, the increased herds stipulated both faster exhaustion of pastures and more intensified migrations of herbivorous animals. That is why the local Upper Palaeolithic tradition of seasonal and collective mass drive hunting of large herd game at the whole was preserved and continued by the population of Mesolithic steppe cultures, too.

The latter kind of economy was very attractive for prehistoric hunters because it permitted the easier and faster obtaining of large amounts of meat. However, such a model of "periodically rich" economy both in the Pleistocene and the Holocene was very dependent on seasonal and climatic conditions (which directed the migrations of game) and therefore was more unstable than "constantly poor" multibranched one. The latter was typical for different closed terrains and since the Final Pleistocene was represented by economy of Early Mesolithic mountainous hunters of the Crimea (as a region of Mediterranean zone). The similar models of eco-

nomy were spread since the Holocene within the forest population of the Northern Ukraine as a region of Atlantic zone of European Mesolithic. An important role in above-mentioned kind of economy has been played also (except individual hunting with bow and arrows) by fishing.

In contrast to multibranched economy, the specialised Final Palaeolithic and Mesolithic drive hunters of steppe zone carried out the same strategy of intensive exploitation of aquatic resources (first of all fish) only during the periodical food crises. In such a case the richest regions of river valleys (especially rapids) became fields of inter-group "possessive competition", collisions and even warfare conflicts [Balakin, Nuzhnyi 1995:191-198]. In the observed area such territory were the rapids of Dnieper River where the oldest Final Palaeolithic and Mesolithic graveyards (Voloshskiy, Vasilyevka 1 and 3 etc.) were discovered as well as evidence of the human mass killing was found [Telegin 1982:205-208]. It is noticeable that in the numerous Neolithic cemeteries (more than 10 graveyards and near 500 burials) situated in the same region similar data of mass warfare conflicts were practically absent [Balakin, Nuzhnyi 1995:196].

For reasons given above, constant attraction and periodical seasonal unstability of tundra-steppe or steppe economy of specialised drive hunters as well as frequent food crises determined the regular infiltration or direct mass migration of steppe population to the regions with more closed landscapes. The latter (mountainous, forests and bush of large river valleys) were poorer for hunting strategy but more stable for fishing and gathering than an open steppe terrain with large herds of herbivores. According to the archeological data this process in the Ukrainian steppe have been taking place more often in southern direction during the Final Pleistocene and mainly to the northern one in the Early Holocene.

For example, since 15-14 millenium BP we have a lot of evidence that numerous "geologically modern" sea and delta shells *Nassa reticulata*, *Cerithium vulgarum* and *Ciclope neritea*, *Theodoxus sp.* (drilled and intactted) are present in the assemblages of some Epigravettian sites from the Northern Ukraine and the South-Western Russia (Mezin, Mezhirich, Semenivka 2 and 3, Yudinovo). These sites are situated more than 500 km northward from the extreme area of shell habitat on the Black Sea coast and a problem of their origin is still opened [Shovkoplyas 1965:278-283; Nuznyi 1997:18].

As a second similar case of direct migration of some tundra-steppe reindeer hunters group is represented by the well known genuine sites of the Swiderian and Arhensburgian cultures in the Crimean and the Carpathian Mountains [Zaliznyak, Yanevich 1987:12-14). But closed mountainous landscapes during the Final Pleistocene and the Earliest Holocene were constantly regions of infiltration or even direct long-time migration of large groups not only reindeer but also bison and auroch hunters of steppe cultures of the Epigravettian and Kukrek traditions (e.g. Vishennoe, the Shpan and Kukrek cultures) [Yanevich 1992:20-31; 1993:3-13; 1987a:7-17].

The spread of forests in the Northern Ukraine, Belorussia, Lithuania and Poland during the Early Holocene also defined another northern direction of periodical migration or infiltration of steppe population. For instance, the influence of

steppe Final Palaeolithic cultures of the Epigravettian tradition to a great extent defined also the peculiar character of microlithic assemblage of the Early Mesolithic Kudlayevka culture in the Northern Ukraine. That was different from the assemblage of related but more western Komornica culture of Poland. This diference has a form of domination of the first various small lanceolate and microgravettian points in microlithic assemblages [Zaliznyak 1991:24-25]. Exactly the same kinds of microliths are very typical for lithic assemblages of the Final Palaeolithic Epigravettian sites of steppe zone. Other expressive case is represented by infiltration of steppe population of the Kukrek culture in the same direction. The typical sites are found in the forest zone of Ukrainian Polesye. The process of the "Neolithization" of the local Late Mesolithic culture was under the Kukrek culture influence [Danilenko 1969:30; Zaliznyak 1991:41-44).

From the author's point of view the proposed hypothesis explains the common model of cultural interraction of population of the Atlantic and Mediterranean zones in the Final Palaeolithic and the Mesolithic of Eastern Europe. This process acquired more intensificated forms during the abrupt climatic and ecological changes of hte Pleistocene-Holocene boundary.

2. THE SHPAN CULTURE AS A NEW PHENOMENON OF THE UKRAINIAN STEPPE MESOLITHIC

The specific assemblage of microliths (including asymmetric triangles, Swiderian points and backed microliths) from the 4th layer and lower part of 3rd layer of Shan-Koba and 5-4th layers of Fatma-Koba rock shelters in the Crimean Mountains for a long time was an object of interest of many archaeologists [Formozov 1954:40; Bader 1961:19]. However the assemblages of both sites stratigraphically lain between the deposits of the Shan-Koba and Murzak-Koba cultures and therefore were mixed with them. The similar microlithic assemblages (formed by backed microgravettian points, asymmetric triangles and oblique truncated points manufactured in the microburin technique and numerous microburins) were identified also at some other mixed sites (Alekseevskaya Zasukha, Balin-Kosh, Sy-At III, Frontovoe I and 3 etc.) both of steppe part of Crimea and alpine meadows [Nuzhnyi 1992: 33-34, 79-81]. As a very specific sign of such backed microliths is a presence of numerous diagnostic impact fractures from their use as pointed arrow-heads.

The afore-described microliths from the Crimean sites had a close analogy with the ones which were found in the human skeletons of Chaplinskiy, Vasilyevka 1 and 3 cemetcries of Dnieper rapids region [Nuzhnyi 1992:79]. The presence of Swiderian tanged points in assemblages of Shan-Koba and Fatma-Koba only as an addition became understandable after the discovery of new sites of Swiderian culture in Crimea dated by Dryas III (the earliest assemblage of Sy-At III, 4th layer of Buran-Kaya III etc.) [Zaliznyak, Yanevich 1987:6-15].

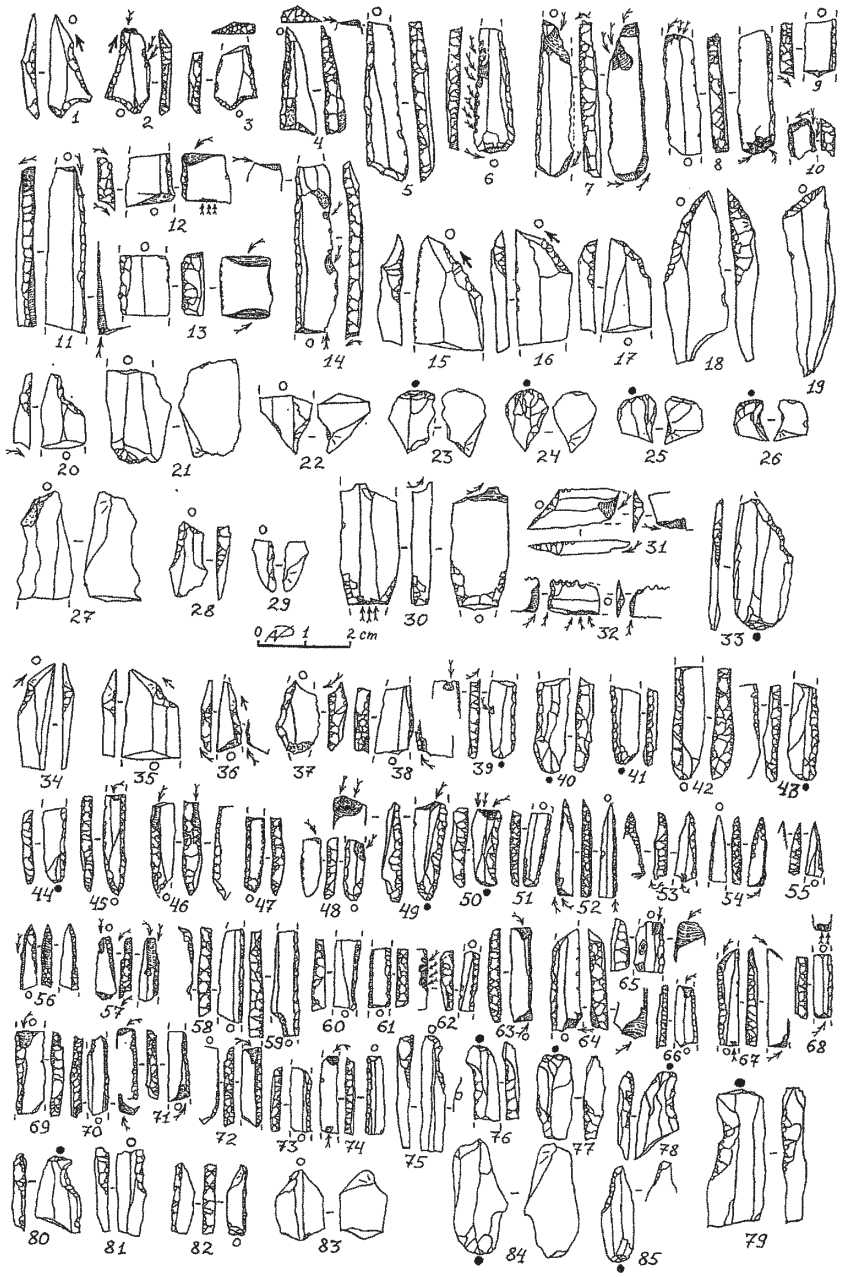

Fig. 1. The microlithic assemblages of the Shpan culture in the Crimea from 2nd layer of Shpan-Koba (1-33) and Balin-Kosh (34-85).

The first more or less clear assemblage of this cultural phenomenon in Crimea was discovered by A.A. Yanevich in the second layer of Shpan-Koba rock shelter situated on the alpine meadows. Above-mentioned assemblage dated by radiocarbon method 9150±150 BP* and other 12 ones mixed (4th and 3rd layers of Shan-Koba, 4-2nd layers of Fatma-Koba, Su-At III, Ala-Chuk, Balin-Kosh, Frontovoe I and 3 etc.) become the main basis for definition of the new Early Mesolithic Shpan culture in the steppe zone of the Southern Ukraine [Yanevich 1993:3-15]. According to this, the genesis of this culture was connected with the local steppe Final Palaeolithic industries of the Epigravettian tradition and concretely with the assemblage of Vishennoe 2 site in Crimea.

The microlithic assemblage of the 2nd layer of Shpan-Koba includes the specific asymmetrical triangles (Fig. 1:1-5) processed with abrupt or semi-abrupt retouch on the longer part and abrupt or bipolar ones on the base. Sometimes these triangles were manufactured in the microburin technique (Fig. 1:1-2) similarly to the oblique truncated points (Fig. 1:15, 16). However, the base of this assemblage is formed by the different fragments of more or less wide and massive backed points (or perhaps parts of triangles, too) processed by the high abrupt and bipolar retouchs (Fig. 1:6--14). The largest body of them are fragmented by the diagnostic macro-fracture from the use as arrow-heads (Fig. 1:6-14). The microburins on the proximal and distal ends of blades are present, too (Fig. 1:21-28), but the first are more numerous. There is one pseudo-microburin (microburin without retouched notch) in the assemblage (Fig. 1:29).

In the above-described assemblage are present also some mixed materials in the form of two typical trapezes of the Late Mesolithic Murzak-Koba culture (Fig. 1:31, 32). They probably got here from the upper layer with pure Murzak-Koba assemblage. In the same way two fragments of Swiderian tanged points (Fig. 1:30) probably hit from lower one which contained materials of the Shan-Koba Early Mesolithic culture, dated by the Final Pleistocene.

Other lithic chipped tools are represented by truncated and angle burins on the blades and sometimes by dihedral ones on the flakes. The scrapers are more numerous than burins and usually have the simple form of end scrapers on the blades or also their double version. The technology of blade processing in an assemblage of the second layer of Shpan-Koba was directed to manufacturing of medium-sized blades with the prismatic cores.

However, among the sites of the Shpan culture even in Crimea the considerable variations both of above-mentioned types of microliths and their dimensions presented in the lithic assemblages occured. These variations probably reflect the different chronological positions of sites and intensificated change of both main technological principles and lithic assemblages of the Shpan culture.

For example, the assemblage of the Sy-At III site, situated on the alpine meadows of the Crimean Mountains, includes many oblique truncated points with microburin spall (Fig. 2:1-5) and small asymmetrical triangles also with the microburin spall on the tips or bases (Fig. 2:9, 10, 12, 13). Among them also two microliths prac-

* The author used an uncalibrated version of ^{14}C chronology (Editor).

tically in the form of asymmetrical trapezes are presented (Fig. 2:14, 15), they are typical for the Late Mesolithic Murzak-Koba culture. However, in the assemblages of latter we have no traces of microburin technique [Nuzhnyi 1992:81-82).

At the same time, just narrow and lengthened straight backed points (processed with the high abrupt and even bipolar retouch) form the main body of the microlithic assemblage of the Sy-At III, too (Fig. 2:17-92). A lot of them are damaged by diagnostic projectile impact fractures (Fig. 2:21, 24-27, 34, 36-38, 44-46, 50, 53-63 etc). The numerous conjoint fragments and unfinished points demonstrate the large diversity of dimensions and low efficiency of both methods of use and technology of their production (Fig. 2:19-22, 92).

Among the microliths also the diffent wastes of microburin technique (Fig. 2:6, 7) and microburins on the proximal (Fig. 2:105-110) and distal ends of blades (Fig. 2:111-119) are present. More or less similar quantity of both these kinds of microburins (which is typical for the Shpan culture on the whole) indicates so--called Mediterranean version of microburin technique [Nuzhnyi 1992:78-81]. The large group of "Krukowski's microburins" on pointed tips of oblique truncated (Fig. 2:93, 95-97) and backed points (Fig. 2: 94, 99, 102, 103) is found, too. A lot of these microburins contain also the previous microburin spalls (Fig. 2:93, 95-97). They are accompained by so-called "pseudo-microburins" which have no retouched notch in the place of flat spall. These microburins were results of an accidental damage of above-mentioned microliths during the processing (Fig. 2:98, 100, 101) or even an immitation of sharp microburin spall on them (Fig. 2:104). The latter technological method in the form of so-called "pseudo-microburin" technique was wide spread also in steppe Mesolithic cultures of the Northern Crimea, Dnieper rapids and Don basin [Nuzhnyi 1992:76-87].

On the other hand, the Shpan microlithic assemblage of other alpine Balin--Kosh site, in the main one and includes large quantity of fragments of narrow and lengthened straight backed points (Fig. 1:38-74) and only single oblique truncated points manufactured in microburin technique (Fig. 1:35, 35). The microburins (Fig. 1:82-84) and other wastes of microburin technique: unfinished oblique truncated points (Fig. 1:75, 76, 78-80), pieces of blade broken on the notch (Fig. 1:77, 81) are not numerous in this assemblage, either. Only one pseudo-microburin was found (Fig. 1:82).

The specific asymmetrical triangles are practically absent in the assemblage of Balin-Kosh (Fig. 1:36, 37), but backed microliths broken by diagnostic impact fracture from use as projectile weapons are still numerous (Fig. 1:38, 39, 45, 46, 48-50, 52-54, 56, 57 etc). The sizes of tanged parts of these broken points (Fig. 1:39, 45, 46, 48-50) indicate of their usage as pointed arrow-heads in contrast to their morphology adapted to the forming lateral composite edges of slotted bone spear points [Nuzhnyi 1990:115-123].

The microliths typical for the Shpan culture are presented also in some mixed assemblages of the northern Black Sea coast, the Lower Dnieper valley and area of Dnieper rapids. For example both similar asymmetric triangles and backed points manufactured in the microburin technique are found in mixed assemblage of

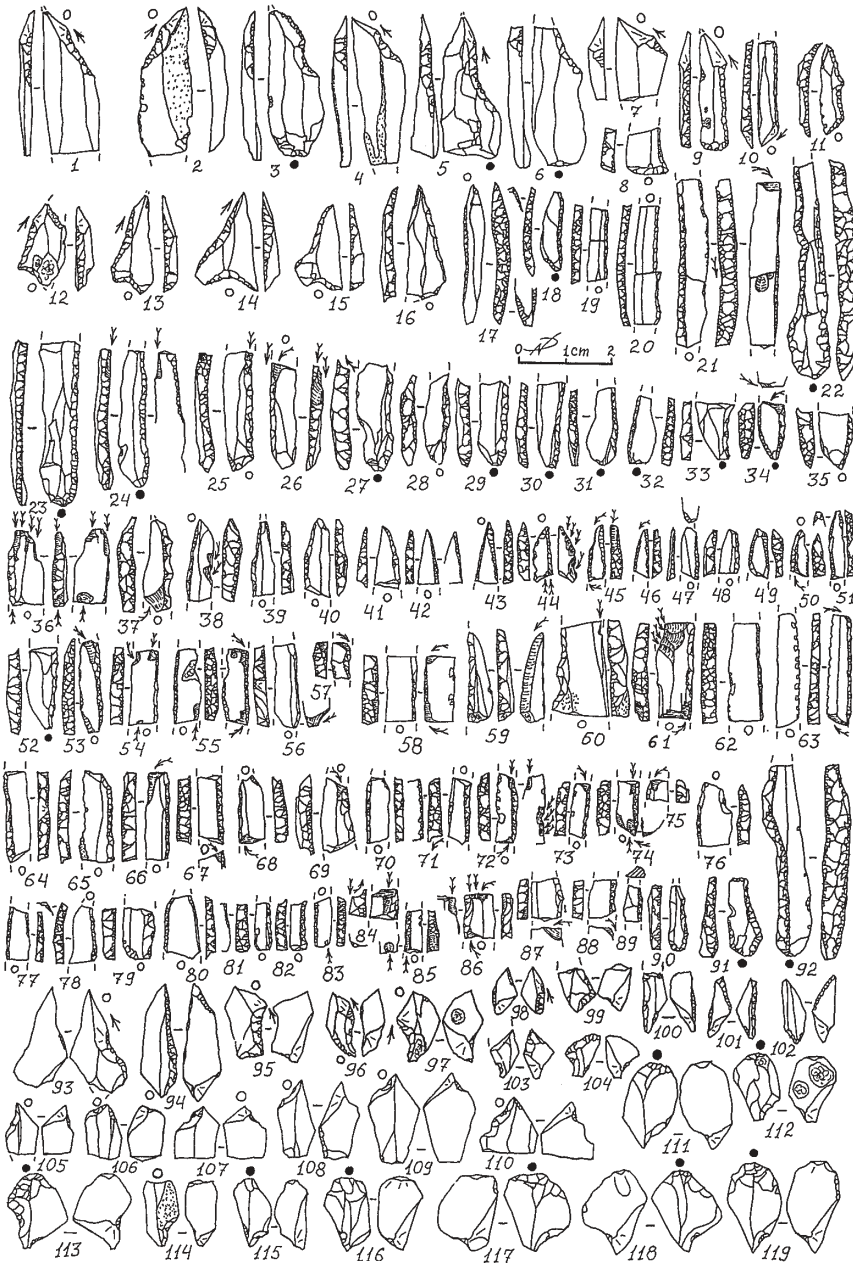

Fig. 2. The microlithic assemblages of the Shpan culture in the Crimea from Su-At III.

Vasilyevka-Progon site (Fig. 3:45-48) on the Lower Dnieper [Nuzhnyi 1992:Fig. 9]. The large body of backed points of this site (with the microburin spall included) are broken with the diagnostic impact fracture from the use as arrowheads, too (Fig. 3:46). The several oblique truncated points with the microburin spall and asymmetric triangle (Fig. 3:49-51) are also present in the lithic assemblages of other sites in region of Dnieper rapids (Vasilyevka-Nenasytets) and in the middle part of the Southern Bug river (Konetspol) [Telegin 1982:116, 120-121; Yanevich 1993:11].

Just the oblique truncated points with microburin spall of lengthened proportions (Fig. 3:46-68) and single backed points, as a component of the Shpan microlithic assemblage, remained in the lithic industries of the local Late Mesolithic and the Early Neolithic cultures of Kukrek tradition (viz. Igren 8, Popiv Mys, Klaguza Ravine, Terlyanska Krycha, Vovnigi-left bank site, Sobachki etc.). It is noticeable that at these sites we have practically no evidence of the usage of genuine microburin technique. Only one classic microburin is found (Fig. 3:44) at the Sobachki site in the same assemblage with a trapeze processed with the microburin technique (Fig. 3:43). The pseudo-microburins as a main sign of pseudo-microburin technique (technology of immitation of microliths with the flat microburin spall) are absent at these sites, too.

There is a reason to believe that such a phenomenon is connected with the different location and seasonality of the above-mentioned sites. For example in the same region we have an assemblage (Lokhanska 3) with the considerable quantity of pseudo-microburins (Fig. 3:37-40) and single waste of genuine microburin technique (Fig. 3:41) but without any oblique truncated points or geometric microliths with the microburin spall.

3. THE FINAL PALAEOLITHIC AND MESOLITHIC GRAVES AND CEMETERIES OF THE SOUTHERN UKRAINE AND PROBLEM OF THEIR CULTURAL DEFINITION

Only two Mesolithic graves (double and single) were found in Crimea in the cave deposits of Murzak-Koba and Fatma-Koba rock shelters [Telegin 1982:202-203]. Both graves were defined at once as the Late Mesolithic objects connected with the so-called "Crimean tardenoisian" or the Murzak-Koba culture [Bonch-Osmolovskiy 1934:131, 162; Bibikov 1940:166-176]. The double grave of male and female buried on their backs in extended position was discovered under the stones of 3rd layer of Murzak-Koba culture. According to S.N. Bibikov [1940:11-147] this layer was homogeneous from geological and archaeological points of view and included only the Late Mesolithic assemblage of the Murzak-Koba culture. The single grave from Fatma-Koba was of male buried on the side in flexed position and covered by stones and the 3rd cultural layer of Murzak-Koba culture [Bibikov 1966:138-140].

Among the modern scientists the connection of both above-mentioned graves with the Murzak-Koba culture is common and only discussion about meaning of so

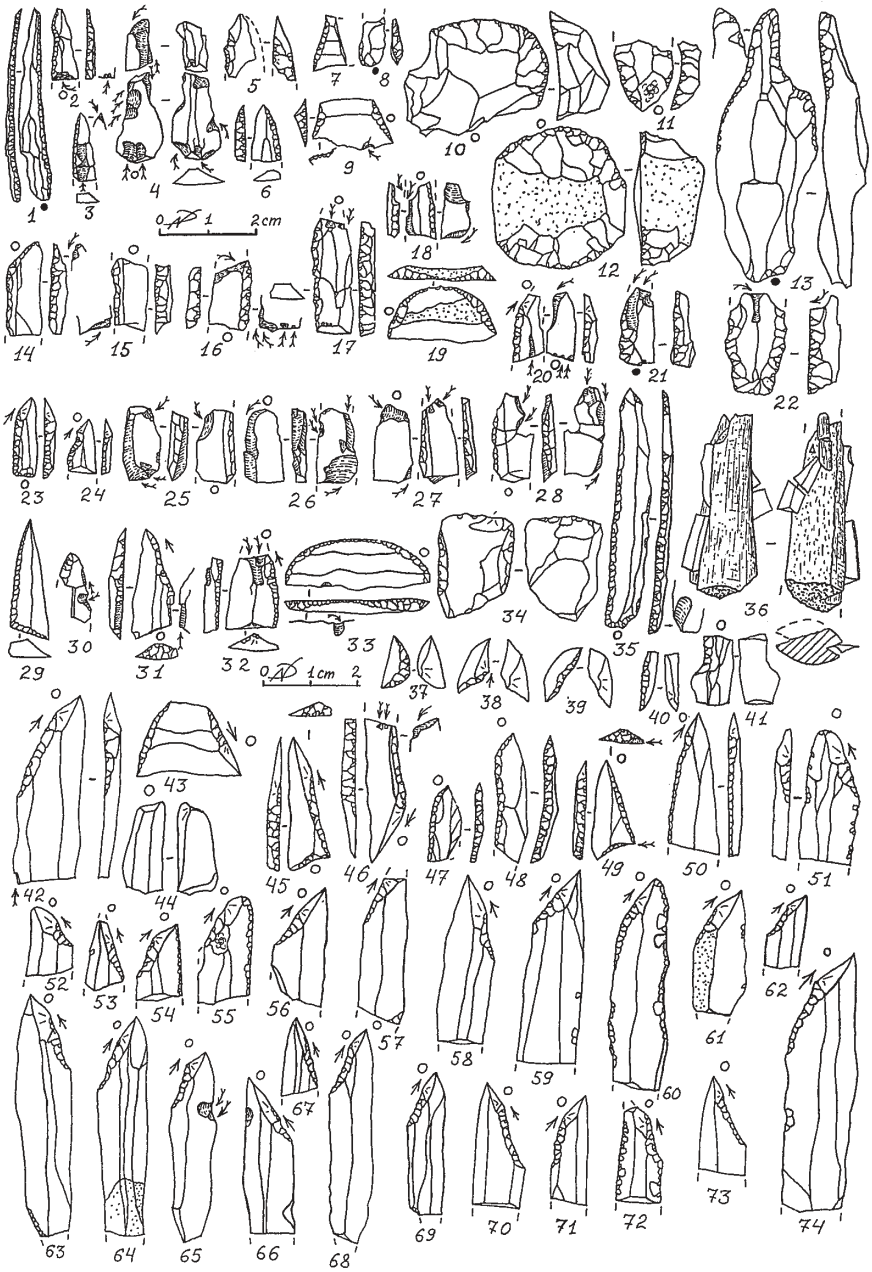

Fig. 3. The lithic assemblages of the Shpan culture from the Lower Dnieper and Rapids cemeteries and sites: Voloshskiy (1-13), Vasilyevka I (14-22), Vasilyevka 3 (23-36) and Chaplinskiy cemeteries (42); Lokhanska 3 site (37-41), Sobachki (43, 44, 52-59), Vasilyevka-Progon (45-48), Vasilyevka-Nenasytets (49--51), Klaguza Ravine (60-62), Terlyanska Krucha (63), Igren 8 (64-67), Popiv Mys (68-72) and Vovnigi-left bank site (73-74).

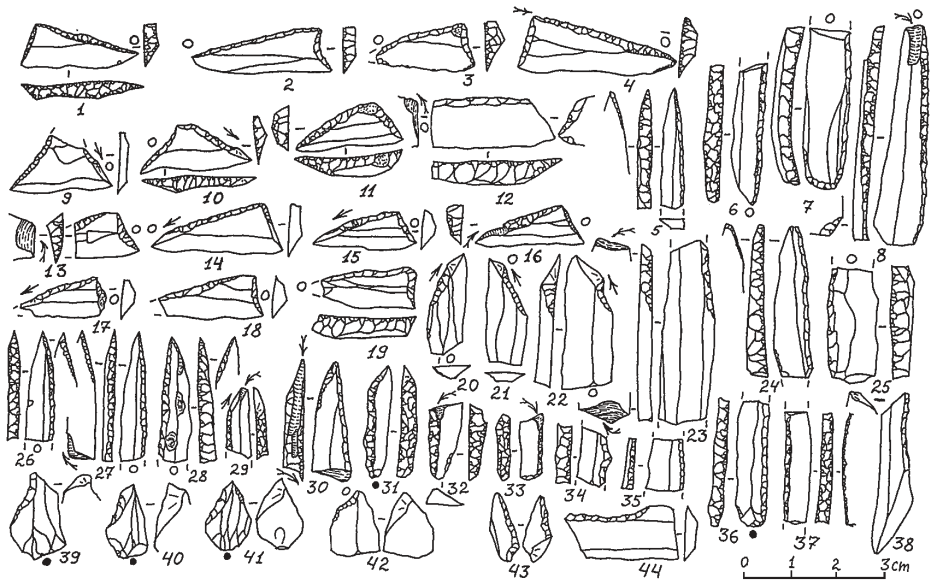

Fig. 4. The microlithic assemblages of the Shpan culture from 4-5 layers (1-3, 5) and mixed deposits (4, 6-8) of Fatma-Koba and 4 layer of Shan-Koba (9-44).

different grave rites of one culture takes place [Bibikov 1966:140; Telegin 1982:210--212]. However, after the last reexamination of the Murzak-Koba assemblage, the presence of materials of other cultures (typical Shan-Koba crescents and microburins, Swiderian tanged points and both Neolithic microliths and ceramic) in the main late Mesolithic assemblage of 3rd layer should be noticed [Nuzhnyi 1992:49].

The cultural definition and dating of the Final Palaeolithic and the Early Mesolithic cemeteries of the Dnieper rapids (Voloshskiy, Vasilyevka 1 and 3, Chaplinskiy) also are the object of scientific discussion. After the discovery of the Voloshskiy cemetery, first in this region, the oldest flexed graves of Vasilyevka were dated on the base of inventory and stratigraphical position by the Final Palaeolithic and the extended ones, by the Early Mesolithic [Danilenko 1955b:60-61]. However, A.D. Stolyar [1959:125-136] and V.A. Alekshin [1983:31] believe that the amophous inventories of all these cemeteries have no analogies among lithic assemblages from the Ukraine and all cemeteries should be dated by the Late Mesolithic. According to the degree of skeletons flexing, the first author also proposed the following relative chronology for above-mentioned cemeteries: Vasilyevka I, Voloshskiy, Vasilyevka 3.

At the same time, S.A. Dvoryaninov [1978:10-13] regarded that Voloshskiy and Vasilyevka 3 flexed skeletons were connected with the local steppe Upper Palaeolithic assemblages. The extended burials of latter cemetery and graves of Vasilyevka I were left by the population of the late Mesolithic Kukrek culture and local Mesoli-

thic culture with geometric microliths of the Northern Black Sea coast accordingly. From the D.Y. Telegin's point of view [1982:212-214], the inventory and stratigraphical position of flexed graves of Voloshskiy, Vasilyevka 1 and 3 had analogies in the local Final Palaeolithic sites of the Lower Dnieper basin (Pidporizhnyi 2, layer 5a of Osokorovka I etc.).

The extended burials from Vasilyevka 3 had similar counterparts in the Late Mesolithic assemblages of Murzak-Koba culture in Crimea and the Kukrek culture of Dnieper rapids region. According to this scheme, the oldest cemetery was Voloshskiy. A later date had Vasilyevka 1 and flexed graves of Vasilyevka 3. The most recent were extended burials of Vasilyevka 3 [Telegin 1982:212-214]. The last detailed comparison of microlithic assemblages of above-mentioned cemeteries with the local Final Palaeolithic and Mesolithic sites, in principle, confirmed this hypothesis [Nuzhnyi 1990:117-119].

However, the preliminary results of radiscarbon dating from two flexed and one extended burials of Vasilyevka 3 confirmed the Final Pleistocene age of them (10060±150; 9980±100; 10080±100 B.P.) [Jacobs, Price 1998] and also the righness of the latest chronological scheme in the part connected with the flexed graves. The certain surprise was only the same age of flexed and extended graves. The latter were dated before the Late Mesolithic. The main problem of cultural definition of cemeteries was connected with the specific character of their so-called "burial inventory" (viz. different projectile points) which were reasons of human death. As it has been noted by S. Dvoryaninov [1978:11], these points probably belonged to the population of other culture than killed and buried humans.

The first cemetery discovered in region of the Lower Dnieper valley and excavated by A.V. Bodyanskiy and V.N. Danilenko [1955b:56-61] was Voloshskiy cemetery situated on the third rapid. This cemetery contained many flexed burials of humans injuried by micrograveттian points (Fig. 3:1-3, 5, 6, 8) and some extended ones accompanied by symmetrical trapezes (Fig. 3:9). The microliths of the first group were covered by blue patina contrary to the second ones which were not. Both kinds of burials were deposited in loess-lake Final Pleistocene clay without any traces of grave pits. However, the flexed skeletons as a whole had deeper stratigraphical position [Danilenko 1955b:56]. Within the cemetery among the graves a marine shell *Nassa sp.* from the Black Sea coast, two end scrapers on the flakes (Fig. 3:10, 12), a base part of point retouched on both sides (Fig. 3:11), a perforator (Fig. 3:13), a blade and a flake were also found. All these lithics were covered by blue patina, too.

The morphological features of both microliths and tools covered by patina from the Voloshskiy cemetery are typical for the local Upper Palaeolithic assemblages of steppe zone connected with the Epigravettian tradition. The geometric microliths from that group of cemeteries are similar to the ones from the local Mesolithic assemblages of steppe area dated to the Boreal period (e.g. Grebeniki or Donets cultures) [Telegin 1982:92-98, 179-185; Stanko 1982:109-117]. Among them different more or less symmetrical trapezes of low proportions and simple outlines constitute a basic part of microlithic assemblages [Nuzhnyi 1992:51-54].

The second cemetery discovered by A.V. Bodyanskiy and excavated by A.D. Stolyar was Vasilyevka 1, which was situated on the 5th Dnieper's rapid "Nenasytets", the most powerful in the region [Stolyar 1959:78-165]. The cemetery contained only flexed burials deposited in loess-lake Final Pleistocene clay without any traces of grave pits, too. Among the buried humans were also two killed persons injuried by more massive kinds of backed lanceolate points (Fig. 3:14-18). Within the cemetery and in its destroyed part similar backed points made in microburin technique with the projectile impact fractures (Fig. 3:20, 21), one crescent (Fig. 3:19) and a base part of massive point retouched on both sides (Fig. 3:22) were found. The latter was broken by the projectile impact fracture, too.

As it was noted above, the massive backed points both processed with the microburin technique and intensivelly used as arrowheads are typical signs of the Shpan culture. The crescent has the closest analogies among the microlithic industries of the Shan-Koba culture in region of the Crimean Mountains or in the assemblage of Belolesye, a single site of latter culture in steppe area on the north-western Black Sea coast. Afore-mentioned culture is dated by the Final stages of Pleistocene from Allerød to Preboreal period [Zaliznyak, Yanevich 1987:11].

The richest cemetery at Vasilyevka 3 situated near above described graveyard was discovered by A.V. Bodyanskiy and excavated by D.J. Telegin [1982:208]. The cemetery contained both flexed and extended burials which had no traces of grave pits in loess-like clay. However, the first graves were deposited deeper than the second ones. Both kinds of burials were dated with the radiocarbon method by the Dryas III [Jacobs, Price 1998] and a lot of them had the humans killed with the microlithic projectile weapons, too.

The humans from flexed burials were injuried by backed lanceolate points (Fig. 3:23-28) of practically identical form as were found in Vasilyevka I cemetery. These points had projectile impact fractures and were processed in microburin technique, too (Fig. 3:23, 24). One backed point has also retouched base (Fig. 3:23). The points from extended burials were slightly different and had a form of asymmetrical triangles (Fig. 3:29-32). However, the latter as a whole are only some changed type of backed micrograveттian points with retouched base which was better adapted for intensive use as arrowheads of pointed type [Nuzhnyi 1989:94].

In one case the base part of such a triangle was processed with bipollar retouch (Fig. 3:31). For manufacturing many microliths the microburin technique was used, too (Fig. 3:31, 32). Practically all microliths were used as arrowheads and had projectile impact fracture (Fig. 3:30-32). Both above-mentioned signs are typical for backed points and asymmetrical triangles of the Shpan culture in Crimea and some of them are present at the sites of the Lower Dnieper region, too (Fig. 3:39, 40, 43). The back bone of one extended skeleton was pierced by the piece of bone slotted spearpoint with the lateral microblade insets. This kind of weapon is well-known among practically all Mesolithic cultures of the steppe zone of the Ukraine (Grebeniki, Kukrek, Donetsk etc.) since the Early Holocene.

Among the burials in the area of the cemetery low crescent (Fig. 3:33), long micrograveттian point with retouched base (Fig. 3:35) and "piece esquillee" (Fig.

3: 34) were also found. The latter kind of lithic tool is very typical for many local Upper Palaeolithic and Mesolithic assemblages of the Ukrainian steppe zone. As it has been noted above the closest analogies of low crescent are in assemblages of the Shan-Koba culture in Crimea.

The last Mesolithic cemetery at Chaplinskiy was discovered and excavated by A.V. Bodyanskiy and A.V. Dobrovolskiy and situated above the first Dnieper rapid [Telegin 1982:203-304]. The cemetery contained four or five badly preserved and flexed Mesolithic graves and ten or nine extended skeletons of the Neolithic and Eneolithic time which were situated in the sand deposits. The first group of graves as a whole had deeper stratigraphical position than the second one. Also was noted a case of destruction of a Mesolithic skeleton by a Neolithic burial. In the area of the cemetery among the graves an oblique truncated point with microburin spall (Fig. 3:42) was found. Near the extended grave also the trapeze processed with flat retouch was discovered. The first kind of microlith has clear analogies both in assemblages of the Shpan (Fig. 1:15, 16, 34, 35; 2:1-5, 7) and Kukrek (Fig. 3:50-74) cultures of Crimea and Dnieper rapids. The second one is very typical for the local steppe Late Neolithic and Eneolithic sites and cemeteries.

4. CONCLUSION

The ecological and landscape stability of steppe region both in the Final Pleistocene and the Early Holocene admitted the successive development of local Upper Palaeolithic and Mesolithic cultures based on collective drive hunting of large gregarious game adapted to conditions of an open terrain. Just to such an economic strategy assemblage of projectile weaponry of Final Palaeolithic steppe hunters based on the local Epigravettian technological tradition was adapted. The main mean of this was connected with the joining of the ancient Aurignacian tradition of wide usage of bone composite spearpoints with the younger Gravettian technology of vertical fixing of backed microliths with resin [Nuzhnyi 1992:165-167).

The different kinds of microgravettian points and rectangles (manufactured of the small blades or microbalades) were used by the steppe Upper Palaeolithic hunters first of all as lateral edges in the composite slotted bone spearpoints. The latter (as a base of so-called "steppe projectile assemblage") perhaps were well adapted for collective mass drive hunting. According to the projectile impact damage the backed microgravettian points only sometimes were used by steppe hunters as pointed arrowheads with bow [Nuzhnyi 1990:122-123].

The similar hunting strategy and technological tradition of an intensive usage of bone slotted composite spearpoints with atlatl has been continued during the Mesolithic time in practically the same landscape conditions of the Holocene steppe. In the purest form we can see this process in the clear steppe cultures of the Kukrek

tradition which were connected with the further development of local Final Palaeolithic industries [Stanko 1982:114-117; Telegin 1982:117-127; Nuzhnyi, Yanevich 1987:40-41]. The microlithic assemblages of these cultures are formed by backed and truncated microblades while the geometric microliths (as a good indicator of bow and arrow usage) were well spread here only in the final Kukrek [Yanevich 1987a:14-16].

Even microlithic assemblages of the steppe Late Mesolithic cultures based on quite different technological tradition of wide usage of trapeze microliths (Grebeniki, Donetsk, etc.) were distinguished in more closed territory of the Norhern Ukraine or the Crimean Mountais (Janisławice, Pesochny Rov, Murzak-Koba cultures). In all cases the microlithic assemblages of steppe cultures had more simple typological structure which reflected the simplier and poorer construction of their arrowheads [Nuzhnyi 1992:49-65].

At the same time microlithic assemblages of the steppe Epigravettian hunters (e.g. Vishennoe culture) migrated into closed territory of the Crimean Mountains during the Final Pleistocene [Yanevich 1992:30] and became gradually more and more changed. This process was carried out in direction of "geometrization" of straight backed and lanceolate points. They received a final form of low symmetrical crescents which were typical for the Shan-Koba culture. The new form of geometrizated backed points was adapted to their different usage as pointed arrowheads and lateral barbs. The first composite arrowheads were more intended for an increased role of individual bow hunting in closed conditions of the mountains. However, the morphology of large body of Shan-Koba microliths (according to the data of experiments and projectile damage) was not suitable for transversal arrowheads. It was that kind of arrowhead that was the most efficient in "blood tracks hunting" with dogs in the conditions of forest or bush terrain [Nuzhnyi 1990:117; 1992:109].

The next wave of steppe migrants into the Crimean Mountains was connected with the population of the Shpan culture and took place during the Dryas III or the Preboreal. But the process of transformation of above-mentioned "steppe projectile assemblages" and their adaptation to new methods of hunting (as a result of the harsh and global climatic changes) was carried out very quickly and probably more dramatically. According to the projectile impact fractures the hunters of this culture were forced to use narrow microgravettian points as arrowheads practically without any change of their morphology. To judge from numerous damaged speciments and data of experiments they absolutely were not adapted to such a new function.

At first the steppe Epigravettian or Pre-Shpan population probably occupied the alpine meadows which had similar landscape conditions as their native tarrain. In this area we have assemblages with the numerous narrow microgravettian points but practically without oblique truncated points with microburin spall and specific asymmetrical triangles (e.g. Balin-Kosh). The latter were transformed from the microgravettian points later as a result of prolonged influence of new projectile function of pointed arrowheads. Oblique truncated points, the most simple kind of pointed arrowhead which could be manufactured from the blade with the abrupt retouch technology had the same function.

The invention of both afore-mentioned kinds of microliths fixed the direct appearance of the Shpan culture in the Preboreal which with the new assemblage of projectile weapons (adapted for new ecological condition) could already have been spread in an area of mountainous forests. The developed microburin technique (well intended for quick processing of oblique truncated edges) perhaps occured later as a result of influence of assimilated population of the Shan-Koba culture. In the layers of cave sites (Shan-Koba and Fatma-Koba) the materials of the Shpan culture are accompanied by asymmetrical crescents and even triangles (smaller sizes than Shan-Koba ones) processed often with the microburin technique (Fig. 4:9-11). The asymmetric triangles of the Shpan culture probably were base prototypes of microlithic assemblage of the Late Mesolithic Murzak-Koba culture.

As a whole, the afore-described process of transformation of "steppe projectile assemblage" based on Epigravettian technology had the same direction in the valleys forest or bush conditions of steppe rivers, too. In the Mesolithic assemblages of Lower Dnieper and rapids both specific asymmetrical triangles and especially oblique truncated points with the microburin spall and without retouched base were wide used. However, the latter had lengthy proportions and were manufactured in the pseudo-microburin technique. According to the materials of the Final Pleistocene cemeteries in the region of Dnieper rapids as in the Shpan culture of the Crimean Mountains two stages of such transformation took place.

The first one was connected with a "faint geometrization" of backed microgravettian points as a result of an intensive use in new function of pointed arrowheads (Vasilyevka 1 and flexed graves of Vasilyevka 3). The second stage was started with invention of oblique truncation and wide use of microburin technology when the asymmetrical geometric and oblique truncated points (more adapted to the same function of pointed arrowhead) were in use (Chaplinskiy, extended graves of Vasilyevka 1).

The spread of forests in Eastern Europe during the Early Holocene stipulated also as much as three waves of direct migration or infiltration of steppe Epigravettian population in a forest zone of the northern Ukraine. The first one took place immediately after the Pleistocene and was connected with the forming of the Kudlayevka culture in the Middle Dnieper basin. The microlithic assemblage of it, based on backed microliths, was very easily and weakly adapted to be used in the arrows (the main projectile hunting weapons of closed landscapes). It is notable that microlithic assemblages of related Komornica culture situated more to the west in Poland and the western Ukraine is as a whole more "geometrizated" and suitable for that [Zaliznyak 1991:23-27].

The second wave of migration of steppe population, perhaps, took place from the Late Boreal and stipulated the forming of the Janisławice culture in the North-Western Ukraine. In this case the more eastern and southern sites had some differences in their microlithic assemblages than western and northern ones situated in Poland, Belorussia and Lithuania. As in the case of the Komornica culture, the western assemblages of Janisławice are as a whole more "geometrizated", too. For instance the typical oblique truncated points with microburin spall (or Janisławice

points) of this culture have usually retouched base and a form of asymmetric triangles and trapezes.

The south-eastern Janisławice sites on the contrary contain mainly these points without retouched base as are present in steppe assemblages of the Northern Crimea, regions of Dnieper rapids and Don [Zaliznyak 1991:39-41]. However, from the L. Zaliznyak's point of view, these points in steppe assemblages were only results of some influence of the Janisławice culture. This hypothesis is doubtful as far as we have the Preboreal carbon date of the Shpan culture in Crimea and Boreal ones of the Kukrek culture in Dnieper rapids.

The last, third wave of direct migration or infiltration of steppe population both in forest zone of the Northern Ukraine and the Crimean Mountains took place in the Middle and the Early Atlantic accordingly. It was connected with the spread of cultures of Kukrek tradition and also with the process of "Neolithization" of local Mesolithic cultures [Danilenko 1969:9-45; Zaliznyak 1991:25-44; Yanevich 1987a:13-17].

The initial areas of the most ancient Neolithic cultures of the Ukraine and adjoining regions of southern Russia (Bug-Dniester, Surska-Dnieper, Azov etc.) were located in steppe zone but only in the valleys of large rivers [Danilenko 1969:216--217]. The population of these cultures as early as in the Early Atlantic had some agricultural elements in economy (viz. cattle and less sheep breeding), certain sedentary residence mobility and ceramic production. However, since hunting (steppe species included) and fishing were still the main branches of their economy so weaponry and lithic assemblage were based on the local Kukrek steppe tradition [Danilenko 1969:176-183].

Probably, the neighbouring population which occupied more open areas of steppe zone limited by large river valleys and still continued the traditional model of steppe economy in purer form was the main source of above-mentioned migrations. This population had some knowlege about both multibranched and agricultural models of economy but used it only sometimes. The activization of multibranched "Mesolithic" or agricultural "Neolithic" models of economy took place during the seasons unsuccessful for collective mass drive hunting large herd hoofed game. The absence of large valleys on the considerable space of this zone (or other terrains with high diversity of food resources which could be sufficient for afore-mentioned models of economy) was the main cause of periodical increased mobility of last steppe hunters. The spread of a new agricultural model of economy among the population over the limits of steppe zone perhaps was a result of these migrations, too.

There is every reason to belive that in the East European Mesolithic two main areas with principally different economical strategies existed. The first was connected with the continuation of "Upper Palaeolithic" collective or specialised mass drive hunting which took place mainly in the open steppe landscapes. The second had the more individual or multibranched "Mesolithic" form. The latter was carried out in more closed forest and mountainous terrains. The mobile steppe population with the first kind of "traditional" economy during the unsuccesful seasons was

periodically spread over "more stable" closed landscapes. It was the main source for both intensificated inter-cultural contacts and transferring new technical and economic ideas into this part of Europe.

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THE LATE MESOLITHIC SUBBASE OF THE UKRAINIAN NEOLITHIC

There are 8 Neolithic cultures on the territory of the Ukraine, which divide into two main groups. The first one is a newcomer from Danube and Balkan regions (Criş, Linear Band Pottery, Cucuteni-Trypolye). Its materials do not comprise any traces of autochthonous subbase. The second group of Neolithic cultures is situated in the Northern, Eastern and Central Ukraine. Its materials demonstrate the bright features of autochthonous Late Mesolithic subbase (Nemen, Dnieper-Donets, Surska, Pitted-Comb Pottery, Bug-Dniester cultures) and the strong influences of previously mentioned group of Balkan newcomers.

The analysis of a cultural situation of the Ukraine in the Late Mesolithic needs to be done to understand the Neolithization process of that area. On the territory under discussion seven cultural unites developed it the Late Mesolithic, namely: Murzak-Koba, Kukrek, Grebeniki, Janisławice, Donets cultures and Studenok, Platovo Stav type of monuments (Fig. 1).

The cultural differentiation of Mesolithic sites in the Ukraine had been made on the basis of typological classification of its flint implements and, first of all, the microliths (Fig. 2). Most of them were used as arrowheads or other kind of inserts in the points of projectile weapons [Bonch-Osmolovskiy 1934; Nuzhnyi 1992].

MURZAK-KOBA

The sites of this culture are known in the Crimea Mountains. The best complexes of Murzak-Koba materials have been found in the Late Mesolithic levels of Crimea caves: Murzak-Koba, 2-4 levels of Fatma-Koba, 2 and 3 levels of Shan-Koba, Kara-Koba, Laspi 7 etc. A population of this culture left the burials in Murzak-Koba and Fatma-Koba caves [Debets 1936]. About 20 Murzak-Koba culture sites are known now.

The first sites of the culture have been excavated by G. Bonch-Osmolovskiy between the First and the Second World Wars in Crimea caves of Shan-Koba and

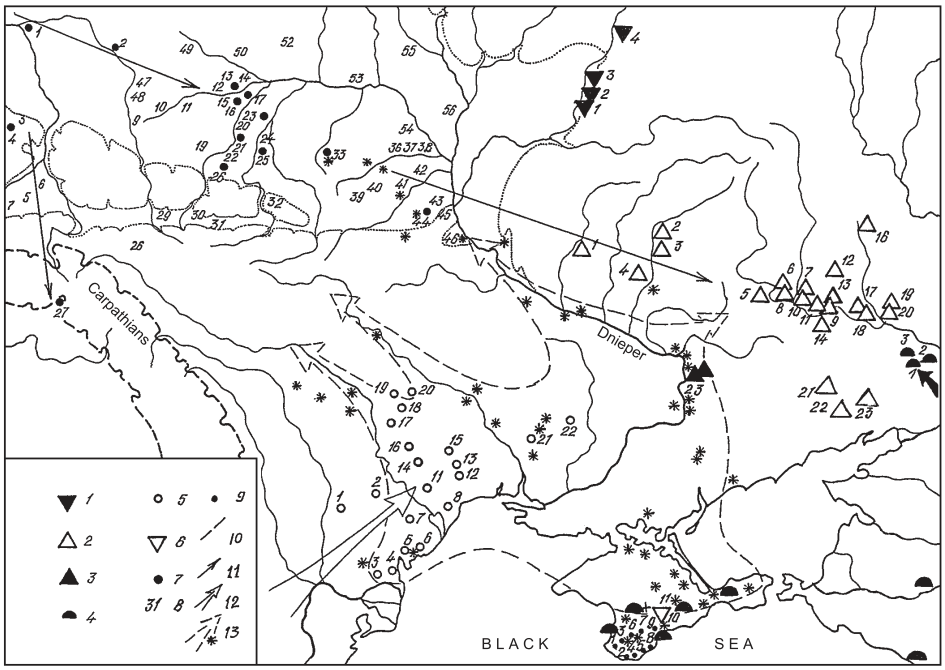

Fig. 1. The Late Mesolithic sites of the Ukraine. 1 - the Studenok type monuments, 2 - the Donets culture, 3 - cemetery of Vasilyevka 1, 3, 4 - the Platovo Stav type, 5 - the Grebeniki culture, 6 - the Shpan-Koba cave, 7 - group of Janisławice sites, 8 - the Janisławice culture sites, 9 - the Murzak-Koba culture, 10 - border of the Kukrek culture, 11 - movement of Janisławice population, 12 - movement of Grebeniki population, 13 - the Kukrek culture sites and movement of its population.

Janisławice culture sites: 1 - Wieliszew XIII, 2 - Czerwony Borek, 3 - Tomaszów 1, 4 - Rydno VI, XIII, 5 - Raniżów, 6 - Gwoździec, 7 - Jawornik Czarna, 8 - Nieborowo, 9 - Zatishye V, 10 - Tur, 11 - Nevir, 12 - Lubyaz, 13 - Perevoloka 2, 14 - Omit, 15 - Nobel, 16 - Lubotin, 17 - Senchitsy 5A, 5D, 18 - Mulchitsy, 19 - Grushvitsa, 20 - Nepirets, 21 - Balakhovichy, 22 - Mala Osnitsa, 23 - Rudnya, 24 - Krinitsa, 25 - Polyany, 26 - Zhurovichy, 27 - Kamyanitsa 1, 28 - Brukhovichy, 29 - Yastrebichy, 30 - Gay Levyatinskiy, 31 - Sapanov, 32 - Netishin, 33 - Korma, 34 - Pischane, 35 - Pribor 9, 36 - Protereb, 37 - Gorki, 38 - Obolon, 39 - Stakhanovo, 40 - Kropivyanka, 41 - Kukhary 2, 42 - Priborsk 3, 43 - Rudoy Ostrov, 44 - Borodyanka 3B, 4, 45 - DVS (Vyshgorod), 46 - Peretichek, 47 - Priluky, 48 - Stradech, 49 - Nosky, 50 - Miloshevichy, 51 - Leskovichy, 52 - Kameny, 53 - Doroshevichy, 54 - Rozhava, 55 - Krasnovka 1B, 56 - Stara Lutava.

Donets culture sites: 1 - Solonitsa, 2 - Okhtirka, 3 - Khukhra, 4 - Bela Gora, 5 - Petrovska 4, 10, 28, 6 - Izyum, 7 - Prishib, 8 - Ustya Oskola, 9 - Zlivka, 10 - Rubcy, 11 - Drobyshevo, 12 - Petrovo-Orlovska, 13 - Shevchenko, 14 - Raigorodok, 15 - Borovskoe, 16 - Pelagiloevka 3, 17 - Olkhova 2, 5, 19 - Tepye, 18 - Orekhovo-Donetska, 20 - Kondryutskiy, 21 - Kremnevaya Gora, 22 - Mospino, 23 - Matveev Kurgan.

Grebeniki culture sites: 1 - Sarateny, 2 - Zaim I, 3 - Vasilyevka, 4 - Mirnoe, 5 - Borisovka, 6 - Diviziya, 7 - Tsarichanka, 8 - Baraboy, 9 - Dobrozhany, 10- Vasilyevka, 11 - Grebeniki, 12 - Karpovo, 13 - Tsybulevka, 14 - Trostyanets, 15 - Katarzhany, 16 - Girzhevo, 17 - Orlovka, 18 - Dovzhanka, 19 - Elenovka, 20 - Poznanka, 21 - Balakha, 22 - Kazanka.

Murzak-Koba culture sites: 1 - Murzak-Koba, 2 - Laspi 7, 3 - Zamil-Koba, 4 - Shan-Koba, 5 - Fatma-Koba, 6 - Kara-Koba, 7 - Alimovskiy naves, 8 - Balin-Kosh, 9 - Su-At III, 10 - Ala-Chuk.

Platovo Stav type of monuments: 1 - Murzina Balka, 2 - Platovo Stav, 3 - Zimovniki I.

Fatma-Koba [Bonch-Osmolovskiy 1934]. After the Second War S. Bibikov conducted excavations of Murzak-Koba and Fatma-Koba caves [Bibikov 1966]. Kara-Koba and Laspi 7 have been excavated by Y. Kolosov [1960] and D. Telegin [1982].

Single-platform, one-sided cores for blades are typical for flint complexes of the Murzak-Koba culture (Fig. 3:37).

There are a lot of small, low and medium trapezes. Among them one can distinguish two main groups: low asymmetric trapezes (the Murzak-Koba type; Fig. 3:1-3), which sometimes are the very simillar to triangles (Fig. 3:4-7) and symmetric low and of medium height (Fig. 3:8-16). Sometimes the trapezes have notched retouch on a upper side (Fig. 3:8-11) and thin retouch on a bottom side (Fig. 3:3, 7).

The blades with notched retouch are the very numerous (Fig. 3:41-51). Scrapers were found in smaller amounts. They include end (Fig. 3:27-30) and subround (Fig. 3:31-40) scrapers on the flakes. Scanty burins on the flakes (Fig. 3:17, 18, 19) and drills (Fig. 3:20-22) have also been found.

Among bone artefacts two-sided harpoons, which are simillar to famous Azilian harpoons appeared (Fig. 3:23). Single inserts of the Kukrek type, pencil-like cores, backed microblades, fragments of two slots bone spearheads in the levels of the Murzak-Koba culture sites are the traces of contacts with a population of the Kukrek culture (Fig. 3:23-26).

In levels of the Murzak-Koba culture sites, among numerous *Helix* shells, bones of the red deer, roe deer, wild boars, birds, fish were found.

According to radiocarbon dates from the site of Laspi 7 of the Murzak-Koba culture the population appeared at the beginning of the 7th mill. BC* and developed in the Crimea Mountains to the beginning of the Neolithic. At first, Ukrainian researchers considered the Murzak-Koba culture to be a second stage of so called Mountain-Crimean culture, the first stage of which was the Shan-Koba culture [Telegin 1982]. But now most investigators do not connect the Murzak-Koba culture with the Shan-Koba.

The Murzak-Koba population took part in formation of the Crimean Neolithic. Typical feature of Crimean Neolithic flint material is a large amount of trapezes and crescents with flat retouch on a back (Fig. 2:1-6).

KUKREK

An investigation of the Kukrek culture began in 1926 and has been carried by G. Bonch-Osmolovskiy, who excavated the Kukrek site in the Crimea [Bonch-Osmolovskiy 1934]. About 50 sites of the Kukrek culture are known. The culture spread and crossed a border of Southern Ukraine (Fig. 1). The first investigated

* The author used an uncalibrated version of ^{14}C chronology (Editor).

settlements are: Kukrek in Crimea, Kamennaya Mogila in the Azov Sea region [Danilenko1986], Igren 8 in the Dnieper rapids region [Telegin 1982:103-112), Abuzova Balka on the Southern Bug River [Stanko 1982:Tabl. XIX].

The most typical Kukrek sites are concentrated in the Black Sea steppes region and in the Crimea. East border of the Kukrek culture was the Molochna River (Kamennaya Mogila), its west border was Lower Danube (Trapovka), and middle Dniester (Frumushika, Varvarovka). Influences of the Kukrek culture reached the Pripet delta (Lazarevka, Pribor 7a) in the Kiev region [Zaliznyak 1978:42-44]. Flint implements of the Kukrek culture have no analogies with other units of European Mesolithic. The development of microblade flint technique is a typical feature of the Kukrek flint industry. As a rule there are a lot of regular microblades among flint artefacts of the Kukrek culture sites. The pencil-like and conical cores are the most numerous. The scrapers and burins have been made of rough flakes, obtained from disk-like cores.

Most important artefacts of this culture are inserts of the Kukrek type (Fig. 4:3-6) backed microblades and oblique truncation (Fig. 4:1-2, 59) and points of the Abuzova Balka type (Fig. 4:2). Trapezes and segments are rarities.

The scrapers have been made from the flakes and often have high form (Fig. 4:9), so called burins of the Kukrek type have been made from the massive flakes with flat burin spells (Fig. 4:12-16).

Very typical for the Kukrek sites are bone spearheads with 1, 2 or 4 slots (Fig. 4:7). Such points are known from Igren 8, Kamennaya Mogila, Mirnoe, Vishennoe sites. In the Dnieper rapids region flat bone points with two slots were found at the Kukrek culture site.

According to V. Danilenko the Kukrek flint industry has been oriented to production of bone spearheads with the slots for the flint inserts. The Kukrek slot spearheads are connected with the microblade flint technique, which appeared in the Late Palaeolithic of the North Black Sea region [Nuzhnyi, Yanevich 1987:38-41]. So, Kukrek population was a descendant of the Late Palaeolithic East Gravettian entity of the North Black Sea region. Most of Ukrainian investigators suggest autochthonous roots of the Kukrek culture in the Ukrainian steppes.

The spreading of Kukrek population to the north over the forest-steppe zone and to the south to the Crimea Mountains was caused by the Early Holocene transgression of the Black Sea.

There are three local versions of the Kukrek culture: Dnieper, Crimea-Azov and north Black Sea versions [Telegin 1982:101).

The series of radiocarbon dates obtained for Kukrek sites: Igren 8 (the beginning of 6th mill. BC), Kamennaya Mogila (6th mill. BC), Kukrek (middle of the 6th mill. BC) [Telegin 1990:31-33]. Vishennoe site is dated by a border between the Pleistocene and the Holocene. The large crescent-like Gravettian points are evidence of genetic connections between the Final Palaeolithic Gravettian culture and the Vishennoe II site [Yanevich 1987a:7-18].

The bones of wild animals from the Igren 8 (auroch, red-deer, boar, roe deer, horse), Kukrek (horse, donkey, auroch), Mirnoe (auroch, horse, donkey, saiga, boar)

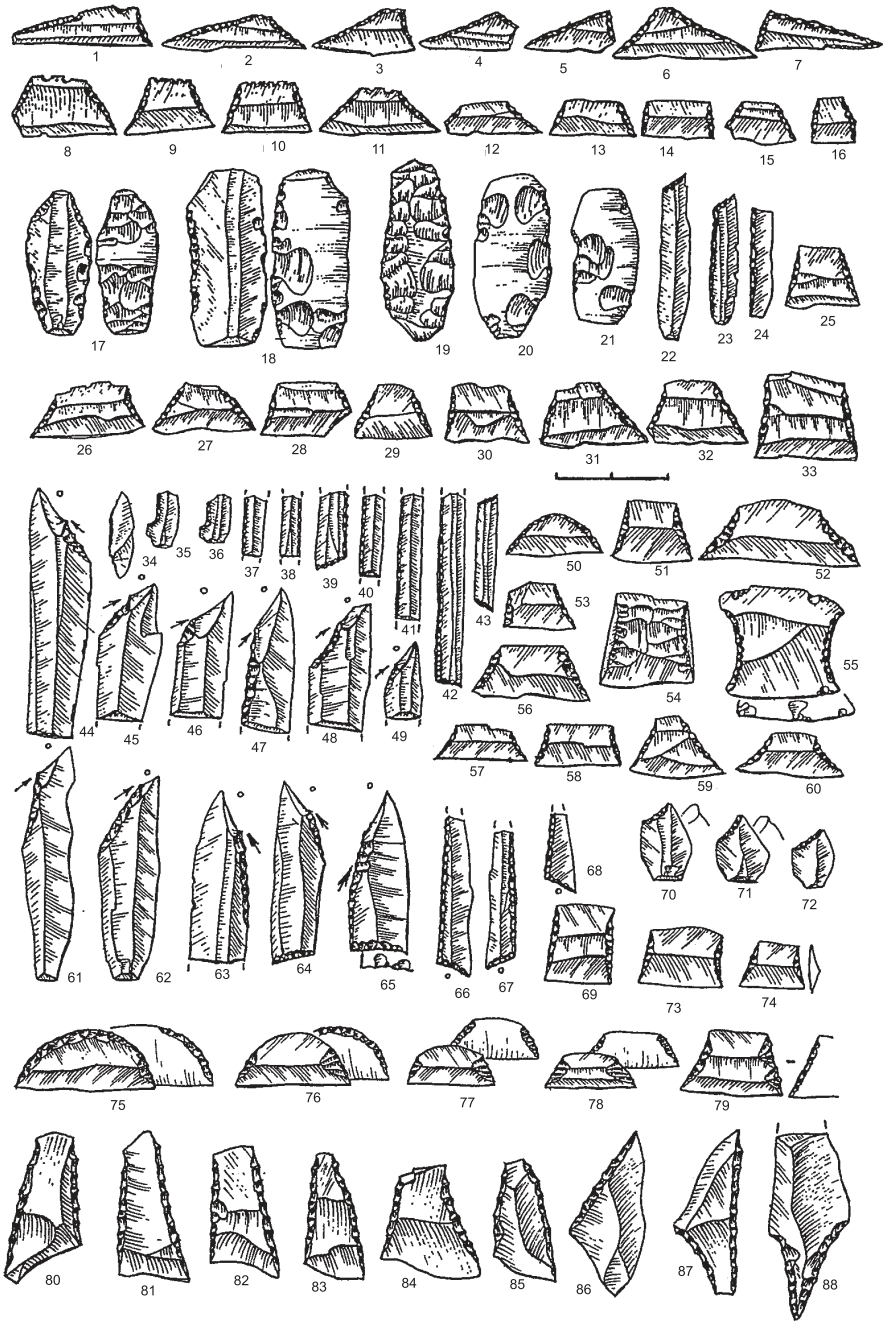

Fig. 2. Microliths of the Late Mesolithic cultures: Murzak-Koba (1-16), Kukrek (17-25), Grebeniki (26-33), Donets (34-60), Janisławice (61-74), Platovo Stav (75-79), Studenok (80-88).

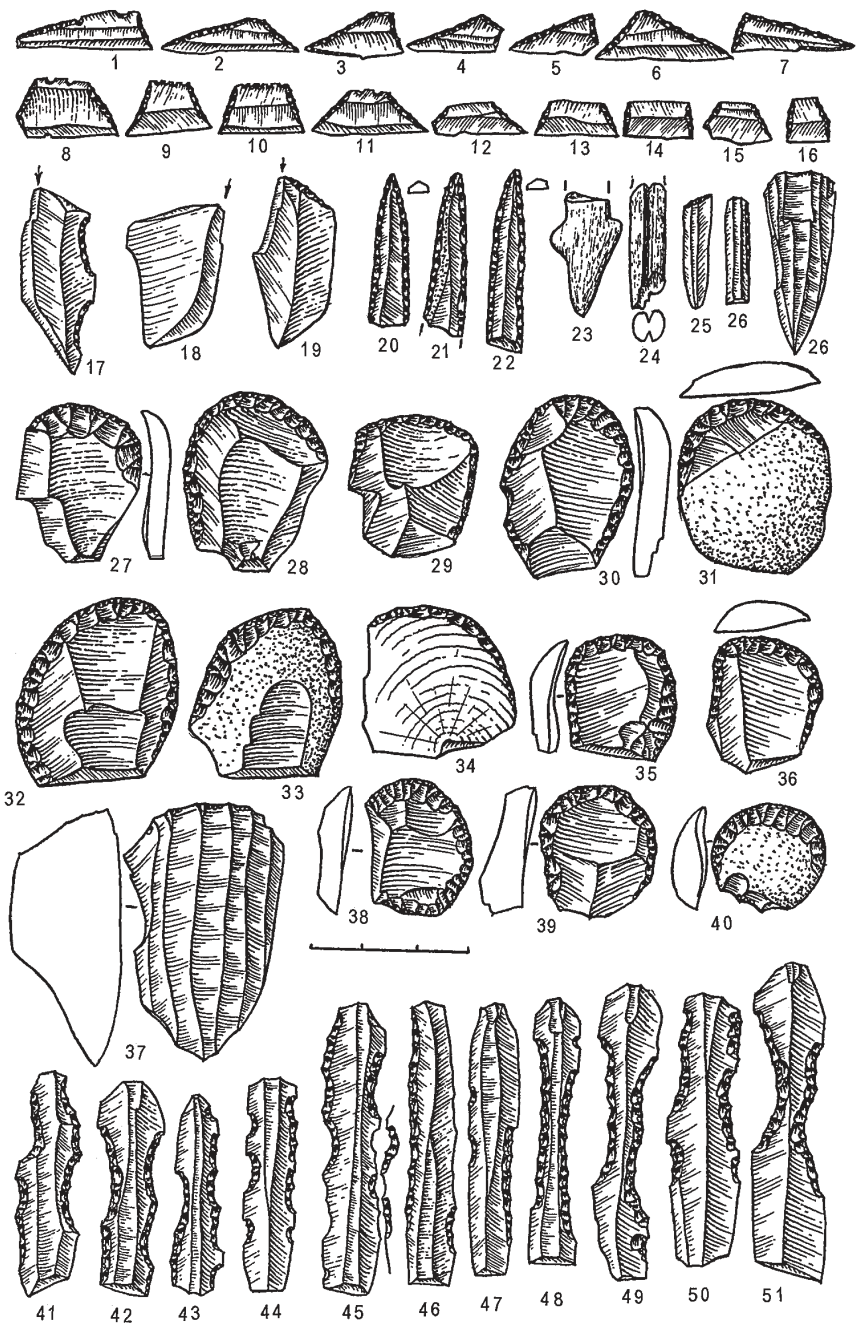

Fig. 3. Laspi 7. Flint implements.

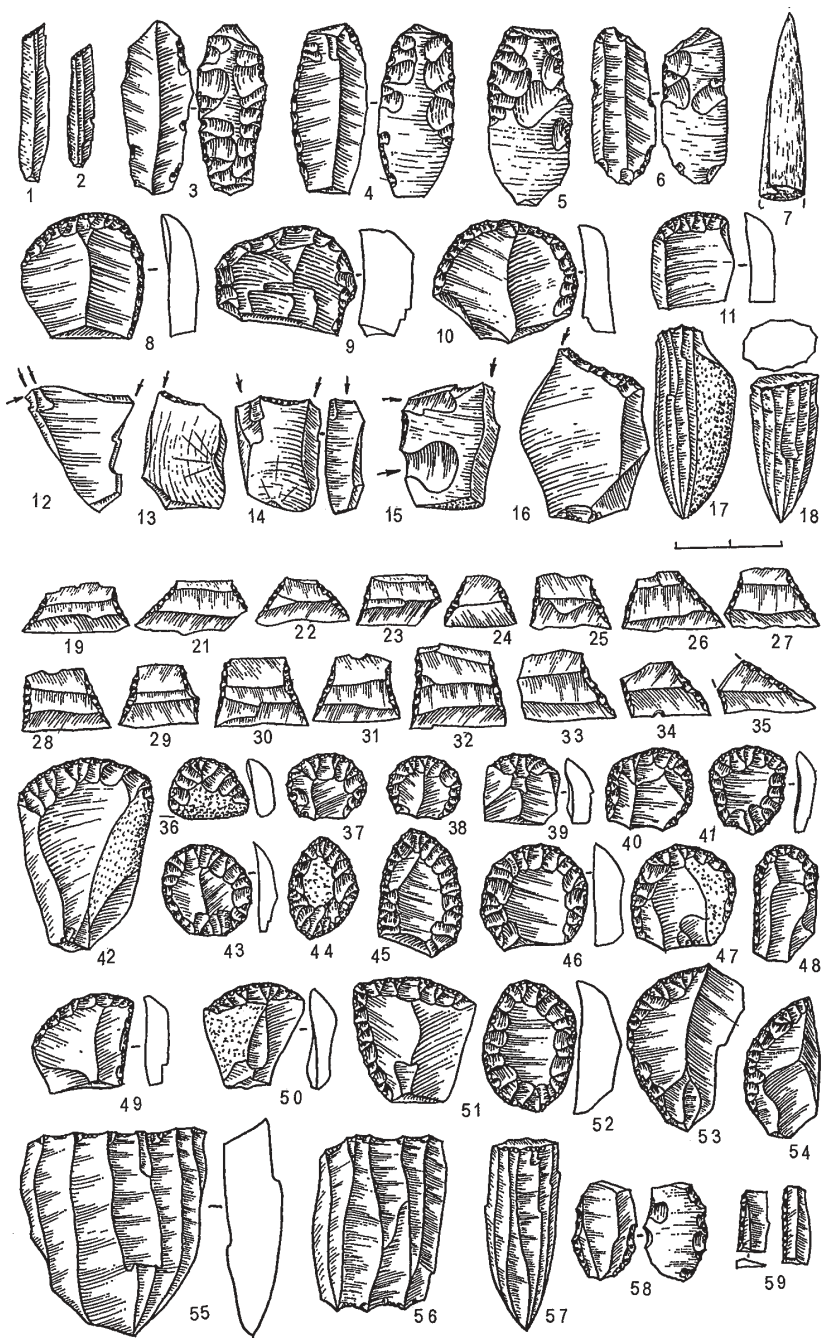

Fig. 4. Kamennaya Mogila (1-18), Grebeniki (19-59). Flint implements.

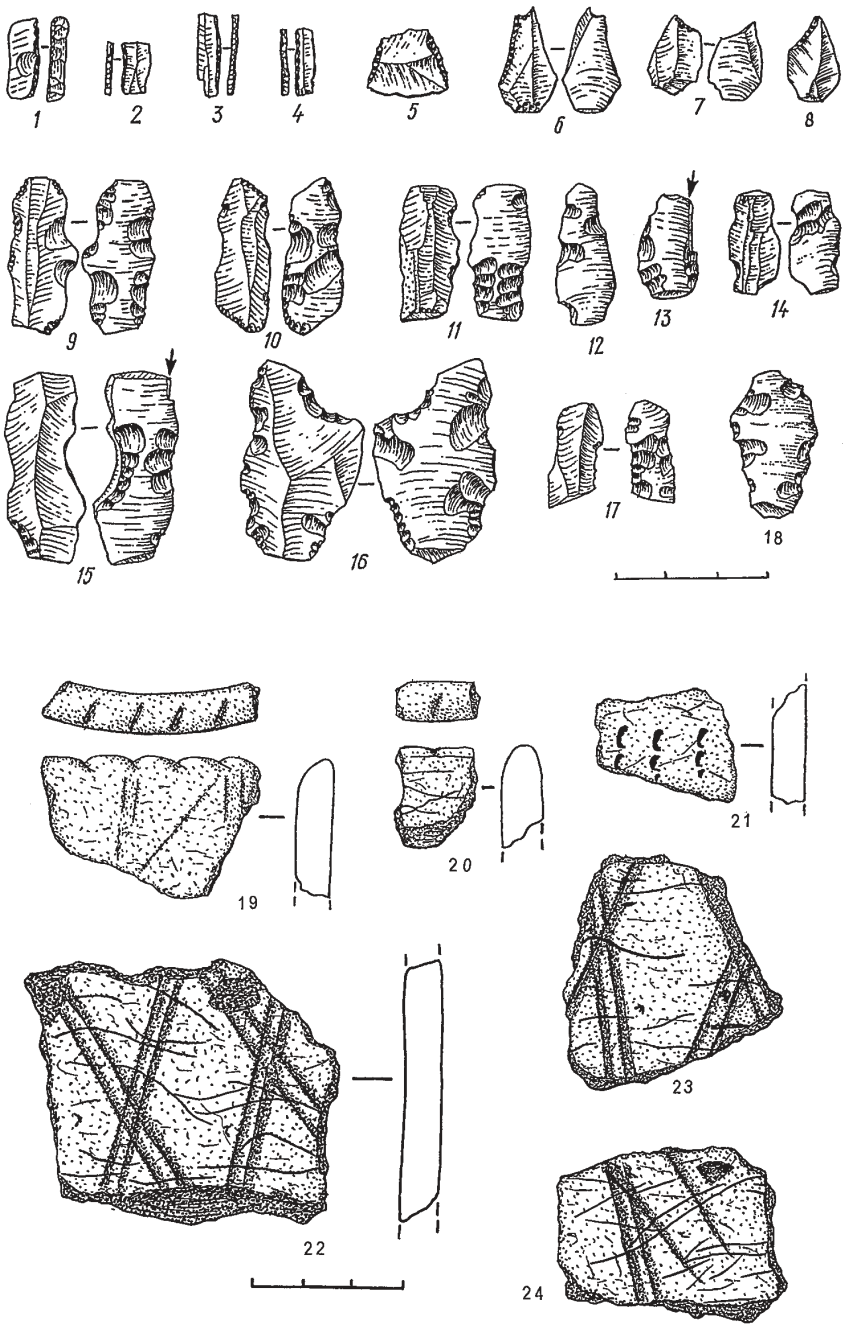

Fig. 5. Lazarevka near Kiev. Flint artefacts and pottery.

testify that hunting hoofed animals was the base of economy among the Kukrek population of the Ukrainian steppes in the Mesolithic. In Dnieper rapids region fishery was an important branch of economy. At Igren 8 site the fish bones, bone fishing hooks, stone weights for nets were found. In Kukrek levels of Kamennaya Mogila the bones of domesticated aurochs were excavated. It gave V. Danilenko [1969] an opportunity to write about an important role of the Kukrek population in the Neolithization of the Ukraine.

Most of the Early Neolithic cultures of the Ukraine (Surska, Bug-Dniester, Dnieper-Donets, Neolithic of Crimea), according to their flint materials, were formed under an influence of the Kukrek culture. On the border between the Mesolithic and the Neolithic Kukrek population spread out to the north along Dniester, Southern Bug, Dnieper to Podolya, Volhynia and Polesye regions (Fig. 1).

GREBENIKI

The Grebeniki site, near Odessa, was excavated by P. Boriskovskiy in 1954. But most sites of the culture have been investigated by V. Stanko [1966, 1971, 1976, 1982]. About 20 Grebeniki culture sites are known now in the Odessa region (Fig. 1): Poznanka [Smolyaninova 1990:66-68], Kazanka [Boriskovskiy 1975:55-63], Dovzhanka, Orlovka, Baraboy IV, Borisovka, Tsybulevka, Karpovo, Dobrozhany [Kraskovskiy 1978]. The sites of Mirnoe and Girzhevo are the best-investigated monuments [Stanko 1966, 1982].

The Grebeniki culture sites are known in the steppe zone between the Lower Danube and the Ingulets River (Fig. 1).

One-sided, flat cores for regular blades are typical for the Grebeniki pressure technique (Fig. 4:55, 56). The most of scrapers were made from the flakes. They are subround, frequently with low working edge (Fig. 4:36-54). The burins are almost absent. Low and medium symmetric trapezes constitute about 20% of tools. As a rule they are made from crossactions of wide, regular blades (Fig. 4:19-35).

Single inserts of the Kukrek type, pencil-like cores, backed microblades, oblique truncation (Fig. 4:58-59) and bone spearheads with the slots have been distinguished among typical Grebeniki flint implements as the traces of influences of the Kukrek culture population. The bones of animals from Mirnoe and Girzhevo sites testiy that auroch and hunting was a base of the Grebeniki culture economy.

Most of researchers date the Grebeniki culture to the Late Mesolithic and they genetically connect it with the Final Palaeolithic site of the Tsarinka type [Stanko 1982]. But the large chronological gap between the Grebeniki culture and its Tsarinka subbase (more than 2000 years) is in contradiction with this statement.

The Neolithization of Europe was a result of migration of the oldest Near East farmers and stock breeders through the Balkan region to the north. Therefore, in the

Early Holocene, the migration from the Lower Danube area took a predominant direction to the North-Western Black Sea region. It gives an opportunity to see genetical subbase of the Grebeniki culture in the Danube and Balkan regions. Its flint assemblage are analogous to materials from the Balkan Protoneolithic sites of Argissa, Sesklo, Criş, Cuina Turcului, etc. [Perles 1988:95; Paunescu 1988:70-88].

The Grebeniki population took part in formation of the Neolithic of North--Western Black Sea region.

JANISŁAWICE

The Janisławice culture, according to S.K. Kozłowski [1965] or Vistula cycle, according to H. Więckowska [1964] has been distinguished on grounds of flint materials from the basins of Vistula and Nemen. About 30 Janisławice sites are known now in the basin of the Pripet River (Fig 1).

Single-platform one-sided cores for regular blades made by pressure technique are typical for Janisławice sites (Fig 6:1). Among the microliths there are numerous Janisławice points (Fig. 7:1-46) and triangles (Fig. 7:47-62, 67-74), regular, high trapezes (Fig, 7:75-84) and microburins (Fig. 7:63-66). There are a lot of scrapers on irregular flakes and blades with retouch. Axes on the flakes and single burins are typical for the Janisławice culture from the Pripet basin.

There are local versions of culture under consideration: central — in the basins of Upper Pripet and Bug, north or Maximonis in Nemen basin, west or Wistka — in Warta and Middle Vistula basins, east or Rudoy Ostrov — in Kiev-Zhitomir region [Zaliznyak 1991].

At first researchers connected genetically the Janisławice culture with Maglemose of the west Baltic [Rimantiene 1971:119; 1996; Ginter 1973:177-186; Koltsov 1977:190; Zaliznyak 1978:89-97]. However, lately most Polish investigators have seen genetical roots of Janisławice on the territory of the Ukraine [Więckowska 1975:339-438; Domańska 1990a; 1991].

But Janisławice flint complex is an example of the Post-Maglemose flint industry. The typical Maglemose artefacts are single-platform, one-sided cores, points and long triangles with microburin spells on the top. These elements of flint technique spread from the west Baltic to the east through the territory of Poland. In fact Janisławice flint industry is a realisation of the west Baltic Maglemose traditions on the base of new Protoneolithic pressure technique that arrived from the Balkan region.

The oldest Janisławice site of Maximonis IV in the Nemen basin has been formed as a result of migration of the Maglemose population from the west [Rimantiene 1971:119]. Later, Proto-Janisławice population spread over the Pripet basin to the Dnieper and moved across left bank of Dnieper to the Donets basin. Janisławice

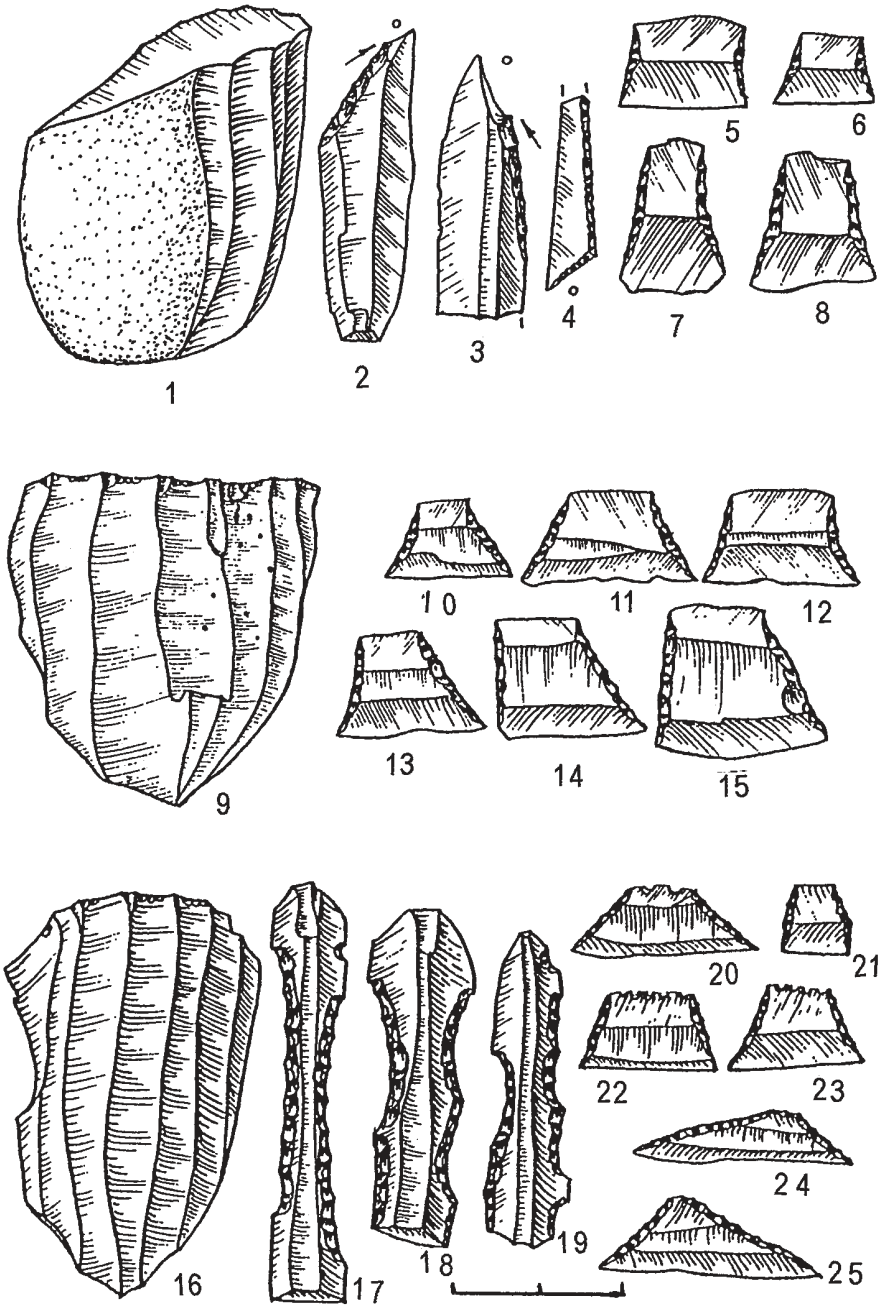

Fig. 6. Pressure technique in the Late Mesolithic of Ukraine. 1 - Janisławice (1-8), 2 - Grebeniki (9-15), 3 - Murzak-Koba (16-25).

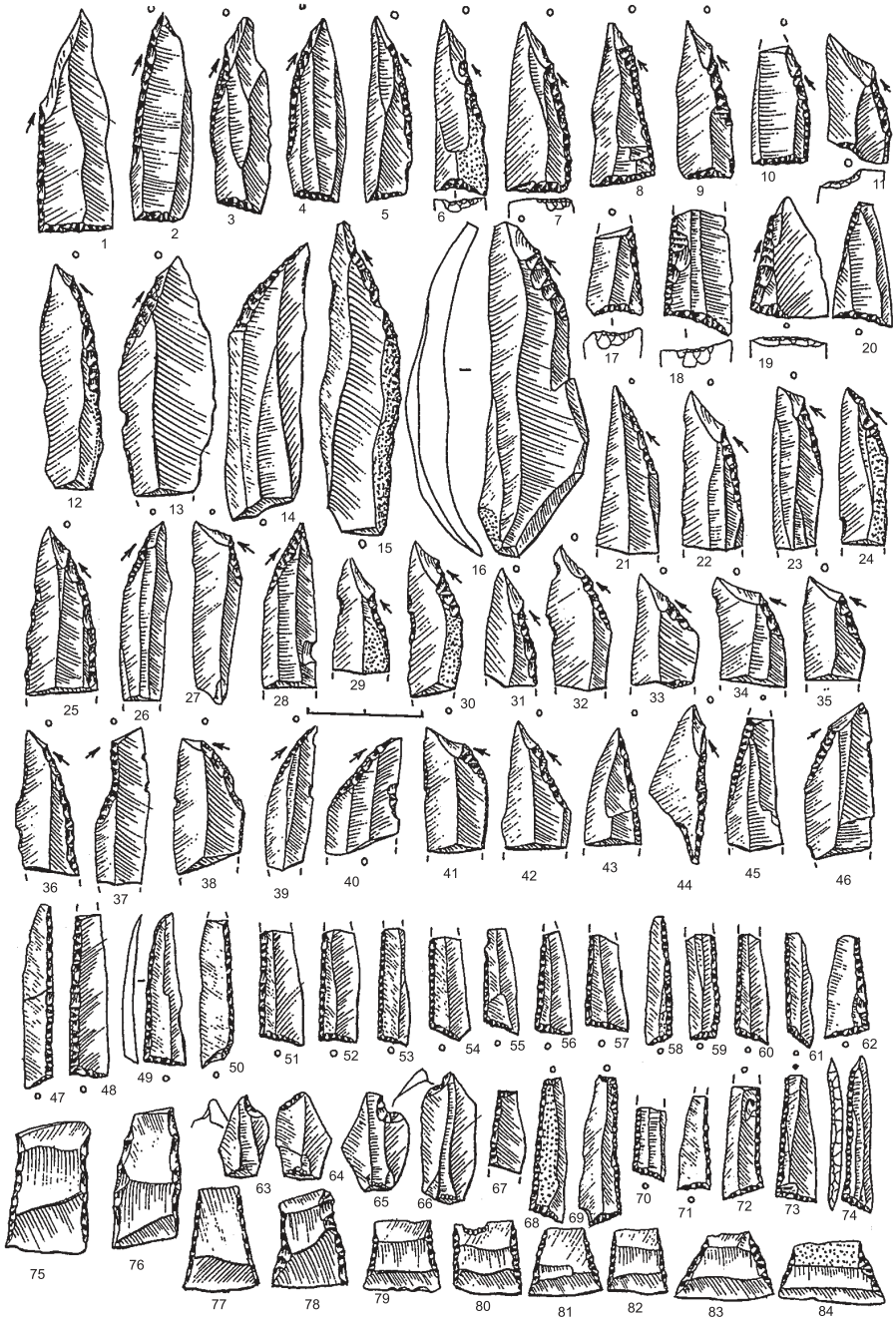

Fig. 7. Janisławice culture site Rudnya. Microliths.

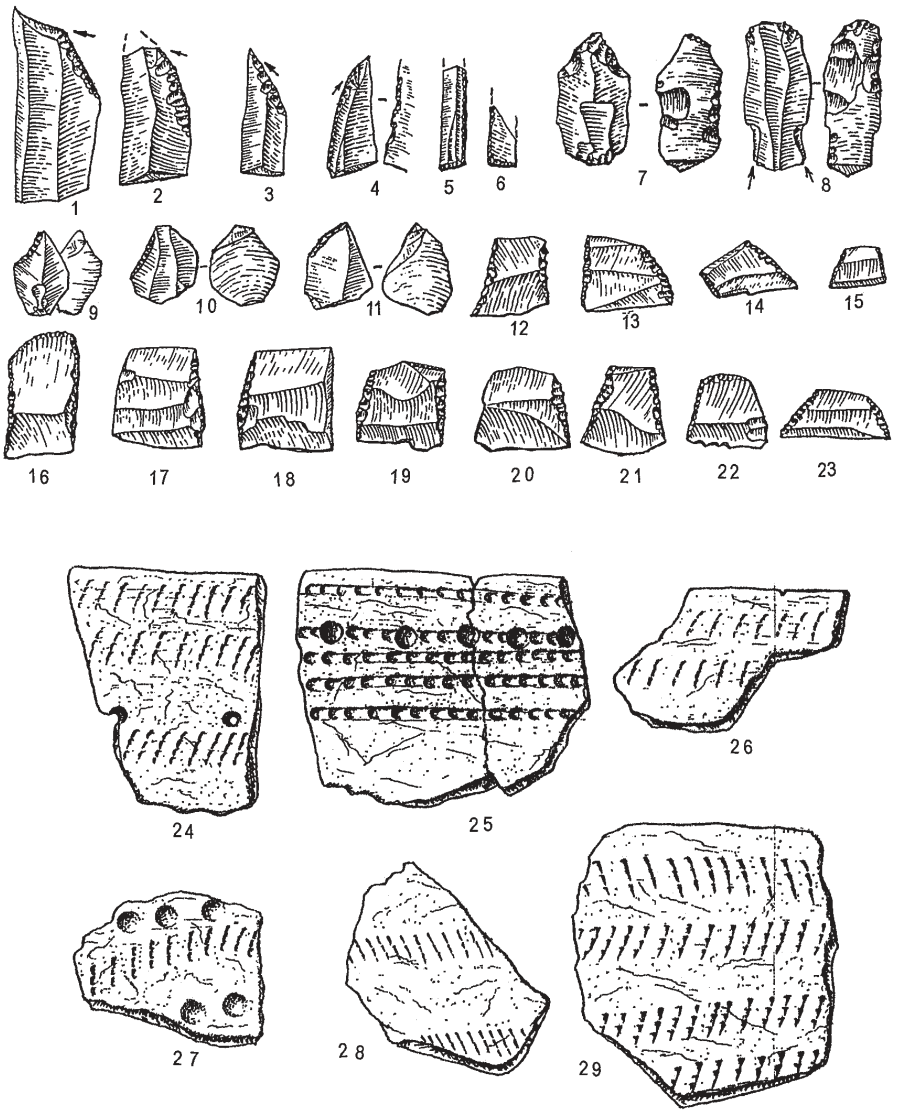

Fig. 8. Borodyanka near Kiev. Flint artefacts and pottery.

forest hunters mixed with the Kukrek population in the Dnieper rapids region and has been assimillated by the tribes of hunters and fishers from the Donets basin. On this mixed base Donets culture originated [Formozov 1959; Zaliznyak 1978:98; 1984a:102-104].

The Janisławice culture had a pottery stage [Kozłowski 1965:147; Koltsov 1977: 192]. There are numerous flint artefacts of the Janisławice type in flint industry at Nemen and Dnieper-Donets Neolithic cultures sites of Polesye lowland [Zaliznyak, Balakin 1985]. The south influences from the Kukrek culture on the Janisławice subbase have caused the Neolithization of the Kiev Polesye [Zaliznyak 1991:41-43] (Fig. 8).

The radiocarbon dates of sites from the territory of Poland and Krinitsa 4 on the Horyn River (7210±40 BC) and flint artefacts typology testify the early Atlantic age of the Janisławice culture sites.

DONETS

The first investigator of Donets sites was M. Sibilev [1930]. For last 20 years they have been excavated by A. Gorelik [1984; 1987]. About 30 sites are known now in the basin of the Severskiy Donets in the East Ukraine. Petrovska, Prishib, Drobyshevo 1, Shevchenko, Pelagiyevka 3, Olkhova 2, 5 etc. are the best investigated.

The microcomplex of the Donets culture sites consists of backed microblades of the Borki type (Fig. 9:1-28), numerous low and medium trapezes (Fig. 9:37-46), Janisławice points (Fig. 9:29-36) and single microburins, crescents and inserts of the Kukrek type (Fig. 9:47-49, 60). There are a lot of microblades from regular conical and pencil-like cores (Fig. 9:66, 67). Burins are more numerous than scrapers. Double burins with retouch on the flakes dominate among the burins (Fig. 9:54-57). Most of scrapers are subround, low on the flakes (Fig. 9:61-64, 68-70), but there are end scrapers, too (Fig. 9:65). In the flint complexes of the Donets culture there are drills (Fig. 9:59), axes (Fig. 9:72), the blades with retouch (Fig. 9:71).

Most of researchers raise an issue of the Donets culture formation on a base of south microlithic Mesolithic under an influence from the north [Formozov 1959]. The large forest complexes on the Upper Donets gave an opportunity to arrival of forest hunters of the Janisławice culture from the Kiev Polesye. The presence of Janisławice points in the flint complexes of the Donets culture evidences the influence of the Janisławice culture of Polesye on the Mesolithic of the Donets basin [Zalizhyak 1978; 1984a, b]. Single point of the Post-Swiderian type proves some kind of contacts with north-eastern neighbours (may be the Butovo culture).

The Donets culture had its Neolithic development stage. Among typical flint materials of the Donets culture the trapezes with flat retouch appeared (Fig. 9:50) as well as pottery with comb ornament of the Dnieper-Donets Neolithic culture (Olkhova 2,5, Petrovka 4,10,28, Drobyshevo l, etc.)

According to A. Gorelik [1984] the Donets culture lasted from the beginning of 6th to 4th mill. BC About 5000 BC it transformed into a Neolithic stage. In 4th mill. BC the Donets culture had been replaced by population of the Neolithic Pitted-Comb Pottery culture.

Fig. 9. Olkhova V. The Donets culture. Flint implements.

PLATOVO STAV

The microlithic flint complexes with crescents and low trapezes with flat retouch on a back are known in the Lower Donets basin (Fig. 2). The regular microblades, end scrapers and pencil-like cores are numerous in flint collection of this type (Platovo Stav, Murzina Balka, Zimovniki 1 etc.). The simillar flint industry spread in the Mesolithic and Neolithic in Crimea, Kuban, and North Caucasus. According to most Ukranian researchers these monuments are genetically connected with the North Caucasus and dated to the Early Neolithic.

STUDENOK

The Studenok type monuments are known in the basin of the Desna River (Studenok, Muragy, Popovo lake etc.) [Zaliznyak 1984a; 1986; 1991:47-52].

The typical feature of the Studenok flint industry is rough flake technique. Among the microliths rough, high asymmetric trapezes on the flakes are predominant (Fig. 2:80-85). There are single asymmetric points of the Altinovo type (Fig. 2:87), tanged points (Fig. 2:88), oblique truncated flakes (Fig. 2:86). There are also a lot of scrapers and burins on the flakes and axes.

The Studenok type monuments consitute the second Late Mesolithic stage of the Pesochny Rov culture. Muragy site is dated by radiocarbon analysis to 7860±100 BP. The Studenok type sites occured in the Atlantic period of the Holocene and were a subbase of the Pitted-Comb Pottery culture of the Desna river basin.

So, during the Late Mesolithic the complicated cultural and historical processes have been taking place on the territory of the Ukraine. Without their generalisation it is impossible to understand a process of Neolithization of East Europe.

Crimea is the specific Mesolithic region of the Ukraine. The Murzak-Koba culture appeared in the Crimea Mountains in the Late Mesolithic. The Kukrek culture population lived, during the Mesolithic in steppes of North Crimea. These people moved to the Crimea Mountains and mixed with the Murzak-Koba culture population. On the base of this mixture the Neolithic of Crimea with trapezes and crescents with flat retouch on a back was formed (Fig. 2:75-79).

Kukrek hunters were autochthons of the steppes of the north Black Sea lowland. This population was genetically connected with the Late Palaeolithic bison hunters of the south Ukrainian steppes. During the Mesolithic and Early Neolithic population of the Kukrek culture migrated in different directions: to the south into the Crimea Mountains, to the east to the basin of Donets River, to the north-west along the Dniester and Bug Rivers in Podolya, Volhynia, Polesye regions, to the north along Dnieper in the Kiev region (Fig. 1). There are typical

Kukrek flint artefacts among the materials of most Ukrainian Late Mesolithic cultures (Murzak-Koba, Grebeniki, Donets, Janisławice).

The reason of Kukrek migration at the begining of Mesolithic was a transgression of the Black Sea. At the end of the Mesolithic the Kukrek population moved to the north may be because of pressure from Balkan Neolithic farmers who migrated from the Danube basin to the Ukraine.

The strong Kukrak influences are observed in the flint implements of the Early Neolithic cultures of the Ukraine (Dnieper-Donets, Bug-Dniester, Surska, Neolithic cultures of Crimea). These materials gave V. Danilenko an opportunity to talk about an important role of the Kukrek culture in the Neolithization of the Ukraine [Danilenko 1969]. In the Dnieper rapids region and in the basin of Molochna River the Kukrek culture transformed into the Neolithic stage.

There was a continuation of cultural and historical development on the north Black Sea lowland from the Late Palaeolithic bison hunters through the Mesolithic Kukrek culture to the Early Neolithic. It was caused by relatively small changes of nature in a steppe zone of the Ukraine on a border of the Pleistocene and the Holocene. As a result the steppe model of economy adaptation preserved with small changes in the north Black See region in the Early Holocene.

The west neighbour of the Kukrek population were Grebeniki tribes, which lived in the north-west Black Sea region in the Boreal and the Atlantic periods of the Holocene. Migrations from Lower Danube to the north-east predominated in this region from the Final Palaeolithic to the Middle Ages. The Neolithic Bug-Dniester, Linear Band Pottery, Cucuteni-Trypolye cultures population came to the South-Western Ukraine from the Danube basin.

This direction of migration caused the Neolithization of Europe by means of the oldest Neolithic farmers spreading from the Near East through the Balkan Peninsula to the Northern Europe. This general tendency gives an opportunity to assume south-western genetical roots of the Grebeniki culture. Therefore, its flint assemblages are very simillar to flint collections from the Balkan and Danube regions (Argissa, Sesklo, Criş, Starčevo, Cuina Turcului) [Perles 1988:29, 30; Paunescu 1988:79-88].

The process of Protoneolithization took place in Europe before the spread of pottery and food producing economy [Kozłowski 1988:9-18]. The essence of it was spread of pressure or chipped stone industry from the Mediterranean region to the north (Fig. 6). Protoneolithization of Europe began around the 7th mill. BC and it took two main directions: from the Kapsian culture of North Africa through West Europe to North German lowland and from the Near East through the Balkan Peninsula to Central Europe with two branches along the Danube to the south Germany and to the north-eastern direction to the Ukraine (Fig. 10)

Regular, one-sided cores for the regular medium-sized blades produced by pressure technique, numerous trapezes on its sections (Fig. 4:19-35) are typical for Protoneolithic flint industry. This flint technique came to the Balkan Peninsula from the Near East in 7th mill. BC. The oldest of such complexes are known from the Protoneolithic sites of East Greece (Argissa, Sesklo, Nea Nicomedea) [Perles 1988].

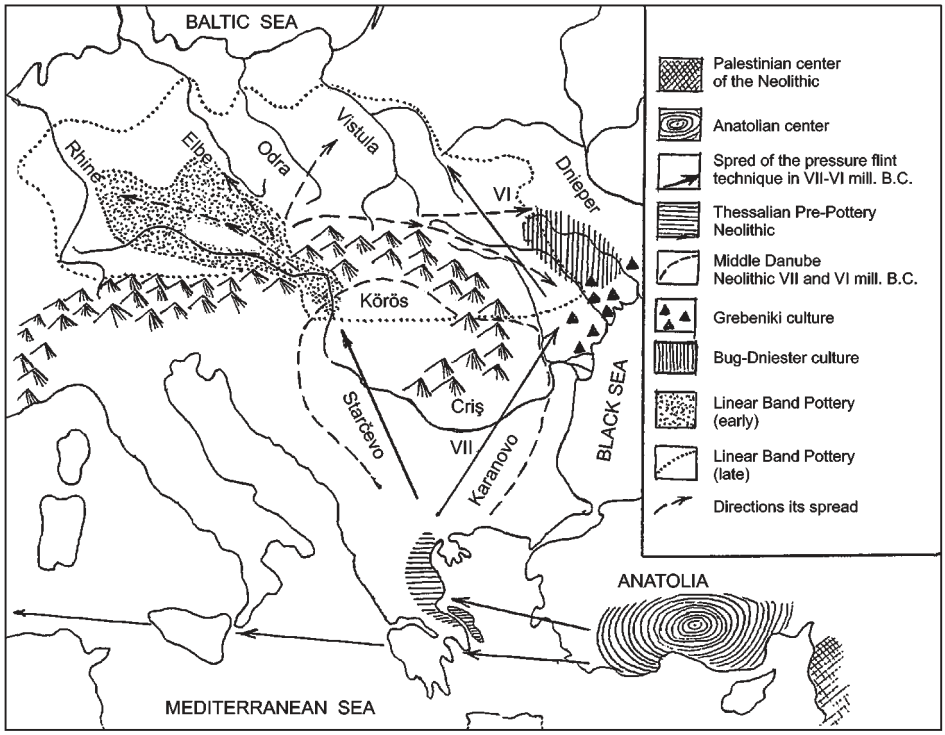

Fig. 10. Neolithization of Europe.

The Protoneolithic pressure technique advanced through Greece to the Danube basin (Starčevo, Karanovo, Körös, Criş cultures) and reached the Ukraine (the Bug-Dniester culture) in 6th mill. BC This technique flourished in the Linear Band Pottery culture which spread over Central Europe from the Rhine to the Southern Bug River in the 5th mill. BC. Local Neolithic population of the southern Baltic (the Funnel Beaker culture) received this flint industry from the Linear Band Pottery culture [Domańska 1995].

The Grebeniki culture flint artefacts are typical examples of this pressure technique (Fig. 6:9-15). Obviously, this population advanced to the Odessa region of the Ukraine from the Lower Danube basin in the 7th mill BC. Judginig from a presence of Kukrek admixture in flint complexes of the Grebeniki culture the newcomers from the Balkan region met and intermixed with aboriginal Kukrek culture population in the Black Sea steppes. This population moved to the north along the Prut, Dniester and Southern Bug Rivers (Fig. 1). On this Grebeniki — Kukrek subbase Neolithic Bug-Dniester culture originated in the region of the Middle Dniester and Southern Bug Rivers in the 6th mill. BC. This oldest Ukrainian Neolithic

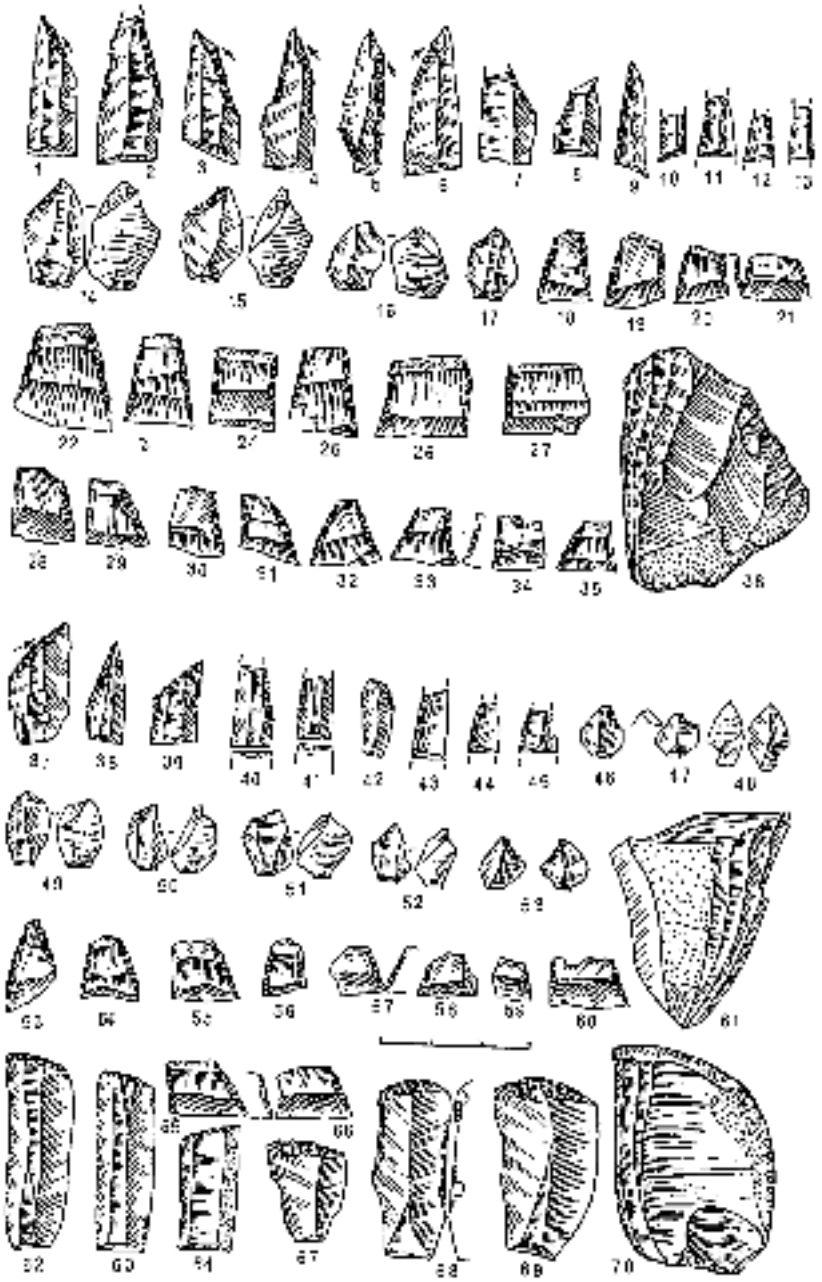

Fig. 11. Flint implements of the Janisławice type from the Neolithic sites of Kiev region: Obolon (1-36), Gorki (37-63). Flint implements of the Linear Band Pottery sites (64-70).

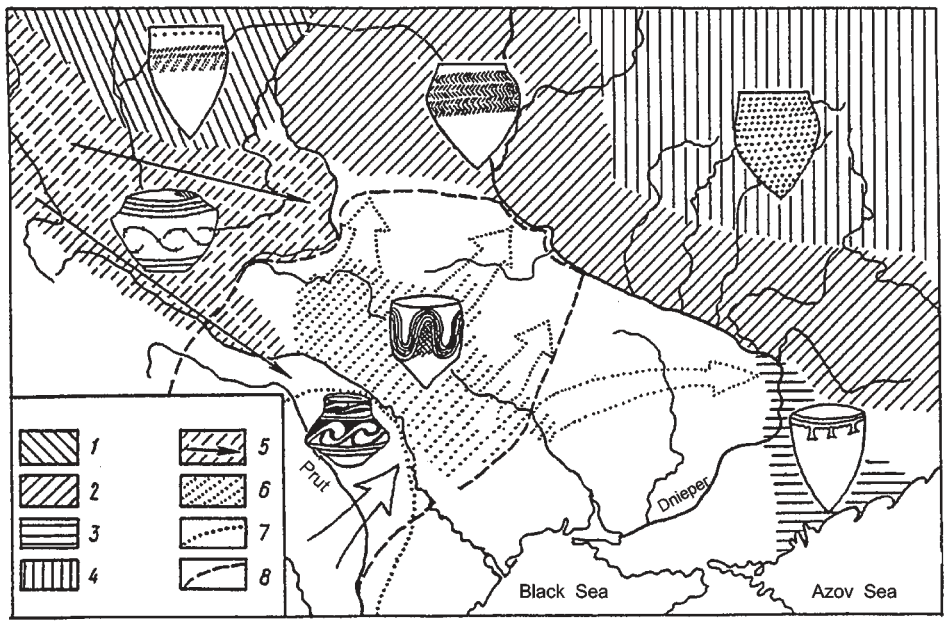

Fig. 12. Neolithic cultures of the Ukraine: 1 - Nemen; 2 - Dnieper-Donets; 3 - Surska-Dnieper; 4 - Pitted-Comb Pottery; 5 - Linear Band Pottery; 6 - Bug-Dniester; 7 - Cucuteni; 8 - Tripolye.

culture was the east periphery of a large Danube Neolithic unity of the 6th mill. BC (Starčevo, Karanovo, Criş and Bug-Dniester culture) and developed under the strong influence of the Criş culture from the Prut river basin (Fig. 12).

In the 5th mill. BC new waves of Neolithic migrants moved from the Danube region to Dniester basin. Under the press of this Linear Band Pottery and Cucuteni newcomers Bug-Dniester population settled to the north-east direction and reached Podolya, Volhynia, Polesye and Middle Dnieper (Fig. 12). The expressive Bug-Dniester featuers of oldest Neolithic ceramic of South Polesye and Middle Dnieper basin are the evidences of it. So, the Protoneolithic pressure technique spread out in Polesye. It caused a transformation of local Late Mesolithic Baltic tradition to the flint industry of Janisławice type. Janisławice flint implements were realisation of the Post-Maglemose Baltic Mesolithic traditions on the base of new Protoneolithic pressure technique (Fig. 6:1-8)

So, according to archeological material, the Neolithization of the Polesye lowland was a result of southern influences of the Bug-Dniester and Kukrek cultures. Kukrek population moved to the north to the Dnieper valley and Bug-Dniester influences spread to Podolya, Volhynia and Polesye along the Prut, Dniester and Southern Bug Rivers. The Bug-Dniester cultural complex consisted of exceptional elements of south-western origin (pottery of the Criş-Starčevo type, flint artefacts of

the Balkan type, etc.) and included certain Kukrek elements (inserts of the Kukrek type, pencil-like cores, numerous backed microblades, etc). Therefore at the oldest Neolithic sites of the Ukrainian Polesye there are: typical pottery with an ornament of the Bug-Dniester culture (Fig. 5) and the Janisławice culture flint implements (Fig. 8:1-6, 9-23; 11:1-63) with clear Kukrek elements (Fig. 5:1-18; 8:7, 8).

According to current archeological data a food-producing economy came on the territory of the Ukraine from the Balkan Peninsula through the Danube basin. The old version of the Neolithization of the Ukraine is not convincing now. Instead of it, the archeological data indicate four waves of the migrants which have followed from the Danube region to the Ukraine since 7th mill. BC: 1) Grebeniki, 2) Bug-Dniester, 3) Linear Band Pottery, 4) Cucuteni-Tripolye. Under the strong influences of these Neolithic newcomers from the Balkan region the local Neolithic culture arisen in the North and East Ukraine (Surska, Dnieper-Donets, Nemen cultures) (Fig. 12).

The border between the Neolithic newcomers from the Danube region and local hunting tribes in the 5th mill. BC was established on the south edge of Middle European lowlands. It was inappropriate for mattock agriculture and did not attract Neolithic colonists. But North Germany, Poland, Polesye lowlands with their forests, rivers and lakes were the very rich with game and fish. Therefore the ancient hunting and fishing economy has been preserved there.

However, the crisis of hunting economy forced the hunters and fishermen to adopt different innovations from more developed southern neighbours. First of all, they assimillated the Neolithic technique of pottery production, the first experience of agriculture and a stock-breeding.

So, in the 5-4th mill. BC to the north of the descendants of the first Balkan farmers (the Linear Band Pottery and Trypolye cultures) in lowlands of North Germany, Poland, and Polesye and in the Dnieper valley autochthonous hunters and fishermen lived. This was some kind of barbaric periphery of the Balkan farmers' protocivilization, which was the subbase of the first Indo-Europeans (Fig. 6).

Modern archeological and anthropological data from the Middle European lowlands allow reconstructing the Proto-Indo-European substratum of the 6-5th mill. BC which was a genetic basis of the first real Indo-Europeans [Zaliznyak 1984a; 1984b: 89, 97-99].

The hunting Mesolithic population of the Maglemose (Svaerdborg) culture lived in the 7th mill. BC in the west Baltic region. As a result of the Baltic Sea transgression about 6000 BC this population began to migrate to the east and south-east. The Post-Maglemose Late Mesolithic entity spread from the North Sea to Severskiy Donets (Fig. 13). It consisted of the cultures de Leien-Wartena, Oldesloe, Chojnice-Pieńki, Janisławice, Donets. The flint implements of those cultures testify their relationship and genesis on the base of the west Baltic Mesolithic [Zaliznyak 1991].

In Poland, sites with materials testifing the movement of the Svaerdborg culture population from the territory of North Germany and Denmark to Polish lowland have been excavated lately [Bagniewski 1993]. There are two stages of the Ma-

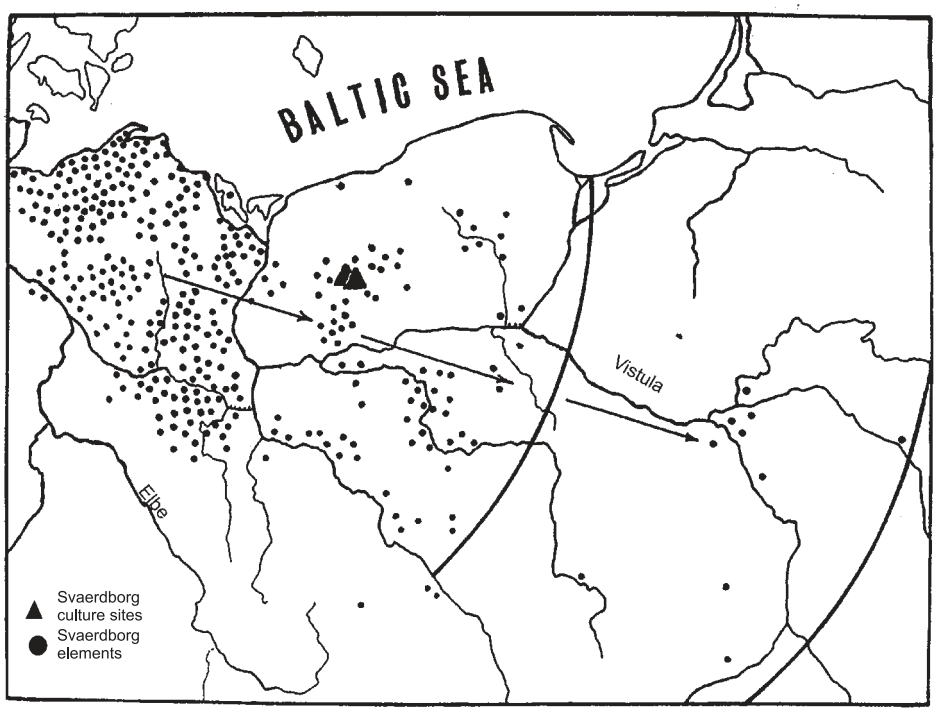

Fig. 13. Influx of Svaerdborg elements into the territory of Poland, [after Bagniewski 1993].

glemose or Svaerdborg tradition development on the territory of Poland. The flint material from Wierzchowo 6 site is like the late Svaerdborg material from Denmark which is dated to the end of the 7th mill. BC. Large and small triangles and the backed bladelets of the Maglemose type are typical. Not so numerous are points of the Svaerdborg type and axes.

Later the Svaerdborg flint industry transformed into the Gudovo type complexes. They are the very simillar to materials of the Oldesloe culture from north Germany and Denmark dated to the 5th mill. BC In Poland such sites are called the Chojnice-Pienki culture.

Sites of the Svaerdborg type are unknown to the east of the Vistula River. In Polesye between the Vistula and the Dnieper in the 5th mill. BC sites of the Janisławice culture spread out (Fig. 13). Recently, most of researchers talk about the Post-Maglemosian character of the Janisławice flint complex. Genetically it is connected with Svaerdborg population of the west Baltic region [Zaliznyak 1991:38, 39].

There are several clear Maglemosian features in flint artefacts of the Janisławice sites from Polesye. I mean specific long triangles (Fig. 7:47-62), backed blade-

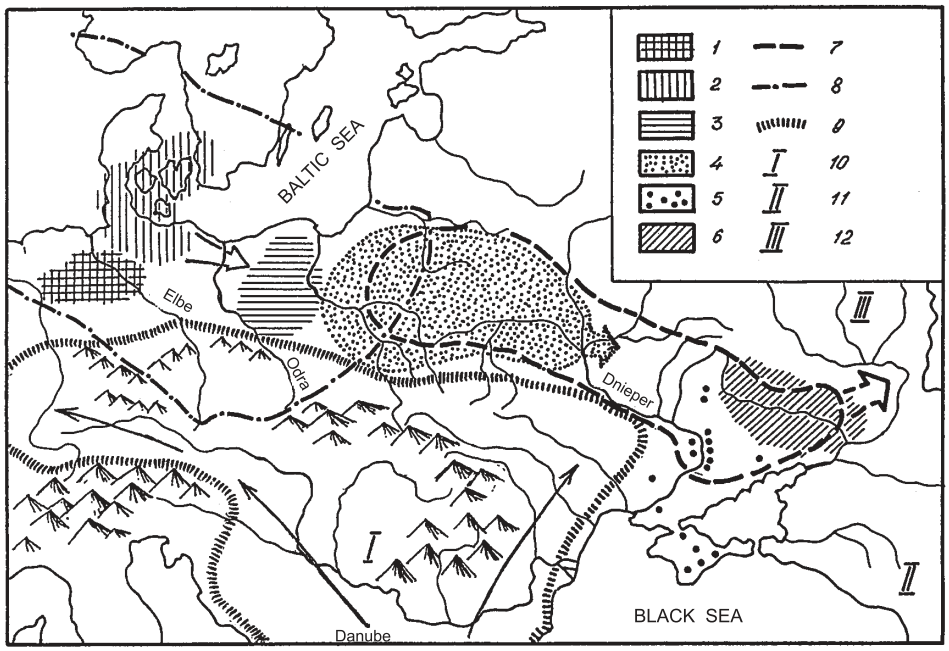

Fig. 14. The Late Mesolithic the and Neolithic subbase of Indo-Europeans. Late Mesolithic subbase: 1 - De Leien-Wartena, 2 - Oldesloe, 3 - Chojnice-Pieńki, 4 - Janisławice, 5 - Sites with the Janisławice points, 6 - the Donets culture. Neolithic subbase: 7 - Cultures with comb pottery, 8 - the Funnel Beaker culture, 9 - Balkan Neolithic, 10 - Near East population, 11 - Pra-Cartvels, 12 - Pra-Ugro-Finns.

lets with microburin spell on the top (Janisławice points) (Fig. 7:1-46), the development of pressure and microburin techniques of flint processing, the single-platform core for regular blades (Fig. 6:1) etc.

Gradual disappearance of the Maglemosian features in the flint materials of the sites towards the east can be seen. Like in the Vistula basin, the Maglemose triangles constitute about a half of the whole microlithic assemblage. At the sites of west Polesye the triangles are not more numerous than 10-20% of the microlithes. In the Kiev region only single triangles were found (Fig. 8:5, 6).

In the basin of the Severskiy Donets there are the very few west Baltic Maglemose elements (Janisławice points, microburins) (Fig. 9:29-36). But most of researchers consider that the Janisławice population moved from the Kiev Polesye to the east and took part in the genesis of the Donets culture [Zaliznyak 1978; Gorelik 1987:159].

So, in the 5th mill. BC, because of migration process from the west Baltic region to the south-east direction the group related Late Mesolithic cultures has been formed. The numerous finds of specific flint artefacts (Janisławice points) in

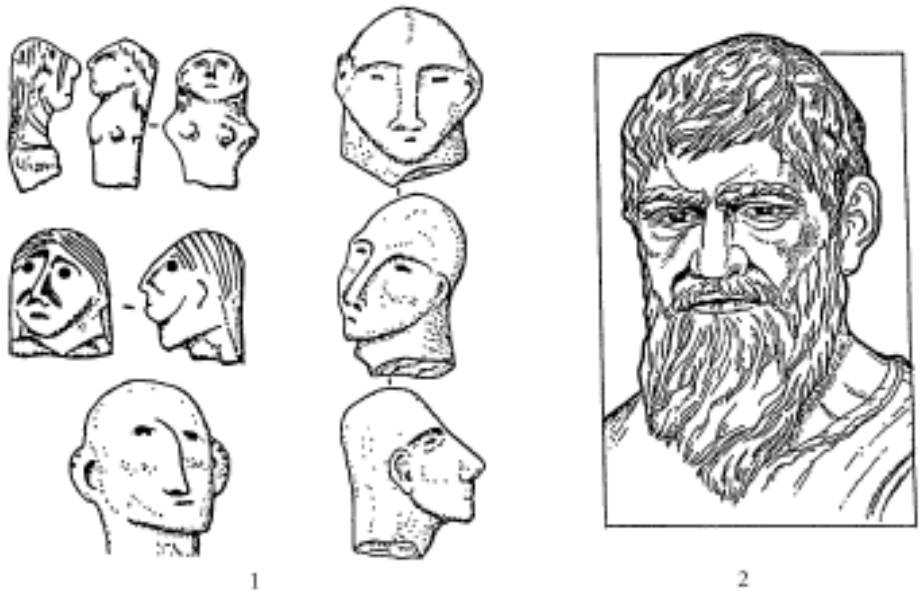

Fig. 15. Trypolyan farmers (1) and oldest Indo-European stock breeders (2). 1 - Trypolyan clay sculpture, 2 - reconstruction based on the skull found in Dnieper rapids.

the Dnieper rapids region and even in Crimea testify that the migrants from the Baltic region reached the Black Sea coast (Fig. 13).

On this Post-Maglemose base in the5-4th mill. BC Neolithic cultures: Ertebølle, Dubichay, Strumil, Nemen, Dnieper-Donets were formed in the south Baltic region, Polesye, Middle Dnieper and the Donets River basin (Fig. 13). It is evienced by Post-Maglemosian character of the flint complexes of the oldest Neolithic sites on the mentioned territory. For example, at the oldest settlements of the Nemen and Dnieper-Donets cultures of Polesye and Kiev region with the comb ornament and series of typical Janisławice points, triangles, microburins (Fig. 8) [Zaliznyak, Balakin 1985].

There is anthropological evidence of an existence of culture-genetic unity between the Rhine and the Donets in the 6-4th mill. BC. The anthropological materials from the cemeteries of the Dnieper basin provide evidence of the Mesolithic population movement from the Baltic area to the Lower and Middle Dnieper. If in the burials near Voloshskiy and Vasilyevka villages (10-8th mill. BC) south Europoids have been buried, the Neolithic cemeteries of the Lower Dnieper (Vovnigy I,III,

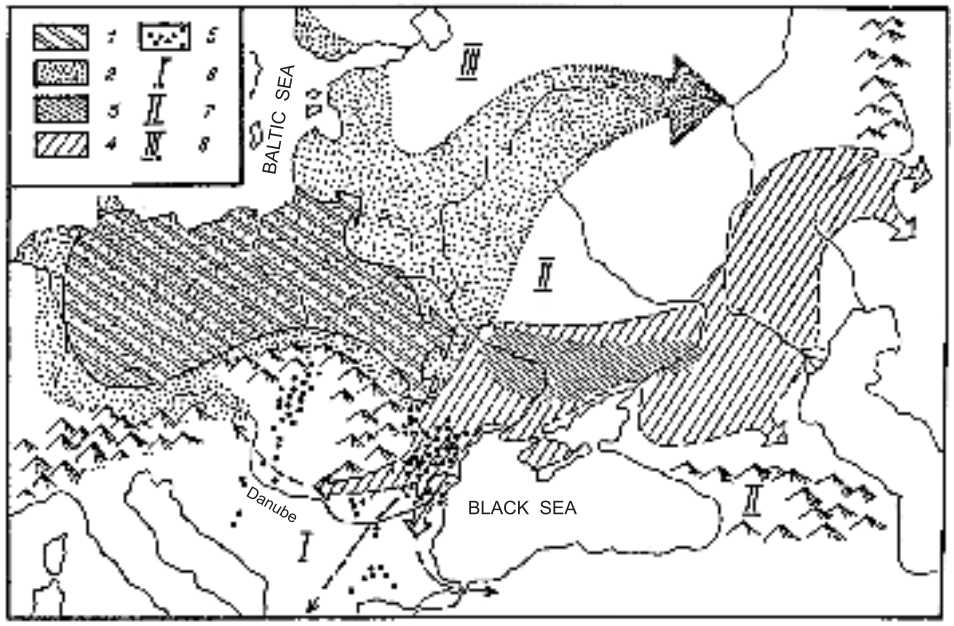

Fig. 16. Indo-European migrations from 4th to 2nd mill. BC. 1 - the Globular Amphora culture, 2 - the Corded Ware culture, 3 - the Seredni Stog, 4 - the Yamnaya culture, 5 - steppe barrows, I - Balkan Neolithic, II - Pra-Cartvels, III - Pra-Ugro-Finns.

Volnyanka, Yasinovatka, Mikilske) from 6-5th mill. BC contain remains of massive north Europoids [Telegin, Potekhina 1987] (Fig. 15).

These Neolithic materials and materials from contemporary burials from Denmark (Vedbaek, Ertebølle etc.) provide evidence of certain cultural and genetic relationship between the populations that had lived there. They were of simillar north Europoidal anthropological type.

The oldest real Indo-Europeans in the 4-3rd mill. BC (Seredni Stog, Yamnaya, Funnel Beaker, Globular Amphora, Corded Ware cultures) belonged to the same or related north European anthropological type, as their direct ancestors from the 5th mill. BC (Dnieper-Donets and Ertebølle cultures). But since the 4-3rd mill. BC we can see the beginning of the process of gracilization. So, the oldest Indo-Europeans began to form in the 6-5th mill. BC on the base of local north European Mesolithic population of hunters and gatherers under cultural influence and certain influx of less massive non-Indo-Europeans from agricultural Neolithic centres of the Balkan and Danube area.

The linguistic analysis of Proto-Indo-European language provides evidence that the Indo-European homeland in the 4th mill. BC was situated between the Proto-Finno-Ugric of the forest-steppe zone from Donets to the Ural, the Pra-Car-

tvels of the Caucasus and bearers of the Near-East languages traditions (the Balkan Neolithic) [Illich-Svitich 1964; Gamkrelidze, Ivanov 1984:870-880]. I mean the forest-steppe and steppe territories of the Dnieper rapids, the left-bank Ukraine, the Lower Don and may be the Kuban River. The oldest, Indo-European stock breeding entities, arouse in the end of 5-4th mill. BC on these territories (Mariupol, Seredni Stog, Novodanilovo, Kemi-Oba cultures etc.). In the west part of the Neolithic Proto-Indo-European zone of Europe (Fig. 13) the first real Indo-European unity was the Funnel Beaker culture of the south Baltic region which is dated to the second part of 4-3rd mill. BC According to archaeological data the spread of the Indo-Europeans in the steppe zone of Eurasia began at the beginning of the 4th mill. BC from the left bank Ukraine (Fig. 16).

So, in the 6-5th mill. BC the same kind of barbaric periphery of the Balkan--Danube Neolithic protocivilization arouse to the north of it in the lowlands from the Rhine to the Donets River (Fig. 13). It has been formed on the base of the autochthonous Mesolithic population which moved from the west Baltic region to the south-east through the Oder, Vistula, Pripet, Middle Dnieper basins to the forest-steppe zone of the Left Bank Ukraine.

These related cultures of aboriginal hunters and fishermen developed under a strong progressive influence from the Balkan Neolithic. Because of this southern influence and a spread of steppes through the aridization of climate the above-mentioned local hunting-fishing society of the north Europoids became to transform in the oldest stock-breeding Indo-European cultures in 4th mill. BC (Mariupol, Seredni Stog, Novodanilovo, Funnel Beaker etc.).

The stock breeding caused the spread of the Indo-European culture and languages in the steppe zone of Europe and Asia in the 4-2nd mill. BC [Mallory 1989]. It happened in the Eneolithic — very favourable for a stock breeding conditions of the climate aridization [Kremenetsky 1991]. The aridization contributed to the spread of the steppes and to the collapse of the Balkan Neolithic civilisation. It stimulated stock breeding as a separate branch of economy and populating the steppes by the oldest stockbreeding tribes from the Indo-European culture and languages from the Danube to Mongolia, India and Iran (Fig. 16) [Zaliznyak 1984b:78-117].

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Aleksander A. Yanevich

THE NEOLITHIC OF THE MOUNTAINOUS CRIMEA

The first Neolithic site, situated in the mountainous part of Crimea, has been discovered at the beginning of the 20th century [Moiseev 1918], and in the 1930s the Neolithic period has been taken into consideration in divisions of the Stone Age of Crimea for the first time [Bader 1940]. In 1950-1980 new sites have been discovered and investigated, and as a result of these a new system of divisions of the Crimea Neolithic came into being [Kraynov 1960; Formozov 1962; Shchepinskiy 1968; Kolosov 1971; Telegin 1982]. At the same time a new approach on relatively fast transition from hunting and food-gathering to farming and cattle breeding in Crimea occur as well as on local pig domestication [Kraynov 1960; Formozov 1962; Kolosov 1971]. These approaches are however in contradiction to the results of new research. The process of the Neolithization of Crimea ran in more complicated way than it had been thought before because hunter-gatherers and farmers could co-exist for a long time. That process reflects the Neolithic of the mountain part of Crimea.

1. PALEOECOLOGY

Crimea, in respect of topography, is divided into two parts: the north — which is a plain, and the south — which is a mountainous part. Three main mountain ranges belong to the mountains region: north with the height of up to 250 m above sea level, central — with the height of about 500 m, and south, the highest, reaching 800-1500 m. The peculiarity of the main (the highest) range are immense plateaux on the mountain ridges.

The climate of the peninsula has been, since the end of Early Holocene, definitely warm and humid, similar to the present one. Boreal warming is well available, especially in pollen diagrams of the Kerch sites [Matskevoy, Pashkevich 1973], and in diagrams from the Shan-Koba settlement [Besusko, *et al.* 1998]. It is also reflected in charcoal analyses [Gammermann 1934] and molluscs (*Helix albestins*) analyses from the Late Mesolithic housing areas. During the climatic optimum in

the mid-Holocene temperatures differed for 1-2 C from the present ones and the total fall for 100 mm at the outmost [Savina, Khotinskiy 1982].

In accordance with the rhythm of climatic changes of the end of Early Holocene and in mid-Holocene typical vegetation zones were formed. In the north part of Crimea, steppes covered with a great variety of grasses developed [Matskevoy, Pashkevich 1973; Pashkevich 1982].

An increasing humidity in the mountainous part of Crimea caused the replacement of coniferous forests by deciduous trees growing in warm circumstances. Their composition is available in charcoal spectra in Late Mesolithic mountainous settlements [Gammermann 1934] and in pollen diagrams of the Shan-Koba site [Besusko, *et al.* 1998]. Characteristic species are as follows: oak, beech, maple and rowan. At the end of the Late Holocene in the mountainous part a typical vertical division of vegetation developed. There were forest-steppe zones, beech and oak forests and steppe on the north slopes [Rubtsov 1978:26-75]. The presence of these zones has been confirmed for the boreal and Atlantic periods by pollen analyses carried out by L. Besusko for Shan-Koba site [Besusko, *et al.* 1998]. The investigation of fauna in the Late Mesolithic settlements of the second mountain range gave similar results. They show a noticeable domination of forest fauna in relation to the steppe one [Vekilova 1971].

At the decline of the Early Holocene the process of fauna complexes forming in different areas of the peninsula came to the end. Forest fauna dominated in the mountainous part; boars, deer and roe deer are known from the Late Mesolithic and Neolithic settlements. Fauna of open or half-open biotops — aurochs, donkey and horse, is known only occasionally from the settlements which are situated in not far distance from the steppe zone (Alimovskiy Naves, Zamil-Koba II) [Vekilova 1971]. Aurochs, bison, tarpan and donkey represent the fauna of the Crimea plain. Their bones dominate in osteological material of the Mesolithic and Neolithic settlements from that area. Saiga antelope and deer are also found in small amounts [Matskevoy 1977].

2. THE LATE MESOLITHIC SUBSTRATUM OF THE MOUNTAINOUS CRIMEA NEOLITHIC

Typological and statistical analyses of the flint material, based on the Robinson's index with microliths as a base, and on comparison of all categories of artefacts allow to distinguish five Late Mesolithic and Neolithic cultures in Crimea [Yanevich 1995]. Three of them are known for a long time, they are: Murzak-Koba, Kukrek and Tash-Air cultures [Bonch-Osmolovskiy 1934; Vekilova 1966; Kolosov 1971; Telegin 1982; Yanevich 1987a, 1995]. The other two cultures are symptoms of new Late Mesolithic and Neolithic cultural phenomena that have been worked out during recent years — namely the Shpan and Alexeevo cultures [Yanevich 1987b, c, 1995].

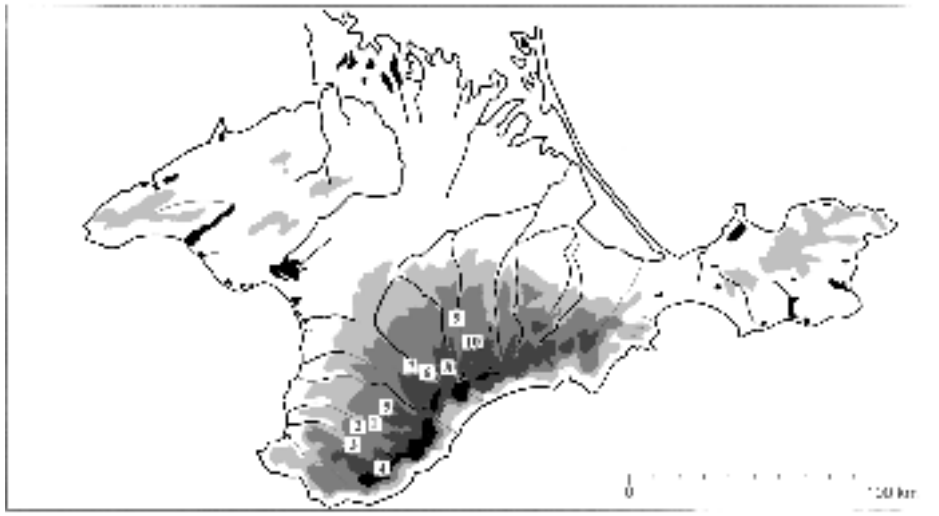

Fig. 1. The map of the Tash-Air culture sites. 1 - Tash-Air 1 ; 2 - Zamil-Koba 2; 3 - Alimovskiy Naves; 4 - At-Bash; 5 - Kaya-Arasy; 6 - Denisovka; 7 - Petrovska Balka; 8 - Shpan-Koba; 9 - Buran-Kaya 3; 10 - Adzy-Koba 2.

There are two different views on the genesis of the Tash-Air culture. According to most of the specialists that culture developed on the local Late Mesolithic substratum [Kraynov 1960:91-104; Formozov 1962:117; Shchepinskiy 1968:121-133; Kolosov 1971:129-135; Yanevich 1995]. Only N.N. Danilenko connected the origin of the Neolithic of the mountainous Crimea with the Kukrek culture [Danilenko 1969:189].

Comparison of the Late Mesolithic and Neolithic flint material shows genetic links between the Murzak-Koba and Tash-Air cultures. The Murzak-Koba culture is represented by the following complexes: Murzak-Koba [Bibikov 1940], Shan-Koba, layer 3 and 2, Fatma-Koba, layer 4, 3 and 2 [Bibikov 1966], Adzy-Koba 3 [Yanevich 1984], Laspi 7 [Telegin 1982], Shpan-Koba — the upper layer, Kara-Koba [Kolosov 1960] and others. Sites of that culture are situated exclusively in the mountainous part of Crimea. In the area of the second (mountain) range they occur in *abris*, on plateaux and on open coastal sites.

The Murzak-Koba culture is characterised by relatively highly developed blade technique. Pyramid cores prevail in its assemblages (51-89%; Fig. 2:49, 50, 77). There also occur cores with double platform (7-43%; Fig. 2:51), *pencil* cores (Fig. 2:52) are known as well (4%), they served to obtaining microblades.

Among the Murzak-Koba culture microliths geometric forms (72-100% of all the microliths), backed bladelets (7%; Fig. 2:70, 71) and truncated pieces (4%) should be mentioned. Occasionally, the Świder points (3%; Fig. 2:76) and the Kukrek inserts (3%; Fig. 2:37, 72) also appear. Among the geometric microliths trapezes

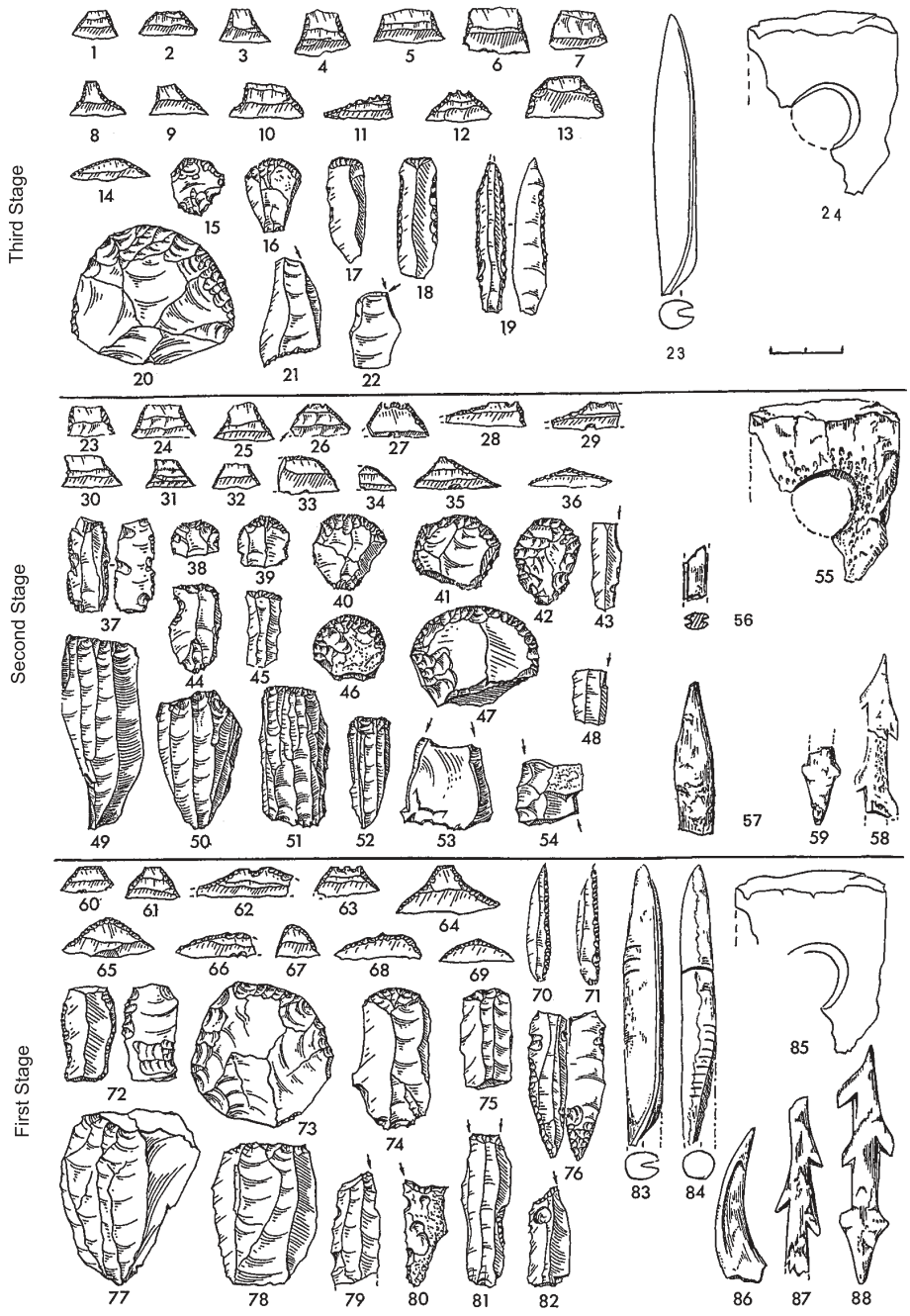

Fig. 2. The Murzak-Koba culture. Flint and horn tools.

prevail (81-11%); their main type is a symmetric trapeze with steep retouch (Fig. 2:7, 25-27, 60-61). The other type is formed by asymmetric trapezes, one-sided concave (Fig. 2:8-10, 30-31). A characteristic type of the Murzak-Koba culture are a very short, symmetric or asymmetric trapezes with notched retouch on upper base (Fig. 2:11, 28, 62), so-called Fatma-Koba trapezes. Segments occur not numerously (5-23%; Fig. 2:14, 68), triangles are rare.

In comparison with another tools, scrapers appear not in large amounts within the Murzak-Koba culture (7-13%). They are usually made of blades but also scrapers on a flake that prevail in certain assemblages, can be found. Straight and convex scrapers on a blade (Fig. 2:17-18, 44-45, 75) and scrapers on a flake (Fig. 2:15-16) should be also mentioned, whereas burins are even less numerous than scrapers (merely 6%). Dihedral burins and burins on snap prevail (Fig. 2:21, 43, 48); burins on truncation (Fig. 2:80-82) are less numerous and they belong to so-called Kukrek-type burins (Fig. 2:53-54). The characteristic feature of the Murzak-Koba assemblages is an occurrence of large amounts of blades with notched retouch (54-66%).

Among bone tools arrowheads, harpoons and frames [Bibikov 1977; Telegin 1982; Kolosov 1960] are represented. Bone arrowheads are homogeneous, they have circle or oval cross-section and are from 0,8 to 1,3 cm in diameter, their length is — judging from well-preserved specimens — about 7 cm. An arrowhead from layer 3 of Shan-Koba and the one from layer 3 of Fatma-Koba have an elongated groove (Fig. 2:83), and an arrowhead from Laspi 7 — two grooves (Fig. 2:56). The length of harpoons is 6-8 cm and their diameter — 0,7-1 cm. They have a symmetric row of teeth (Fig. 2:58-59, 87-88).

It is possible to distinguish three stages of the Murzak-Koba culture development on the basis of flint tools technology and morphology (Fig. 2). The first stage includes the Murzak-Koba, Shan-Koba (layer 3) and Fatma-Koba (layer 4) assemblages, the second one — the Fatma-Koba (layer 3), Adzy-Koba , Laspi 7, Shpan-Koba (layer 1-2 and 1-3) and the Kara-Koba assemblages, and the third — the Shan-Koba (layer 2), Shpan-Koba (layer 1-1) and Kukrek (layer 3).

3. GENERAL CHARACTERISTICS OF THE TASH-AIR CULTURE

Nowadays over 30 Tash-Air culture sites are known. They are as follows: Tash-Air 1 (layer 8-5a), Zamil-Koba 2 (layer 8-5); [Kraynov 1960], Adzy-Koba 2 [Yanevich 1984], At-Bash [Formozov 1962], Kaya-Arasy (lower layer); [Shchepinskiy 1962], Buran-Kaya 3 (layer 3), Denisovka [Shchepinskiy 1968], Zuya 1 [Vekilova 1951] etc. All of them are situated in the mountainous area of Crimea, in the second mountain range or on plateaux (Fig. 1). In the mountains they are mainly *abris*, some of them are open. The open sites are situated on the plateau, usually on the edge of it, in the vicinity of springs. Apart from the two areas — the mountainous one and the forest one-sites of that culture are not known.

Flint production

Characteristic feature of the Tash-Air culture is a high level of blade technique. Blades derive chiefly from cores with single platform (40-74%, Fig. 3:17, 39-40; 4:33, 35; 5:31-32). Special types of cores with single platform are specimens with round flaking surface (Fig. 3:39; 5:32). Specimens with double platform represent the second type of cores (31-51%; Fig. 4:34; 5:30). Other types are rare.

The Tash-Air culture microlithic technique is represented by geometric microliths (89-93%) and backed bladelets (3-11%; Fig. 3:32; 4:10-14; 5:12). Among the geometric microliths trapezes play a significant role (65-77%). Medium high specimens with a flat retouch (Fig. 3:1-2; 4:1-7; 5:1-6, 10) should be stressed as the main type of the Neolithic trapezes of the mountainous part of Crimea. They differ in proportions and size of the flat retouch. High symmetric and asymmetric trapezes with steep retouch have also been registered. Segments are not so frequent (23-25%). Nearly all the segments are of medium height and symmetric, with predominance of specimens with a flat retouch (Fig. 3:4-5, 31; 4: 9). Nevertheless, segments with a steep retouch are frequent, especially in late inventories (Fig. 3:4; 5:8).

Scrapers are the most abundant group of tools (29-41% of all the retouched artefacts). There are scrapers, mainly straight ones, that constitute the predominant group (Fig. 3:10, 13, 33-35; 4:16, 18-23, 30-31; 5:13-23). Double scrapers are scarcely represented (Fig. 4:17; 5:24). Scrapers on a flake occur in the shape of massive semi--round scrapers (Fig. 3:16, 38; 4:24; 5:29). Burins do not form a large group (10%) and burin on snap is their main type (Fig. 3:14, 37;4: 25-29; 5:26). The characteristic feature of the Tash-Air culture assemblages are borers, which appear in relatively large amounts (6%) in the shape of rather big blades with a steep retouch (Fig. 5:25, 27). Retouched blades are numerous, while the other forms of retouched tools occur in scanty amounts.

Bone and horn products serve as points, axes, knives, awls and pins frames. A bone tool from Tash-Air 1 (layer Va) [Kraynov 1960] seems to be very interesting; it differs from Mesolithic bone blades of Crimea and can probably be interpreted as a tool of a specific role. Horn frames are preserved mostly in parts; the only completely preserved specimen originates from Zamil-Koba 2. It is made of a split boar tusk [Kraynov 1960: Table 13:5, 7].

Pottery

According to the kind of admixture and ornamentation the Tash-Air culture pottery can be divided into some groups of different chronology. The first group includes the earliest, not numerous fragments found at Tash-Air 1 (layer 6) and

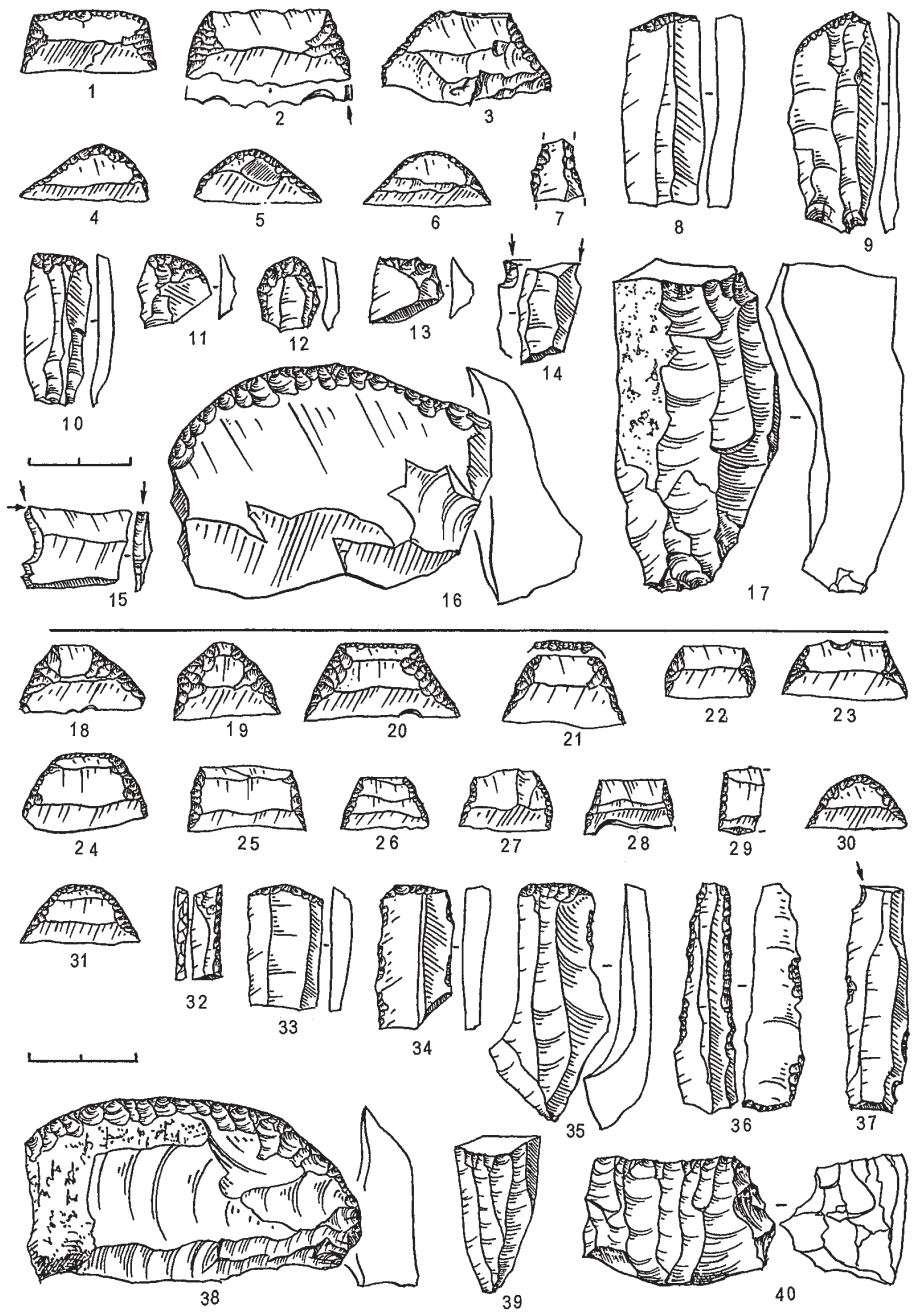

Fig. 3. Tash-Air 1. Flint tools from layer 8 (1-17) and 7 (18-40).

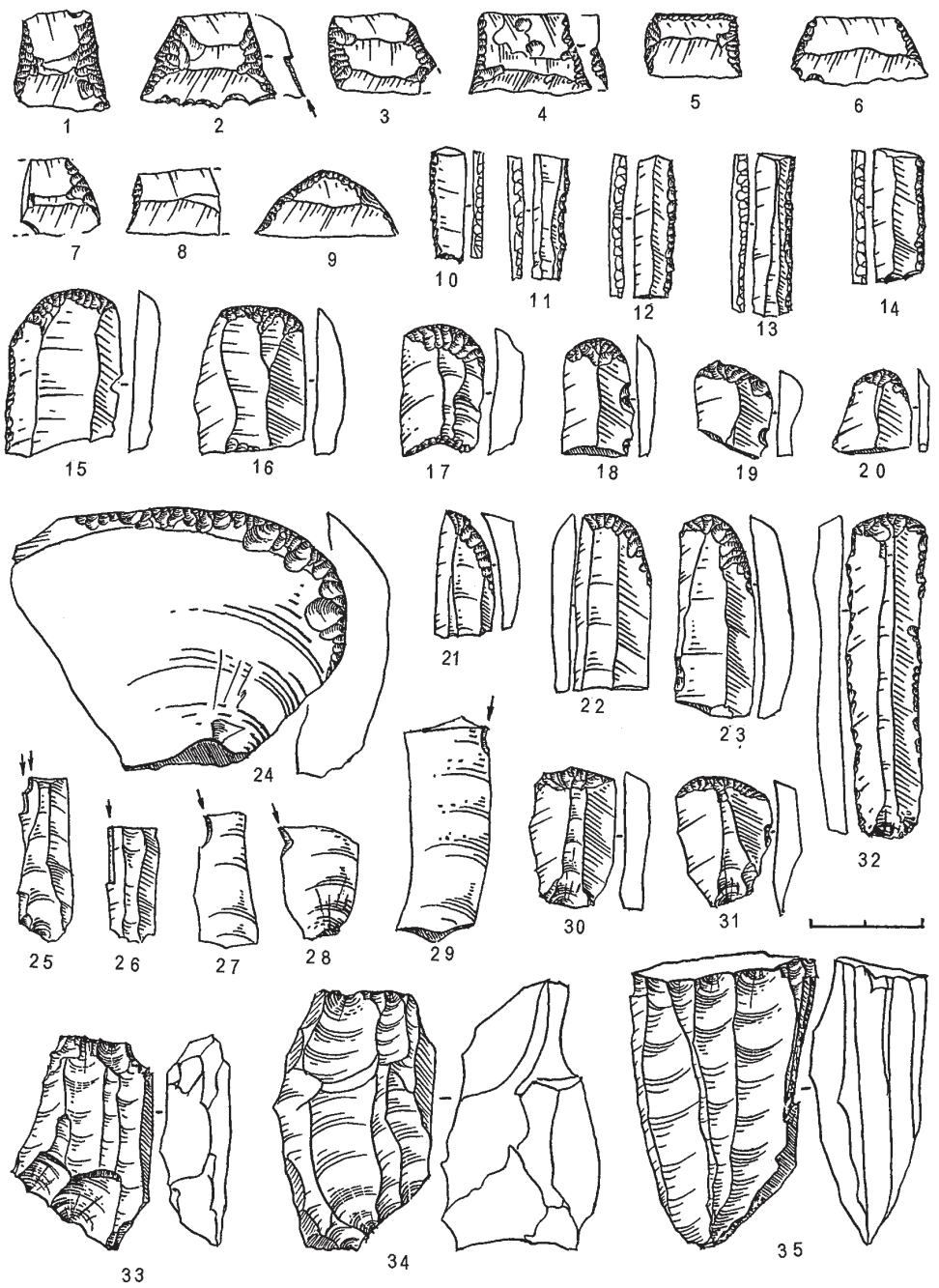

Fig. 4. Tash-Air 1. Flint tools from layer 6.

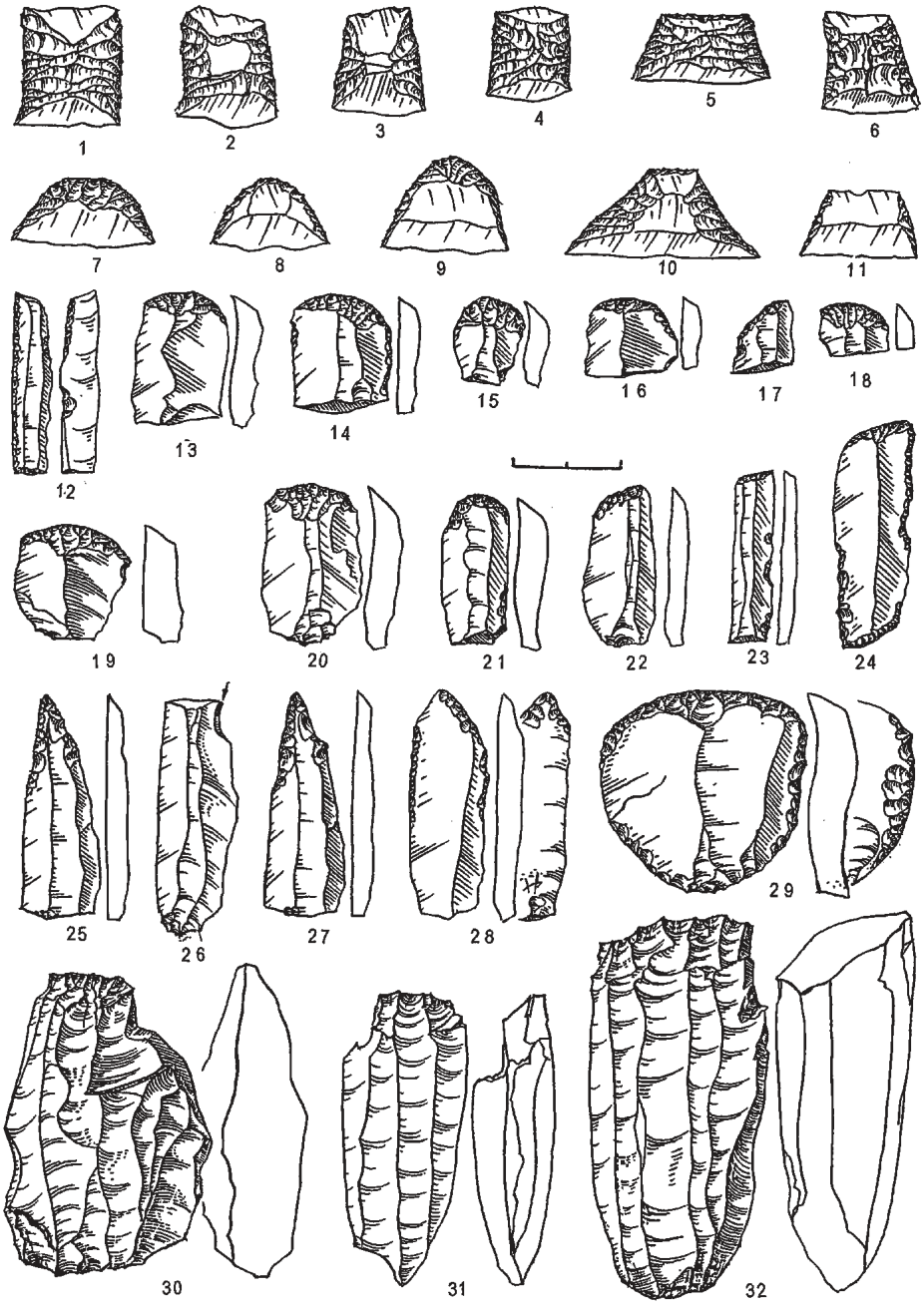

Fig. 5. Tash-Air 1. Flint tools from layer 5a.

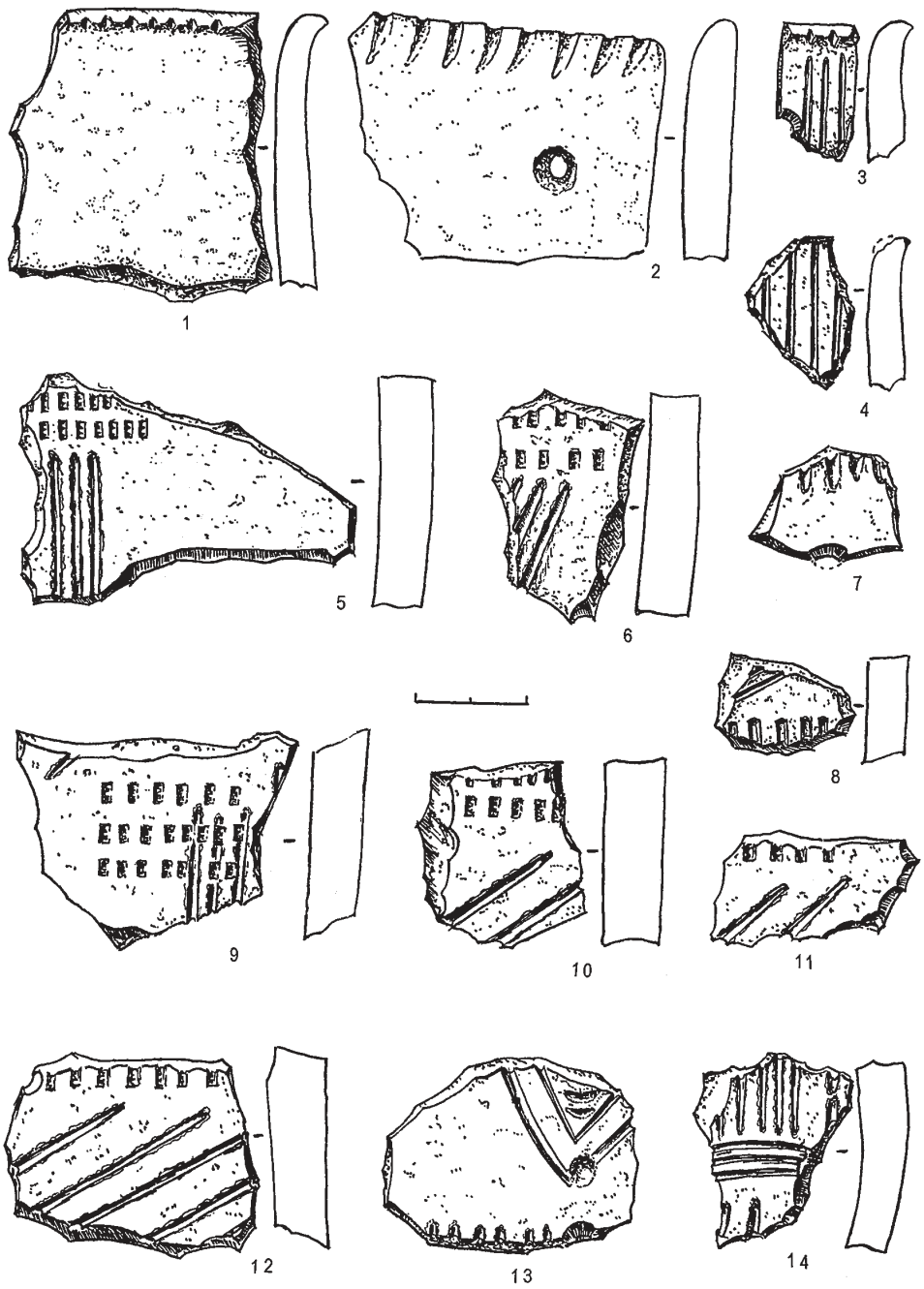

Fig. 6. Tash-Air 1. Pottery from layer 5a.

Zamil-Koba (layer 6) [Kraynov 1960:33-34], they are black or dark grey and have an admixture of fine sand. All the fragments are non-ornamental and come from vessel's body except one part of the bottom.

The second group comprises the pottery from Tash-Air (layer 5a), Zamil-Koba (layer 5) [Kraynov 1960], Kaya-Arasy (lower layer), At-Bash, Balin-Kosh [Fomozov 1962] and Denisovka [Shchepinskiy 1968] (Fig. 6:1-14). They are dark red, brown or dark brown fragments with carefully smoothed surface and they are parts of thick vessels with a fine admixture of crushed shells, limestone or quartz, ornamented with comb decoration or incised lines. These come from slightly profiled vessels with pointed bottoms, especially specimens found at At-Bash and Balin-Kosh. The closest analogy can be found between that pottery in Surska-Dnieper culture vessel forms [Danilenko 1969:189; Telegin 1971:6-7].

There ar fragments from Tash-Air (layer 5a) and Zamil-Koba (layer 5; Fig. 7:1-13) that constitute the third pottery group. These have their yellow or brown surface smoothed. They come from thin, slightly porous vessels with an admixture of crushed shells or limestone. Decoration of geometric compositions is made with a long comb. The similarity to the Surska-Dnieper and the Azov-Dnieper culture pottery forms should also be stressed [Danilenko 1971].

Periodization and chronology

Because of scarce amounts of pottery the Tash-Air culture periodization is based on flint production development, with geometric microliths morphology taken into special consideration. Increasing number of trapezes with flat retouch in the Tash-Air assemblages allows establishing the relative chronology for sites of that culture. The role played by pottery as a determinant grows only in late phases of the Tash-Air culture.

Three stages can be distinguished in the development of the Tash-Air culture. The earliest is represented by Tash-Air site 1 (layer 8 and 7) and Zamil-Koba site 2 (layer 8 and 7). The characteristic features of flint tools assemblages are: flat retouch on about 1/3 of microliths number and not very large cores sizes. The assemblages do not contain pottery. Tash-Air 1 (layer 6), Zamil-Koba 2 (layer 6), At-Bash, Adzy-Koba 2 and others represent the second stage. Flat retouch is registered for almost half of microliths, single trapezes with surface completely covered with flat retouch also occur. The feature of the greatest importance for that stage is the appearance of pottery. There are Tash-Air 1 (layer 5a), Zamil-Koba 2 (layer 5), Kaya-Arasy (lower layer), Buran-Kaya (layer 3), Denisovka and others that form the third stage. Almost all of geometric microliths are covered with flat retouch, cores are massive.

The establishment of the absolute chronology of the Tash-Air culture is difficult because of the lack of radiocarbon dates. Lower chronological limit for the culture

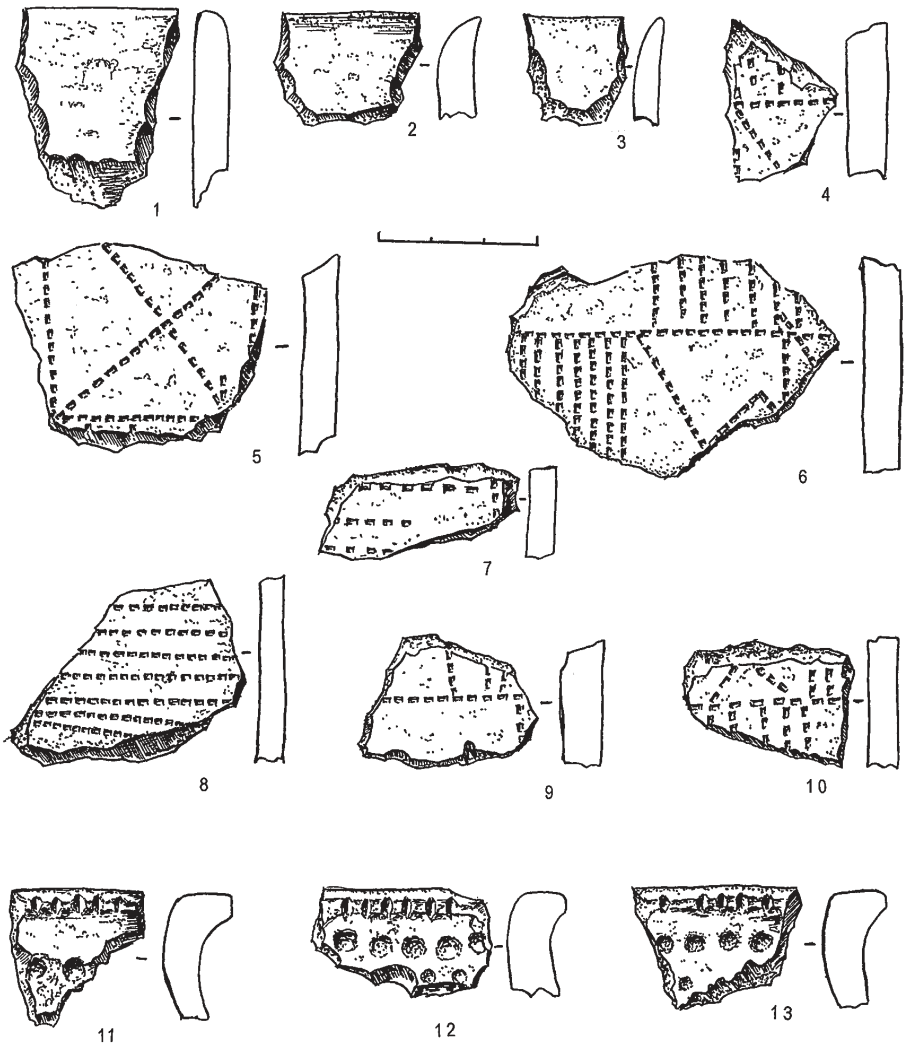

Fig. 7. Tash-Air 1. Pottery from layer 5a.

under discussion is given by ^{14}C dates of the second stage of the Murzak-Koba culture: for lower layer of Shpan-Koba 6240±150 BC* [Yanevich 1993] and for Laspi 7 series from 5500±380 to 7150±130 BC [Telegin 1982]. On the ground of conducted ^{14}C analyses it is possible to place tentatively the Tash-Air culture over a span from the end of the 6th to the beginning of the 3rd millennium BC.

* The author used an uncalibrated version of the ^{14}C chronology (Editor).

4. MESOLITHIC AND NEOLITHIC ECONOMY OF THE MOUNTAINOUS AREA OF CRIMEA

A forest animal hunting was the base of the Mesolithic and Neolithic economy of the area under discussion. The percentage of the forest animals reaches 85% of the osteological material of the Shan-Koba culture, 95% of the Murzak-Koba culture and 90% — the Tash-Air culture. As hunting in limited zones was more effective by means of bows and arrows, it caused the situation that they were the main equipment of the mountainous Crimea hunters. Direct evidence is provided by geometric microliths domination — used, as mentioned above, as arrowheads at Shan-Koba and Tash-Air cultures. Judging from ethnographical and historical analogies [Kroeber 1925; Kühn 1952; Lin Jao Chua, Cheboksarov 1961; Mellaart 1967] following methods were practised: approaching, chase, battue — in case of deer, approaching when hunting roe-deer, battue — in boar hunting.

In economy of the mountainous Crimea population land snail (*Helix albestins*) collecting was of main importance. At numerous settlements their shells were found. They constituted a main content of a cultural layer at Laspi 7 [Telegin 1982:90-92]. Collecting plants was obvious as well. Fishing was a component of economy but regarding scarce fish sources in Crimea, it played a second-rate role. Only at Kara-Koba [Kolosov 1960] an abundance of fishbone was found.

The annual economic cycle of the mountainous Crimea population was divided into the two main periods: winter period in the second mountain range zone and summer one on plateaux. These cycles guaranteed the best use of food supplies of the mountain area. The second mountain range area sites were used only in cold periods. About 90% of deer and roe deer concentrate in oak forests in wintertime. Settlement of the second mountain range area is evidenced by covering of bird, boar, roe-deer skulls with their horns cut as well as remains of wandering fish (*Salmo trutta*) in monthly cycles in cultural layers in winter. Winter character of that settlement is shown by usage of abris with south or west exposition and by relics of buildings — for instance at Shan-Koba and Zamil-Koba II [Bibikov 1977].

Mesolithic and Neolithic settlements are with no doubt connected with summer periods — in all probability — with summer migrations of wild animals to subalpine meadows and steppes. In summer there are 30% of the mountainous area on plateaux while in winter, for the reason that the covering of snow, only 5% . Boar bones lying (in monthly cycles) at Shan-Koba as well as the topography of the settlements indicate the settlement on plateaux. They are situated in open areas, entirely not sheltered from the winter winds, reaching a speed of 42 m/sec.

The development of gathering — hunting economy in the mountainous forest of Crimea is divided into three stages. In the first, the Early Mesolithic stage the economy was forming; it ended in the turn of Holocene. The second, Late Mesolithic stage (Boreal and the beginning of Atlantic period) was a full bloom time of that type of economy. Only the forest animals were the aim of hunting. As a result of spread of flora of warm area and molluscs, food-gathering became one of the leading

branches of economy. Discoveries of specialised tools (like harpoons), and fishers' settlements (Kara-Koba) show an increasing role of fishing. An intensification of economy led to strictly defined seasons — using natural sources on plateaux in summer and in the second mountain range in winter.

The third stage, the Neolithic one, in the Atlantic period, was a continuation of described type of economy. As in the previous case, a forest animal hunting was of the greatest importance. The percentage of animals hunted this way was 70-80% of all animals. Wide spread of bows and arrows is indicated by numerous geometric microliths at the Tash-Air culture sites. Food-gathering, as well as fishing, was still practised. Nevertheless, domestic animals bones (especially pigs) were found at the Neolithic sites of the mountainous Crimea [Kraynov 1960]. So, it was the Neolithic period when an integration of two types of economy took place, and it was breeding that played a second-rate role. That stage was a phase of consolidation — according to M. Zvelebil [1986] and his model of farming — breeding economy formation.

5. SUMMARY

The investigations of the mountainous Crimea Neolithic period give the picture as follows:

1. The process of forming and development of the mountainous Crimea cultures had an autochtonic character. The Neolithic has been formed here on the basis of local Late Mesolithic. Flint production is a continuation of the Murzak-Koba culture production, and it also refers to the Neolithic bone and horn tools. The pottery shows influences from the north coast of the Black Sea, especially from the Surska and Azov cultures.

2. The type of Late Mesolithic economy was the base for the process of Neolithization of the discussed part of Crimea. The Neolithic economy is a further development of the economy of the Late Mesolithic hunters, gatherers and fishers of mountain forests.

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THE ROLE OF EASTERN IMPULSE IN DEVELOPMENT OF THE NEOLITHIC CULTURES OF UKRAINE

Significant materials about the Neolithic of the Ukraine and Southern Russia are accumulated nowadays. They allow to offer the reconstruction of one historical aspect connected with eastern impulse in development of the Neolithic of the Ukraine.

In 1960s V.N. Danilenko [1969:176-183] has assumed, that the beginning of the Neolithic in the Ukraine was associated with the eastern cultural impulse. In his opinion, the progressive drying of a climate in Eastern Europe has resulted in crisis of the hunting economy, and the ancient population has passed to cattle breeding. In searching for new pastures it has become to move west. The resettlement of population from the eastern areas of Europe to the Ukraine, was confirmed by V.N. Danilenko on the grounds on similarity of the earliest Neolithic pottery. He wrote, that pointed bottom pots with scratched and pressed decoration are known from the Caspian steppes up to the north-west Black Sea area. V.N. Danilenko dated the first occurrence of pottery in the Ukraine to the end of the 7th millennium BC* [1969:186].

Long time there were no materials confirming this point of view. All Caspian Sea and Volga basin cultures were dated not earlier than to the 5th millennium BC. However, at present there appeared data about the earlier Neolithic cultures. Archaeologists from Samara and Orenburg have studied series of the Early Neolithic sites in the northern Caspian Sea basin (Kugat, Kulagaisi) and in the south of the forest-steppe Volga basin [Vasilyev, Vybornov 1988:10, 19-26]. In the Volga basin the Early Neolithic materials of such sites as Chekalino 4, Lebyazhinka 4, Nizhneorlyanskaya 2, Staro-Elshanskoe 2 and others were incorporated into the Elshanskaya culture [Mamonov 1994:22]. It is characterized by profile pointed base vessels with the organic inclusions in clay. These vessels mainly have no decoration. Less often they are decorated by scratched, tape or pressed ornament (Fig. 2). Just such ceramics are closest to the pottery of the early Rakushechniy Yar culture (Fig. 3:2, 5; 4) and of the earliest sites of Surska (Fig. 5:1-4) and Bug-Dniester cultures (Fig. 6:3, 4, 6, 7). A series of radiocarbon dates, palynological and natural-science researches are referred of the Elshanskaya culture sites to the end of the Boreal

* The author used an uncalibrated version of ^{14}C chronology (Editor).

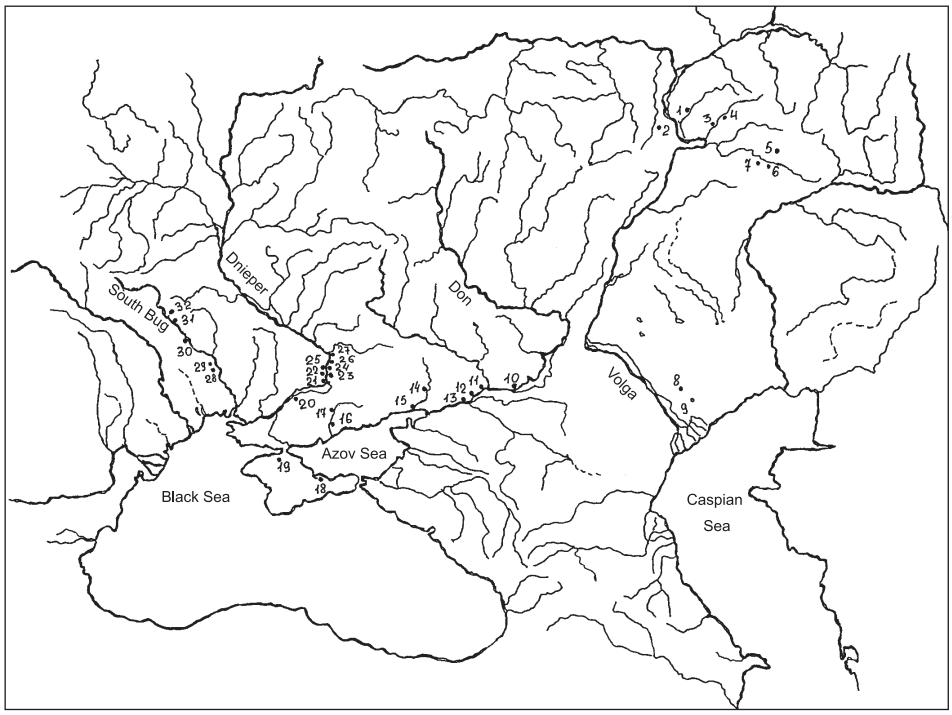


Fig. 1. Map of the Neolithic sites: 1 - Lebyazhinskoe, 2 - Lugovoe 3, 3 - Krasniy Gorodok, 4 - Chekalino 4, 5 - Ivanovka, 6 - Staro-Elshanskoe, 7 - Maksimovka, 8 - Kulagaisi, 9 - Kugat, 10 - Tsimlyanskoe, 11 - Samsonovskoe, 12 - Razdorskoe 1, Rakushechniy Yar, 13 - Bessergenovka, 14 - Razdolnoe, 15 - Mariupol cemetery, 16 - Semenovka, 17 - Chapaevka, 18 - Frontovoe 1, 19 - Dolinskiy cemetery, 20 - Babino, 21 - Sobachki, 22 - Vovchok, 23 - Vovnigskoe right-bank settlement and Vovnigskiy 2 cemetery, 24 - Vovnigskoe left-bank settlement, 25 - Vinogradniy island, 26 - Nikolskiy cemetery, 27 - Vasilevskiy 5 cemetery, 28 - Kodachok island, 29 - Gard, 30 - Pugach, 30 - Mitkov and Bazkov islands, 31 - Sokoltsy 1, 2, 6, Schurovtsy, 32 - Samchintsy.

and dated them to the second half of the 7th — a boundary of 7th-6th millennia BC. The second half of the Boreal in the Volga basin was characterized by maximal drying of a climate and spreading of the steppe landscapes in the forest-steppe areas [Mamonov 1994:23-24]. Thus, the study of these new sites confirm V.N. Danilenko's assumption about an opportunity occurrence of the first pottery in the Ukraine as a result of borrowing it by more eastern Neolithic population.

Unfortunately, nowadays in the Ukraine there are not enough materials of the Early Neolithic epoch. It is possible only to ascertain, that in the Early Neolithic in the forest-steppe Southern Bug area the Bug-Dniester culture was formed. Recognizing an opportunity of the occurrence of first pottery as a result of influence of eastern groups of the Neolithic population it is necessary to note, practically

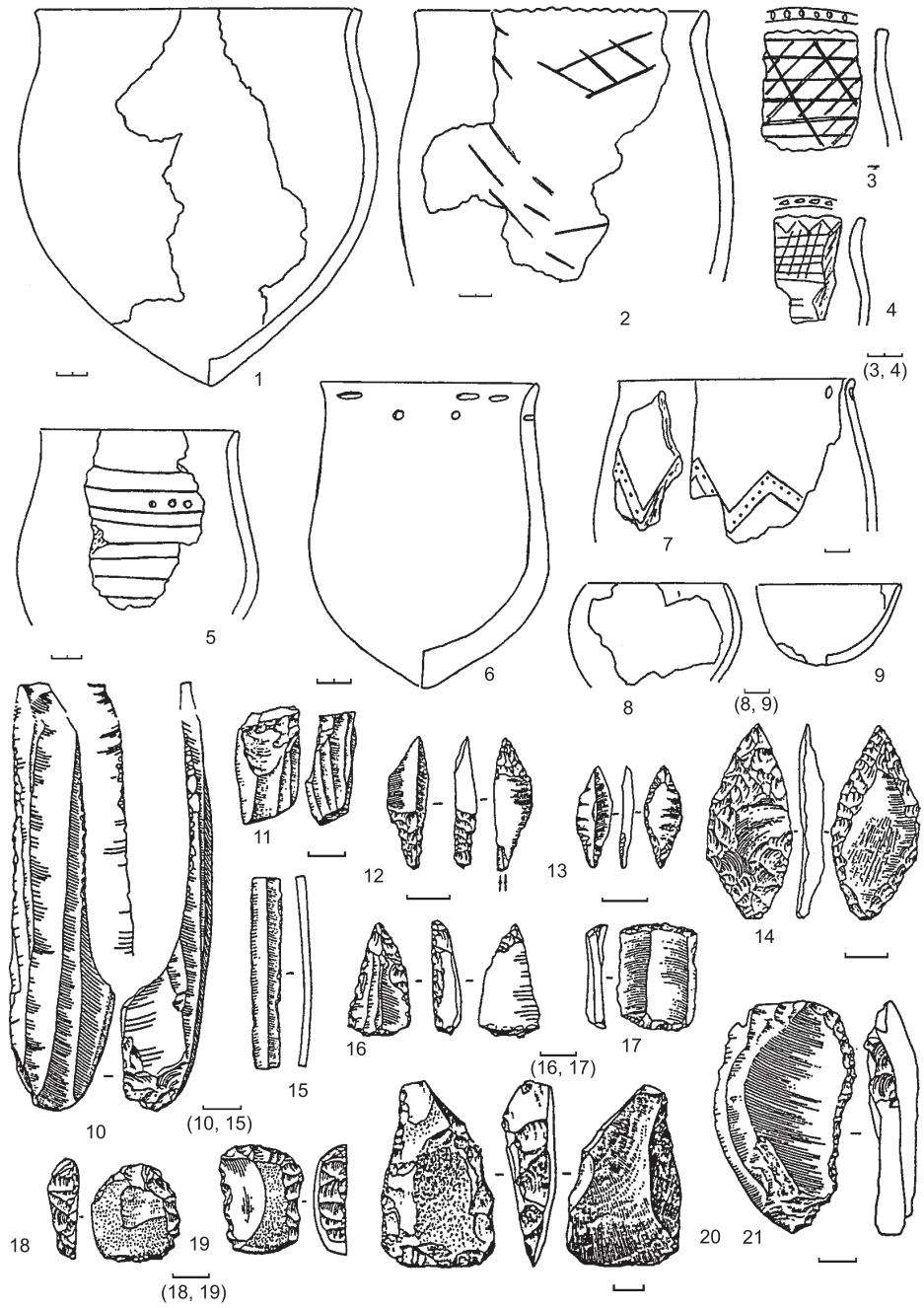


Fig. 2. Materials of the Elshanskaya culture settlements: 1-5 - Ivanovka, 6 - Staro-Elshanskoe [after Vasilyev, Vybornov 1988], 7-21 - Chekalino 4 [after Mamonov 1994].

simultaneous pottery borrowing of significant number of the forms and sorts of decoration by the population of the Criş culture, dwelt in the Dniester basin (Fig. 6:1, 2, 5). The earliest among the investigated sites of the Bug-Dniester culture on the Southern Bug (lower layers of the settlements on the Bazkov and Mitkov islands, lower layers of Sokoltsov 1, 2, 6) on the base of pottery with pinched decoration, glossy bowls and cups are synchronized with the Criş culture and previously dated to the end of the 6th — first half of 5th millennia BC. In V.N. Danilenko's opinion, the basic role in economy of the Bug-Dniester population was played by hunting and fishing, however, the early agriculture was also known [1969:162, 165]. In the Lower Dnieper region steppe and the western Azov Sea region in the Early Neolithic the Surska culture was formed (Fig. 5). Its earliest sites at present are poorly investigated.

In the same time on the Lower Don the sites of the Rakushechniy Yar culture were located (Fig. 3; 4). The population of this culture was engaged in hunting, fishing, food gathering, animal husbandry and, probably, early agriculture. In layers of the Rakushechniy Yar culture at the Rakushechniy Yar settlement the bones of cattle and small cattle, as well as pigs and dogs were found. Probably, to domestic species are shown by the bones of cat and horse [Belanovskaya 1983; 1995:150-151].

At present we have considerably more data about the cultures of the advanced Neolithic in the Northern Black Sea area. By the middle of 5th millennium BC in the Northern Azov Sea region a new population which has left sites of the Lower Don Neolithic culture appeared [Kotova 1994:10-18]. To these sites are reffered: the second and third layers of the Razdorskoe settlement 1 [Kiyashko 1987], the fifth — second layers of the Rakushechniy Yar settlement [Belanovskaya 1995], the Samsonovskoe [Gey 1983:8-13] and the Tsimlyanskoe settlements, a number of sites inspected by G.I. Goretskiy in area of the Tsimlyanskoe reservoir on the Lower Don [Goretskiy 1955:58-78], and also lower layer of the Razdolnoe settlement [Kotova 1994:16-17] and the Mariupol cemetery on the Kalmius River [Makarenko 1933]. Sites of the Lower Don culture are dated to the middle of the 5th — beginning of the 4th millennia BC [Kotova 1994:53-54].

On the basis of stratigraphy of the Razdorskoe 1 settlement [Kiyashko 1987:79], and of the Mariupol cemetery [Kotova 1990], the author distinguished two periods in development of the Lower Don culture [Kotova 1994:10-18]. Most striking materials of the first period were presented in the second layer of the Razdorskoe settlement and materials of the second period — in the third layer of the same settlement. The publication of materials from the Rakushechniy Yar settlement has allowed to introduce a number of corrections. The study of pottery from layers 5-2 of this site has shown, that it combines the features of pottery of the second and third layers of Razdorskoe 1 settlement. It demonstrates the transition from ceramics of early shape to the older one. The given circumstance has allowed to assume, that in development of settlement sites and pottery traditions of the Lower Don culture three periods existed.

The second layer of the Razdorskoe settlement concerns the first period (Fig. 7). The pottery of this layer is made of clay with an inclusion of crushed shells.

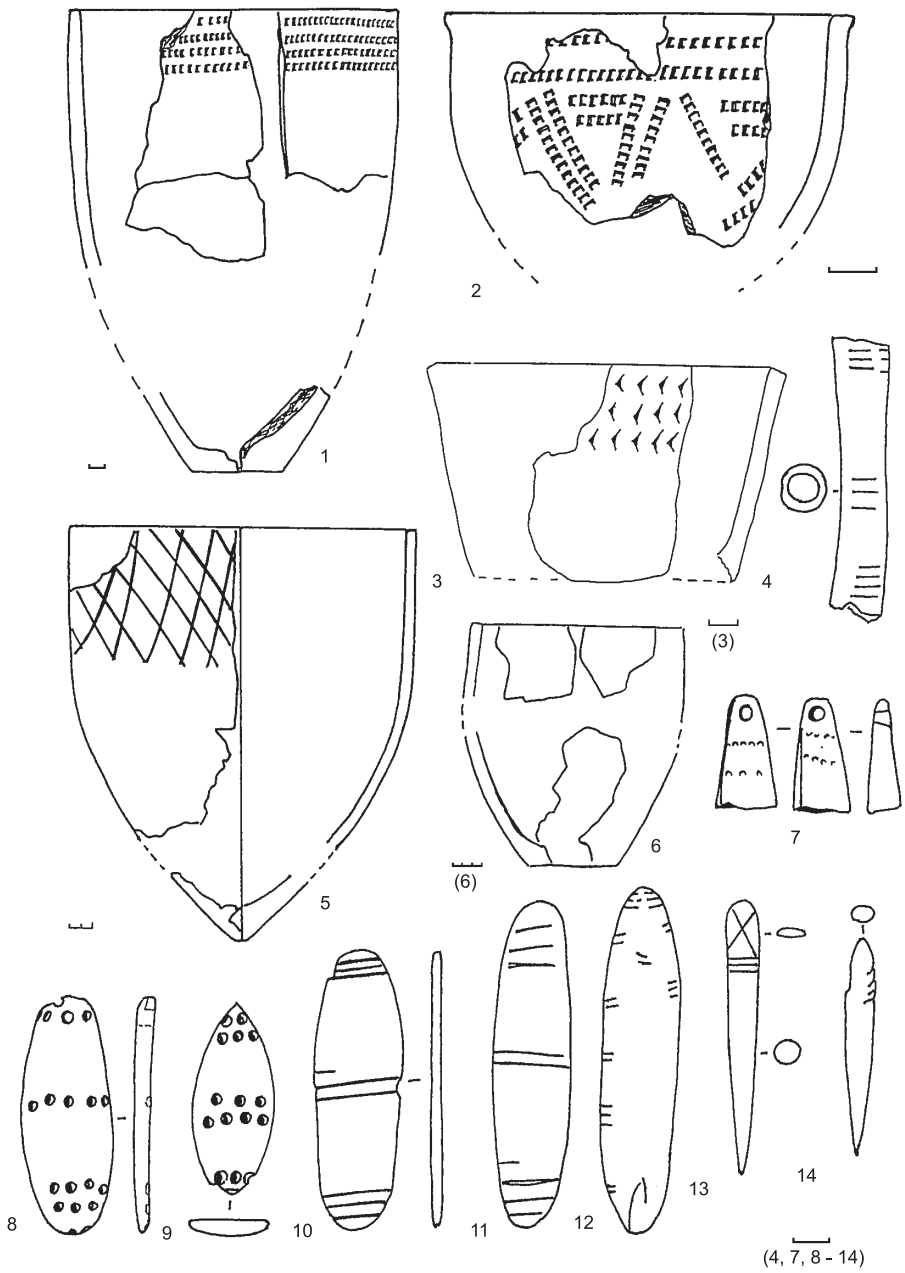


Fig. 3. Materials of the Rakushechniy Yar culture: 1, 4, 7-14 - from T.D. Belanovskaya's excavation at the Rakushechniy Yar settlement [after Belanovskaya 1995]; 2, 3 - from D.Y. Telegin's excavation at the Rakushechniy Yar settlement; 5-6 - lower layer of the Razdorskoe 1 settlement.

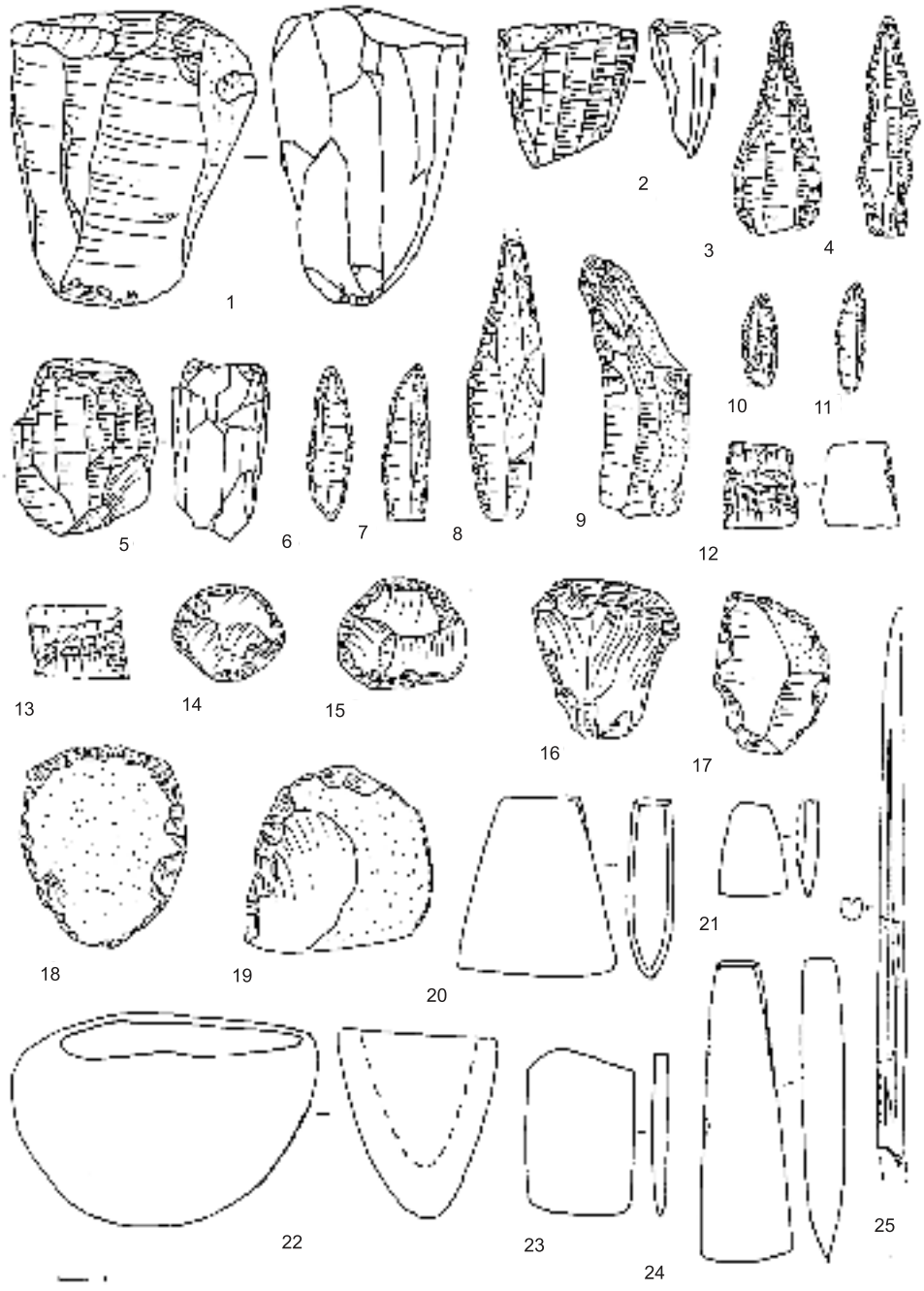


Fig. 4. Materials of the Rakushechniy Yar culture from the Rakushechniy Yar settlement [after Belanovskaya 1995]: 1-19 - flint, 20-24 - stone, 25 - bone.

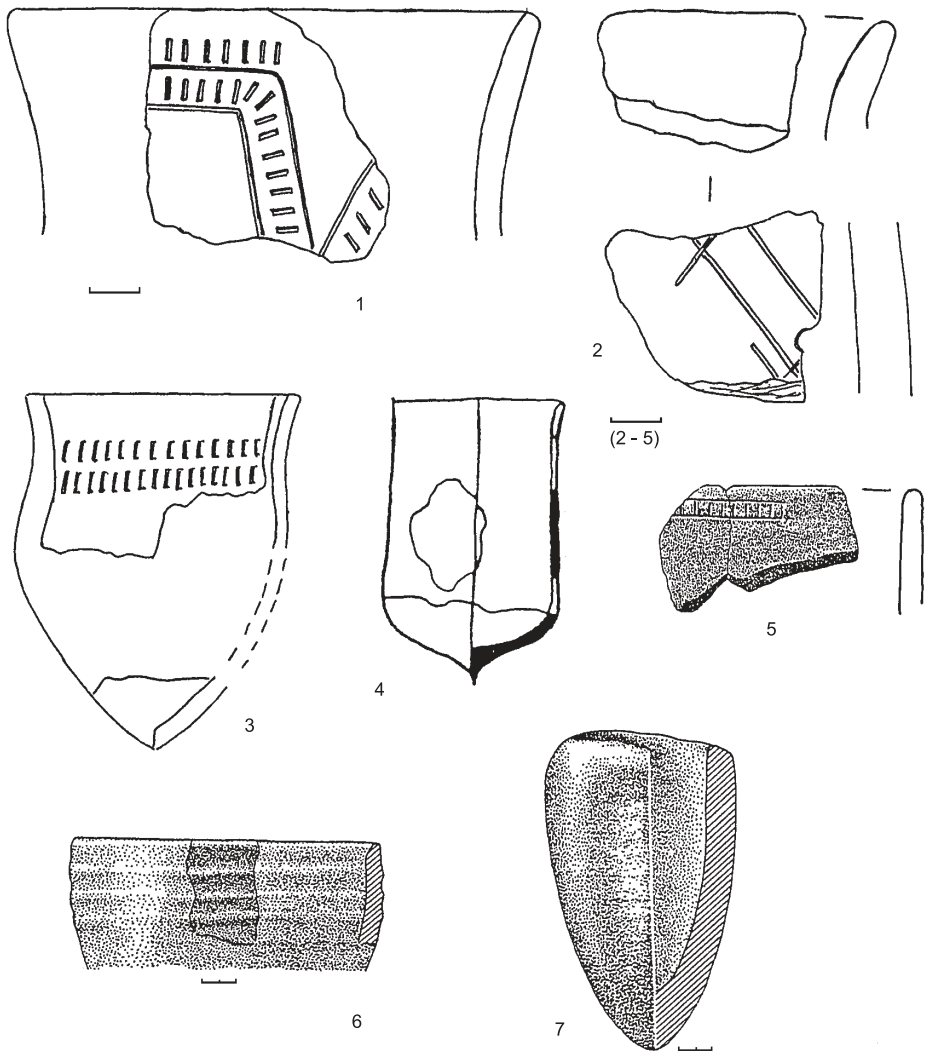


Fig. 5. Materials of the Surska culture settlements (first period): 1 - Kodachok island; 2, 3, 6 - Vinogradniy island; 4 - Vasilyevka, 5 - Surskoy island, 7 - Budilovskiy rapid. 1-4 - ceramics, 5-7 - stone. [3, 4 - after Danilenko 1969].

The internal surface of vessels is smooth. The pottery had flat base (Fig. 7:13) and rounded body. It had the maximal diameter on the one third of body or rim. Rims of the majority of vessels had excrescences (Fig. 7:4) or slanting cut (Fig. 7:1, 6). In pottery decoration the prints of short comb stamps which formed the horizontal

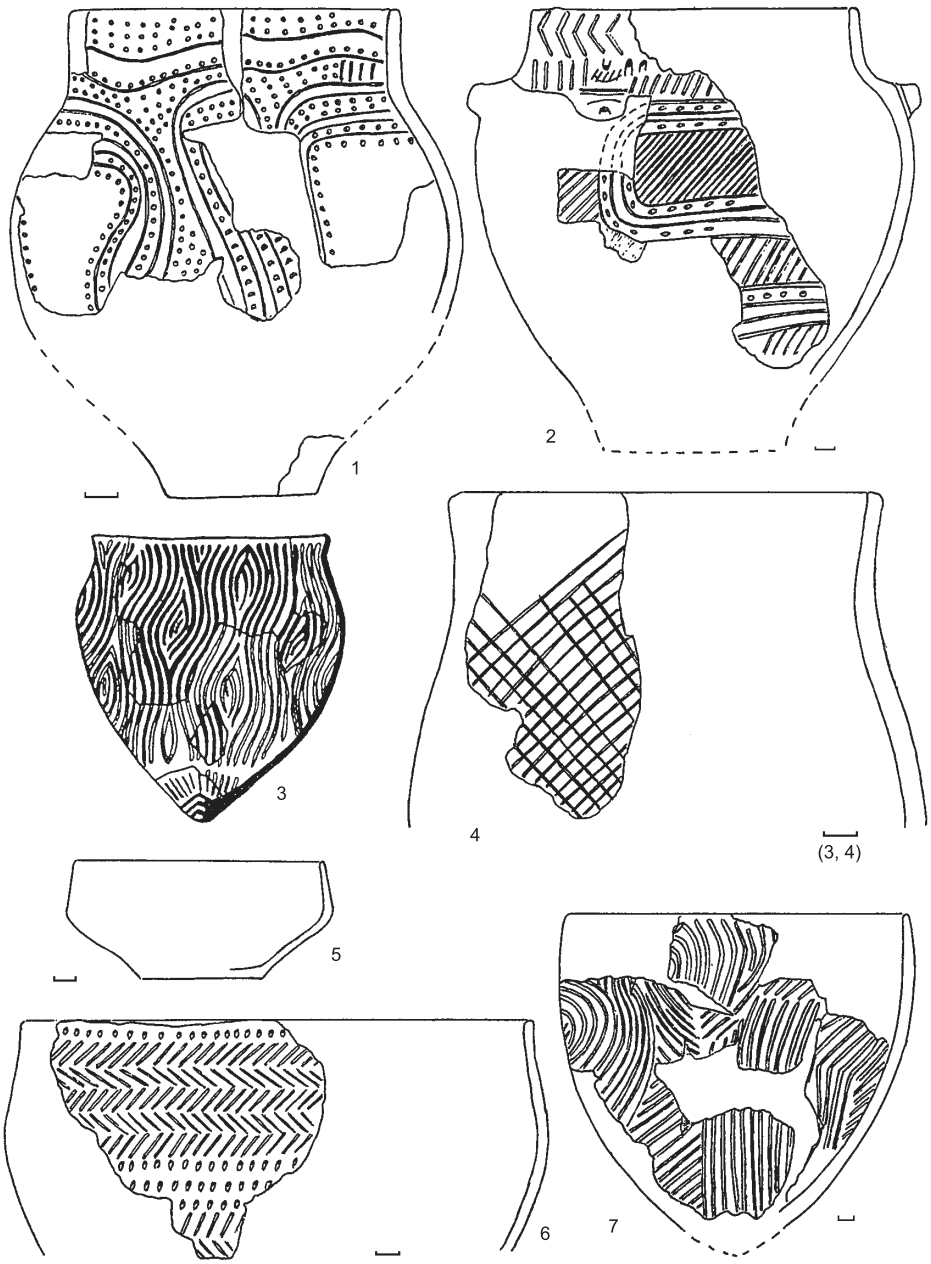


Fig. 6. Ceramic of the Bug-Dniester culture settlements (first period): 1, 4, 6, 7 - Sokoltsi 2, lower layer [4 - after Danilenko 1969]; 2 - Sokoltsi 1, lower layer; 3 - Mitkov island, lower layer; 5 - Sokoltsi 6, lower layer.

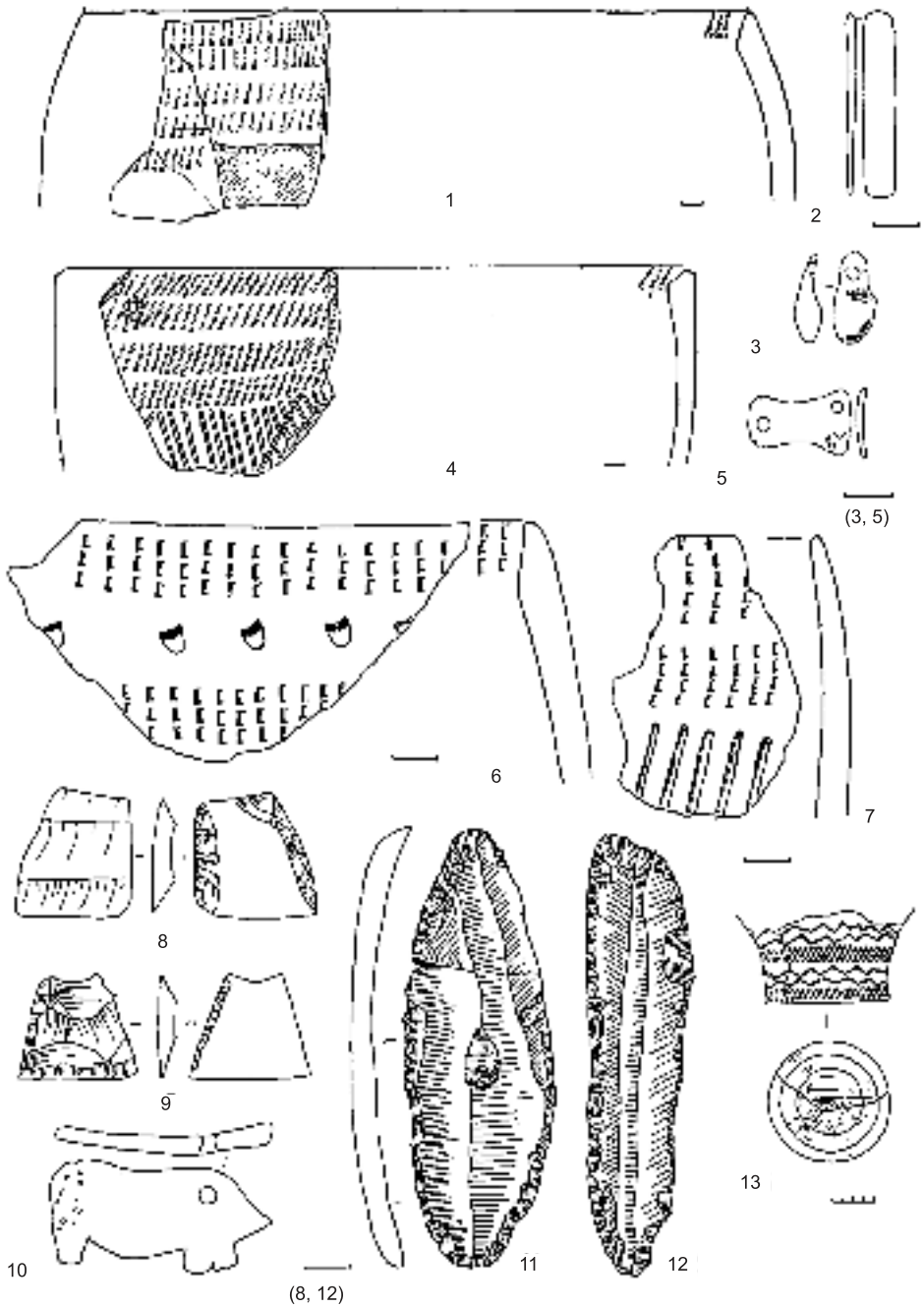


Fig. 7. Materials of the Lower Don culture from 2-nd layer of the Razdorskoe 1 settlement (first period): 2 - pearl, 3, 5, 10 - bone [2, 3, 5, 10-13 - after Kiyashko 1987].

lines, dominated, sometimes were combined with vertical ones (Fig. 7:1, 4, 6, 7). Less often there are scratched lines, forming the angular compositions, "fir" and zigzags (Fig. 7:4, 7). Ornament was rendered on the body, bottom (Fig. 7:13) and cut of rim (Fig. 7:1, 4, 7).

Layers 5-2 of the Rakushechniy Yar settlement concern the second period of development of the Lower Don culture. As well as the earlier, the pottery was manufactured with an admixture of crushed shells. At this time the pottery with collar rims appeared (Fig. 8:6, 8). In its decoration the horizontal tape compositions, in which rows of comb prints were bordered by the scratched lines were used (Fig. 8:4, 10).

The materials of the Rakushechniy Yar settlement allow to characterize in detail tools of the second period of the Lower Don culture. The blades were obtained from flat conical or pyramidal cores (Fig. 9:2, 3). Pencil-shaped and prismatic nucleus were less frequent. Practically all cores had a slanting striking platform (Fig. 9:3). Spherical and disk nucleius were used for flakes obtaining. In process of chipping the cores were fixed by an edge or by the pointed end.

Among the blades the specimens of length less than 5 cm prevail. Only about 20-30% of all retouched pieces had length more than 5 cm. Among the safed pieces and their fragments the specimens of width from 1,2 up to 2,4 cm predominate. The number of microblades of width less than 1,2 cm is gradually reduced.

T.D. Belanovskaya among the blades with a retouch has distinguished knives, by which has been attributed the blades with retouch along one or two sides (Fig. 9:7). All such artefacts were found only in layers of the Lower Don culture (layers 5-2). And only 1 specimen was found in layer 8. The large part of knives had length of 5-7 cm, the separate specimens reached 9-10 cm. Their width in most cases was from 1,5 up to 2 cm, sometimes achieving 2,5-3 cm. The knives had a retouch mainly along two sides and pointed end. Only in layers 3 and 2 the tools with scraper-formed end were found (Fig. 9:11).

Among instruments the drills and borers are numerous. They are made on blades (Fig. 9:4-6). Their length in most cases was from 2 up to 4 cm, and width from 0,5 up to 2,5 cm.

In layers of the Lower Don culture geometrical microliths are found. They have form of trapezes, parallelograms and rectangulars. The trapezes are most numerous. Among assemblages published by T.D. Belanovskaya, they make from 2% up to 4% in different layers. The trapezes had the various forms (Fig. 9:13, 14, 16-18). The low and high trapezes prevail. They had a retouch on the side of back, less often on the side of ventral surface. The latter is characteristic for finds in layers 4-2. A greater part of trapezes had a planed ventral surface (Fig. 9:13, 16-18).

Among the tools published by T.D. Belanovskaya the second place after the retouched blades and their fragments is occupied by the scrapers, which make from 23% of assemblages in a layer 5 up to 44% of assemblages in a layer 2. T.D. Belanovskaya has distinguished 9 types of scrapers: end scrapers on blades, fan-shaped, circular and subcircular, subquadrangular, thumbnail, ogival, notched and end scrapers on flakes. In layers of the Lower Don culture the end scrapers on blades prevail, they make 50% of all scrapers (Fig. 9:11). One third (17% from all num-

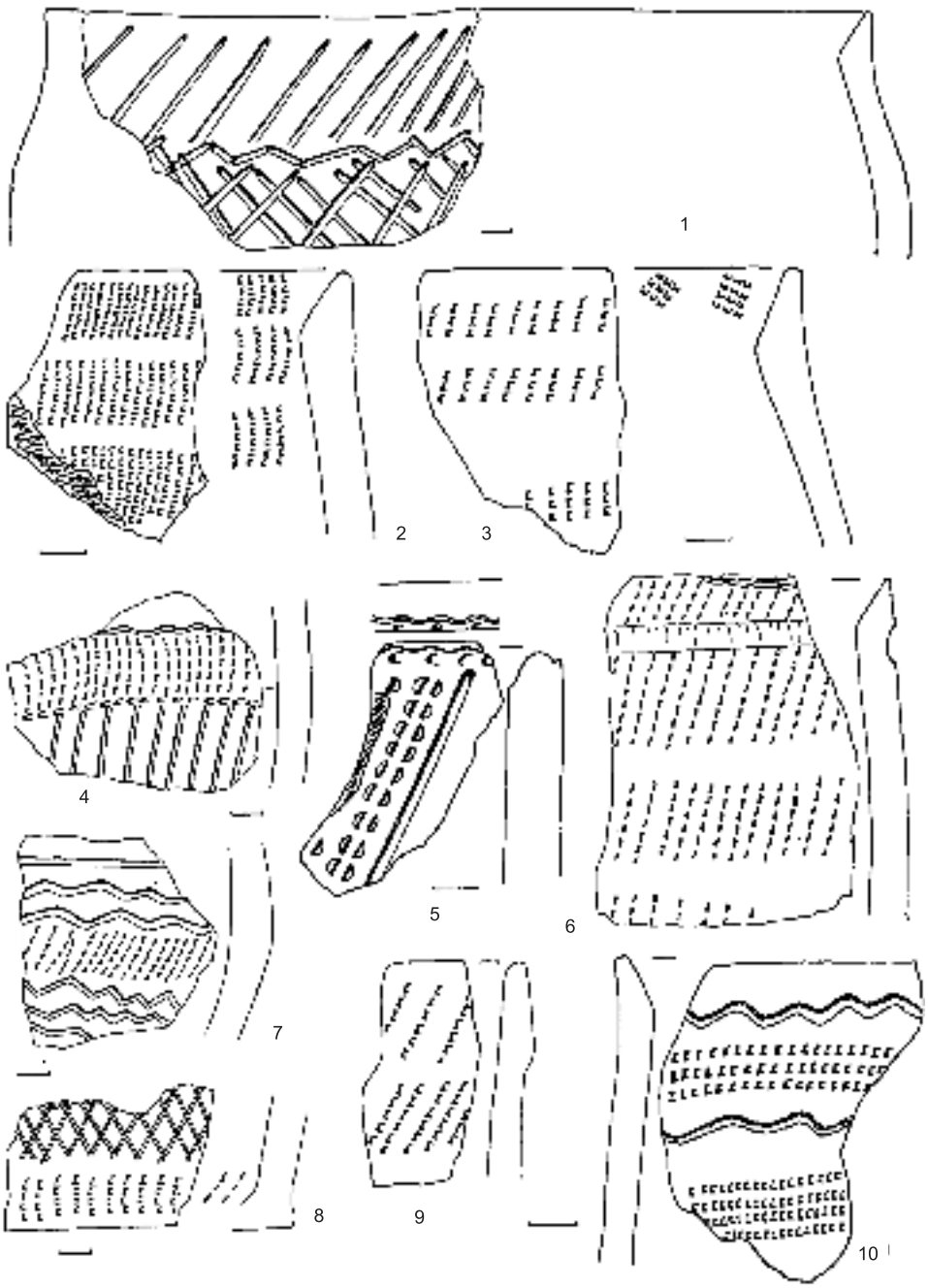


Fig. 8. Pottery of the Lower Don culture from the Rakushechniy Yar settlement (second period): 1, 5 - layer 5; 2, 6, 10 - layer 3; 3, 9 - layer 2; 4, 7, 8 - layer 4.

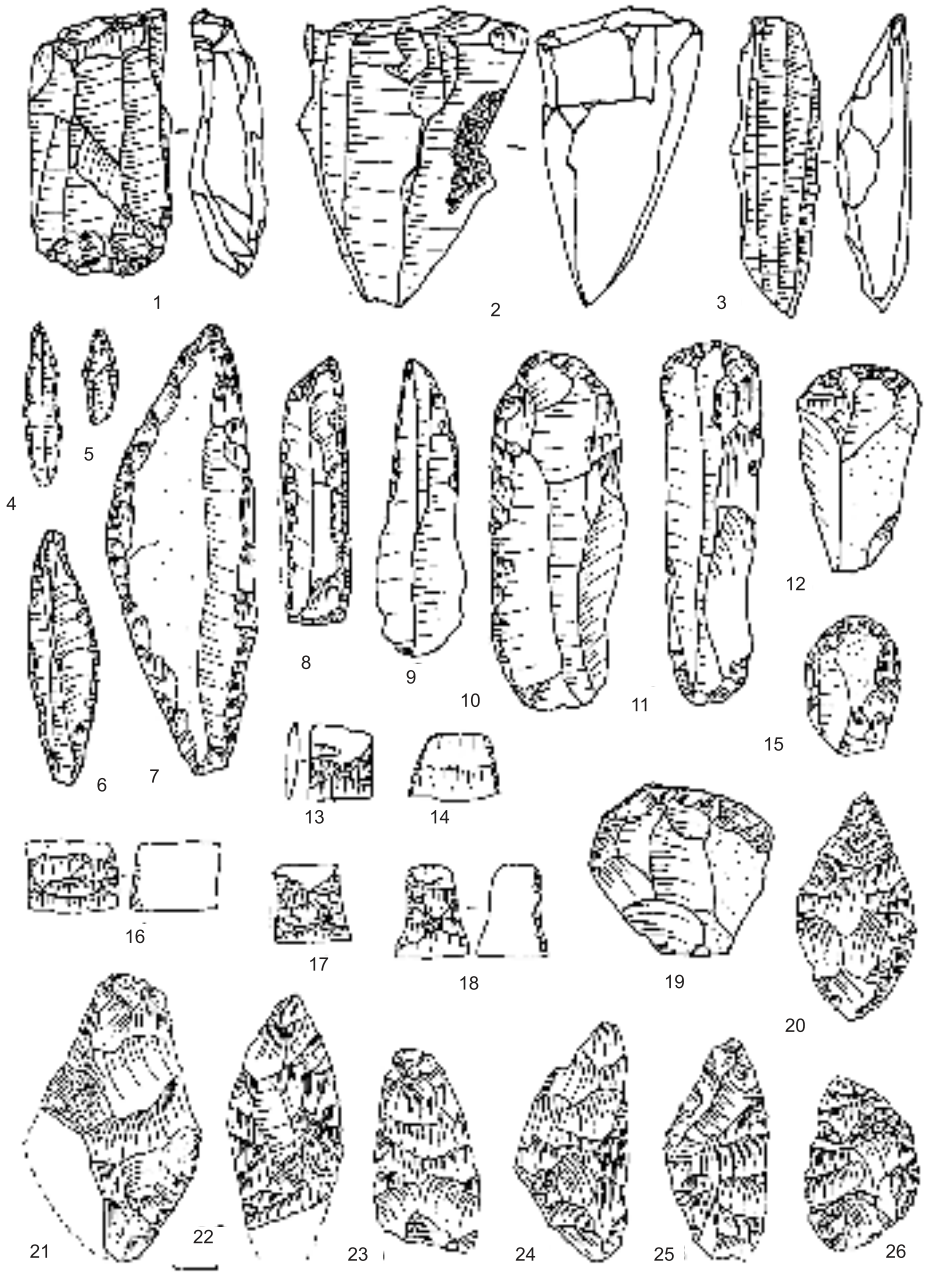


Fig. 9. Materials of the Lower Don culture from the the Rakushechniy Yar settlement (second period) [after Belanovskaya 1995]: 1, 3, 10, 21, 23 - layer 2; 2, 4-6, 8, 9, 11, 13, 14, 16 - layer 4; 7, 12, 18, 20, 22, 25 - layer 3; 15, 17, 19, 24, 26 - layer 5.

ber of scrapers) were fan-shaped ones (Fig. 9:12). Subcircular end scrapers were very numerous (24%). Frequently there were also end scrapers on flakes (18%; Fig. 9:19). Other forms of scrapers were rare. It is possible to trace the tendencies in change of structure of scrapers in layers. Among the end scrapers on blades the number of artefacts on short blades is reduced, and the amount of scrapers made on long blades, and also fan-shaped scrapers increased. In the fifth layer 38% of scrapers were made on short plates, 12% of scrapers were fan-shaped and only 2% of scrapers were made on long blades. In the second layer fan-shaped scrapers represented already 24% of scrapers, 14% scrapers were made on long blades and only 8% of scrapers are made on the short blades. In comparison with the fifth layer, in the higher layers the number of subcircular scrapers is reduced from 36% to 12%, and also the diameter of circular scrapers increased. Number of scrapers, which were made on flakes increases rapidly in the third and second layers: the fifth layer — 2%, the fourth layer — 16%, the third layer — 35%, the second layer — 31%.

The changes in use of the certain semi-finished products are observed. The width of implements varies not considerably. Their length did not remain constant. The tendency of reduction of scrapers number is fixed. Their length was less than 3 cm. A number of articles with a length of more than 5 cm increased.

In this period the bifacial worked tools represented by knives (Fig. 9:24, 26) and points (Fig. 9:21-23, 25) are known.

Judging by the materials of the Rakushechniy Yar settlement the population of the Lower Don culture built the dwellings of subrectangular form with pole constructions and with use of clay daub [Belanovskaya 1995:16-18].

The final, third period is represented by materials of the third layer of the Razdorskoe 1 settlement [Kiyashko 1987:75], a part of materials from the fifth layer of the Samsonovskoe settlement [Gey 1983 :Fig. 11:6, 12, 13], the materials of the Bessergenovskoe and Tsimlyanskoe settlements, Khutor Vedernikova sites and those near the stanitsa Romanovskaya [Goretskiy 1955:58-78], a lower layer of the Razdolnoe settlement and others.

As well as earlier, when pottery was manufactured with the crushed shell admixture, however, the internal surface of vessels was smoothed by comb stamps in horizontal direction. The diffusion included the vessels with flat base and round body, which maximal diameter coincide with middle of the body (Fig. 11:1, 6). There are not numerous non-profiled or poorly profiled vessels with thickened or slantwise inside cut off rim. The profiled pots with collar-shaped rim are predominant (Fig. 11:1, 6; 12:1, 4). Their wide flat collar rim is made on rounded or convex edge. In decoration the prints of comb stamps prevail, among which "a walking comb" occures (Fig. 11:1, 6; 12:1, 4). A scratched decoration is kept, too. The horizontal compositions are replaced by complex ones, in which tapes form the meanders, zigzags, "floating" figures (Fig. 12).

Judging by the materials from the third layer of the Razdorskoe settlement, for the third period of the Lower Don culture in implements manufacturing blade technique is characteristic. Among the knife-shaped pieces of middle size the in-

struments in form of end scrapers gained acceptance. The bifacial end scrapers on blade are known as well. In the third layer of the Razdorskoe settlement the geometrical microliths are absent and the bifacial worked points are known (Fig. 11:2, 4, 5, 8). They have the flat or figured base.

Finds of the horn mattocks and querns at the Rakushechniy Yar settlement [Belanovskaya 1995:89-90], and also the mattock-formed tools at the Razdorskoe settlement [Kiyashko 1987:75] testify a probable existence of agriculture within the Lower Don culture population. They also bred the horned cattle, sheep, pigs and kept dogs [Belanovskaya 1995:151]. Bones of horse were found, too. They were defined by E.V. Garutt, who has left opened a question of their belonging to the wild or domestic form of a horse.

Funerary customs of the Lower Don culture are reflected in materials of the Mariupol cemetery and two burials (5 and 6) at the Rakushechniy Yar settlement [Belanovskaya 1995:158-160]. The latter were extended and laid on the back, with head to the west. The ochre colouring was absent. Burial 5 was accompanied by bone point. Burial 6 correlates with layers of the Lower Don culture of this settlement.

The funerary rites of the Mariupol cemetery have been reconstructed repeatedly, including V.N. Danilenko [1955a] and A.D. Stolyar [1955] works. These authors assumed that the cemetery itself represented a dug trench, probably, having wooden overlapping and being used during the long time. However, the similar reconstruction is contradicted by N.E. Makarenko's data [1933], who carefully investigated the cemetery and fixed his observaton. The study of the cemetery on his materials has shown, that the burial-place consisted of the burials in individual pits, disposed as a row [Makarenko 1933:11]. This row extended from north to south. The basic part of the cemetery included about 130 inhumations and 1 cremation. The analysis of the sequence of burial accomplishment allowed to distinguish some stages in functioning of the cemetery [Kotova 1990; 1994:12-14]. Our study has allowed to mark out two periods in development of funeral rites of the Lower Don culture.

For the first period the extended, not coloured skeletons laid on the back are characteristic. In the majority of them the carpals of slightly bent hands laid on the pelvis. The dead were oriented by heads in western and eastern directions with seasonal variations. The account of these variations has shown, that the deceased had been buried in a warm season. It is possible to assume that a part of burials with bones laid out of anatomical order, belonged to the people who died in winter, but were buried only in spring, when the ground thawed.

The earliest burials of the first period were on the depth of 90-70 cm from the surface (stage 1 of cemetery functioning). The subsequent burials (stage 2) were buried higher, on the depth of 40-60 cm. Only 50% of funerals of the first period were accompanied by grave goods. They included the *Unio* shells, large, medium and microlithic blades (Fig. 14:1), flakes, scrapers (Fig. 14:3, 4), angle burins (Fig. 14:2). The funeral clothes were decorated by teeth of deer (Fig. 15:29), sea shells with an aperture (Fig. 15:25), nacreous beads of the round form (Fig. 15:26), rhombic (Fig. 15:36), cylindrical (Fig. 15:31, 32), round (Fig. 15:30, 37) and figured (Fig. 15:33, 34) beads made of bone, gagate flat beads, stone pendants (Fig. 15:24), bones points,

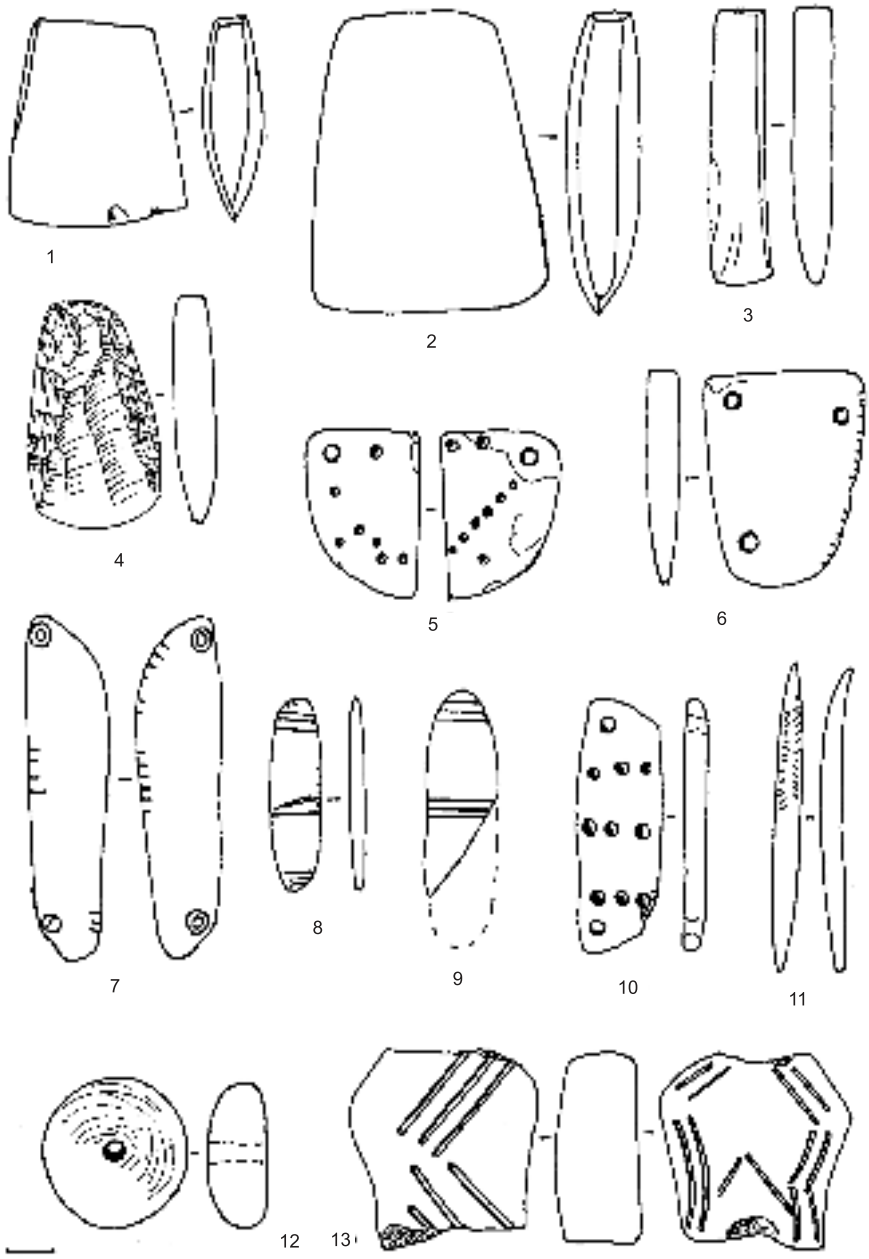


Fig. 10. Materials of the Lower Don culture from the Rakushechniy Yar settlement (second period) [after Belanovskaya 1995]: 1, 6, 10, 12 - 4 layer; 2, 3, 5, 7, 9, 11, 13 - 5 layer. 1-7,10 - stone; 8, 9, 11- bone; 12, 13 - clay.

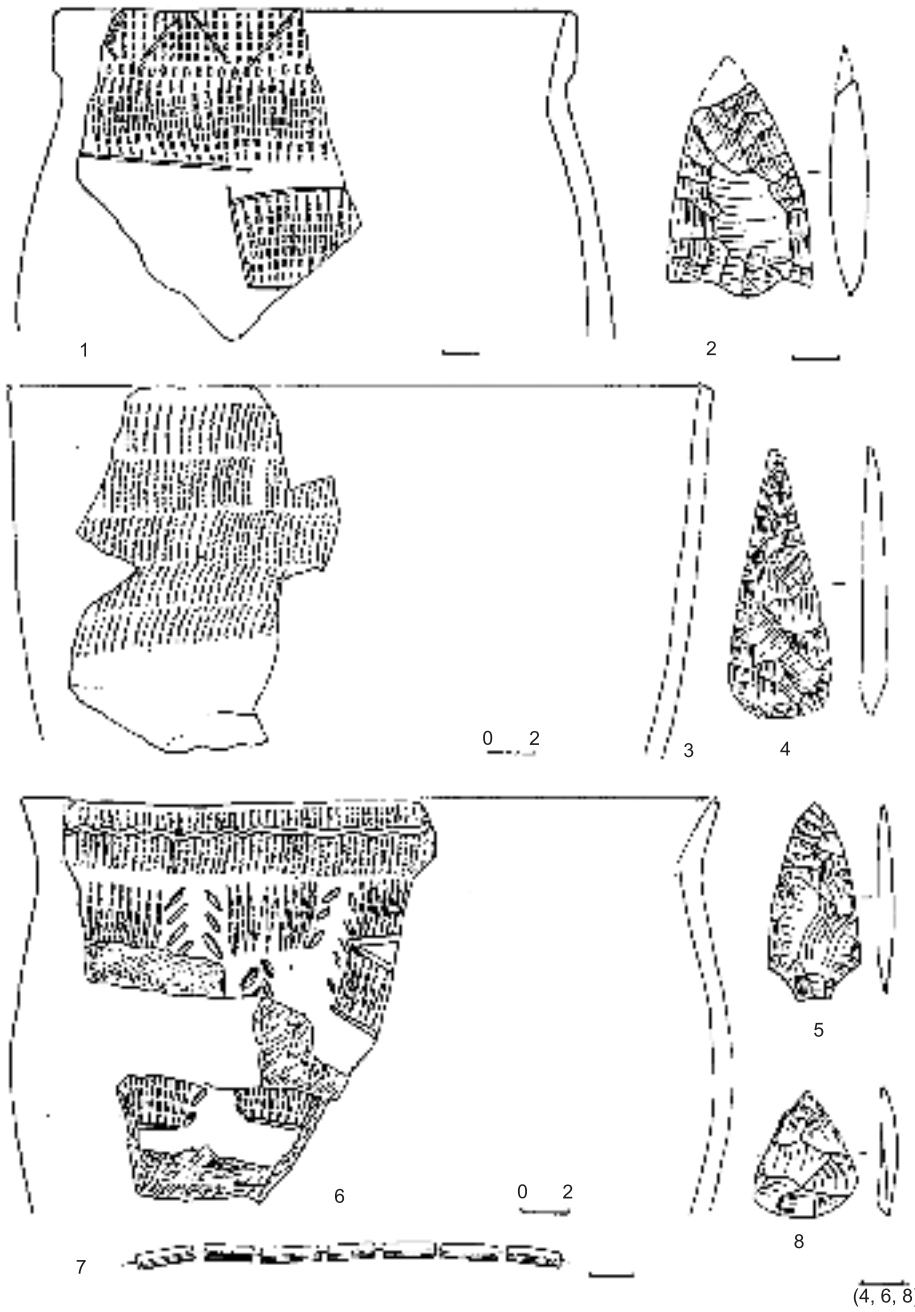


Fig. 11. Materials of the Lower Don culture from 3 layer of the Razdorskoe 1 settlement (third perod) [2, 3, 5, 7 - after Kiyashko 1987].

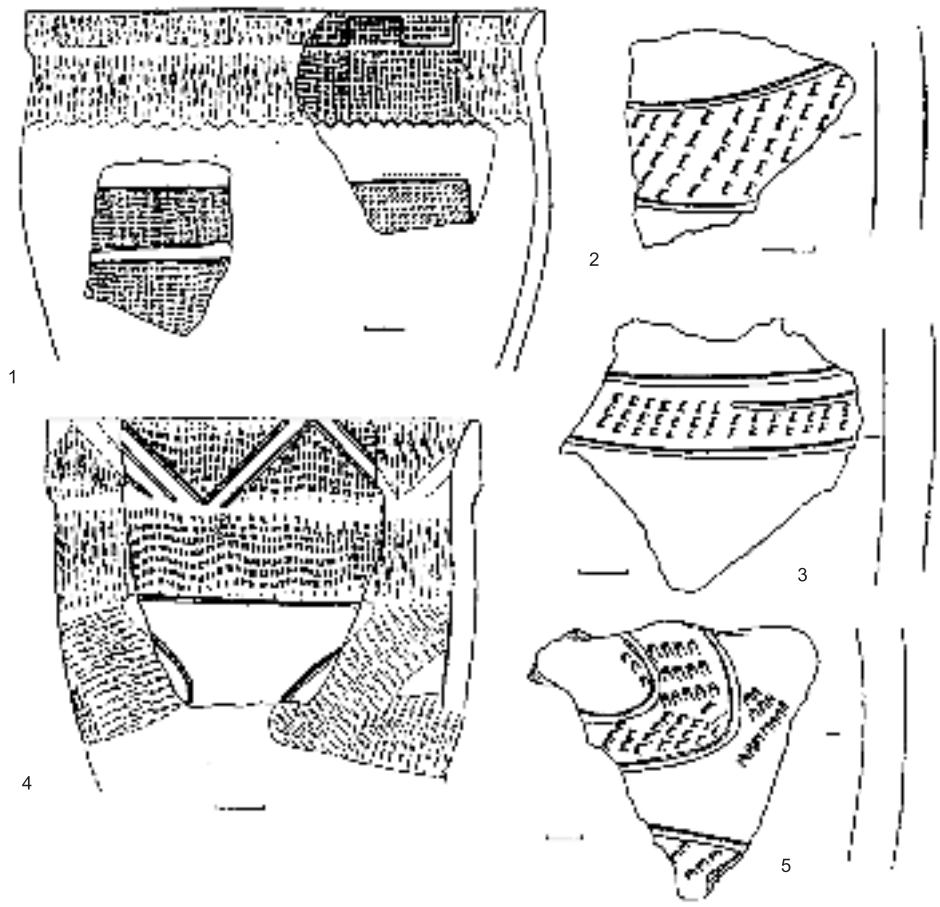


Fig. 12. Materials of settlements of the Lower Don culture: 1, 3 - Second Romanov Perekat [after Vasilyev 1981]; 2 - Tsimlyanskoe; 4 - Razdorskoe 1; 5 - Rakushechniy Yar, 2 layer [after Belanovskaya 1995].

boar's fangs with apertures (Fig. 15:12), adornments from boar's fangs, including not ornamented plates of types A (Fig. 15:11), A-B (Fig. 15:10), B (Fig. 15:6), according to A.D. Stolyar's typology [1955:20]. At the beginning of the first period such adornments and grave goods as *Unio* shells and teeth of deer, in the end — clothes decorated mainly with nacreous and bone beads, and also plaques from the boar's fangs predominated.

The second period of the cemetery functioning is connected with spreading of tradition of colouring the dead with ochre. The dead were buried in individual pits, but during the interments the earlier skeletons were destroyed [Makarenko

1933:11]. A positon of dead's hands becomes more various. The separate burials lay on the side (No 13 and No 74), but sitting (No 55) and in flexed position (No 53) are known, too. Judging from the stratigraphy the cremation at the grave 50 concerns this period. In burial 122 there is some coal of an oak. In comparison with the first period the amount of grave goods (79%) considerably increases. Grave material and ornament of funeral clothes become more varied. Among adornments there are teeth of fish, nacreous beads with cut segments (Fig. 15:27, 28), bone pearl-shaped (Fig. 15:35) and gagate cylindrical beads (Fig. 15:20), pendants made of nacre, marble, porphyry (Fig. 15:22, 23), not ornamented plates from boar's fangs of the types A-G (Fig. 15:16) and G (Fig. 15:17), ornamented plates from boar's fangs of the types A (Fig. 15:15, 19) and B (Fig. 15:9), bone plaques (Fig. 15:18), figures (Fig. 15:1, 2), pipes (Fig. 15:5). Grave goods of the second period also includes stone axes (Fig. 14:21), large, middle and microlith blades (Fig. 14:5-9, 11), flakes, scrapers (Fig. 14:15-17, 19, 20), borer (Fig. 15:10) and cross maces. Simultaneously, a number of burials accompanied by the *Unio* shells and the adornments from teeth of deer is reduced. At a final stage of the cemetery existence these arttefacts do not appear any more. The greatest variety of individual sets of grave goods and adornments of clothes is characteristic for the beginning of the second period. By the end of the cemetery existence the amount of burials inventory grows up to 84%, but the number of items and adornments in each separately taken burial is reduced and their set becomes more monotonous. The belonging of the Mariupol cemetery to the Lower Don culture is determined by a number of attributes. Cemetery in Rostov, recently investigated, situated in the territory occupied by sites of the Lower Don culture is identical as the Mariupol cemetery. Besides, according to V.N. Danilenko's information [1974:74], only expressive pottery fragment (the fragment of a vessel bottom with comb ornament) from the Mariupol cemetery has an inclusion of crushed shell in clay. It differs from the greater part of pottery of the Azov-Dnieper culture having an admixture of sand. From the Rakushechniy Yar and Razdorskoe 1 settlements the parallels for plaques from the boar's fangs, for plates from nacre, stone pendants, figures of bulls (Fig. 7:3, 5, 10) and bone beads are also known (Fig. 11:7).

The Mariupol cemetery in respect of the funeral rites is most similar to the Vasilyevskiy 5, Vovnigskiy 2 ones [Telegin, Potehina 1987] and early part of the Nikolskiy cemetery [Bodyanskiy 1959]. They resemble each other by the burials in individual grave pits located as a row, the latitudinal direction of dead, the replacement of burials not painted with an ochre by the painted ones, the general grave goods and adornments of funeral clothes (the teeth of deer and fish, the beads from bone, stone and nacre, large and medium flint plates, the flakes and instruments from them). However, at the Mariupol cemetery the various adornments from bone and fangs of boars, the stone and nacreous pendants, the nacreous beads with the cut segment, the sea shells with apertures, the flint axes are found. All these grave goods are not known at such cemeteries as the Vasilyevskiy 5, Vovnigskiy 2 and early part of the Nikolskiy burial-place.

The least similarity to the Mariupol cemetery is represented by the funeral rite of such cemeteries as the Nikolskiy, Lysogorskiy and Yasinovatskiy, which concern

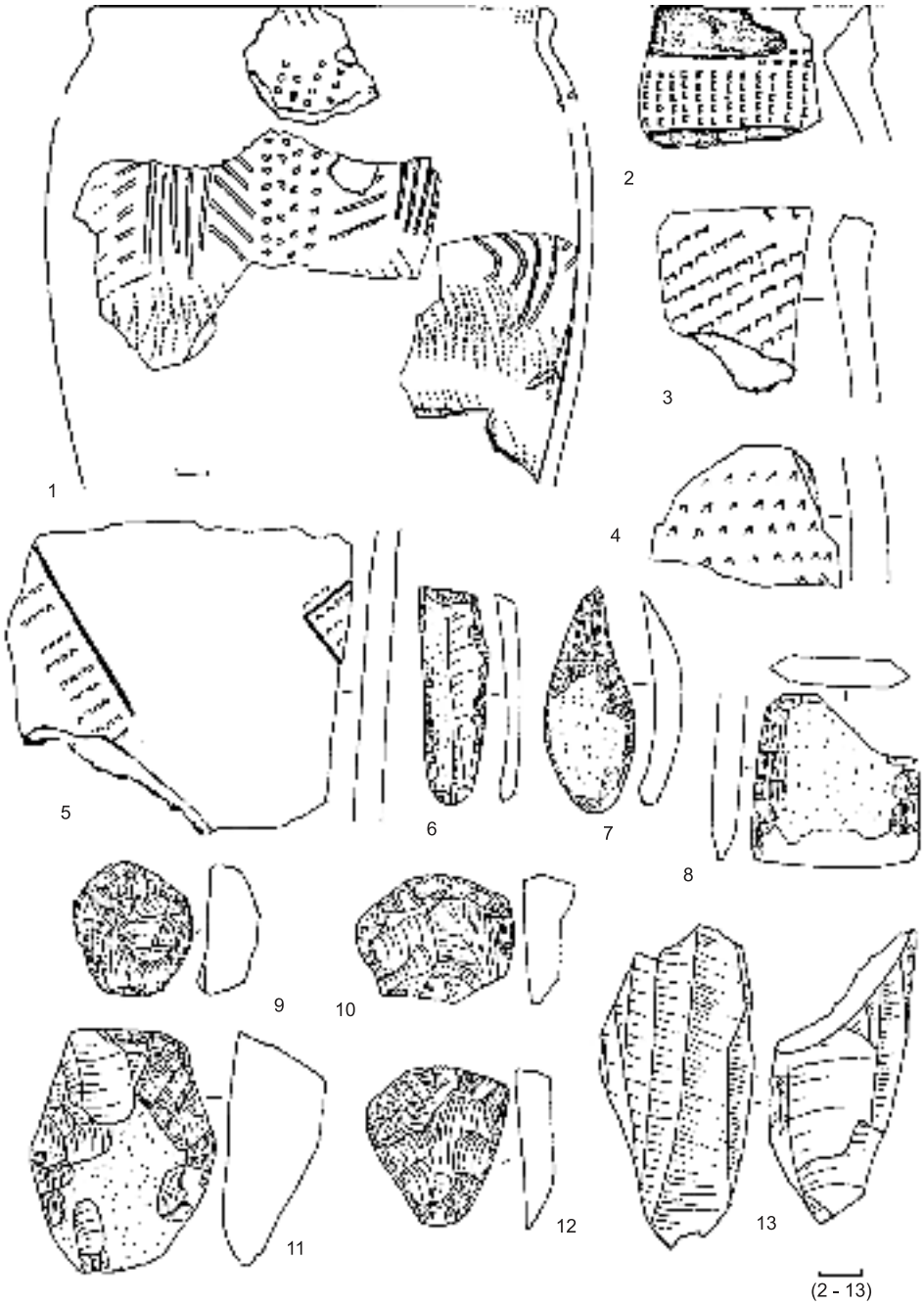


Fig. 13. Materials of lower layer of the Razdolnoe settlement.

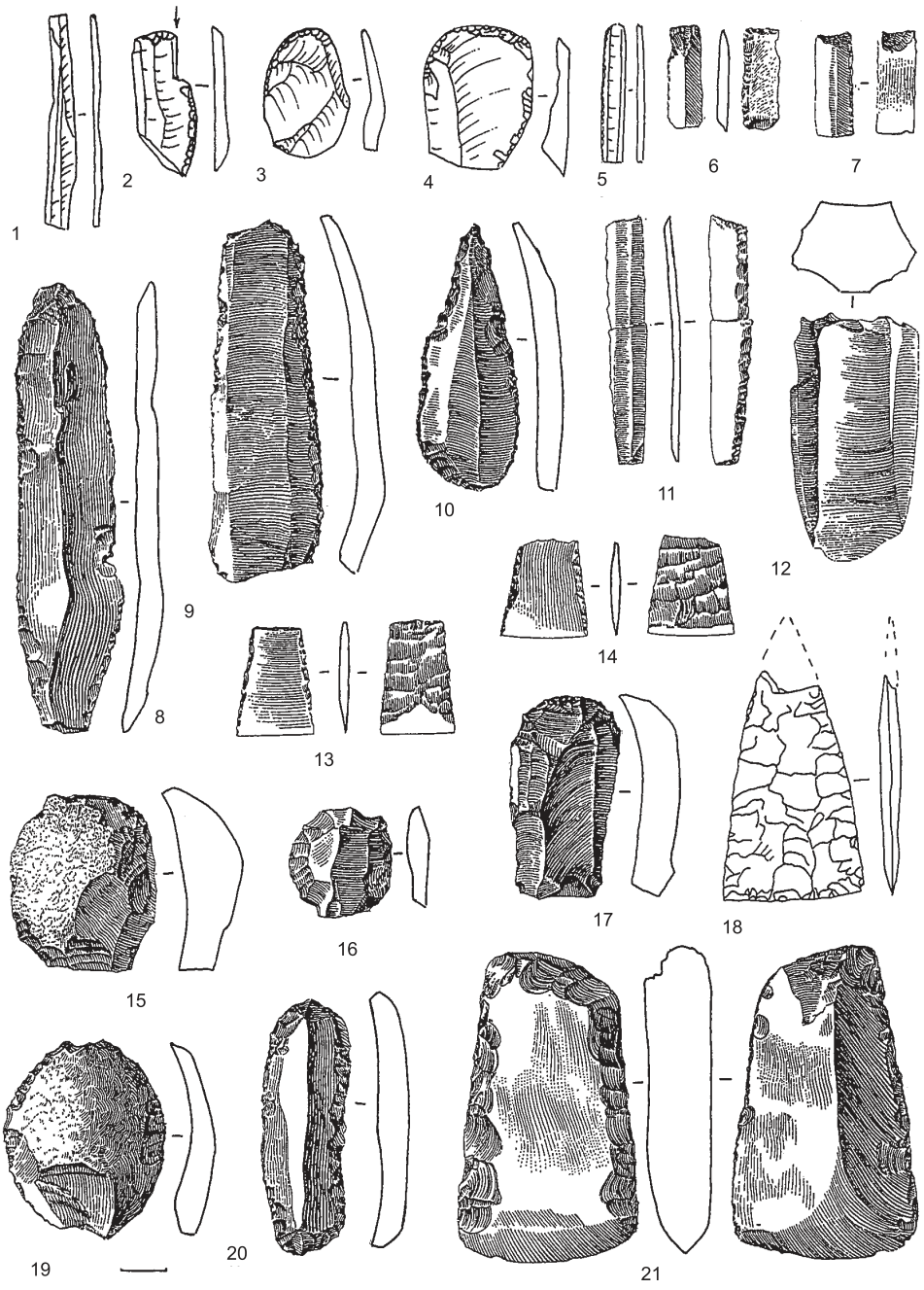


Fig. 14. Materials of the Mariupol cemetery [6-21 - after Makarenko 1933].

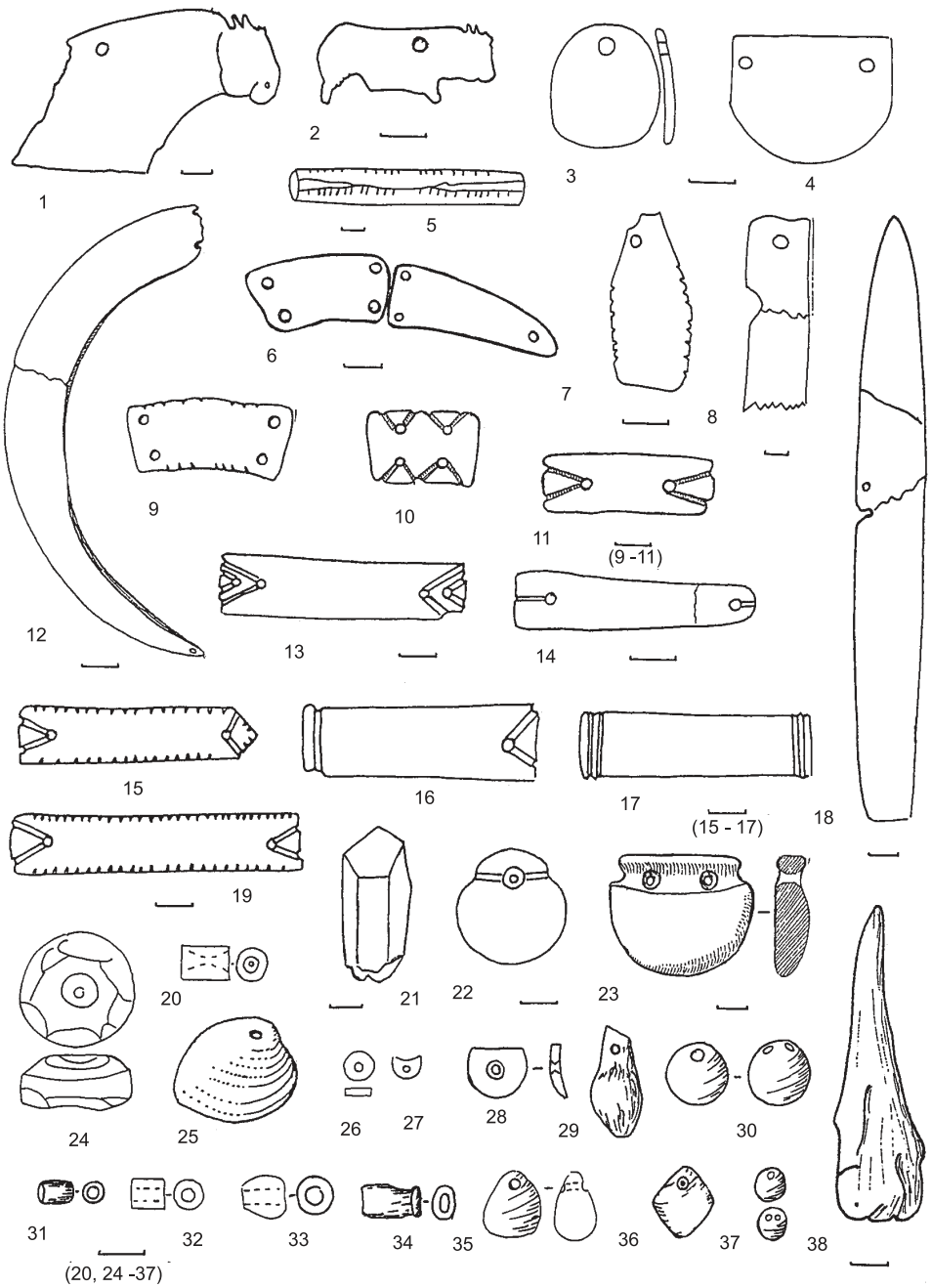
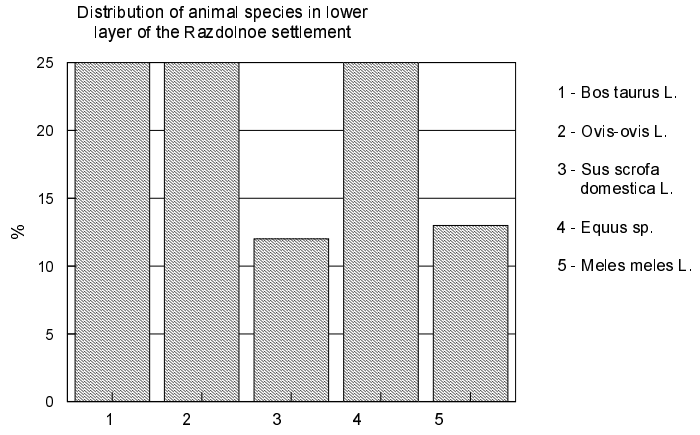


Fig. 15. Materials of the Mariupol cemetery : 1-5, 7, 8, 18, 29-37 - bone; 6, 9-17, 19 - fang of boar; 20-24 - stone; 25-27 - nacre; 28 - tooth of deer [1-29, 33, 37 - after Makarenko].

to the second period of the Azov-Dnieper culture. There the burials were located in the large pits, which were used for subburials. The grave goods, similar at first sight, also differ. They include the sea shells, the plaques from the fangs of boars, the beads made of bone and gagate, the bone pendants and stone axes. However, in the Lower Dnieper region not all types of plates are represented. The plates of type A and undecorated plaques of type B, that is, the earliest forms of similar adornments according to a stratigraphy of the Mariupol cemetery are absent. At the cemeteries of Lower Dnieper region there are also plates in the form of butterfly, which are absent at the Mariupol cemetery. It is necessary to note, that, in contrast to the Mariupol cemetery, in all cemeteries of the Lower Dnieper region single all kinds of adornments, except the pendants made of teeth deer and fish appear. It must be emphasized that the grave goods of the Mariupol cemetery as a whole because of the variety and large number have no analogies at cemeteries of the Lower Dnieper region.

Except the Mariupol cemetery, in the Kalmius basin also not numerous materials of the lower layer of the Razdolnoe settlement refer to the Lower Don culture (Fig. 13). It contains the syncretic materials combining traditions of the Lower Don and the Surska cultures [Kotova 1994:16-17]. It is possible to assume, that the community consisting of the representatives of such cultures as the Surska and Lower Don, lived at the end of the 5th — beginning of the 4th millennium BC at the Razdolnoe settlement. They bred the horned cattle, sheep and pigs. Archeozoologist E.A. Sekerskayae defined the horse bones as belonging to *Equus callus*, but in connection with dating the layer to the Neolithic epoch, she attributed them to the wild species (Table 1).

Table 1



At present it is difficult to determine a basis of formation of the Lower Don culture. V.N. Danilenko [1974:39] and T.D. Belanovskaya [1995:190] marked similarity of the Lower Don pottery with pottery of the Neolithic settlements of the Ural region. Nowadays in the Ural new sites from the advanced Neolithic are being

investigated. Ceramics similar to the pottery of the Lower Don culture is found (Fig. 16). Insufficient study of the Neolithic of steppe country between the Don and Volga does not allow to speak with confidence about migration of the population from the Ural Region to the Lower Don. However, taking into account, that all Neolithic cultures of the Azov, Lower Dnieper and Don steppe region had other forms of vessels and other decoration than the Lower Don culture, such an assumption has the right to exist. Probably, a group of the Neolithic population from the forest-steppe Volga basin or Ural Region migrated, through the Volga valley, to the south-west up to the northern Azov Sea basin. Here the newcomers partially have been forced out, partially assimilated to the local Neolithic population of the Rakushechniy Yar culture.

The bifacial tools evidenced the connections of origin of the Lower Don culture with the Volga-Ural region. This population was the first among the inhabitants of south of the East Europe, who used the bifacial points. However, the similar points are known in the Volga-Ural region from the Early Neolithic (Fig. 2:14).

The arrival of new population is fixed on the sharp change of culture, which is traced at the Razdorskoe settlement 1, where the layer of the Rakushechniy Yar culture is recovered by stratum with completely distinctive materials of the Lower Don culture [Kiyashko 1987:73]. The materials of the Rakushechniy Yar settlement, on the contrary, demonstrate the gradual assimilation of local population of the Rakushechniy Yar culture by newcomers. At first, in the lower layers of the Rakushechniy Yar settlement, among the pottery of the Rakushechniy Yar culture, single vessels with an inclusion of shell and comb decoration appeared, which then dominated in fifth-second layers, concerning to the Lower Don culture. There are syncretic groups of pottery as well. So, in the layer 4, a vessel with stroked ornament, typical for the Rakushechniy Yar culture, but with collar-shaped rim, typical for the Lower Don ceramics was found [Belanovskaya 1995:114, Fig. XXIII, 2]. The continuity is traced also in the adornments and stone tools found at the Rakushechniy Yar settlement (Fig. 3; 4; 9; 10).

The population of the Lower Don culture widely settled in the northern Azov sea area. In its movement to the west, some groups of people have reached the Dnieper. In the third quarter of the 5th millennium BC, a part of the Lower Don culture population settled in the Molochnaya River basin and in the Lower Dnieper steppe. Its life in the surrounding of the indigenous population belonging to the Surska culture has resulted in modification of traditions and creation of the Azov--Dnieper culture on the Lower Don basin [Kotova 1994:56-57].

Some groups of the Lower Don culture population penetrated into the South Bug basin, too. Influence of the Lower Don population and its probable penetration into the Bug-Dniestr milieu have resulted in significant changes of the Bug-Dniester traditions and in formation of a complex of the Samchintsy period. Most fully these materials are presented at the Samchintsy settlement and in the second layer of the settlement on the Bazkov island. Under the Lower Don influence the Bug--Dniester population has become acquainted with the use of shell, in the ceramics manufacture, as an inclusion to clay and the comb decoration of vessels (Fig. 17).

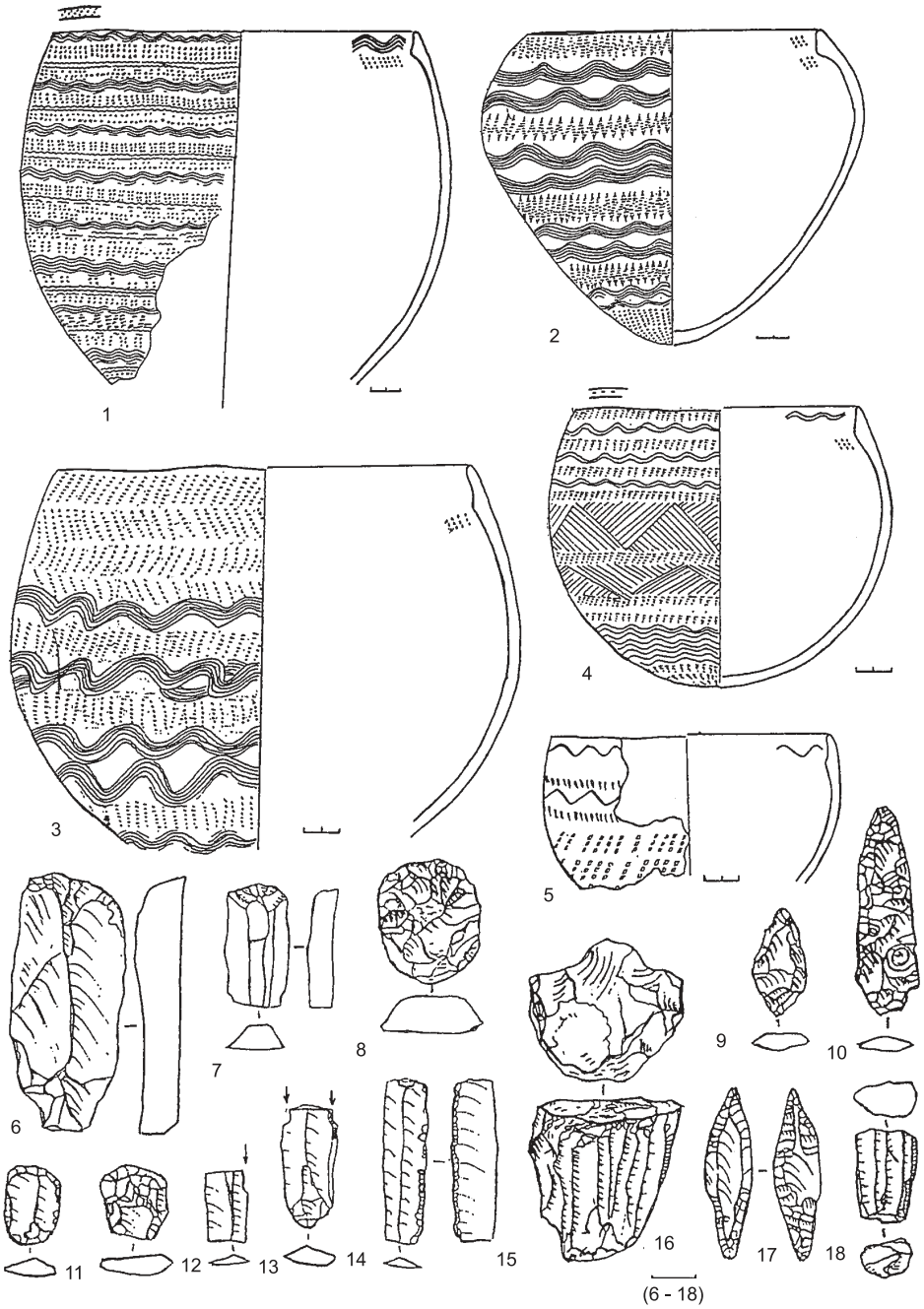


Fig. 16. Materials of the advanced Neolithic of the Ural Region on the Isetskoe right-bank settlement [after Kerner 1991].

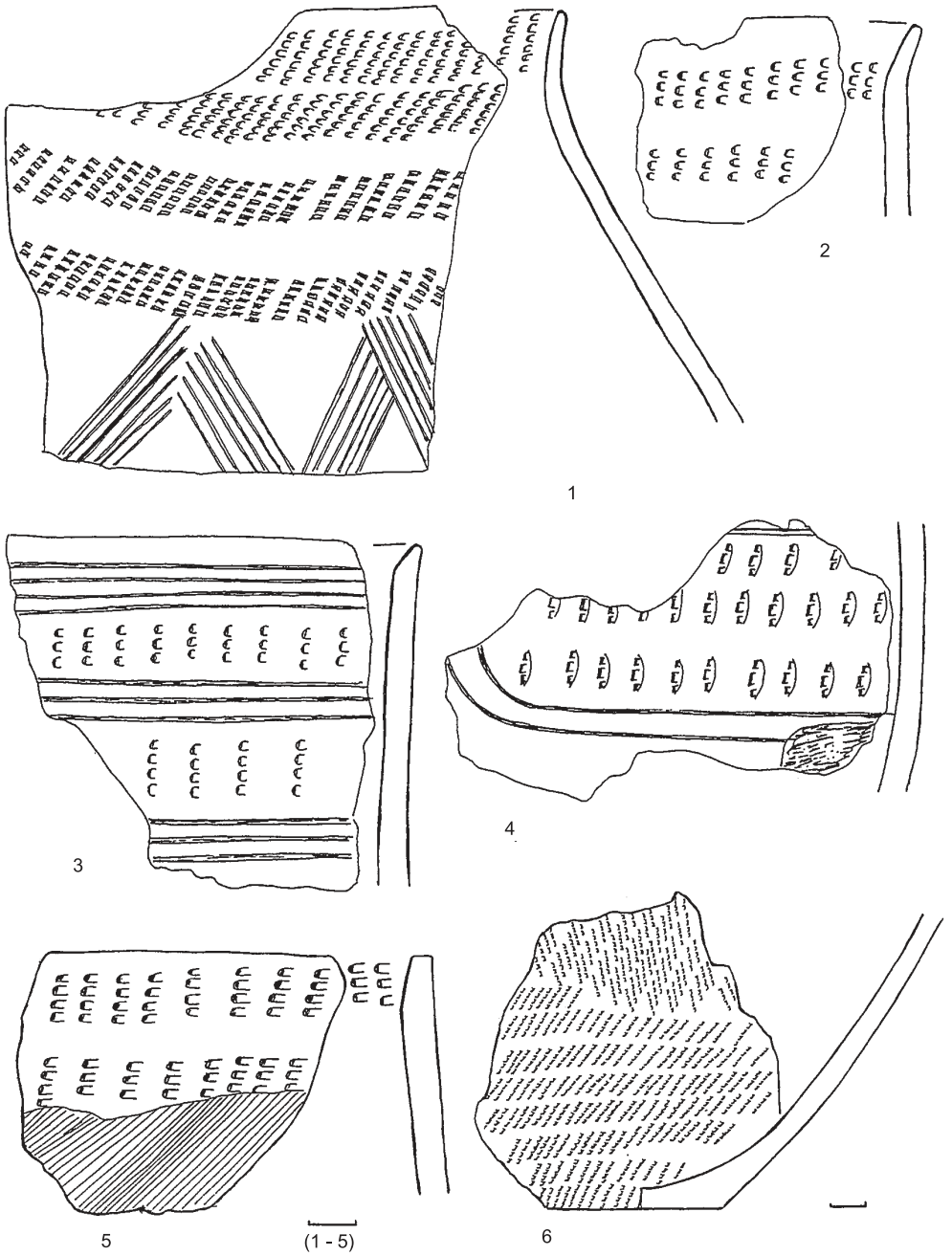


Fig. 17. Ceramics of settlements of the Bug-Dniester culture (Samchintsy period): 1, 2 - Samchintsy; 3 - Sokoltsy 6; 4 - Mitkov island; 6 - Bazkov island; 5 - Schurovtsy.

Separate pots with rim slantwise cut inside off are gaining acceptance as well (Fig. 17:3, 5).

Probably, results of influence of the Lower Don population were also some buildings of subrectangle forms which have appeared in the Samchintsy time, alongside the structures of suboval form typical for the Bug-Dniester population.

It is necessary to note, that also the Bug-Dniester influence on traditions of the Lower Don culture is confirmed. It was displayed in borrowing stretched and tape decoration. The idea of tape ornamental compositions was remade by the Lower Don population in the traditional for this culture execution. In contrast to the Bug-Dniester pottery, where the tapes were filled with the scratched lines or strokes, on the Lower Don ceramics they were filled with comb prints. It is necessary to specify, that the tape decoration was used also by population of the Surska culture. However, for these ornamental compositions are characteristic the angle figures (Fig. 5:1) different from the smooth, round compositions of the Bug--Dniester pottery (Fig. 6:1, 2). Just spreading of the subround tape patterns and their use by the Lower Don population (Fig. 12), parallel with angle ones (Fig. 11:6), make possible to speak about the direct influence of the Bug-Dniester culture. The influence of the population of the Surska culture, settled in the western Azov Sea area, simultaneously with the representatives of the Lower Don culture, was reflected in occurrence of stroked decoration and in goffering of rims of some Lower Don vessels [Kiyashko 1987: Fig. 1:21).

In the fourth quarter of the 5th millennium BC the influence of population of the Lower Don culture on the Neolithic inhabitants of the Southern Bug basin decreased. The contacts with the Lower Don population, probably, have been interrupted as the result of gradually worsening of inhabitation conditions in south of a steppe zone, that was connected with the drying of the climate, which reached its peak at the end of the 5th — beginning of the 4th millennia BC [Spiridonova 1991:198, Fig. 37]. Overcoming of influences of the Lower Don culture and revival of the Pre-Samchintsy traditions in the pottery-making have caused the formation of sites in the Savran period of the Bug-Dniestr culture. It is dated to the fourth quarter of the 5th — beginning of the 4th millennium BC.

However, just at this time close contacts of the population of the Azov-Dnieper culture with the most southern groups of the Bug-Dniester population, which inhabited north of a steppe zone are traced.

In mid-1950s the Azov-Dnieper culture was distinguished by V.N. Danilenko, who in the latest work has given only its brief characteristic [1974:36-40]. The sites of the Azov-Dnieper culture are known in the western Azov Sea area, Lower Dnieper steppe region and the steppe areas of Crimea. In development of the culture two periods are distinguished [Danilenko 1974:38; Kotova 1994:43-44]. The first (the Neolithic) period is dated to the second half of the 5th — beginning of the 4th millennia BC. It is characterized by the ceramics with comb decoration and the ground cemeteries, which consisted of individual grave pits. The second, Eneolithic, period is dated to 1-3 quarters of the 4th millennium BC. It is characterized by the ceramics with scratched and stroked decoration. The cemeteries of the second

period of the Azov-Dnieper culture (Nikolskiy, Lysogorskiy, a part of Yasinovatskiy burial-place) consisted of large grave pits, which were used during long time for subburials.

The first period is presented in the Molochnaya River basin by not numerous materials from the lower layer of the Semenovka settlement and, probably, materials of the Chapaevka site. In the Lower Dnieper region the lower layers of the Sobachki, Vovchok ang Vovnigi settlements are related to the first period. In the steppe Crimea the materials of this period were found in the upper layer of the Frontovoe 1 settlement [Matskevoy 1977:79-81].

The funeral rites of the first period of this culture are presented in such cemeteries as Vovnigskiy 2, Vasilyevskiy 5, Dolinskiy and early part of the Nikolskiy burial-place [Bodyanskiy 1959]. The population buried the dead in individual grave pits on the territory of large earth cemeteries. On the territory of the cemetery the pits formed the rows. The skeletons are extended on the back with heads to east or west. On the surface of cemeteries the single bonfires and piles of stones, which were prototypes of sacrificial platforms were found. They were distributed in the second period of this culture development. The set of burial goods included the *Unio* shells, the teeth of deer and fish, the beads from stone, bone and nacre, the flint implements. Two stages in development of funeral rites are distinguished on the base of materials of the specified cemeteries. At the first stage of the earlier period the dead were not painted with an ochre, at the second stage of this period the use of ochre in the funeral ceremony began [Kotova 1994:43-44].

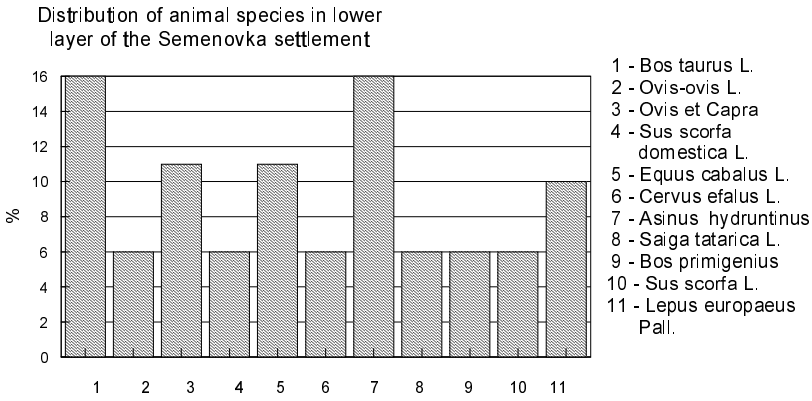
Two stages are traced within materials of settlements, too.

The first stage of the Azov-Dnieper culture and coexistence with the Surska culture are fixed in lower layer of the Semenovka settlement near Melitopol (Fig. 18:2-5). This layer presumably dates to the third quarter of the 5th millennium BC [Kotova, Tuboltsev 1996]. The Azov-Dnieper pottery from this layer is made of clay with inclusions of crushed shell. It is ornamented by prints of comb stamps, including the "walking comb" (Fig. 18:3, 5). The vessels have no collars on the rims. Combined the ornament from oval strokes, typical for the Surska culture, with the prints of "walking comb" occurs an one vessel (Fig. 18:5).

The population lived in this settlement, bred neat and small cattle, horses and pigs. The animal husbandry provided about 50% of meat food. The main object of hunting was probably European donkey, but boar, red deer, saiga and hares were also hunted. In this favorable period with sufficient humidifying of the climate, apart from the European donkey and saiga — typical occupants of the steppe — in the flood-lands boars and red deer were found. Probably, in valleys of the rivers at this time of flood-land woods grew, in which typical animals of forest-steppe and forest zones lived (Table 2).

Except the Semenovka, the ceramics of the first stage are found at the Babino settlement in the Lower Dnieper steppe region (Fig. 18:1). As a whole the first stage of the first period previously is dated to the second half of the 5th millennium BC.

Table 2



To the second stage of the first period (the end of the 5th — begining of the 4th millenia BC) concerns such settlements as Chapaevka (Fig. 19) in the Molochnaya River basin; Sobachki, Vovchok and other sites of the Lower Dnieper steppe region (Fig. 20; 21). During the second stage ceramics was manufactured from clay with the inclusions of sand and vegetation. It had the flat base. The pottery included pots (Fig. 20:1, 8; 21:11) and round — sided bowls (Fig. 20:2, 3, 5). Part of them have the rims with collar (Fig. 20:1, 5, 8) or the rims slantwise cut inside off (Fig. 20:2, 10). The pottery was ornamented by prints of long and short comb stamps. For division of ornamental zones the comb zigzag frequently was used (Fig. 20:2, 5). The decoration was rendered on the whole surface of a vessel, including the internal cut of rim and base.

For the Azov-Dnieper culture in the end of 5th — beginning of the 4th millennia BC bifacial worked points of spear-head and arrow-head, the trapezes with thinned back, grinded chisels and adzes (Fig. 20; 21) are characteristic. The important role in economy of the Azov-Dnieper culture was played by the cattle breeding. It provided about 70% of meat food. The Azov-Dnieper population bred the neat and small cattle, horses and pigs (Table 3).

Materials of such late Bug-Dniester settlements as Pugach 1 and 2, Gard 3, which have been studied by N. Tovkailo [1990] in the Nikolaev Region, confirm the significant influence of the Azov-Dnieper traditions on the ceramics manufacture and implements on the Bug-Dniester population. This is true in regard to the spreading of vessels with the collar rim (Fig. 22:1, 2), the comb zigzag in decoration of ceramic, the grinded stone axes, the trapezes with thinned back, the bifacial retouched points (Fig. 22:20, 15, 24).

In contrast to the earlier time, at the end of the 5th — beginning of the 4th millennium BC, the Bug-Dniestr population bred horses, neat and small cattle [Zhuravlev, Kotova 1996:12]. The horned small cattle and horse, probably, had appeared as a result of borrowing from the Azov-Dnieper population. Judging by the materials of the Sobachki settlement, these animals were rather numerous in

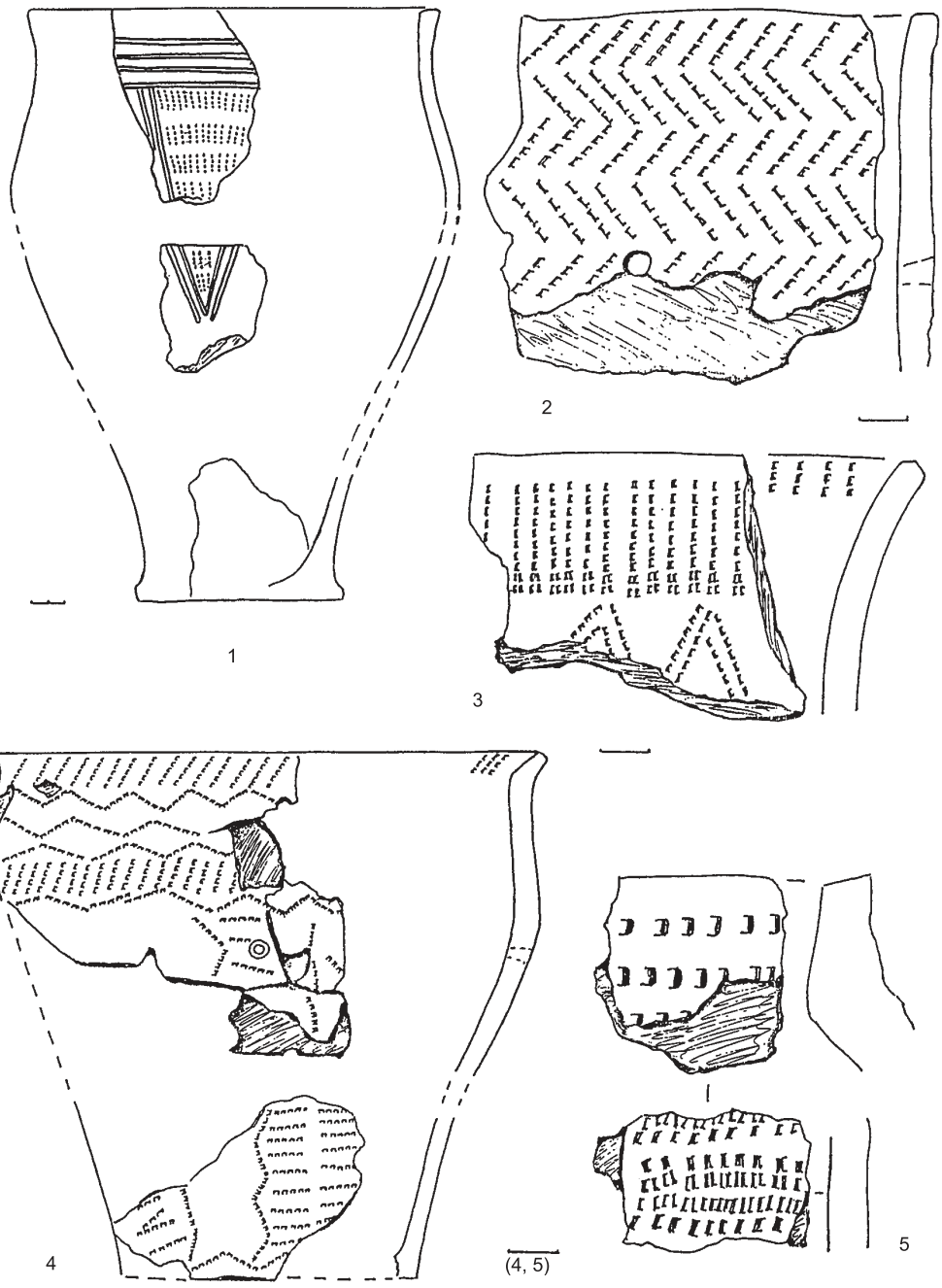


Fig. 18. Materials of first stage of the Azov-Dnieper culture (first period): 1 - Babino; 2-5 - lower layer of the Semenovka settlement.

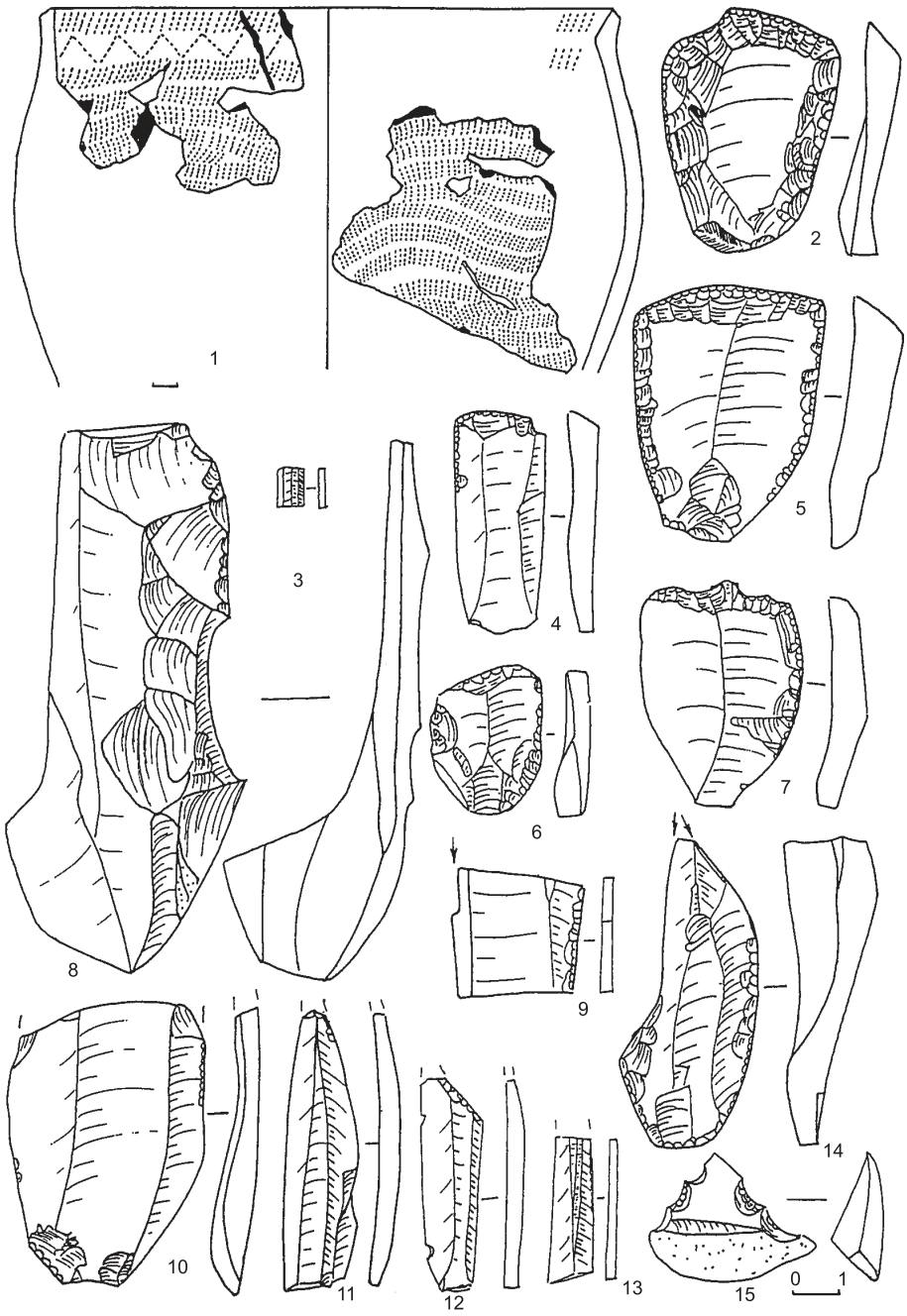


Fig. 19. Materials of the Chapaevka settlement.

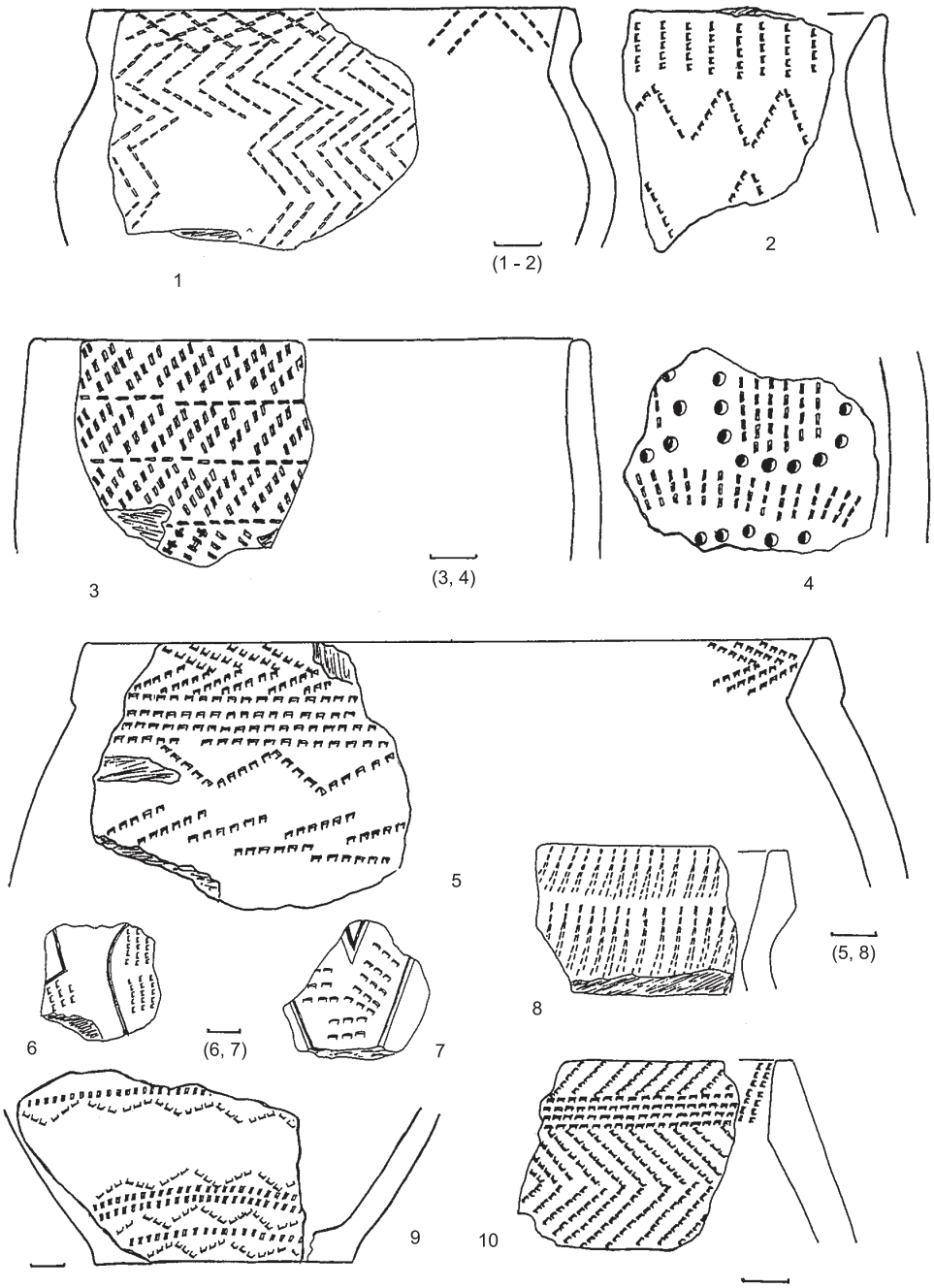


Fig. 20. Ceramics of settlements of the second stage of the Azov-Dnieper culture (the first period): 1, 3-5, 9, 10 - Vovchok; 2, 7 - Vovnigskoe left-bank; 6 - Vovnigskoe right-bank; 8 - Vovnigi.

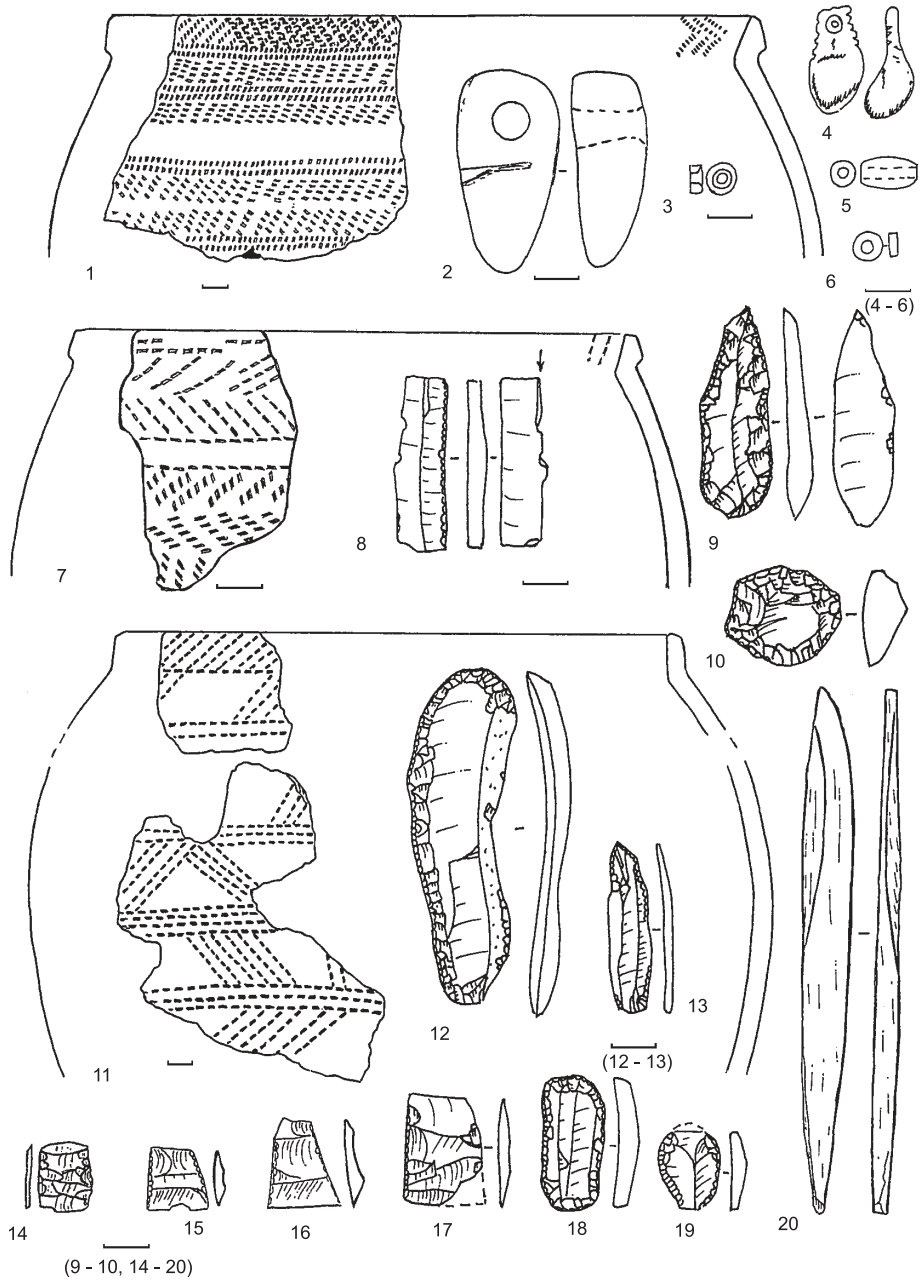


Fig. 21. Materials of the second stage of the Azov-Dnieper culture (the first period): 1, 11 - Sobachki settlement, 2, 5, 6, 8, 13, 15-17, 20 - Vovnigskiy 2 cemetery; 3, 4 - Nikolskiy cemetery (from the excavation of V. Bodyanskiy); 7 - Vovchok; 9, 10, 12, 14, 18, 19 - Vasilyevskiy 5 cemetery 5. 2, 3, 5 - stone; 4 - tooth of deer; 6 - nacre; 20 - bone.

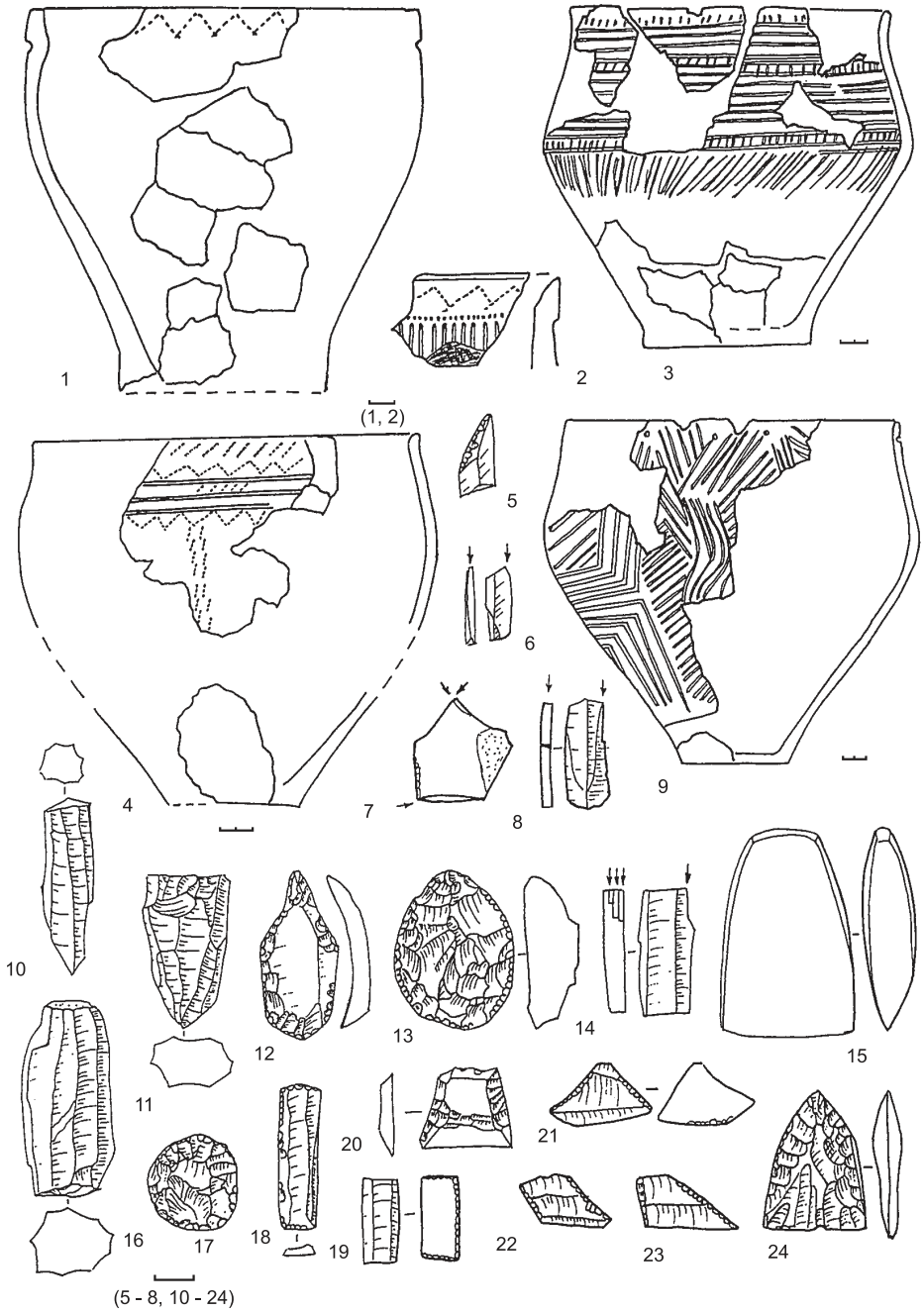
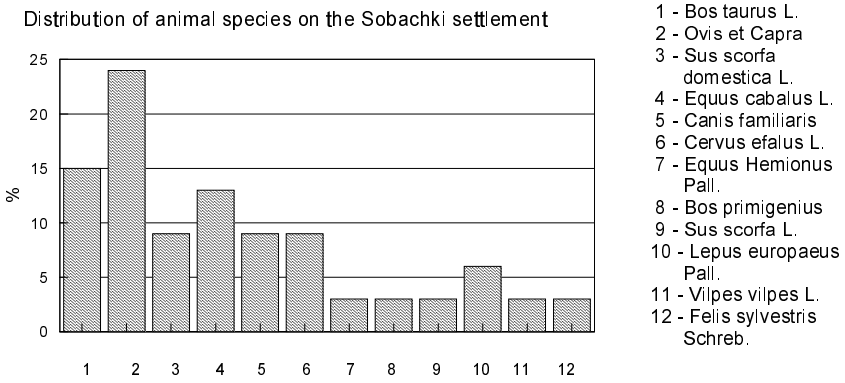


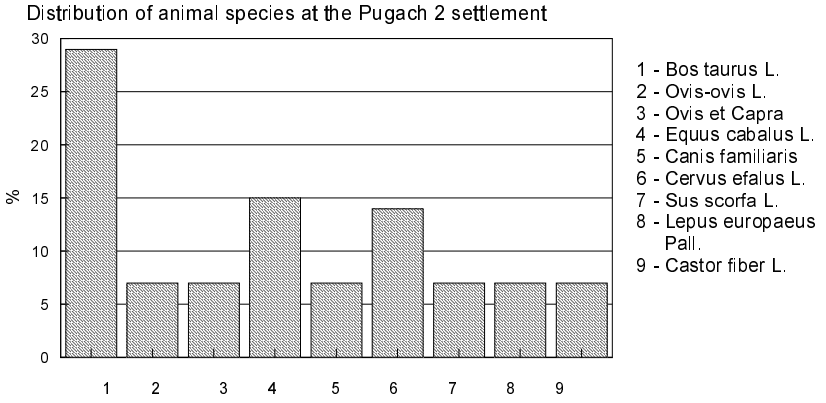
Fig. 22. Materials of the Pugach settlement [after Tovkailo 1990].

Table 3



herd of the Azov-Dnieper population. It is necessary to emphasize, that small cattle and horse occur just in the steppe Bug-Dniester sites and just in an arid period (Table 4).

Table 4



Thus, the study of the Neolithic sites of the middle of the 5th — beginning of the 4th millennium BC has shown that the east cultural impulse played an important role in the procces of development of Neolithic cultures of the Ukraine. As a result of migration of the population of the Lower Don culture in the western Azov Sea basin and the Lower Dnieper steppe region was formed the Azov-Dnieper culture — one of the brightest Neolithic cultures of the Ukraine. The Lower Don population has brought traditions of the advanced animal husbandry, which, probably, played a basic role in the economy. From this population the Neolithic inhabitants of the

Ukraine borrowed the use of comb stamps for ceramic decoration and the bifacial worked spear-heads and arrow-heads.

Somewhat later, about the fourth quarter of the 5th millennium BC, the Azov--Dnieper culture became to play an important role in development of the Neolithic cultures in the Ukraine. Due to this culture influence, in the Bug-Dniester population, in the final phase of its development, the advanced animal husbandry with horned small cattle, horses and pigs breeding, the vessels with collar-shaped rim, the grinded tools from stone and the bifacial worked spear-heads have spread.

In conclusion, we will note that the given work is considered to be at an initial stage of a difficult and important theme. Its purpose should be considered to be an attempt to focus researchers' attention to existing problem of the eastern impulse in the Neolithic of the Ukraine.

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UKRAINE MESOLITHIC CEMETERIES: DENTAL ANTHROPOLOGICAL ANALYSIS

1. INTRODUCTION

The earliest known skeletal evidence for relatively large-scale habitation of Ukraine has been found in Dnieper Rapids Region Mesolithic cemeteries [Telegin 1982; 1989]. Hypotheses dealing with the affinities of the people buried in three of these, Voloshskoe, Vasilyevka I, and Vasilyevka III, are examined in this paper. According to I.I. Gokhman [1966] and T.S. Konduktorova [1973] the skeletal metrics of the skeletons excavated from these cemeteries incorporated a variety of physical features, which resulted from a complex regional interaction of peoples during the Mesolithic Era. Voloshskoe is thought to have contained two groups of peoples, Mediterraneans, who were narrow faced and very gracile, and Australoids (two skulls) [Debets 1955a]. Vasilyevka I burials were Ancient Mediterraneans and Protoeuropeans, who were broad faced and massive North Europeans descended from a mixture of late Palaeolithic peoples, such as those from Brno and Předmostí [Konduktorova 1957; Gokhman 1966]. Vasilyevka III flexed burials were Protoeuropeans, and Vasilyevka III extended burials were Mediterraneans [Gokhman 1966].

2. METHODS AND MATERIALS

To evaluate these hypotheses, I studied 32 dental morphological traits, three dental pathologies, and eight mortuary features in the Ukraine Mesolithic and comparative European and Near East samples [Haeussler 1995a; 1996, n.d.a]. The samples, curation information, and archaeological histories are listed in Appendix I. Their locations are shown in Figure 1.

The plaques and definitions of the Arizona State University and Dahlberg dental anthropology system were my standards for dental morphological trait eva-

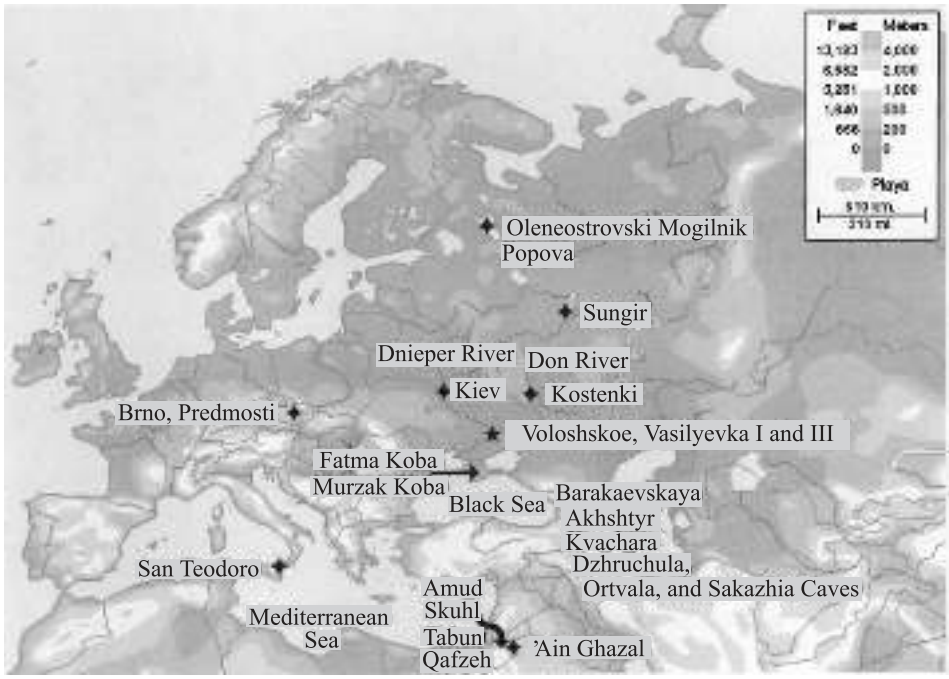

Fig. 1. Map showing the locations of samples compared in the text.

luation. Following this system, frequencies of the dental features, including pathologies, are based on specimen counts [Dahlberg 1956; Turner et al. 1991]. Hypoplasia means two or more teeth with hypoplastic pits and/or lines; caries, one or more carious teeth per individual.

Because the samples are very small, I used the Coefficient of Similarity (C^s) and Index of Similarity (I^s) [Haeussler, n.d.a] for comparing the morphological dental trait frequencies. If two samples are very similar to one another, the C^s values should be close to 1.0. A high I^s value indicates a relatively large sample and/or many traits. A relatively low value reflects a very small sample size — usually six or less in the samples compared here. In this analysis, a C^s value with an I^s lower than 0.980 is considered less reliable than one with a value of 0.980 or greater. Appendix II has the formulae and brief explanations. The comparative C^s values are presented on diagonal bar graphs, which have been constructed so that each bar is rooted in the coordinates 0,0. The graphs have been rotated so that each of the bars is visible.

In addition to biological traits, I compared eight features associated with the burials in the Ukrainian and comparative samples (Table 1). In the absence of habitation sites, except at Voloshskoe, mortuary evidence is the only indication of

the culture of the deceased and the people who buried them [Binford 1971]. The features fall into three categories: those relating to 1) the burials (existence of a burial ground, presence of a habitation site, and proximity to a body of water), 2) the skeleton (body position, number of skeletons to a grave); and 3) personal grave goods (those from stone and bone, red ocher, and anthropomorphic figures).

For consistency, I have followed the chronological classification of Telegin [1982; 1989]: Voloshskoe, Vasilyevka I, Vasilyevka III flexed, and Vasilyevka III extended burials. Herein, *cemetery* means a burial ground. I have accepted as a cemetery any site designated as a *mogilnik* in the Russian-language literature or as a *cemetery* in English-language accounts. The mass grave at Předmostí is considered a cemetery for comparative purposes of this analysis. *Near East* means the lands around the eastern shores of the Mediterranean Sea, including northeastern Africa and southwestern Asia. The term *Mediterranean* includes the Near East.

The results of the analysis are partitioned into two topics. These are the regional heterogeneity of the Mesolithic people and the affinity of the Mesolithic people with Europeans and Near Easterners.

3. HETEROGENEITY OF THE UKRAINE MESOLITHIC SAMPLES

3.1. DENTAL ANTHROPOLOGICAL COMPARISONS

The dental morphological trait analyses support the concept that Ukraine Mesolithic peoples were biologically heterogeneous on a regional scale. By heterogeneous I mean that, out of the 22 features for which all four samples had trait sites, three traits occur in all of the samples with varying frequencies, nine traits are present in some samples and are absent in others, and nine traits are absent from all the samples [Haeussler 1996]. Figures 2 to 5 graphically illustrate that Vasilyevka I, Voloshskoe, and the two Vasilyevka III sub-samples are dentally different from one another. Were the samples homogeneous, the bars would extend to 1.0 or close to it. Voloshskoe and Vasilyevka I, the early samples of D.Y. Telegin's [1982; 1989] chronology, are dentally heterogeneous (Fig. 2, 3), as are the two Vasilyevka III sub-samples (Fig. 4, 5). The latter indicates that the two types of burials represent different peoples, regardless of chronology or archaeological typology.

Additional evidence for the dental heterogeneity of the four samples can be observed in the variations in the frequencies of dental hypoplasia. Percentages range from 0.0% in Voloshskoe to 20.0% in Vasilyevka I to 37.5% in the Vasilyevka III flexed burial subsample [Haeussler 1996]. The frequencies of hypoplasia in the Vasilyevka III flexed burial subsample (37.5%) differs from that in the Vasilyevka III extended burial subsample (9.1%). These variations indicate that the samples may

Table 1

Archaeological features associated with burials

Site	Dates (BP)	Burial ground	Habitation site	Proximity to water	Body position	Single or multiple	Personal grave goods made from bone and stone	Red ocher	Anthropomorphic figures in burial
Ukraine Mesolithic									
Voloshskiy		Yes	Site	Dnieper River	Most flexed 13 on right 1 on left 2 on back, 2 extended	Most single 1 pair	Shell microlithic tools	None	None
Vasilyevka I		Yes	No	Dnieper River	24 flexed (16 on right, 8 on left)	Most single, 3 pairs	Fragments of blades with blunted edges trapezoid microblades scrapers	Yes	None
Vasilyevka III	10,080±100 to 8,030±100	Yes	No	Dnieper River	33 flexed on side (24 on right 9 on left, 1 on back) 7 extended	Most single, 3 pairs, 3 tripole	Microlithic tools	Yes	None
Fatma Koba		No	Unknown	Chernaya River	Flexed on right side	Single	None	None	None
Murzak Koba		No	Burial in site	Chernaya River	Extended head to east	Two	Worked bone, small blade trapeze, end scraper	None	None
Russian Palaeolithic									
Kostenki 2, 14, 15, 17, 18	$38{,}080\pm^{3{,}200}_{5{,}460}$	No	Yes	Don River	2 flexed (14, 18) 2 seated (2, 15)	Single	Headdress of polar fox teeth bone knife and needle, stone tools	Yes (14, 15)	None in burials

Site	Dates (BP)	Burial ground	Habitation site	Proximity to water	Body position	Single or multiple	Personal grave goods made from bone and stone	Red ocher	Anthropomorphic figures in burial
Sungir	25,500±200 to 14,600±600	?	Yes	Klyazma River	All extended on back		Thousands of beads and bracelets, pendants	Kostenki 14, 15 all Sungir	Horse and mammoth carvings
Russian Mesolithic									
Oleneostrovsky Mogilnik	5,700±80 to 9,910±80	Yes	Possibly[2]	Lake Onega	Most (118) extended on back, 11 on side, 5 flexed, 5 vertical	Most (133) single, 15 double, 2 tripole	Elk teeth pendants, human and snake figures, quartz and flint arrow heads, flint inserts	Yes	Elk heads, human & snake figures
Popova	7,150±160 to 9,730±110	Yes	Small site nearby, uncertain relationship to cemetery	Kinem River	All extended on back		Animal teeth pendants, pits with bones & fragments of tools, possibly cultic in nature	Yes	None
Near East Palaeolithic									
Amud, Qafzeh, Skuhl, Tabun	27,000±500 to 45,000±2000	No	Caves	Unknown					
Near East Neolithic									
'Ain Ghazal	4,000 to 6,300	No	Yes	Unknown	Flexed, semi-flexed under house floors	Single, caches of skulls		Yes	Plaster human statues
Czech Republic Palaeolithic									
Předmostí	26,320±320 to 26,870±250	Yes	Yes	Unknown	Flexed	Mass grave	Mammoth scapula Flat pebbles, clay pellets	Yes	

Site	Dates (BP)	Burial ground	Habitation site	Proximity to water	Body position	Single or multiple	Personal grave goods made from bone and stone	Red ocher	Anthropomorphic figures in burial
Brno[1]	Würm II	No	No	Unknown	Unknown	Single	Mammoth tusk, scapula, rhinoceros ribs 600 shells (*Dentalia*) ivory & stone circles	Yes	Ivory human male statue

[1] Brno Information is for Brno II. [2] According to Timofeev (personal communication).
Compiled from Bibikov [1940:175, Fig. 6], Zhirov [1940], Haeussler [1996: Table 37], Konduktorova [1973:9-12; 1974], Telegin [1982:Fig. 3, Table 24, 240-241; 1989:109, 123], Day [1986], Oshibkina [1983:180-191; 1989:37-38, 1990] Praslov [1984:110], Gurina [1989:31], Mamonova and Sulerzhitskiy [1989:Table 2], Price and Jacobs [1990], Jacobs [1994], Potekhina (personal communication), Potekhina and Telegin [1995], Adovasio et al. [1996], Svoboda, et al. [1996], Schmandt-Besserat [1997].

represent either 1) people who were members of different contemporaneous groups living under various cultural and subsistence-related stresses, such as those which might have been associated with the many cases of violent deaths [Konduktorova 1974; Nuzhnyi 1990; Balakan, Nuzhnyi 1995; Gokhman, personal communication]; or 2) people who lived at different times and under dissimilar ecological stresses that affected nutrition and eventually dental enamel formation [Hillson 1986]. In comparison, I found that only 5.3% of the dentitions in the Oleneostrovskiy Mogilnik sample had hypoplasia. In contrast, 61.8% of the burials in the Neolithic cemetery of Lokomotiv on the Angara River (6870±70 to 6670±80 BP*) [Mamonova, Sulerzhitskiy 1989] had hypoplasia [Haeussler 1996], as well as numerous individuals with evidence of violent death [Mamonova, Bazaliyskiy 1991].

In contrast to the broad range of frequencies of hypoplasia, the four Ukraine Mesolithic samples are alike in their mutual lack of caries, abscesses, and periodontal disease. The healthy status in these pathogen-related diseases in all four of the Mesolithic samples indicates a dependence on foods common to a hunter-gatherer subsistence, and a lack of habitual consumption of processed foods associated with a subsistence based on agriculture or transition to it [Turner 1979; 1982; Clarke *et al.*, 1986; Meikeljohn, *et al.* 1988].

3.2. ARCHAEOLOGICAL COMPARISONS

Variations in all three types of characteristics (features of the cemetery, the skeletons, and personal grave goods) indicate the cultural heterogeneity of the four Ukrainian Mesolithic samples (Table 1). Two features were common to the three cemeteries: location adjacent to the Dnieper river, a cemetery feature, and microliths. Although microliths can be interpreted as grave goods [Haeussler 1996], they are presently considered as evidence of conflict within the population [Balakin, Nuzhnyi 1995; Nuzhnyi, personal communication]. Microliths embedded in bone in three of the 12 flexed skeletons at Voloshskoe, two out of the 24 flexed skeletons at Vasilyevka I, and seven out of the 45 flexed skeletons at Vasilyevka III are indicative of violent deaths. Extended skeletons at Vasilyevka III also had microliths which differed in shape from those in the flexed burials [Nuzhnyi 1990; Balakin, Nuzhnyi 1995; Nuzhnyi, personal communication].

Two of the three cemeteries (Vasilyevka I and III) lacked evidence of an associated habitation site, a cemetery feature. This may indicate purposeful and possibly ceremonial transportation of the dead to a designated area apart from that on which the people lived. They were then positioned in a manner proscribed by the folkways of their culture, sprinkled with red ocher, and provided with grave goods indicative of themselves and the personal and community expressions of their cohorts. In light of the numerous violent deaths, the possibility of a battleground or a ritual

* The author used an uncalibrated version of the ^{14}C chronology (Editor).

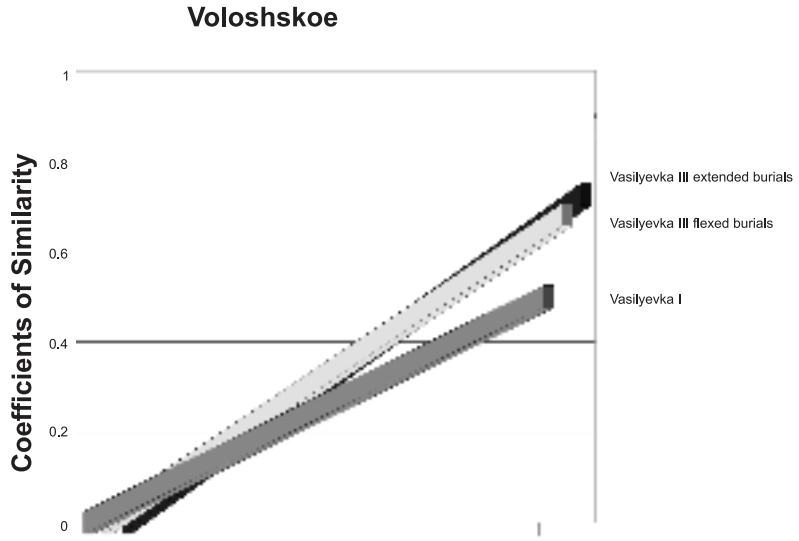

Fig. 2. Graph showing C^S values for Voloshskoe compared with the three other Ukraine Mesolithic samples: Vasilyevka I, the Vasilyevka III flexed burial subsample, and the Vasilyevka III extended burial subsample. Data for Figures 2 through 12 are given in Haeussler [1996, n.d.a]

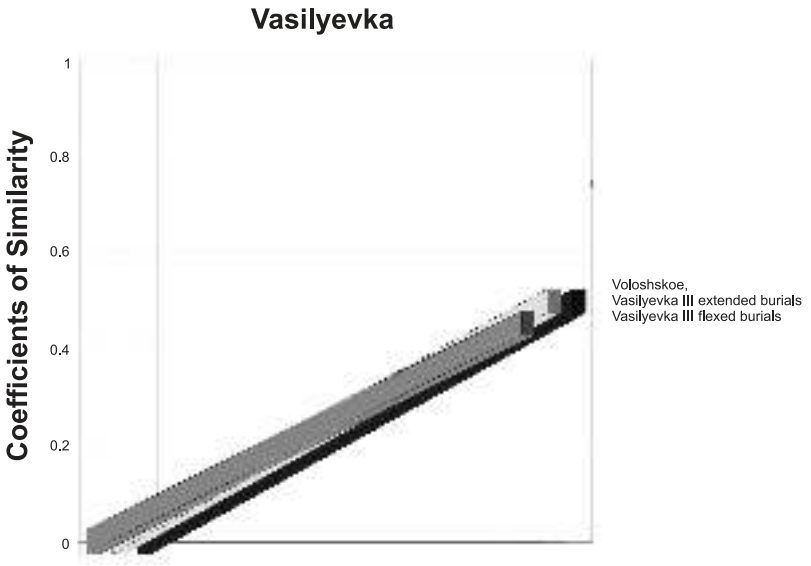

Fig. 3. Graph showing C^S values for Vasilyevka I compared with the three other Ukraine Mesolithic samples: Voloshskoe, the Vasilyevka III flexed burial subsample, and the Vasilyevka III extended burial subsample

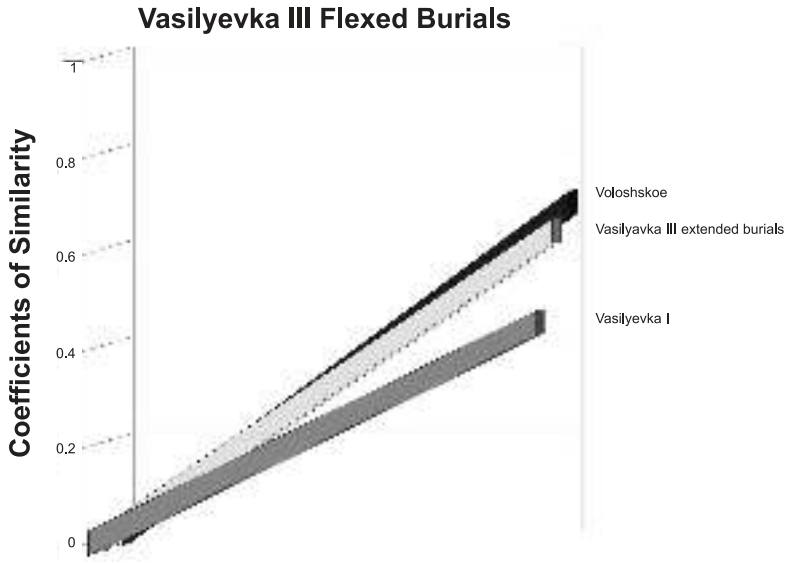

Fig. 4. Graph showing C^S values for the Vasilyevka III flexed burial subsample compared with the three other Ukraine Mesolithic samples: Voloshskoe, Vasilyevka I, and the Vasilyevka III extended burial subsample

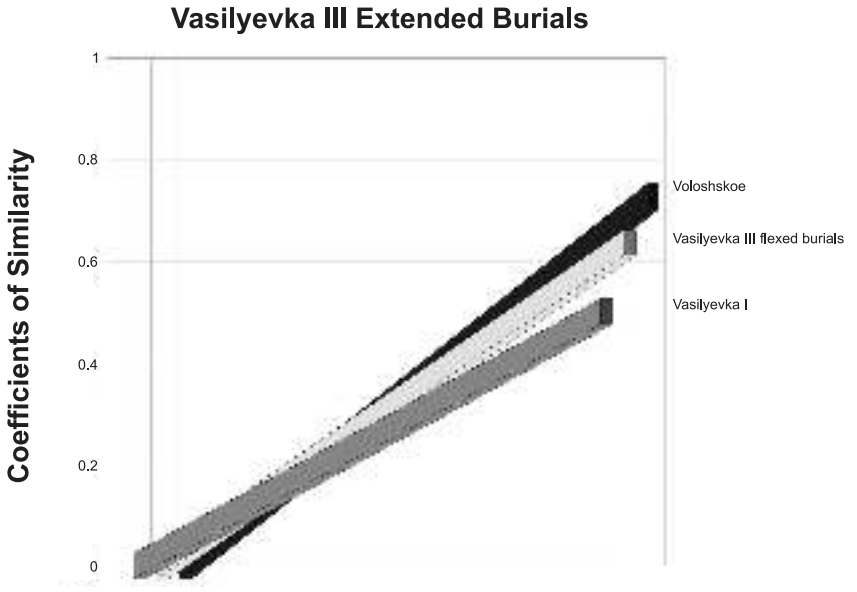

Fig. 5. Graph showing C^S values for the Vasilyevka III extended burial subsample compared with the three other Ukraine Mesolithic samples: Voloshskoe, Vasilyevka I, and the Vasilyevka III flexed burial subsample

burial ground for those involved in the conflict must be kept in mind [Nuzhnyi 1990; Balakan, Nuzhnyi 1995].

The numbers of individuals in a grave and positions of the skeletons differed within and among the cemeteries. In each cemetery single burials were in the majority. However, multiple burials also occurred in all three. Most remains were in a flexed position, although Voloshskoe and Vasilyevka III also had extended burials (Table 1). D.Y. Telegin [1982; 1989] has interpreted this flexed-extended burial dichotomy in Vasilyevka III as evidence for two diachronic cultures.

In features of a personal nature, the burials differed in two elements (a shell and red ocher) and were alike in one (microliths), discussed above. The shell (*Nassa reticulata*) [Nuzhnyi, personal communication] was found in only one Voloshskoe burial. Red ocher occurred in Vasilyevka I and Vasilyevka III flexed and extended burials, but not in Voloshskoe (Table 1).

3.3. SUMMARY

The dental morphological trait data suggest that the Voloshskoe, Vasilyevka I, and Vasilyevka III flexed and extended burial samples were heterogeneous on a regional scale. Archaeological evidence (differences in one cemetery feature, two skeletal features, and personal goods) points to the cultural heterogeneity of the samples. Variation in the dental pathology of hypoplasia indicates differential pathology-producing stress among the Mesolithic samples. Absence of dental pathologies of caries, abscess, and periodontal disease point to a homogeneous substance dependant on hunting and gathering.

4. NEAR EAST AND PROTOEUROPEAN AFFINITIES

The second part of this paper has a dental anthropological evaluation of an ancient Mediterranean (Near East) skeletal affinity for Voloshskoe [Debets 1955a], a Protoeuropean and ancient Mediterranean skeletal affinity for Vasilyevka I [Konduktorova 1957], a Protoeuropean skeletal affinity for Vasilyevka III flexed burials [Gokhman 1966], and a Mediterranean skeletal affinity for Vasilyevka III extended burials [Gokhman 1966]. The results of the dental morphological analysis are given in four pairs of bar graphs (Fig. 6 to 13). In each case, the first graph shows the comparative C^s values for the comparisons between a specific sample and all of the others. The second graph illustrates only the C^s values for samples with an I^s value equal to or greater than 0.980.

5. VOLOSHSKOE ANCIENT MEDITERRANEAN (NEAR EASTERN) AFFINITY

5.1. DENTAL MORPHOLOGICAL TRAIT COMPARISON

The dental morphological trait data add a European dental affinity to the Mediterranean and Australoid skeletal similarities of Voloshskoe suggested by G.F. Debets' osteological analysis [1955a]. The C^s values indicate that Voloshskoe is most closely dentally related to the Crimea Mesolithic and Caucasus Palaeolithic and Mesolithic samples. The sequence of decreasing relatedness continues in four additional European samples: the Czech Republic Palaeolithic, Sicily Upper Palaeolithic, Russian Upper Palaeolithic, and Russian Mesolithic. These are followed by the Near East Palaeolithic and Neolithic samples (Fig. 6), which are the least like Voloshskoe dentally.

Removal of comparisons with low I^s values (0.980 and less), that may be suspect due to the small numbers of traits and specimens, clearly illustrates the dental similarity between Voloshskoe and the European Russian Upper Palaeolithic and Mesolithic era samples. This relationship is closer than that between Voloshskoe and the Near East Palaeolithic and Neolithic eras (Fig. 7).

5.2. ARCHAEOLOGICAL COMPARISONS

Comparative archaeological analysis shows that Voloshskoe had some parallels with all of the extra-regional samples, but a basic difference from the Russian Upper Palaeolithic and Near East Palaeolithic and Neolithic sites (Table 1). Parallels existed in the proximity to a habitation site, flexed skeletal position, and the presence of personal grave goods, such as red ocher.

The Ukraine burials indicate that they and the Russian Upper Palaeolithic and Mesolithic peoples were members of different cultures. The basic difference is the presence of a cemetery at Voloshskoe and its absence at the Russian Upper Palaeolithic and Near East Palaeolithic and Neolithic sites. This observation, however, applies only to the sites compared in this study. For example, a Mesolithic cemetery existed at Afalou-Bou-Rhummel in Algeria [Vallois 1952].

Habitation sites were associated with Voloshskoe, as well as with most of the extra-regional comparative burial sites. Those at 'Ain Ghazal were in a village [Schmandt-Besserat 1997]. The Russian (Kostenki and Sungir) and Czech Republic Upper Palaeolithic (Předmostí) burials were associated with sites. A site may have existed at the Mesolithic cemeteries of Popova [Oshibkina 1982] and Oleneostrovskiy Mogilnik [Timofeev, personal communication]. The Crimean burials at Murzak Koba were also found within a site [Zhirov 1940].

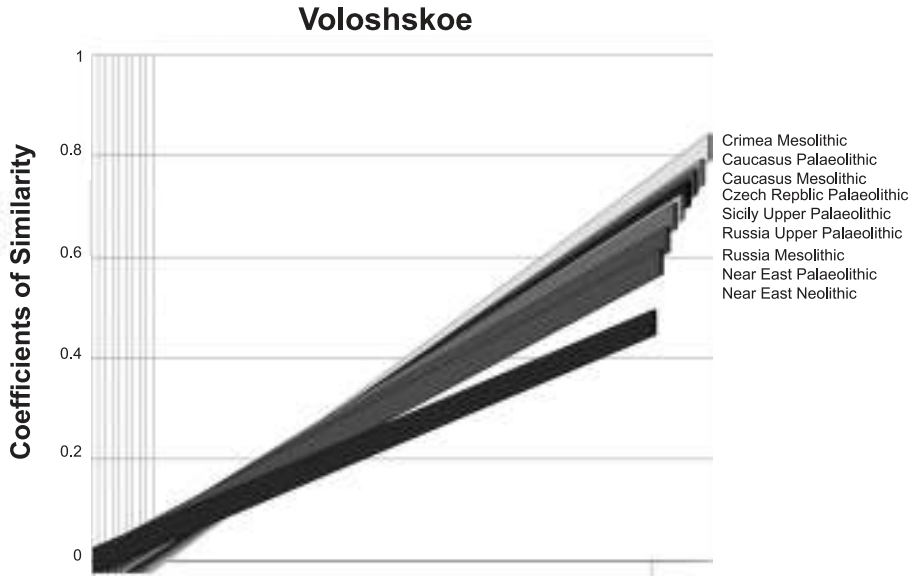

Fig. 6. Graph showing C^S values for Voloshskoe compared with the extra-regional samples

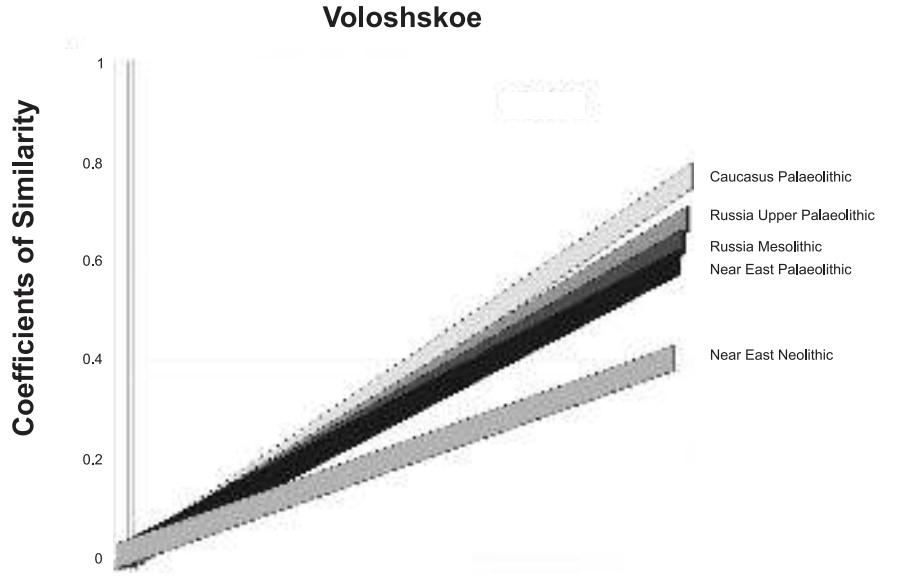

Fig. 7. Graph showing C^S values whose I^S values are 0.980 or greater for the Voloshskoe compared with the extra-regional samples

Nearly all of the comparative sites had flexed burials, which predominated at Voloshskoe (Table 1). The burials at Fatma Koba, Kostenki 14 and 18, a few Oleneostrovskiy Mogilnik graves, and all of the Předmostí and 'Ain Ghazal burials were flexed.

In spite of the parallels in the presence of a habitation site and the flexed position of the skeleton, the comparison of grave goods in Voloshskoe and Russian Upper Palaeolithic and Mesolithic cemeteries suggests membership in different cultures. Grave goods varied in quantity and in type. When compared with the wealth of artfully made objects found in the Russian Upper Palaeolithic and Mesolithic graves (Table 1), the Voloshskoe burials were relatively poor. Voloshskoe had a shell and microlithic tools, whereas the Russian Upper Palaeolithic and Mesolithic burials had elk head figures, zig-zag motif on bone, bear and beaver teeth, stone and bone tools at Oleneostrovskiy Mogilnik and animal teeth pendants, bones, and fragments of tools at Popova (Table 1). 'Ain Ghazal also had grave goods, yet they differed from those at Voloshskoe because they had plaster human figures and red ocher Schmandt-Besserat [1997].

The Mesolithic Ukrainians may have had less opportunity for artistic endeavors than did the Upper Palaeolithic and Mesolithic Europeans and Near Easterners. Direct evidence for violent death has been reported at Voloshskoe [Balakin, Nuzhnyi 1995], but not at Kostenki, Sungir, Oleneostrovskiy Mogilnik, or Popova. Yet, the numerous stone points in graves at Oleneostrovskiy Mogilnik [Gurina 1956: Fig. 14, 15, 21, 22, 25, 29, 33] could well have been involved in human life threatening activities. No such evidence has been reported in 'Ain Ghazal, although no explanation of the of the decapitations and caches of skulls has been published [Schmandt-Besseral 1997].

5.3. CONCLUSIONS ABOUT VOLOSHSKOE

Dental morphological trait data suggest that the individuals buried at Voloshskoe were dentally more like Palaeolithic and Mesolithic Europeans (Caucasus, Czech Republic, Russia, and Sicily) than the Palaeolithic and Neolithic Near Easterners compared here. Archaeologically, numerous parallel elements exist between Voloshskoe and all of the cemeteries. A major differentiating feature is the presence of a cemetery at Voloshskoe and the absence of a burial ground in the Near East, as well as the Caucasus Palaeolithic and Mesolithic, and the Russian Palaeolithic sites.

6. VASILYEVKA I PROTOEUROPEAN AND/OR MEDITERRANEAN AFFINITIES

6.1. DENTAL MORPHOLOGICAL TRAIT COMPARISONS

Vasilyevka I dental morphological trait frequency comparisons parallel the European and Near Eastern osteological similarities suggested by T.S. Konduktorova [1957]. The Crimean Mesolithic and Caucasian Palaeolithic and Mesolithic samples are the most similar to Vasilyevka I dentally, followed by the European Czech Republic Palaeolithic samples (Fig. 8). The Russian Palaeolithic and Mesolithic samples are seventh and eighth in the decreasing order of C^s values, with the Near East Palaeolithic and Neolithic samples occupying the places above and below the Russian samples (Fig. 8). Moreover, the Sicilian sample is dentally more like Vasilyevka I than are the Russian samples.

Elimination of the samples with low I^s values (0.980 or less) clearly illustrates the affinities between Vasilyevka I and both European and Near East samples (Fig. 9). The Vasilyevka I — European Russia C^s values fall between those of the Near East Palaeolithic and Neolithic comparisons (Fig. 9).

6.2. ARCHAEOLOGICAL COMPARISONS

As was the case with Voloshskoe, parallels exist between Vasilyevka I and the European Russian Mesolithic and the Czech Upper Palaeolithic Republic burials (Table 1). For example, Vasilyevka I and Oleneostrovskiy Mogilnik, Popova, and Předmostí were cemeteries with a predominance of single graves in Russia. Similar to the Voloshskoe comparisons, Vasilyevka I and Předmostí burials were mostly flexed, while extended burials predominated in Russian Upper Palaeolithic and Mesolithic graves. Red ocher and other grave goods was found these sites, although Vasilyevka I was relatively poor in grave goods when compared to the Russian and Czech Republic sites.

Like the Voloshskoe comparison, the major difference between Vasilyevka I and the Near East is the presence of a cemetery at Vasilyevka I and the lack of a burial ground at 'Ain Ghazal (Table 1). Yet, 'Ain Ghazal burials were similar to Vasilyevka I in two features (flexed body position and red ocher), although they differed in the presence of anthropomorphic figures at 'Ain Ghazal and their absence at Vasilyevka I.

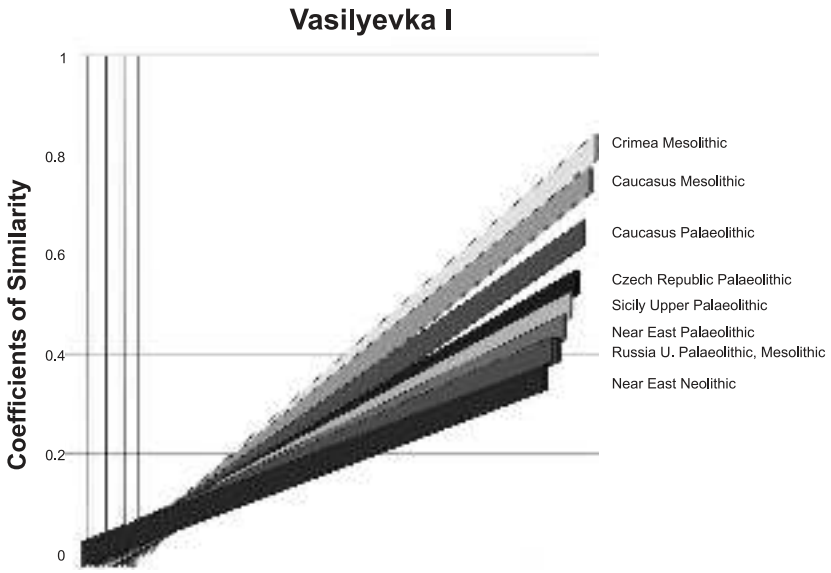

Fig. 8. Graph showing C^S values for Vasilyevka I compared with the extra-regional samples

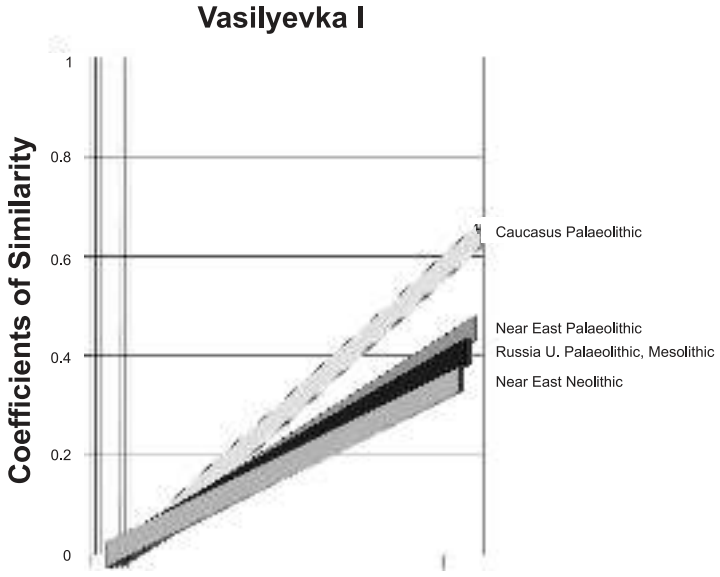

Fig. 9. Graph showing C^S values whose I^S values are 0.980 or greater for the Vasilyevka I and the extra-regional samples

6.3. CONCLUSIONS ABOUT VASILYEVKA I

Dentally, Vasilyevka I has affinities to both Near East and European samples analyzed herein. Archaeological evidence indicates some parallels between Vasilyevka I, European Upper Palaeolithic and Mesolithic, and Near East Neolithic burials (body position and red ocher). However, the presence of a burial ground differentiates the site from the Near East sites compared here.

7. VASILYEVKA III FLEXED BURIAL SUBSAMPLE — PROTOEUROPEAN AFFINITY

7.1. DENTAL MORPHOLOGICAL TRAIT COMPARISONS

The dental trait frequency comparisons (Fig. 10) support a close dental relationship between the Vasilyevka III flexed burial subsample and the European samples, as exemplified by the Russian Upper Palaeolithic and Mesolithic frequencies. These results parallel the outcome of I.I. Gokhman's [1966] osteological analysis.

As in the previous two comparisons, the Crimea Mesolithic and Caucasus Palaeolithic samples are more like the Vasilyevka flexed burial subsample than are all of the others. However, the Czech Republic Palaeolithic sample is only seventh out of nine in the order of relatedness. Unlike its place in the previous two comparisons, the Caucasus Mesolithic sample is the least like the Vasilyevka III flexed burial subsample.

Further comparison of samples whose I^s values are 0.980 or more clearly shows the close dental relationship between the Vasilyevka III flexed burial subsample and the European samples. The similarity is greater than that with the Near East Palaeolithic and Neolithic samples (Fig. 11).

7.2. ARCHAEOLOGICAL COMPARISONS

Parallels exist between the Vasilyevka III flexed burials and the Russian Mesolithic burials (Table 1). The Ukraine and Russian Mesolithic burials were in cemeteries. Interments were flexed and had grave goods and red ocher. However, the Russian cemeteries varied from the Vasilyevka III flexed burial subsample because Oleneostrovskiy Mogilnik and Popova had extended burials and a relative wealth of artistic grave goods.

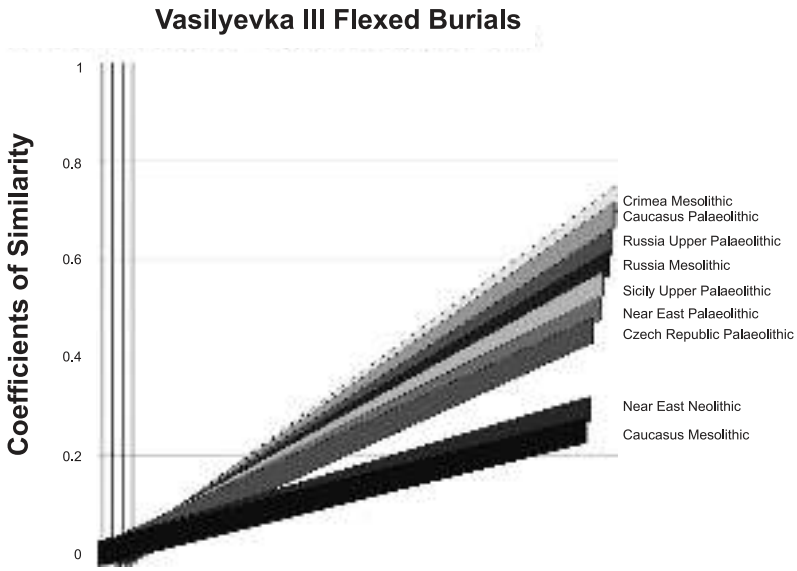

Fig. 10. Graph showing C^S values for the Vasilyevka III flexed burial subsample compared with extra-regional samples

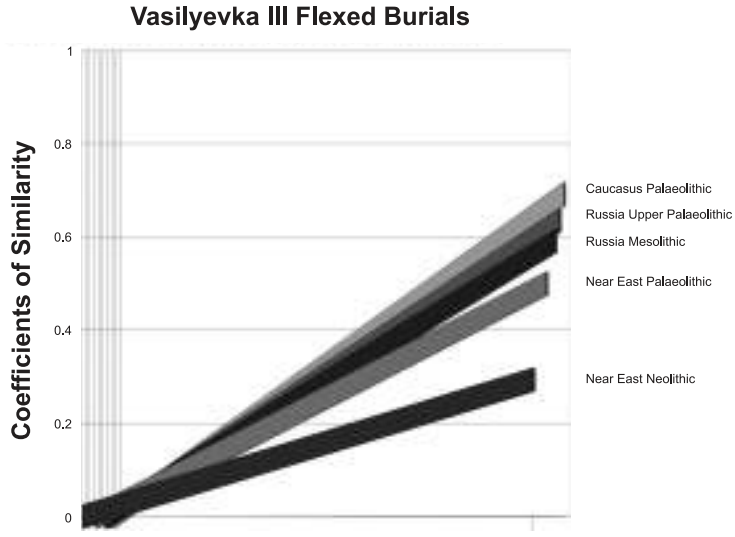

Fig. 11. Graph showing C^S whose I^S values are 0.980 or greater for the Vasilyevka III flexed burial subsample compared with the extra-regional samples

Some correspondences between the Vasilyevka III flexed burial subsample and Russian and Czech Upper Palaeolithic burials can also be found: a cemetery at Vasilyevka III and Předmostí but not at Kostenki, and flexed burials and ocher in Vasilyevka III, Kostenki (2 and 15), and Předmostí.

As was shown with the Voloshskoe and Vasilyevka I comparisons, basic archaeological differences with the Near East occur. These are the presence of a cemetery and the absence of anthropomorphic figures in all of the Ukraine Mesolithic cemeteries, and the reverse in 'Ain Ghazal.

7.3. CONCLUSIONS ABOUT VASILYEVKA III FLEXED BURIALS

Both the dental morphological trait and archaeological analyses support a close relationship between the Vasilyevka III flexed burial sample and Europeans, exemplified by the Russian Upper Palaeolithic and Mesolithic samples. This relationship is closer to European than to Near Eastern samples. The exception is the Czech Republic sample, which is dentally among the least like the Vasilyevka III flexed burial subsample.

8. VASILYEVKA III EXTENDED BURIAL SUBSAMPLE — NEAR EAST AFFINITY

8.1. DENTAL MORPHOLOGICAL TRAIT COMPARISONS

Comparison of the dental trait frequencies of the Vasilyevka III extended burial subsample shows Near Eastern (Mediterranean) relationships suggested by I.I. Gokhman's [1966] skeletal analysis, as well as affinities with European samples (Fig. 12). As was the case with the previous three comparisons, however, the Caucasus Palaeolithic and Crimean Mesolithic samples are the most dentally like the Vasilyevka III extended burial subsample. Contributing to the picture of dual affinities is the equidistance from the Vasilyevka III extended burial subsample of the Near East Palaeolithic and Russian Upper Palaeolithic bars midway in the sequence of C^s values (Fig. 12). In contrast, the Near East Neolithic sample is the least like the Vasilyevka III extended burial subsample.

Examination of samples with high I^s values (equal to or greater than 0.980) clearly shows the close relationship with the Caucasus Palaeolithic sample (Fig. 13). The similarity with Near East Middle Palaeolithic, and the Russian Upper Palaeolithic and Mesolithic samples are also clearly illustrated. As has been the

case with comparisons with Voloshskoe, Vasilyevka I, and the Vasilyevka III flexed burial subsample, the Near East Neolithic sample is the least like the Vasilyevka extended burial subsample.

8.2. ARCHAEOLOGICAL COMPARISONS

Comparison between Vasilyevka III extended burials and those from Upper Palaeolithic and Mesolithic Russia shows numerous similar features, especially in the Mesolithic samples (Table 1). As has been discussed above, the Russian Upper Palaeolithic site of Kostenki lacks a burial ground, whereas Vasilyevka III was a cemetery. Mesolithic Russian similarities with Vasilyevka III are the presence of a cemetery, extended burials, single and multiple burials, and red ocher. As has been the case in the previous three comparisons, the Russian cemeteries had artistic grave goods. Yet, Vasilyevka III extended burials had only microlithic tools.

A Near East Palaeolithic and/or Neolithic cultural relationship in material culture evidence is less evident than a European affinity. As has been pointed out above, the Near East Palaeolithic sample lacks evidence of purposeful burials. The single cultural commonality between Vasilyevka III extended burials and those at 'Ain Ghazal was presence of single burials. Near East Neolithic burials differed from the Vasilyevka III extended burials because of the lack of a cemetery, flexed body position, interment under house floors, and anthropomorphic figures at 'Ain Ghazal (Table 1).

8.3. CONCLUSIONS ABOUT VASILYEVKA III EXTENDED BURIALS

Dental morphological trait analysis shows European, as well as a Near East affinities, for Vasilyevka III extended burials. Archaeologically, the Vasilyevka III extended burials had more features that parallel those associated with Russian Mesolithic cemeteries than other graves examined for this study, including Near East Neolithic burials.

9. CRIMEA AND THE CAUCASUS

Until recently [Haeussler 1995b, n.d.a] the two samples that have placed at the top of Figures 6, 8, 10, and 12 have not been analyzed in dealing with the Mesolithic Ukraine affinities. The Caucasus Palaeolithic and Crimea Mesolithic samples, small

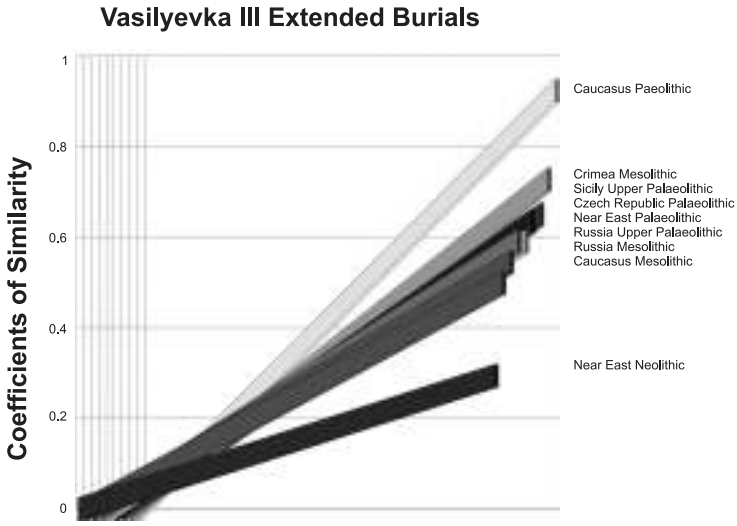

Fig. 12. Graph showing C^S values for the Vasilyevka III extended burial subsample compared with the extra-regional samples

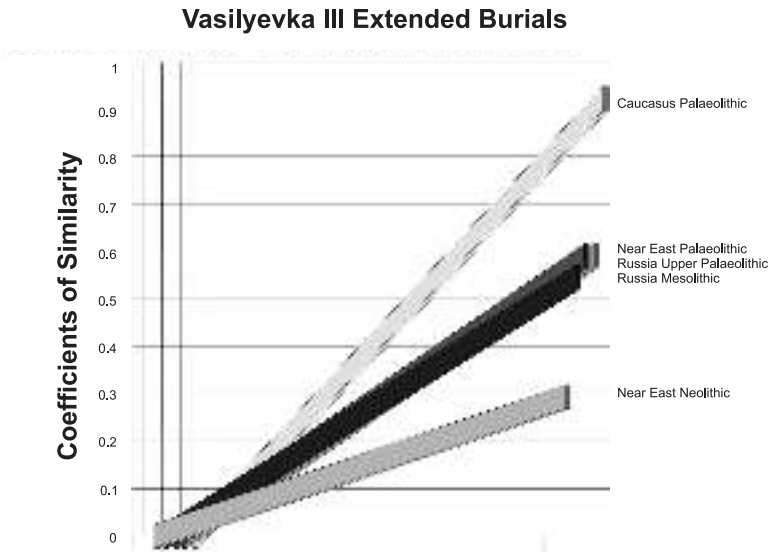

Fig. 13. Graph showing C^S values whose I^S values are 0.980 or greater for the Vasilyevka III extended burial subsample compared with the extra-regional samples

as they are, cannot be overlooked here because of their geographic proximity to Ukraine.

In spite of the similarity in dental morphological trait frequencies, however, no cultural parallels exist (Table 1). For example, the Caucasus Palaeolithic materials lack evidence of purposeful burials. The unstable position of the Caucasus Mesolithic sample on Figures 6, 8, 10, and 12 can be interpreted by small sample size and few trait sites: two individuals represented only by the mandibles. Archaeological analogies cannot be made, because no evidence for purposeful burial has been found at either Kvachara or any other Caucasus Mesolithic site [Tsereteli, personal communication].

In Crimea the Fatma Koba and two Murzak Koba individuals had likely been purposefully buried, as evidenced by the positions of the skeletons. However, they differed from the Dnieper River burials by the lack of a cemetery and personal grave goods (Table 1).

10. DISCUSSION

The osteological, dental anthropological, and archaeological information given above indicate that the Mesolithic population of the Dnieper Rapids region was indeed complex. This complexity required more than a single linear peopling event, be it of a short or long duration. For example, the dental anthropological comparisons parallel the osteological analyses in two out of the four samples, Vasilyevka I and the Vasilyevka III flexed burial subsample. Vasilyevka I has an alternating sequence (Caucasus Palaeolithic, Near East Palaeolithic, Russia Upper Palaeolithic, Russia Mesolithic, and Near East Neolithic) of dental trait frequency similarities and similarities to Near East and European skeletal traits [Konduktorova 1957]. The Vasilyevka III flexed burial subsample has dental traits more similar to the European (Caucasus Palaeolithic, Russia Upper Palaeolithic) than to the Near East Palaeolithic and Neolithic samples compared here and skeletal [Gokhman 1966] traits similar to Europeans.

Two of the samples, Voloshskoe and the Vasilyevka III extended burial subsample, have a mixture of dental and skeletal affinities. Voloshskoe has dental morphological trait frequencies more similar to the European samples than to the Near East samples compared herein, but is skeletally like Near Easterners [Debets 1955a]. The Vasilyevka III extended subsample has an alternating sequence (Caucasus Palaeolithic, Near East Palaeolithic, Russia Upper Palaeolithic and Mesolithic, and Near East Neolithic) of dental relatedness to both Near Eastern and European samples compared here, but has Mediterranean skeletal features [Gokhman 1966].

Archaeologically, in spite of the presence of numerous parallels in individual skeletal and grave goods features, the Ukraine cemeteries are more like the Russian Mesolithic and Czech Palaeolithic burial grounds than all of the other sites com-

pared here. The differentiating feature is the presence of cemeteries in these sites and their absence in the Near East Palaeolithic and Neolithic, Caucasus Palaeolithic and Mesolithic, and Russian and Sicilian Upper Palaeolithic sites. The presence of a cemetery has more weight than any other burial feature because its very existence reflects a society, whereas elements pertaining to the skeleton and personal grave goods reflect membership in a sub-unit of the population, such as a clan, family, or cohort.

Yet the Ukraine burials have relatively less grave goods than those in Russia and the Czech Republic. Whether the existence of conflict within the Ukraine Mesolithic Era contributed to this relative paucity of grave goods requires a careful examination of the Oleneostrovskiy Mogilnik materials. Unfortunately, nearly all of the Předmostí skeletons have been destroyed.

Interpretation of these seemingly contradictory physical anthropological and archaeological data relies on the Dnieper river and its paleoecology during the Boreal Era. The Dnieper River is presently the fourth longest river in Europe, exceeded only by the Danube, Ural and Volga rivers. It originates northwest of Moscow in the Valdai Hills, whose highest summits form the drainage divide between the Volga, Western Dvina, Msta, and Dnieper rivers. The Dnieper river flows southward, traversing the Polesye lowlands of Russia, Belorussia, and Northern Ukraine. From Kiev southward, the Dnieper River flows along the Ukrainian Shield, thereby delineating the Dnieper Uplands on the west from the Dnieper-Donetsk Lowlands extending to the east [Soffer 1985; Howe 1994]. Approximately 2,255 km from its source, the Dnieper River empties into the Black Sea east of the mouths of the Danube and Dniester, and west of the mouth of the Don Rivers.

During the Valdai Glacial Era (Würm in Western Europe, Wisconsin in North America), the northern part of the Dnieper River was less attractive to humans looking for permanent habitation than it was during the Boreal Era. It was situated in a zone of continuous permafrost that reached from the Scandinavian Ice Shield in the west to the Sea of Japan in the east. The southern portion of the Dnieper River flowed through a region of discontinuous permafrost that extended from Poland to China. The mouth of the river was in an a zone that experienced deep seasonal freezing [Baulin, Danilova 1984]. During the glacial maximum, the last part of which saw occupation of Upper Palaeolithic sites such as Mezhirich, south of Kiev, the land was a periglacial steppe-forest, a combination of steppe on a watershed with rarified forests along river floors [Dolukhanov, personal communication].

By the Boreal Era, which coincided with the Mesolithic era, forests extended southward from the zone of tundra that bordered the Arctic Ocean. Most of the zone of discontinuous permafrost and deep seasonal freezing had become a mixed grass and xerophytic steppe. During the years which encompassed the development of the cultures represented by the Mesolithic Dnieper Rapids cemetery samples, the forest zone moved south to the region of Kiev. From Kiev to the Black Sea, the land remained a steppe [Baulin, Danilova 1984; Dolukhanov, Khotinskiy 1984], which gradually transformed into a steppic corridor [Dolukhanov, personal communication].

Zones, such as the land around the Dnieper Rapids were ecologically abundant, attracting the animals and fish on which the Mesolithic peoples depended for their subsistence [Nuzhnyi, personal communication]. By 9,000 BP the megafauna, which the Upper Palaeolithic peoples utilized, had become extinct. Ecological conditions permitted domestication of animals and later, albeit sporadically, plants [Dolukhanov, Khotinskiy 1984].

Demographically, the Boreal Era Dnieper Rapids region was accessible by the Dnieper River from the north and from the south. The area could also be reached from the west via the tributaries of the Dnieper River and from the east via eastern tributaries and the plains, as the open southern Dnieper River region land supported increasing numbers of peoples.

After the retreat of the Scandinavian Ice Shield, many of the forest dwelling Mesolithic people in northern Russia, may have retained their forest-adaptation and remained in the north. As the Boreal Era forests expanded southward, some northern people and their cultures, such as relatives of those buried at Popova and Oleneostrovskiy Mogilnik, could have moved southward with the forests. Peoples from Crimea, the Caucasus, and the Near East to the south could have moved northward at different times and with varying degrees of successful occupation. However, any movement of people from the Near East and the Mediterranean Sea region had to involve circumventing part of the Mediterranean and arriving at the Black Sea by some route that involved either the Caucasus Mountains and possibly the western Caspian region or Turkey and Bulgaria.

Therefore, the variations in dental trait frequencies, osteological affinities, and archaeological remains discussed above indicate that we may be looking at the result of microevolutionary events caused by complex movements of peoples and their cultures, as suggested by I.I. Gokhman [1966] and T.S. Konduktorova [1973]. This would have occurred when the Boreal Era steppe landscape of Ukraine could support larger numbers of peoples than it did during the Upper Palaeolithic Era, when the land was a zone of deep seasonal freezing.

Such microevolutionary events may not be unique to the Dnieper River. As an example, Kievan monuments to historically important interactions of peoples during the past millennium illustrate the types of microevlutionary events that may occurred during the 2,000 carbon dated years represented in the Mesolithic samples. These are the memorial to Ki, Shek, Khorib, and Lebid; the Sophia Cathedral; Babi Yar; and the monument to the Great Patriotic War (World War II). In spite of a great amount of documentation, do not know the extent to which the skeletal and dental traits of contemporary Ukrainians reflect any of these historical events.

For example, Ki, for whom Kiev is named, along with Shek, Khorib, and their sister Lebid were Rus who came from the north by boat in the 9th century. They settled the hills of contemporary Kiev, but we do not know whether they mixed with or replaced the gene pool of the aboriginal people.

The Sophia Cathedral was built by Yaroslav the Wise in 1037 to commemorate his victory over the Pechenegs, a Turkic people who aggressively occupied the steppes north of the Black Sea. The church was also planned as a symbol to unify the

local tribes through a common religion and language. It was designed by and built by Greeks and modeled after the Hagia Sophia in Istanbul. Writing on the walls is evidence of the first Russian writing, which utilized the Greek alphabet. Both the religion and the language have persisted by replacement of those that existed previously. Apparently, the Pechenegs were unsuccessful in making a genetic impact on the gene pool. Yet, we do not know the extent to which the skeletal and dental traits of Yaroslav and his contemporaries replaced or mixed with the local people.

Three hundred years later, the Mongol horde sacked Kiev. However, the Mongols left little impact on the physical appearance of the people. S.P. Segeda suggested that the event was too swift for their physical features to be apparent in the contemporary people. Yablonskiy [1986] proposed that only the high officials were truly Mongols and too few to have made a lasting genetic impact.

Babi Yar is the site of fratricide and genocide of thousands of individuals during the 1940's. Although a few descendants of Babi Yar peoples, their religion, and their culture persist today, we do not know the extent to which their skeletal and dental traits will remain in the population.

The most visible landmark in Kiev is an immense eastward looking female figure, a monument to the defenders against the most recent invaders, who more than 40 years ago failed to colonize the Dnieper. The invaders were defeated and their skeletal and dental traits failed to replace those of the thousands of members of the local population buried singly and in the large cemetery to the north. Deciding factors in the victory were ecology, which may leave its mark in the archaeological and geological record, and the tenacity of the Ukrainian defenders, which will live only in the memories of their descendants.

11. SUMMARY AND CONCLUSIONS

Examination of morphological and pathological traits and material culture evidence from burials in three cemeteries suggests agreement with I.I. Gokhman [1966] and T.S. Konduktorova [1973] that the physical features of the Ukraine Mesolithic people were the result of a complex interaction of peoples during or preceding the 2,000 carbon-dated years spanned by these samples. Voloshskoe, Vasilyevka I, and Vasilyevka III flexed and extended burial subsamples are dentally and archaeologically heterogeneous on a regional scale. Inter-regionally, the Voloshskoe and Vasilyevka III flexed burial samples are dentally more like the Russian Upper Palaeolithic and Mesolithic samples than those from the Near East studied herein. However, Voloshskoe skeletons are similar to those in from the Near East [Debets 1955a], while Vasilyevka III flexed burials are skeletally like Europeans [Gokhman 1966]. In contrast, Vasilyevka I and the Vasilyevka III subsample have an alternating sequence of dental relatedness to European and Near East samples examined du-

ring this study. However, the Vasilyevka I skeletons resemble Europeans and Near Easterners [Konduktorova 1957] and the Vasilyevka III extended burials, Mediterranean people [Gokhman 1966].

Archaeologically, Voloshskoe, Vasilyevka I, and Vasilyevka III have features that vary on the level of intra-regional cultural variation. Inter-regionally, the three cemeteries are more like European burial grounds than the Near East graves.

Interpolation of geographical, ecological, and historical information into these results suggests that the Mesolithic peopling of the Dnieper River occurred when the Boreal Era steppeland of Ukraine was capable of supporting larger numbers of peoples than it did during the Upper Palaeolithic Era, when the land was a zone of deep seasonal freezing. The dental and skeletal traits in these samples may be the result of numerous microevolutionary events as people moved with varying degrees of success and permanency into the Dnieper Rapids region from the south (Near East, Caucasus, Crimea), west (Czech Republic), north (Northern Russia), and east (Eastern Russia)*

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Appendix I. Samples, site locations, institutes where examined, and archaeological and publication history.

Site	Location	Number of Specimens	Institute
UKRAINE			
Ukraine Mesolithic			
Voloshskoe	Near Dniepropetrovsk East Bank Dnieper River	15	IA
Vasilyevka I	Near Dniepropetrovsk East bank Dnieper River	15	IA
Vasilyevka III (flexed)	Near Dniepropetrovsk East Bank Dnieper River	11 (Burials 12, 16, 18, 22, 24, 25, 26, 27, 37, 38, 42)	MAE
ekasilyevka III (extended)	Near Dniepropetrovsk East Bank Dnieper River	9 (Burials 10, 14, 19, 23, 31, 33, 34, 35, 36)	MAE
Crimea Mesolithic			
Fatma Koba	Badarskaya Valley	1	MAE
Murzak Koba	Badarskaya Valley	2	MAE
EUROPE			
Czech Republic Palaeolithic			
Brno	Brno 1 from Červený Kopec south of Brno, Brno 2 from Francouzská Street in Brno, Moravia	2 (Brno 1 and 2)	MM
Předmostí	Near Přerov, northeast of Brno, Moravia	4 (2 casts: IV K319 and unlabeled; 2 mandibles: A17088)[1]	MM
Russian Upper Palaeolithic			
Kostenki	Don River near city of Voronezh	5 (Kostenki 2, 14, 15, 17, 18)	MAE
Sungir	Vladimir District, near city of Vladimir	3 (Sungir 1, 2, 3)	LAR
Russian Mesolithic			
Oleneostrovskiy Mogilnik	Karelian Republic, on Yuzhny Oleniy Ostrov in Lake Onega, 300 km northeast of St. Petersburg	38	MAE
Popova	Kargapolskiy District, Archangelsk region, left bank Kinem River, which flows into Lake Lacha	3	MAE
CAUCASUS			
Caucasus Palaeolithic			
Akhshtyr	Russia, Sochi-Adler Pontic Area	1	MAE
Barakaevskaya Cave	Russia, Kuban River Basin	2 (Barakaevskaya v, g)	MAE
Dzhruchula Cave	Georgia, Tkibulskiy District	1	GMG
Ortvala Cave	Georgia, Terdzhoiski District	2 (2420, 3117)	IPTsIANG
Sakazhia Cave	Georgia, Terdzhoiski District	5 (486, 606, 607, 1125, 1133)	IPTsIANG
Caucasus Upper Palaeolithic			
Devis Khvreli	Georgia, Zastafon District	1	GMG

Site	Location	Number of Specimens	Institute
Caucasus Mesolithic			
Kvchara	Georgia, near the Black Sea	2	Photo L. Tsereteli
NEAR EAST			
Near East Upper Palaeolithic			
Qafzeh DK-H2	Israel, 2.5 km from Nazareth, southwest flank of Mount Qafzeh	1	RM
Near East Palaeolithic			
Amud	Israel, Wadi Amud, 50 km east-north-east of Haifa	1	RM
Qafzeh 9, 11	Israel, 2.5 km from Nazareth, southwest flank of Mount Qafzeh	2	RM
Skuhl I and IV	Israel, Wadi-el-Mughara, Mount Carmel, southeast of Haifa	2	RM
Tabun II	Israel, Wadi-el-Mughara, Mount Carmel, southeast of Haifa	1	RM
Near East Neolithic			
'Ain Ghazal	Jordan, northeast edge of Aman	16	Data from Roller (1992)
MEDITERRANEAN			
Sicily Upper Palaeolithic			
San Teodoro	Near Messina, Italy	2 (San Teodoro 1 and 2)	MGP

[1] One of the mandibles is "possibly" Předmostí according to M. Dočkalová, physical anthropologist at the Moravian Museum. Provenance numbers of all of the Russian and Ukrainian specimens are given in Haeussler [1996].

Archaeological and Publication History

Voloshskoe: Excavated by E.F. Lagodovskaya in 1946, A.V. Bodyanskiy and V.N. Danilova in 1952, V.N. Danilenko in 1953, and A.V. Bodyanskiy in 1954. Osteological description by Debets [1955a] and Gokhman [1966]. Skeletal and dental metrics in Jacobs [1993a; 1994]. Dentition in Haeussler [1995a; 1996; 1998, n.d.b.]. Catalogued in Gokhman and Kozintsev [1980].

Vasilyevka I: Excavated by A.D. Stolyar in 1953 and described by Stolyar [1957, 1959]. Osteological description by Konduktorova [1957] and Gokhman [1966]. Skeletal and dental metrics in Jacobs [1993a; 1994]. Dentition in Haeussler [1995a, 1996, 1998, n.d.b.]. Catalogued in Gokhman and Kozintsev [1980].

Vasilyevka III: Excavated by D.Ya Telegin, A.D. Stolyar, and I.I. Gokhman in 1953, 1955. Site discussed in Telegin [1957]. Osteological description by Gokhman [1966]. Skeletal and dental metrics in Jacobs [1993a; 1994]. Dentition in Haeussler [1995a; 1996; 1998, n.d.b.]. Catalogued in Alekseeva, *et al.* [1986].

Fatma Koba: Excavated by Bonch-Osmolovskiy in 1927. Site described by Bonch-Osmolovskiy [1934]. Osteological description by Debets [1936]. Dentition in Haeussler [1996]. Catalogued in Klein, *et al.* [1971].

Murzak Koba: Excavated by S. Bibikov and E.V. Zhirov in 1936. Site described by Bibikov [1940]. Osteological description by Zhirov [1940]. Dentition in Haeussler [1996].

Brno: Brno 1 excavated by A. Makowsky in 1888. Site and fauna described by Makowsky in 1888, 1890, and 1899. Brno 2 excavated by A. Makowsky in 1891. Publications summarized in Vlček [1971], Svoboda, *et al.*, [1996].

Předmostí: excavated by R.J. Maška in 1894 [Předmostí 1-21, 26], M. Kříž in 1895 [Predmost 22-24, 28, 29], and K. Absolom in 1928 [Predmost 27]. Publications summarized in Vlček [1971], Adovasio, *et al.* [1996], and Svoboda, *et al.* [1996].

Kostenki 2 (Zamyatnin) Excavated by P.M. Efimenko in 1923, S.N. Zamyatnin in 1927, and P.O. Boriskovskiy in 1953, 1955, and 1956. Described by Boriskovskiy and Dimetrieva [1982a]. Osteological description by Gerasimova [1982]. Dentition in Haeussler [1992b; 1995c; 1996]. Catalogued as Kostenki 1 in Klein, *et al.* [1971].

Kostenki 14 (Markina Gora) Excavated by A.N. Rogachev in 1954. Described by Rogachev and Sinitsyn [1982a]. Osteological description by Debets [1955b] and Gerasimova [1982, 1987]. Dentition in Haeussler [1992b; 1995c; 1996]. Catalogued as Kostenki 2 in Klein, *et al.* [1971] and as Kostenki XIV in Gokhman and Kozintesv [1980].

Kostenki 15 (Gorodtsov) Excavated by A.N. Rogachev in 1952. Described by Rogachev and Sinitsyn [1982b]. Osteology in Yakimov [1957] and Gerasimova [1982]. Dentition in Haeussler [1992b; 1995c; 1996]. Catalogued as Kostenki 3 in Klein, *et al.* [1971] and as Kostenki XV in Gokhman and Kozintsev [1980].

Kostenki 17 (Spitsyn) Excavated by P.O. Boriskovskiy, [1955]. Described by Boriskovskiy, *et al.* [1982]. Tooth mentioned in Klein [1969]. Dentition in Haeussler [1992b; 1995c; 1996]. Catalogued as Kostenki 5 in Klein, *et al.* [1971] and as Kostenki XVII in Gokhman and Kozintsev [1980].

Kostenki 18 (Pokrovskiy Log) Excavated by A.N. Rogachev in 1953. Described by Rogachev and Belyaeva [1982]. Osteological description by Debets [1955c] and Gerasimova [1982]. Dentition in Haeussler [1992b; 1995c; 1996]. Catalogued as Kostenki 4 in Klein, *et al.* [1971] and as Kostenki XVIII in Gokhman and Kozintsev [1980].

Sungir: Excavated by O.N. Bader in 1950's to 1970's. Description in Bader [1978, 1984]. Osteological and dental description by Bukhman [1984], Gerasimova [1984], Lebedinskaya and Surnina [1984], Khrisanfova [1984], Nikityuk and Kharitonov [1984], Trofimova [1984], Zubov [1984], and Haeussler [1996].

Oleneostrovskiy Mogilnik: Excavated by V.I. Ravdonikas in 1936-1938. Description by Gurina [1956]. Osteological description by Yakimov [1960a]. Dentition in Haeussler [1992a; 1995b; 1996]. Catalogued in Gokhman and Kozintsev [1980].

Popova: Collected by S.V. Oshibkina in 1979. Described in Oshibkina [1982]. Osteological analysis by Gokhman [1984]. Dentition in Haeussler [1996].

Akhshtyr: Excavated by E.A. Velikova in 1961. Discussed by Velikova and Zubov [1972], Zubov [1968], and Zubov [1978; cited in Lyubin 1989]. Dentition described in Haeussler [1992c; 1994; 1996, n.d.a.]. Catalogued in Klein, *et al.* [1971].

Barakaevskaya: Excavated by V.P. Lyubin and P.U. Autlaev 1976-1982. Described by Lyubin, *et al.* [1977; 1986]. Skeletal materials described by Lyubin, *et al.* [1986] and mentioned in Lyubin [1984 and 1989]. Dentition described in Haeussler [1992c; 1994; 1996, n.d.a.]. Catalogued in Ullrich [1992].

Ortvala Cave: Excavated by M. Nioradze in 1980 and 1987. Dentition described in Haeussler [1992c; 1994; 1996, n.d.a.].

Sakazhia Cave: Excavated by M. Nioradze in 1975 and 1979. Discussed by Nioradze [1976], Gabunia, *et al.* [1978:157-161], Lordkipanidze [1989:49], Kharitonov [1990:89], Nioradze and Shchelinskiy [1990]. Dentition described in Haeussler [1992c; 1994; 1996, n.d.a.]. Catalogued in Ullrich, 1992.

Devis Khvreli: Excavated by G.K. Nioradze in 1926-1927 and described by G.K. Nioradze [1933]. Dentition described in Haeussler [1992c; 1994; 1996, n.d.a.]. Catalogued in Klein, *et al.* [1971].

Kvchara: Excavated by L. Tsereteli. Discussed in Bader and Tsereteli [1989:96]. Dentition in Haeussler [1996].

Amud: Found in 1961 by Tokyo University Scientific Expedition to Western Asia directed by H. Suzuki. Major publication by Suzuki and Takai (eds.) [1970]. Dental morphology in Haeussler [1998].

Qafzeh: 9 and 11 found by B. Vandermeersch in 1966. Descriptions in Vandermeersch [1981] and Tillier [1984]. Dental morphology in Haeussler [1998]. Quafzeh Dk-H2 is Upper Paleolithic according to Joseph Zias [Personal communication, 1992].

Skuhl: Found between 1929 and 1934 by Joint Expedition of the British School of Archaeology in Jerusalem and the American School of Prehistoric Research, directed by D.A.E. Garrod. Early publications: Garrod and Bate [1937] and McGowan and Keith [1939]. Dental Morphology in Haeussler [1998].

Tabun: History and major publications same as Skuhl. Dental morphology in Haeussler [1998].

'Ain Ghazal: Dentition described in Roler [1992]. Burials discussed in Schmandt-Besserat [1997].

San Teodoro: Found by C. Maviglia prior to 1938. Skeletal materials described by Maviglia [1941]. Fauna and photograph of San Teodoro 1 skeleton in Burgio and Di Patti [1990]. Catalogued in Sergei, *et al.* [1971]. Dental morphology in Haeussler [1998].

Abbreviations

GMG	State Museum of Georgia, Tbilisi, Georgia
IA	Institute of Anthropology, Moscow State University, Moscow Russia
MM	Moravian Museum, Brno, Czech Republic
IPTsIANG	Institute of Paleobiology, Center for Archaeological Investigations, Georgian Academy of Sciences, Tbilisi, Georgia
LAR	Laboratory of Plastic Reconstruction, Moscow, Russia
MAE	Museum of Anthropology and Ethnography, St. Petersburg, Russia
MGP	Museo di Geologia, Palermo, Italy
RM	Rockefeller Museum, Jerusalem, Israel

Appendix II

The coefficient of similarity (C^S) is a simple numerical indication of the similarity of two small samples being compared. The C^S is based on the percentage of parallel trait expressions. Parallel trait expression is defined as a frequency of a trait in one sample that is within 5.0% of that in the sample being compared, the 5.0% being allotted to chance. This type of simple calculation was devised because the goal of the C^S is to quantify similarities between samples, which are too small to achieve statistical significance with the commonly used [Hanihara 1976; Irish 1993; Lukacs, Hemphill 1992; Turner 1985] Mean Measure of Divergence.

The C^S values are based on the mean of the numbers of traits with similar expressions, rather than on the cumulative differences in frequencies between samples. The larger the value of the C^S, the greater the similarity between two samples being compared.

The formulae for the coefficient of similarity (C^S) are:

when $X_{ni} = \frac{K}{N}$ is the frequency of a single trait,

when K is the number of positive observations of trait_i in sample_n being compared,

when N is the number of possible observations (trait sites) of traiti in the sample_n being compared,

when T is the number of traits being compared,

when D is the number of dentitions in the sample being compared,

when $(X_{1i} - X_{2i}) > 0.5, |(X_{1i} - X_{2i})| = 0$,

when $(X_{1i} - X_{2i}) \leq 0.5, |(X_{1i} - X_{2i})| = 1$,

the Coefficient of Similarity is:

$$C^S = \frac{\sum_{i=1}^{t} |(X_{1i} - X_{2i})|}{T}$$

Since the C^S based is only on frequeny data, the Indicator of Similarity (I^S) provides a simple assessment of sample size (D_n) and the number of traits (T) being compared. The lower the I^S value, the less the likelihood that the C^S value is meaningful.

The formula for the Indicator of Similarity (I^S) is:

$$I^S = 1 - \left[\frac{1}{TD_1} + \frac{1}{TD_2}\right].$$

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SOUTH-EASTERN INFLUENCES ON THE FORMATION OF THE MESOLITHIC TO EARLY ENEOLITHIC POPULATIONS OF THE NORTH PONTIC REGION: THE EVIDENCE FROM ANTHROPOLOGY

During the Soviet Era some research projects dealing with the ancient history of South-Eastern Europe were subjects to political restrictions imposed by the regime. A number of them were even removed from the studies of scholars. Examples are the influence of the Normans on the Kievan Rus and the history of the tribes and settlements of the Goths in Crimea. However, no one can find a trace of limitations imposed by an official ideology on the origin of the Neolithic and Eneolithic populations. Scholars were able to study and discuss objectively the overwhelming influence of western cultures (for example, Bug-Dniester and Cucuteni-Tripolye) during certain periods of prehistory without persecution by party ideologists who had academic degrees or who lacked them.

During the time of strengthening of the sovereignty of some newly independent states, some scholars may have been inclined to change the former minus to the present plus. However, we are certain that continuation, not revolution, is characteristic of the present views and the goal of the future study of the past in the prehistory of the Ukraine. Meanwhile, in response to the original proposal of the initiators of this conference, I will examine all possible non-Balkan — eastern and southern — influences and components, which contributed to the formation of the physical type of the Mesolithic, Neolithic, and Early Eneolithic populations of the Ukraine.

In the recent discussion of the problem of Neolithizaton of the North Pontic region, some researchers [Krizhevskaya 1974; Shnirelman 1992; Jacobs 1993b, 1994c] point out importance of the Caucasus as a route of transmission of new economic strategies. According to K. Jacobs's [1993b] new data "the possibility that extensive and intensifying exploitation of cereal grains occured in the Southern Russian Plain well before and independently of developments in the Danube basin". D.W. Anthony [1994] instists on the traditional position that the process spread from the Balkans and the Danube. However, I. Potekhina and D.Y. Telegin [1995] note that the southern and western routes of the spread of agriculture may not have been the only ones.

The standard idea that the production of food entered the North Pontic region primarily through diffusion from the neighbouring population of south-eastern

European farmers is confirmed by the anthropological evidence. However, the new idea that the earliest and the main route of penetration of agricultural impulses and animal husbandry, that originated in the Levant, ran across the Caucasus to the region north of the Black Sea, still requires this type of confirmation. To prove that the corridor between the Black and Caspian Seas was "either a source of or a route for important influences that demographically, socioeconomically, and biologically transformed the early Holocene Ukraine" [Jacobs 1993b], it is necessary to outline the genetic relations or at least the common craniological components in an anthropological composition of the populations of South-Western Asia and the North Pontic region.

We can see the first evidence of the southern and south-eastern influence on the anthropological composition of the Ukrainian population in the Mesolithic skeletal materials. The Mesolithic population of the Dnieper rapids region and Crimea was not homogeneous. In their morphological traits, the Crimean skeletons belong to the Proto-European type [Debets 1948]. The male skeleton from Murzak-Koba has the closest affinity to the Predmost variant. The male skeleton from Fatma Koba and the female skeleton from Murzak Koba resemble each other and are more similar to the Cro-Magnon type than the male from Murzak Koba. According to V.P. Yakimov [1961], the Crimean skulls have specific character, considerable cranial height, which distinguishes them from the rest of the Mesolithic skulls but is similar to the Ibero-Maurisian culture skeletons from the cemetery of Afalou-Bou--Rhummel in Northern Africa [Vallois 1952]. The similarity between the Crimean and Afalou skulls indicates that southern craniological features (Afalou) may have been ancestral to those which characterize the Crimean Mesolithic physical type.

As support for the southern influence, archaeologists, such as S.N. Bibikov [1959], point to the important role of Palaeolithic elements from Northern Africa in the Mesolithic cultures of Crimea. However, such analogies are insufficient to confirm a common origin of the Northern Africa and North Pontic populations.

We can obtain substantial evidence for the south-eastern links of the Ukrainian Mesolithic from the large skeletal series of the Dnieper rapids region. By the Mesolithic, fishing communities in this region had achieved sufficiently long-term stability and produced sizeable cemeteries: Voloshskoe (19 burials), Vasilyevka I (26 burials), and Vasilyevka III (45 burials). According to G.F. Debets [1955a], I.I. Gokhman [1966], and T.S. Konduktorova [1973] different anthropological variants (cranial measurements) could be distinguished among this population.

For example, G.F. Debets [1955a] distinguished two types among the nine Voloshskoe skulls that could be measured. G.F. Debets called the first type the Australoid type, and assigned to it two skulls with a combination of prognathism with a broad nose and low orbits. The realiability of the Australoid type was not confirmed in further investigation of the Ukrainian Mesolithic cemeteries. The second type is very important for our discussion. It is characterized by pronounced dolichocrany, great cranial height, a strongly expressed horizontal profile, and a very narrow (129,2 mm), high, vertically elongated face with high orbits and a narrow nose. G.F. Debets named this type Ancient Mediterranean. G.F. Debets saw analogies to these skulls

in Mesolithic and Neolithic skulls from Kenya, which also had a combination of marked dolichocrany and a high narrow face [Leakey 1935].

The discovery of the Ancient Mediterranean type seemed too unusual for the territory of the steppe Ukraine, which was inhabited mainly by different variants of proto-Europeans during the Mesolithic — Neolithic. The people of the proto-European type were tall and massive with a considerably large skull with a very broad face. The bizygomatic breadth of the male skulls in different variants of the North Pontic proto-Europeans varied between 142,5 and 151,8 mm [Potekhina 1992]. The representatives of this type were buried in Vasilyevka I, in "flexed" burials of Vasilyevka III, and in all of the Mariupol type cemeteries. In addition, I.I. Gokhman [1966] distinguished a special variant with a moderately broad (135,6 mm) face in skulls from the "extended" burials of Vasilyevka III cemetery. This variant is intermediate between the hypermorphic proto-Europeans and pure Mediterranean but is closer to the former. Y.D. Benevolenskaya [1990] named this variant the mesomorphic Mediterranean type. It was widespread in Mesolithic — Eneolithic Europe (Zvejnieki, Oleneostrovskiy, Alexandriya).

Since no other evidence (beyond Voloshskoe cemetery) of the Ancient Mediterranean type has been found in the North Pontic area, anthropologists expressed some doubts and criticism concerning its reality in this region (Gokhman 1966). Only after T.S. Konduktorova [1957, 1973] had distinguished the traits of the Ancient Mediterranean type in the skulls from Vasilyevka I (but in a softer form than in Voloshskoe), the reality of this type was finally confirmed in the steppe Ukraine during the Mesolithic.

The Ancient Mediterranean type completely disappeared from the anthropological structure of the North Pontic populations in the Neolithic. During the Neolithic, the same territory, the Dnieper Rapids region, was inhabited by the bearers of the Dnieper-Donets culture, who constructed the Mariupol type cemeteries [Telegin, Potekhina 1987]. These populations exhibit a unique complex of features (thick cranial vault bones, massive and fairly large skulls, and postcranial robustness) and are generally classified as protomorphic or hypermorphic proto-Europeans (sometimes called the Vovnigi type). Two craniological types can be distinguished. The first has a sharp dolichocrany and a very broad (142,5 mm) and well-profiled face. The second, the mesocranic type, has an even broader (151,8 mm), high, and slightly flattened face [Potekhina 1992].

The first type was probably genetically related to the proto-European type of the native Mesolithic population. The second one should be associated with the most ancient hypermorphic North-European race, which includes the Mesolithic craniological series from Denmark and Sweden. First of all, this component appeared in the anthropological structure of Vasilyevka II, the most ancient Mariupol type cemetery. Due to the general chronological division of all of the Mariupol type cemeteries into three stages, we can trace the gradual increase of the role of the second, the North European, component in the later stages of these cemeteries. Such changes in anthropological composition of the Neolithic North Pontic populations were associated with several waves of migration from northern territories.

The considerable increase in the robustness of the Neolithic North Pontic populations, as compared with the Mesolithic people, is traditionally explained as a result of penetration of the representatives of hypermorphic North Europeans into the Dnieper Valley and replacement of "already gracilized" people by "still not gracilized" ones [Gokhman 1966; Konduktorova 1974; Potekhina, n.d.]. Recently, K. Jacobs [1993b] suggested that the growth of robustness reflects the increasingly stressful musculo-skeletal subsistence activities of the Ukrainian Early Neolithic populations. If so, the increase in the postcranial robustness in the process of the hard work of the Neolithic people during this period should be accompanied by the increase in the massiveness of the skull, or at least, by an increase in the main cranial and facial diameters, which are closely correlated with the long bone dimensions. In contrast, the comparison of three chronological groups of skulls from the early, late, and final stages of the Mariupol type cemeteries shows a slow, but rather steady decrease in robustness and the size of brain cases and faces in the late and, especially, in the final stage [Potekhina 1992]. These changes point to the beginning of the process of gracilization, which took place in the North Pontic region earlier than it has previously been thought.

The in-migration of the North Europeans into South-Eastern Europe produced fundamental changes, not only in the formation of anthropological structure of the Neolithic tribes, but also in ethnic composition of the native population. The anthropological changes were accompanied by new features in the material culture. These included new kinds of graves construction, the appearance of a large collective pit-grave, changes in burial goods, tools, the use of ritual fire, and a skull cult. The historical importance of the advance of ancient North Europeans into South-Eastern Europe lies in the ethnic changes. The Ancient Mediterranean inhabitants of the Dnieper rapids region were completely dislodged.

The Early Eneolithic in the North Pontic region is characterized by several different cultures (Sredni Stog, Novodanilovka, Post-Mariupol, Lower Mikhaylovka, Yamnaya, Kemi-Oba). The bearers of the Novodanilovka and Post-Mariupol cultures belong to the proto-European type, while the series of Sredni Stog skulls includes both the proto-European and the mesomorphic Mediterranean types [Potekhina 1992]. The new evidence of the Ancient Mediterranean type was found only in the materials of Kemi-Oba culture of Crimea. The Kemi-Oba culture and somewhat earlier the Lower Mikhaylovka group of the North Pontic steppe have been put into a common cultural-historical area.

The skulls from the Kemi-Oba burials are characterized by marked dolichocrany, very narrow and high faces, and well expressed horizontal profiles [Kruts 1972]. They are very similar to the skulls from the Voloshskoe cemetery. The low Penrose distance coefficient (0,288) between the Kemi-Oba and Voloshskoe skulls points to their close genetic links.

While seeking the origin of the Voloshskoe and Kemi-Oba population, represented by the same, Ancient Mediterranean type, comparative analysis of the synchronous craniological series of the adjacent territories directs us towards the sout-heast (Fig. 1), because Western Europe and the Balkan-Danube region were

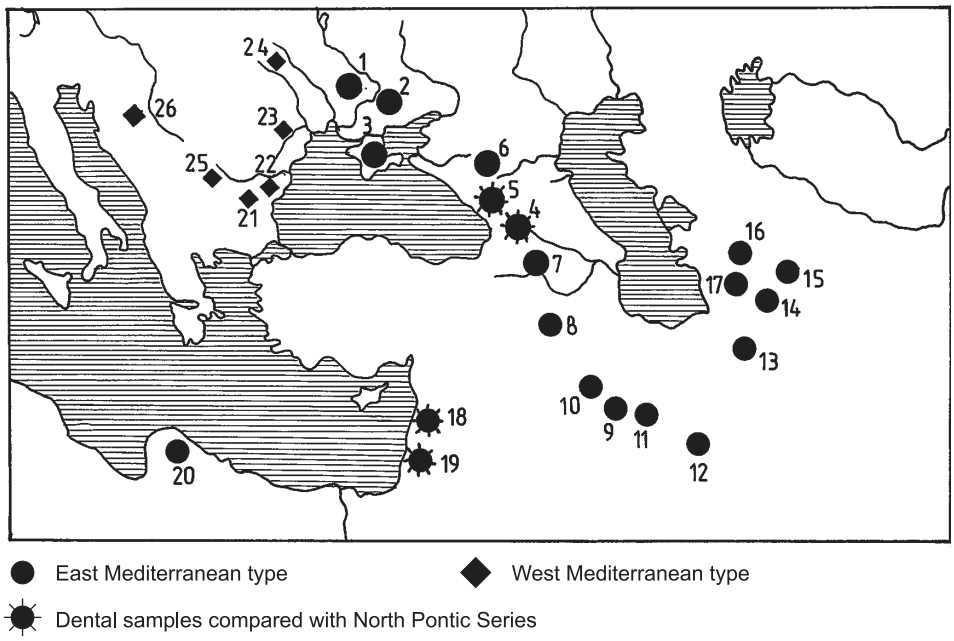

Fig. 1. Sites characteristic of the Ancient (East) Mediterranean and the West Mediterranean craniological types. 1 - Voloshskiy; 2 - Vasilyevka I; 3 - Kemi-Oba; 4 - Dzhurchula Cave, Ortvala Cave, Sakazhia Cave; 5 - Akshtyr Cave, Barakayevskaya Cave, Kvchara Cave; 6 - Unakoz Cave; 7 - Shengavit; 8 - Hasanlu; 9 - Dzheyjan Tepe; 10 - Vad Khora; 11 - Tepe Dzhemshidy; 12 - Sialk; 13 - Tepe Gissar; 14 - Altyn Depe; 15 - Geoksyur; 16 - Ovadan Depe; 17 - Chogally-Depe, Chokmakly-Depe; 18 - Quafzeh, Amud, Skhul, Tabun; 19 - Ain-Ghazal; 20 - Afalou-bou-Rhummel; 21 - Russe; 22 - Kubrat; 23 - Troyan; 24 - Vykhvatyntsy; 25 - Vincha; 26 - Vlasats

inhabited by West Mediterranean type populations [Criş-Starčevo, Gumelnitsa and Tripolye cultures). The representatives of the West Mediterranean type were generally short people with narrow and gracile faces, and dolicho-, mesodolicho- or brachycephalic skulls. The main trait, which distinguishes them from the Ancient Mediterranean type, is a considerably lower face. Therefore, the relative height of the face (the upper facial index) can be used as a diagnostic criterion for identification of these two Mediterranean types.

The Ancient Mediterranean type originally inhabited the Near East and adjacent areas. In literature, it is often called the East Mediterranean type, because it is usual for the populations of the East Mediterranean region and of western part of Central Asia (Fig. 1). During the Mesolithic, the East Mediterranean region was also inhabited by the massive and broad-faced people of the proto-European type, such as those buried in the Natufian culture cemeteries of El Vad, Eynar, and Vady Falla [Ferembach 1973].

During the Eneolithic, the East Mediterranean type populations were widespread in southern and eastern Turkmenia (Altyn-Depe, Geoksyur, Kara-Depe,

Ovadan-Depe, Chogally-Depe), Iran (Tepe Sialk, Tepe Gissar, Tepe Dzheyjan, Tepe Dzhemshidy), and the Caucasus (Shengavit, Ginchy) [Ginsburg, Trofimova 1972; Cappieri 1973; Alekseev 1974; Kiyatkina 1987]. Comparative analysis of the Voloshskoe and Kemi-Oba skulls with those from Turkmenia, Iran and the Caucasus indicates their similarity. The Penrose coefficients vary from 0.164 to 0.299.

In the Eneolithic, the Caucasus was the contact zone of the proto-Europeoid and the East Mediterranean types. The skulls of the Kuro-Araks culture cemetery, Berkaber, have traits of both types [Alekseev, Mkrtchan 1989]. Our recent study of the Early Eneolithic skull from Unakoz Cave in the northern Caucasus points to the strong East Mediterranean component (very narrow and high face) [Potekhina 1995]. All of these facts indicate the possibility of the penetration of the East Mediterranean type into the Caucasus in the Early Eneolithic.

The earliest south-eastern links of the Ukrainian Ancient Mediterranean Mesolithic (Voloshskoe and Vasilyevka I) and the Crimean Mesolithic populations can be traced in the morphological analyses of the dentitions [Haeussler, n.d.a]. According to A.M. Haeussler's analysis, the comparisons indicate a close relationship of the Ukrainian Mesolithic with the Caucasus Palaeolithic (Akhshtyr, Barakayevskaya, Dzhruchula, Ortvala, Sakazhia Caves) and the Near East Neolithic (Ain Ghazal) and the Near East Palaeolithic (Skuhl, Tabun, Amud, Qafzeh) (Fig. 1). According to A.M. Haeussler's opinion, "any movement of people from the Mediterranean Sea region would have included circumventing some of the Mediterranean people and arriving at the Black Sea by a route that involved either the Caucasus, the western Caspian region, Turkey, or Bulgaria."

Thus we face the question of the genetical influence of the ancient Mediterraneans from the Near East to the steppe regions of the Ukraine. Two possible routes for such an influence exist: 1) the western route, from Anatolia to the Balkan region, and around the western side of the Black Sea and 2) the eastern one, through the inter-Black/Caspian Seas corridor. Since we lack anthropological evidence of the East Mediterranean populations similar to those of the Ukrainian Mesolithic and early Eneolithic in the Balkan-Danube region, the western influence route from the Near East to the North Pontic region finds no support here. Therefore the eastern route appears more than simply plausible. The anthropological similarity of some Ukrainian groups (Voloshskoe, Vasilyevka 1, Kemi-Oba) and populations of the Caucasus, the Near East, and south-western Turkmenia points to very ancient links, which could have been carried through the inter-Black/Caspian Seas corridor.

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GENETIC HETEROGENEITY OF FINNO-UGRIANS (ON THE BASIS OF ESTONIAN MODERN AND ARCHAEOLOGICAL MATERIAL)

1. INTRODUCTION

Estonians, a small and one of the westernmost population of the Finno-Ugric language group are surrounded by the other peoples of Baltic-Finnic language group (Finns, Karelains, Votic, Vepsians, Izhorians, Livonians). The majority of neighbouring peoples belong to the Indo-European language group (Latvians, Lithuanians, Russians and the others at the coastal countries of Baltic Sea — Poles, Germans, Danes, Swedes).

Nowaday Finno-Ugric and Samojed (Uralic) language groups peoples live in a vast territory from the Baltic Sea to the Taymyr Peninsula in Siberia, and from the Arctic Ocean to the Danube, the middle reaches of Volga and Irtysh river in South.

Estonians, in spite of the rather restricted territory inhabited by them, are not homogeneous in respect to their racial composition. While the greatest linguistic differences appear between the northern and southern parts of Estonia [Kask 1959], the greatest anthropological differences appear in west-east direction. On the basis of somatological data, two principal anthropological types have been stated among the Estonians — the West-Baltic and the East-Baltic [Aul 1936]. The West-Baltic type (comparatively dolichocephalic, with tall stature) predominates in West Estonia, while the East-Baltic type (more brachycephalic, with somewhat shorter stature) occurs mainly in East Estonia, especially in the South-East region, but also in some localities of South-West Estonia. The zones of distribution of the above-mentioned types are not isolated territories but they fuse gradually with one another. Both types are somatologically polymorphous.

The aim of this report is to give a short anthropologic characterisation, the structure and the anthropologic position of Estonians in Europe on the basis of recent anthropological studies in Estonia. For that genetic data, but also craniological and odontological data have been used. From that arise certain problems concerning the genetic — morphologic and linguistic diversity.

Genetic heterogeneity. Genetic data are based on 7 blood group systems, the trait of PTC tasting, and colour blindness. The material was collected by the author from 39 localities in different regions of Estonia [Heapost 1994]. All the individuals examined were indigeneous Estonians, all the grandparents and parents of which have been born in the same locality. The local samples were joined into seven regional groups (Fig. 1) more or less according to the main dialectal areas [Murumets 1982; 1983].

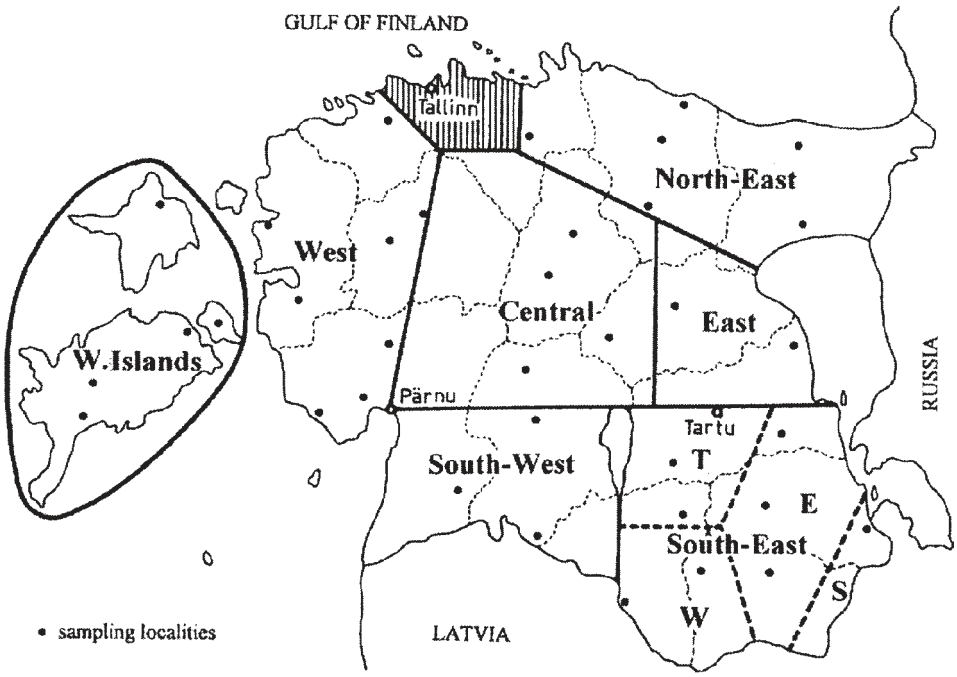

Fig. 1. Regional division of Estonia used in this study. The South-East region is divided into four local dialect areas: T = Tartu, E = East-Võru, W = West-Võru, s = Setu.

The differences of allele frequencies between the regional populations are valued by the chi-square method. The degree of genetic diversity of the groups is determined by the method of genetic distances [Cavalli-Sforza, Edwards 1967]. The grouping of populations on the basis of these distances is made using cluster analysis.

Data for international comparisons were taken from literature: for Finns and Finnish Swedes [Nevanlinna 1973; Virtaranta-Knowles, *et al.* 1991], Hungarians

[Mourant, *et al.* 1976; Walter, Danker-Hopfe 1993], Karelians [Shneider, Tihomirova 1991], Komis [Eriksson, Frants 1982], Lapps [Mourant, *et al.* 1976; Cavalli-Sforza, *et al.* 1994; Walter, Danker-Hopfe 1993], Latvians [Kariks, *et al.* 1966; Race, *et al.* 1948; Heapost 1994], Lithuanians [Harvey, *et al.* 1983], Mansi [Davydova 1974], Maris [Eriksson, *et al.* 1979], Russians [Umnova, *et al.* 1968], Swedes [Beckman 1959], Udmurtians [Shneider, *et al.* 1989], Vepsians [Heapost 1994], Vologda Russians [Sistonen, *et al.* 1993] and data about European populations by their language groups [Walter, Danker-Hopfe 1993], also data about European populations [Mourant, *et al.* 1976; Cavalli-Sforza, *et al.* 1994].

The studied genetic systems and the allele frequencies for the Estonian mean and the four most different regions are given on Table 1. As occurs, there are relatively great differences between the regional subgroups, especially in Duffy, Lewis and Rhesus systems. Although heterogeneity may be observed in the distribution of different allele frequencies, an east-westerly direction in anthropological features can still be observed as in case of alleles of MN system for example. *M* frequency is higher in eastern and lower in western regions of Estonia. *M* frequency is common to Baltic Finns (Finns 64%, Vepsians 64%, Karelians 63%, Estonians in eastern districts 63-64%) northern Russians (64%), and Baltic nations (64-65%). *M* frequency is also high in some districts of Belorussia and the Ukraine [Mikulitch 1989; Danilova 1971]. Very common is that allele in Near East, in India. In western populations, but also in eastern Finno-Ugric peoples, the *M* frequency is below 60%. Some of West-Estonian regions differ from other Balto-Finnic regions having a relatively low *M* frequency (as in general Saaremaa group, in the western coastal area — 53-58%). This frequency is nearer to that in Finnish Swedes (60%) and resembles the *M* frequency of Swedes in Southern and south-eastern regions of Sweden (54-57%) [Beckman 1959]. The high *M* frequency seems to be connected with the ethnical component originating from a southern part of East Europe. *MS* haplotype frequency of MNSs system in Estonia (32%) is higher than in the other European populations. Estonians are close to Finno-Ugric peoples Karelians, Udmurtians, northern Russians, the Baltic language peoples, but also to the more southern peoples — Greek language group people and to Sardians (33%) and Rumanians (30%) from the Romance language group [Walter, Danker-Hopfe 1993]. The relation of *MS:Ms* in Estonians ($\sim$ 1) is different from that of the most Finno-Ugric and European populations, having similarities with that in Lapps, in Greek language group, in Sardians and Rumanians from the Romance language group; the Celtic language group is also comparatively close to Estonians. The relation of *NS:Ns* in Estonians ($\sim$ 0.12) is similar to that in Maris, Mansi and in Celtic language group.

CDE haplotype frequency from Rhesus system in Estonians is especially high (2%). That frequency is comparatively high also in northeastern and eastern Finno--Ugric peoples — Karelians, Vepsians, Mansi, being very high in Komi-Permians (3,8%). In West European populations the *CDE* frequency is very low, except for Greek group (2%), and a Gaelic speaking sample from Scotland (1,5%). The *cde* frequency as in the other population-genetic markers in Estonians (the mean 33%) shows a heterogeneity with the highest frequency on West-Estonian Islands (38%).

Table 1

Allele frequencies of the polymorphic systems used in all investigated Estonians and in the four most different regions

System and alleles	Estonia, Mean	(min-max)	West Islands	West Estonia	North-East Estonia	South-East Estonia
ABO:						
A_1	0.2009	(0.1289-0.2489)	0.2126	0.1851	0.2008	0.2072
A_2	0.0391	(0.0194-0.0824)	0.0433	0.0317	0.0489	0.0382
B	0.1606	(0.0950-0.2038)	0.1443	0.1737	0.1267	0.1829
0	0.5993	(0.5164-0.6983)	0.5998	0.6096	0.6235	0.5716
n	2722		650	456	330	573
Duffy:						
Fy^a	0.3562	(0.2291-0.4426)	0.3591	0.2811	0.2924	0.3730
n	1544		224	183	153	486
Kell:						
K	0.0483	(0.0208-0.0885)	0.0330	0.0447	0.0510	0.0548
n	1614		324	183	151	462
Lewis:						
le	0.4445	(0.3368-0.6268)	0.4431	0.5184	0.3368	0.4610
n	1711		327	186	97	454
MN:						
M	0.6174	(0.5303-0.7357)	0.6166	0.5791	0.6445	0.6231
n	5249		639	613	550	1214
MNSs						
MS	0.3161	(0.3083-0.3221)		0.3121	0.3083	0.3187
Ms	0.3251	(0.3101-0.3361)		0.3101	0.3361	0.3287
NS	0.0379	(0.0370-0.0393)		0.0378	0.0370	0.0393
Ns	0.3209	(0.3133-0.3300)		0.3400	0.3186	0.3133
n	267			90	97	80
P:						
P_1	0.3907	(0.2893-0.5286)	0.3970	0.4532	0.3369	0.3896
n	1969		327	258	206	590
Rhesus:						
cDe (R_o)	0.0389	(0.0000-0.0975)	0.0416	0.0198	0.0356	0.0248
CDe (R_1)	0.3902	(0.2953-0.4897)	0.3960	0.4243	0.0335	0.4047
C^wDe (R_1^w)	0.0280	(0.0100-0.0545)	0.0227	0.0253	0.3479	0.0332
cDE (R_2)	0.1529	(0.0751-0.2176)	0.0869	0.1292	0.1803	0.1740
CDE (R_z)	0.0208	(0.0000-0.0925)	0.0206	0.0046	0.0470	0.0253
cde (r)	0.3287	(0.2423-0.4072)	0.3805	0.3350	0.3249	0.3177

System and alleles	Estonia, Mean	(min-max)	West Islands	West Estonia	North-East Estonia	South-East Estonia
Cde (r')	0.0271	(0.0000-0.0790)	0.0243	0.0497	0.0309	0.0127
cdE (r")	0.0134	(0.0000-0.0540)	0.0274	0.0121	0.0000	0.0077
n	2039		330	257	209	558
PTC-tasting:						
t	0.5007	(0.3475-0.6358)	0.6003	0.4976	0.4900	0.4780
n	2796		332	571	366	685

The *cde* frequency decreases eastwards (being in Eastern Estonia — 32%). The Estonians' mean *cde* frequency is the closest to Vepsians, Finns, but it is higher than that in Komis, Udmurtians, Lapps, especially in Mansi. The *cde* frequency in western Estonians is closer to Baltic peoples, Russians, the whole slavic group (38.5%), the Germanic group (38.8%). A comparatively low *cde* haplotype frequency like in South-East Estonia can be found among the most southern peoples of the Romance language group (Italians — 35.4%, Corsians — 33.2%, especially low in Sardians — 22.4%) also in Greeks (27.7%).

A wide range variation is characteristic of the other allele frequencies as well. The mean frequency of Fy^a in Duffy system in Estonia is lower than in the other peoples compared, having similarities in more southern populations as in Italy and Near East.

Our genetic data are in good agreement with the other anthropological investigations suggesting that the biggest differences in Estonia can be found between the subpopulations of Western and Eastern regions: the genetic distance between these populations is about three times bigger than that between the Northern and Southern ones [Heapost 1994].

By the grouping of some local populations on the basis of genetic distances most samples are clustered very well into the bigger regional groups with their nearest neighbours. However, there exist two exceptions. First, the sample of Muhu Island is clearly different from the other West-Island (Saaremaa and Hiiumaa) samples, being clustered together with North-Eastern group. Some differences between the Muhu and the other West-Islands samples, and the similarities of the Muhu group to the West-Estonian coastal and North-Eastern samples are expressed also in dermatoglyphic data [Horn 1974]. Secondly, the sample of West-Võru dialect area stands relatively far from the other South-Eastern groups. At that time, the Setu sample is closely related to most of the South-Eastern and East Estonian groups [Heapost 1993a, b]. A greater frequency of "western traits" in the West-Võru dialect area in South-East Estonia has also been observed in anthropological [Aul 1964] and linguistical data [Kask 1956]. According to the archaeological data these differences could have appeared in the first centuries of our era together with the

Table 2

Allele frequencies of the polymorphic systems in Estonians, in some Finno-Ugric and in other peoples or peoples by their language group

Locus	A1A 2B0				Rhesus							MN		MNSs				P	K	Fy
Alleles	A1	A2	B	0	CDE	CDe	Cde	cDE	cDe	cdE	cde	M	N	MS	Ms	NS	Ns	P1	K	Fya
Populations, Language groups																				
Estonians	.201	.039	.161	.599	.021	.418	.027	.153	.039	.013	329	.617	.383	.316	.325	038	.321	.391	.048	.356
Karelians	.137	.038	.193	.632	.011	.377	.023	.134	.080	.000	.375	.631	.369	.277	.345	.106	.272	.445	.042	.458
Vepsians	.182	.047	.135	.636	.014	.453	.014	.108	.084	.000	.327	.644	.356	–	–	–	–	.463	.057	.438
Komi-Zyr	.123	.046	.221	.610	.010	.376	.011	.258	.059	.002	.284	.504	.496	.243	.307	.109	.341	.499	.066	.522
Komi-Per	.202		.193	.605	.038	.345	.000	.239	.090	.071	.217	.539	.461	.161	397	.100	.342	.386	.033	.495
Maris	.187		.265-	.549	.000	.454	.005	.140	.030	.000	.371	.589	.411	.211	.351	.050	.388	.456	.017	.599
Udmurtians	.180	030	236	.554	.000	.415	.020	268	.092	.000	.185	.605	.395	.269	.325	.088	.318	.290	.045	.502
Hungarians	.231	.067	.142	.560	.002	.422	.016	.144	.026	006	384	.575	.425	.244	331	107	.318	.384	.042	.446
Mansi	.170		.188	.642	.010	.302	.000	.466	.154	.027	.049	.449	.551	.086	.336	068	.510	.335	.004	.588
Lapp	.137	.266	.091	.506	.000	.610	.012	.172	.048	.000	.167	.545	.455	.257	.256	.137	.350	.439	.020	.695
Finns	.214	.094	.125	.566	.000	.428	.012	.183	.035	.002	.339	.643	.357	.247	.395	.078	.280	.451	.020	.471
Swedes	.216	.087	.079	.618	.000	.417	.010	.167	.019	.004	.383	.562	.438	.241	.321	.086	.352	.545	.037	.422
Latvians	.197	.050	.167	.586	.002	.444	023	.139	.015	.002	.375	.668	.332	.266	.366	.062	.306	.411	.023	.465
Lithuanians	.218	.035	.094	.652	.000	.439	.024	.139	.022	.000	.366	.644	.356	.277	.367	.065	.291	.483	.048	.487
Russians	.256		.164	.580	.001	.418	.022	.161	.033	003	.362	.551	.449	.249	.356	.079	.316	.496	.036	.494
Russians V	.163	.064	.186	.587	.000	.413	.012	.148	.035	.000	.392	.636	.364	.268	.368	.082	.282	.476	.059	.479
Germanic	.208	.071	.080	.641	.001	.423	.011	.152	.019	.006	.388	.548	.452	.242	.306	.071	.381	–	–	–
Celtic	.138	.043	.076	.744	.006	.401	.009	.157	.024	.006	.397	.574	.426	.265	.309	.052	.374	–	–	–
Romance	.198	.048	.072	.681	.005	.529	.014	.101	.026	.006	.318	.562	.438	.251	.311	.087	.351	–	–	–
Greek	.209	.060	.095	.636	.021	.497	.023	.126	.043	.012	.277	.564	.436	.272	.292	.123	.314	–	–	–
Slavic	.241	.047	.147	565	.003	.429	.017	.135	.028	.003	.385	.571	.429	.241	.330	.093	.336	–	–	–
Basque	.181	.086	.027	.706	.005	.395	.029	.072	.029	.003	.466	.547	.453	.225	.322	.104	.349	–	–	–
Romany	.221	.099	.112	.568	.001	.567	.029	.082	.006	.002	.313	.750	.250	.211	.539	.101	.149	–	–	–

appearance of stone graves which are characteristic of more western districts of Balto-Finns [Laul 1986]. In the Eastern area, another kind of material culture was widespread (sand barrows). In the Western part of Võru dialect territory, where the stone-graves spread, western features are also present in the population genetic characters.

In comparison of regional populations with one another it has been revealed that the genetic differences between all seven regions (like the main dialect regions) are statistically significant, with the exception of the East group, which is very similar to the southern regions [Viikmaa, Heapost 1996]. As it is demonstrated by the clustrogram of genetic distances, the Central, South-West, East, and South-East regions are very close. The North-East, West Islands, and West-Estonia are standing separately (Fig. 2).

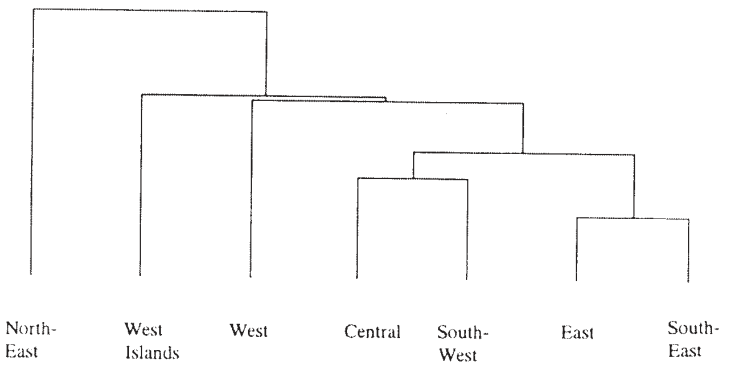

Fig. 2. Clustrogram of grouping of Estonian main regional populations based on cluster analysis using the genetic distance matrix of Cavalli-Sforza & Edwards [1967].

The comparison of the whole Estonian population with other Finno-Ugric and neighbouring populations is based on six blood group systems (A_1A_2BO, Rhesus, MN, P, Duffy, Kell, a total of 19 alleles). The genetic distances (Table 3) suggest that the Estonians are most closely related to the Russians and the Latvians, to their nearest neighbours, the Vepsians and Karelians are also very close to the Estonians, followed by the Finns, Lithuanians, Finnish Swedes, Komis and Maris.

To compare the Estonians with some other Finno-Ugric, neighbouring and some more western populations, five polymorphic systems were used (A_1A_2BO, Rhesus, MNSs, Haptoglobin, Transferrin; 23 alleles in total). In this case the Baltic language group was left out. According to this comparison (Table 4) the genetic distance is smallest between the Estonians and the Russians, followed by the Poles,

Table 3

Genetic distances by Cavalli-Sforza & Edwards between Estonians and some neighbouring and other Finno-Ugric peoples

	Vepsians	Karelians	Komis	Maris	Finns	Finnish Swedes	Latvians	Lithuanians	Russians
Estonians	0.0069	0.0074	0.0167	0.0189	0.0108	0.0115	0.0064	0.0114	0.0065
Vepsians		0.0029	0.0168	0.0128	0.0089	0.0075	0.0085	0.0072	0.0066
Karelians			0.0120	0.0104	0.0096	0.0095	0.0073	0.0094	0.0059
Komis				0.0082	0.0106	0.0103	0.0120	0.0133	0.0081
Maris					0.0080	0.0100	0.0079	0.0085	0.0058
Finns						0.0017	0.0041	0.0055	0.0043
Finnish Swedes							0.0063	0.0042	0.0051
Latvians								0.0045	0.0032
Lithuanians									0.0033

Table 4

Genetic distances by Cavalli-Sforza & Edwards between Estonians and some neighbouring and other peoples

	Finns	Swedes	Russians	Poles	Germans	Hungarians	Vologda Russians
Estonians	0.0095	0.0082	0.0038	0.0057	0.0057	0.0064	0.0097
Finns		0.0056	0.0078	0.0055	0.0082	0.0072	0.0045
Swedes			0.0051	0.0042	0.0012	0.0025	0.0068
Russians				0.0045	0.0043	0.0030	0.0079
Poles					0.0038	0.0027	0.0040
German						0.0035	0.0078
Hungarians							0.0066

the Germans, the Hungarians, the Swedes, then the Finns and the northern (Vologda) Russians. So we can conclude, that the linguistic unit does not correspond to the genetic one and the Finno-Ugric linguistic unit is clearly not a genetic unit.

The mean allele frequencies of the Estonians are comparable to those typical of the populations in North-East Europe, but the allele frequencies are characterised by tendencies in two opposite directions (like in other Finno-Ugric populations): Western (a higher frequency of K, Lu^a, MS, Hp^1, lower Fy^a, CDe) and eastern (with higher B, CDE, with lower A_2, P_1, cde, t, Le (a+) phenotype) [Heapost 1994; Viikmaa, Heapost 1996].

Craniological data. To understand the population genetic characterization and structure of Estonians comparative studies of Estonian XI-XV centuries and Neolithic time cranial samples were carried through on the basis of cluster anaysis. It was shown that Estonian cranial samples were assembled mainly into two clusters. The mesomorphic samples cluster embraces a large part of East-Estonian cranial samples. The other cluster combines the cranial samples of another type, with massive, very long and high dolichocran with high face skulls from almost all Estonia, especially from western and northern Estonia. Morphologically similar to that type of skulls were also the Neolithic Boat Axe Culture inhabitants skulls in Estonia [Heapost 1995].

Close similarities on the basis of craniological material were also shown between Estonian XI-XV centuries populations, especially those from East, Central and South-East Estonia, and many neighbouring populations — from Latvia, Finland, Karelia, North-West Russia and even Volga-Kama area [Heapost 1993a; 1995]. Most of these samples belong to the mesocran anthropological type with some local variations, and all the cranial samples, used in comparison, form completely mixed clusters with Estonian and other Finno-Ugric samples. The anthropological type represented by East-Estonian XI-XV centuries cranial samples in one or the other variant was spread on a large area of East-European forest belt. Evidently they have been closely related population groups. It is interesting to notice that the Finno-Ugrians of the Volga district had pure Europoid characters before any possible Slavic influence could have occurred. Next, the Estonian morphologically close cranial samples were summed up into two bigger ones. These two types of bigger samples were compared to some samples (mainly from 500-1500 AD) of neighbouring territories: the Baltic states, NW Russia, Volga-Kama district, Hungary, Poland, Germany, Denmark, Norway, Sweden), also to Kivutkalns Bronze Age sample, Boat Axe culture sample of Stone Age of Estonia and the cranial samples from Zvejnieki (Mesolithic to Late Neolithic). Cluster analysis on the basis of 10 cranial traits were used [Heapost 1997].

In Fig. 3 one can see, that the samples compared have been assembled mainly into two clusters — the mesocran, mesomorphic cranial samples from Eastern Estonia, North-Western Russia, Volga-Kama district (FU), Hungary, Poland, also the Selonians from Latvia, the Lithuanian sample belongs to one comparatively compact cluster (No 3-6). The mesocran samples subcluster characterized mainly by a lower cranial height is formed by German samples and a South-East Sweden sample (14-15). The Livonian sample (8) characterized mainly by a narrow head and face and a lower cranial height links to German's subcluster. The Norwegian sample stands separately and links to the mesocran cranial samples cluster (24). The other main cluster (20-22) is composed by the dolichocran samples (20-19) — West Estonian sample, Bronze Age Kivutkalns sample, Latvian samples (Zemgallians and Latgallians) and the Neolithic Boat Axe Culture sample from Estonia. The South--West Swedish sample also joins to that cluster. The dolichocran Zvejnieki samples but also the Zvejnieki Late Neolithic sample, the Danish and Jaunpiebalga sample from Latvia (25-22) joins with the dolichocran samples cluster on a higher level.

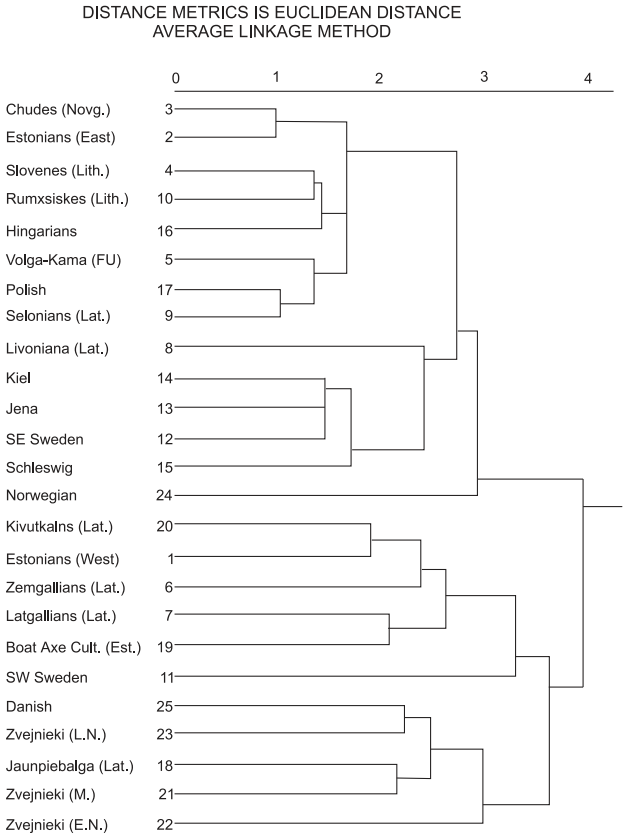

Fig. 3. Clustrogram of grouping of the cranial samples.

Odontological data. Odontological traits are of taxonomic peculiarities, dividing conventionaly into s.c. "eastern" and "western" traits. The distribution frequency of eastern traits increase in the eastern direction and attain their maximum value in Mongoloid populations; the frequency of "western" traits increases in the western directions. In Estonia different parts can be characterized by different concentration of eastern and western features. The main classification unit in odontology is odontologic type, combined with complexes of respectiv traits [Zubov 1982].

On the territory of Estonia one can find the following odontological types [Sarap 1994]: 1) The Baltic variant of the Central European type (on the Islands and in Western Estonia, and in some parts of Eastern and Southern Estonia). The type is characterised by low occurrence of Eastern features and high occurrence of Western ones, and a strong reduction of lower molars. 2) The northern gracile type (spread in Central and Northeastern parts of Estonia, in some parts of Northern,

Southern, Southwestern and Southeastern Estonia). The special originality this type is characterised by a high frequency of eastern and western features occurring in parallel and a strong reduction of lower molar. A classical variant of Northern gracile type is spread in Southwestern and Northwestern Finland. The odontological type of the population in that district is close to eastern Estonians [Zubov, Haldeeva 1989]. 3) The influence of the North European relic type is observed in North-, East- and South-Estonia. That type is spread especially among the Lapp population and Northeastern Finns. Features of that type are also observed in Southeastern Finns, in Vepsians, Karelians, Komis and Maris. Peculiarity of this type is the coexistence of moderate frequency of Western features and a high frequency of some typical Eastern features. The combination of some "ultra-western" and "eastern" traits (the northern gracile type) of dental system in other Finno-Ugric populations, in the Baltic region as well as in the Volga and Ural regions is also ascertained [Zubov 1982; Zubov, Segeda 1986].

The conspicious peculiarity of the Northern Gracile type is well expressed in the quantity of ISC (Index of Specific Combination). Usually, ISC does not exceed 150, (neither in Caucasoids nor in Mongoloids), but it is always larger among the representatives of Northern gracile type, attaining the value of 200-300 and even higher.

ISC varies in Estonia between 37-504. North-Eastern Estonia is especially prominent with ISC (502). Very high values of ISC occur in several South-Estonian local population samples (300-500). The ISC values are especially low in the dialect regions of the Islands, Western Estonia, and East-Estonia (72, 91, 81). In the latter a certain influence of the North European relic type besides the Central European odontological type has been observed. So the odontological data also show a considerable heterogeneity of the Estonians, where typical Finno-Ugric and more western complexes of traits have been intermingled.

By the index ISC Finno-Ugric peoples differentiate from all the other surrounding peoples and form a Finno-Ugric (not Uralic) odontologic community starting from Hungary and Finland and reaching to Western Siberia to the eastern boarder of the distribution area of Khants, Mansi and Samoyedes, the latter being quite different by their odontological type [Dubov 1990].

Two large areas of the elevated distribution of ISC index were established in worldwide comparison [Dubov 1990]: North Europe and Western Siberia — area of distribution of Finno-Ugric peoples (northern gracile type) and Southern Asia — from Mediterranean to India (area of southern gracile type). According to A.I. Dubov that connection should be genetical, while data of various sciences (ethnography, archaeology, linguistics) find evident southern roots of the ancestors of Finno-Ugric peoples.

In the Baltic States three odontological complexes have been established — Central European, Northern gracile and North European relic type. No absolute borders between these types which would follow the linguistic, ethnic or other differentiations have been observed. In Estonia the Central European and Northern gracile type are common. In Latvia Central European, Northern gracile and North

European relic type is spread, in Lithuania — mainly Central European type just like in Ukraine and in Russia in general. The presence of one odontological type in many ethnoses proves the pre-ethnic time of that [Zubov, Haldeeva 1989].

In Latvia the northern gracile type prevails. It is spread also on the territory of the narrowfaced variant of the West Baltic anthropological type in Latvia. That embraces also districts, once inhabited by Livonians and South-Estonians, extending into places farther off towards southern directions. The North European relic type is mainly spread in Eastern Latvia, where the East Baltic anthropologic type is spread [Gravere 1987]. An occurrence of the Northern gracile type traits among the other peoples is a clear evidence, that on these districts Finnic peoples have been mixed with the other ethnic groups. Such is the situation in the North-Western provinces of Russia.

The time of appearance of gracile dental complex in the forest belt of East Europe, also to Latvia, is presumed to be the Bronze Age. The gracile dental complex has been established in Latvian Kivutkalns people as well as in Balanovo culture people on Volga-Oka districts. These are supposedly genetically connected with southern gracil odontological type [Gravere 1987]. The Bronze Age Fatyanovo culture people on Volga-Oka (western) districts represent another odontological type, characterised by no reduction of molars.

Index of Mongoloidness and Pigmentation. Great anthropological variety is typical for Finno-Ugric peoples and among them variants of traits occur, which are common to the more eastern peoples (s.c. mongoloid addition). In studies of Finno--Ugric peoples K. Mark [1994] has brought into use the indexes of Mongoloidness (MI) and the Pigmentation (PI). The MI is based on 8 somatoscopic primary traits. In PI hair and eye colours are summarised. MI and PI show the position of a population group or a region on the s.c. scale of mongoloidness and pigmentation in comparison with the other Finno-Ugric peoples and their neighbours.

The differences in distribution of these traits between Estonian regions are not great and sometimes they even show an opposite trend. Altogether they still give a clear east-west tendency. The MI value is smallest in West Estonia (22.0), towards the East the mongoloid addition becomes more noticeable, which is seemly connected with the East Baltic anthropological type. According to the increase of MI value the compared FU and neighbouring peoples can be placed as follows: Finnish Swedes (10.1), Western Finns (16.3), Mordvinians Erza (21.6), Karelians (28.0), Eastern Finns (29.5), Vepsians (30.1), Mordvinians-Mokša (32.8), Komis (33-39), Saami (46.6), Maris (48.3), Khanti-Mansi (about 85).

Eye and hair colour are the pigmentation traits of interest. These traits vary quite largely, but light colours still form the majority. In comparison with the neighbouring peoples, the very light pigmentation of Estonians is especially conspicuous. J. Aul [1964] states that as for average light degree of eye colour only very few peoples can compete with the Estonians. The hair colour of Estonians is comparatively even more light. The population of Islands, the Setu and South-West regions is of light pigmentation. In the rest of regions the pigmentation is very light, especially in North-East, Central and North Estonia [Mark 1994]. All the Balto-Finnic

peoples and also Finnish Swedes have a light or even a very light pigmentation. Among them the most light pigmented are North-East Estonians (PI 11.2), Eastern Finns(15.0) and West-Estonians (17.8); South-East Estonians have a slightly darker pigmentation (20.0), followed by Western Finns (22.5), Finnish Swedes (25.8), Karelians (26) and Vepsians (34.4). Thus, the most depigmented are the North-Eastern Estonians and Eastern Finns, but not the most Europoid (with the most lower value of MI) populations (as Finnish Swedes and Western Finns). Among the peoples of the Baltic states the Latvians and Lithuanians have a slightly darker pigmentation of eyes and a noticeably darker hair pigmentation than Estonians [Mark 1994].

Between the values of these two indexes no positive correlation has been found [Mark 1994]. Majority groups of larger MI value belong to the most light ones (as Central and North-East Estonia). The same phenomenon appears in Finland and at places also among the other Finno-Ugric peoples. On the basis of that K.Mark presumes, that a strong depigmentation process has taken place already in the groups mixed with mongoloid addition.

Heterogeneity of Finno-Ugric peoples is well expressed in dermatoglyphic traits. According to G. Heet and N. Dolinova [1997:128]: 1) Finno-Ugrians are extremely heterogeneous concerning dermatoglyphics traits, and exceed the average euroasiatic level of differentiation. It may be due to the initial heterogeneity of their ancestors as Finno-Ugrians have been mixing between themselves as well as with neighbouring populations. The process of mixing was most important in the whole anthropological history of the Finno-Ugrians. 2) Among the Finno-Ugrians two main racial components stand out quite distinctly: the Europoid and Mongoloid one. The Europoid component is subdivided into two variants. The majority of Finnic speakers belongs to the first one, it is the result of a cross-breeding of the Northern Europoids (who prevailed) with the Mongoloids of West Siberian origin. The second one is less represented and linked to the population of Volga region and Hungarians who include the marked share of Southern Europoid admixture. The Mongoloid component is connected with aboriginal population of Western and Southern Siberia. This picture is observed on both the territorial and ethnical levels.

3. DISCUSSION

All the types of studies presented in this paper reveal remarkable heterogeneity of Estonians. The mean allele frequencies of Estonians are comparable to those typical of the populations in North-East Europe, but the allele frequencies are characterised by tendencies in two opposite directions (like in other Finno--Ugric populations): western and eastern. The combination of some "western" or even "ultra-western" and "eastern" traits of dental system in Estonians and in other Finno-Ugric populations, in the Baltic region as well as in the Volga and Ural re-

gions has also been ascertained [Zubov 1982; Zubov, Segeda 1986; Sarap 1994]. In general, the differences are more impressive in western-eastern direction than in northern-southern direction. Some subgroups of the Estonians, especially in North--East and South-East show peculiarities characteristic to some more eastern Finno--Ugric peoples, whereas the western groups (especially in West Estonian mainland) are more strongly associated to the Indo-European neighbours. The dual branching of genetic data corresponds well with cranial, odontological and other anthropological data and the distribution of the two main anthropological types (West- and East-Baltic types) in Estonia. Cranial types in Medieval Estonia were common to a wide territory and similar cranial forms can be traced back to the local Bronze Age and the Neolithic. All of this suggests that the Estonians have a complex origin, indicating towards relations with the Finno-Ugric stem from one side, and with the Indo-European peoples from the other side.

Some combinations of traits and allele frequencies characteristic to Estonians and many other Finno-Ugric populations showing simultaneous "eastern" and "western" frequencies (for example, negative correlation of indices of Mongoloidness and Pigmentation, the northern gracile odontologic type, and some allele frequencies) cannot be explained by the assumption of Mongoloid admixture in the Caucasoid populations. We suppose that these antagonistic frequencies of different traits are tracks of the original genetic structure of the Finno-Ugric ancestor population which was not clearly differentiated in Mongoloid-Caucasoid directions. It does mean that the Finno-Ugric population represents a separate and ancient Caucasoid branch in the racial divergence. Continuity of archaeological culture in Estonia from the Mesolithic has been pointed out [Jaanits, *et al.* 1982]. Regardless of that the Late Bronze and Iron Age is proved to have been a decisive period in the Baltics. Great changes have taken place with the appearance of the stone cist graves on the coastal zone of Finland, on Saaremaa Island and mainly on the Northern coast of Estonia, in Northern Latvia. The settlement increased almost in all parts of Estonian territory. Earlier than in Estonia above-ground cairns have made their appearance in other lands around the Baltic, including Scandinavia. A special kind of coastal culture has inhabited the coastal areas of Estonia, South-West Finland, Åland, Eastern coastal area of Central Sweden, also Northern Latvia, especially the lower reaches of the Daugova River [Jaanits, *et al.* 1982]. Even today certain single similarities in some allele frequencies may possibly refer to that culture on the coastal areas of the Baltic Heapost 1994]. Meanwhile in the Late Bronze Age great differencies occur between the North and West Estonia, especially between the coastal districts of North and West Estonia on one side and the Southern Estonia on the other side. The population density in South-Estonia increased with the appearance of stone graves from northern part of Estonia, mainly from the southern direction AD, but also with South-Eastern connections. The regional differences (linguistic, anthropologic, genetic, etc.) of Estonia in modern times can probably be taken back to the same period. Already the Neolithic inhabitants of the Boat Axe culture in Estonia did not belong to the one and the same anthropological type [Aul 1935]. According to J. Aul, in prehistoric times the East and West Baltic types

did not occur in their pure forms either, and already at that time the territorial transition between these types was rather smooth, as it is nowadays. He also speculated that at that time these types were genetically not yet differentiated to such a degree as in modern times. The tribes of the Boat Axe culture and the Corded Ware culture were spread on a vast territory in Northern and Central Europe with the eastern variants of Fatjanovo and Balanovo cultures inbetween Volga-Oka Rivers [Kraynov 1972]. Two odontological types in the tribes of the Bronze Age Fatyanovo and Balanovo cultures have been established: Central European odontological type in Fatyanovo and northern gracile type in Balanovo culture peoples with southern components in it [Gravere 1987]. Both types are also presented in Baltic Finns today, also in Finno-Ugric populations, especially the northern gracile type with antagonistic traits in it. The northern gracile type features were also common in the Bronze Age Kivutkalns population, with some features indicating to the southern gracile odontological type [Gravere 1987].

Anthropologically, the Kivutkalns Bronze Age population had similar features with the narrowfaced Boat Axe and Corded Ware culture tribes in Saxonian-Thuringian, in Poland (Złota), also in Balanovo, and differentiate from broadfaced Fatyanovo and Boat Axe culture tribes of Estonia [Denisova 1975].

In anthropological differentiation of the Middle Age Baltic Finns, Balts and Slavic peoples on one side and Germans on the other side definitely expressed features of anthropological heterogeneity on the ground of proportions of the face and braincase of skull, typical of the tribes of Boat Axe and Corded Ware culture. A more or less exact geographic location of these Middle Ages types may probably be traced back to the prehistoric times [Alekseeva 1990].

According to comparative statistical studies of the European cranial samples from various periods of time, it turned out that the greatest changes in cranial measurements (the gracilization) have taken place between the Mesolithic and the Neolithic. Since then a separation into regions (East Europe, Balkan peninsula, Eastern middle Europa) reveals a series of regional differentiations [Schwidetzky, Rösing 1990]. The taxonomic structure of European populations has been analysed during three different periods — the Early Middle Ages, the Late Middle Ages and the Recent Period [Sokal, *et al.* 1987] and Finno-Ugric speakers always are centrally located and scattered throughout the graph, while skull series of some other language groups began to shift towards one or another direction on the graph. No special regions of phonetic space could be identified for Romance, Baltic, Hellenic, and Finno-Ugrian speakers.

In the literaturte we can find data, according to which the genetic distance between peoples correlates significantly with geography, but not with linguistics [Harding, Sokal 1988]. It is also shown that the speakers of Baltic-Finnic and Slavic groups do not differentiate genetically, there could not show genetic differencies between Baltic and Slavic language groups etc. [Sokal, *et al.* 1996].

One may presume, that the population which came to the Baltic especially in the Bronze and the Iron Age, together with the close archaeological culture, may have been genetically, morphologically close, but linguistically may have not been

thoroughly differentiated yet. In the course of times, of course, different admixtures from eastern as well as from western populations were added.

Some conclusions: 1. All type of studies show genetic heterogeneity of Estonians. 2. The closest genetic similarities of Estonians with the neighbouring populations are not related to their language groups. 3. The mean gene frequencies of Estonians are comparable to those typical of the populations in North- and East Europe, but the gene frequencies are characterised by the tendencies in two opposite (western and eastern), but also southern directions as in other Finno-Ugric populations. 4. The craniological types spread in Estonia were common over a wide territory both in eastern and western districts. 5. Forms similar to the cranial samples of Medieval Times can be traced back to the local Bronze Age and the Neolithic. 6. The genetic heterogeneity and the antagonistic traits in Estonians seem to be a trace of the original genetic structure of Finno-Ugric ancestor population, which was neither Mongoloid nor Caucasoid.

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NEW CRANIOLOGICAL MATERIAL ON THE SAAMI FROM THE KOLA PENINSULA

The Saami[1] — the most ancient population of the extreme north of the Old World — is one of the best studied and at the same time one of the most mysterious folks in the world. Probably, judging by the interest to their origin, the amount of gathered information on them in different fields of anthropology, archaeology, linguistics and ethnography, they can be compared only to Ainus — the main enigma of the Asian part of the Continent.

The problem of the Saami' origin started to attract attention of the European researchers soon after their getting acquainted with the Saami' original culture and specific appearance. This attention may be explained by the fact that the low dark-haired Saami looked very unusual among tall northern europeoids with weak pigmentation. In the early anthropological classifications the Saami who differed obviously from the surrounding European population and from the distant Asian population were distinguished in an independent taxonomic unit, standing by itself apart from europeoids as well as from mongoloids. Even K. Linney assigned the Saami to an independent "big" race. Topinar considered them as hiperboreans, and Deniker distinguished them into the Lapps race. Coon also considered the Saami as an independent race. Researchers explain appearing of the anthropological features specific for West-Europeans among the Saami by the long isolation of this folk on the extreme northern territories of Europe.

As methods in anthropology develop and theories of features taxonomically important for distinguishing mongoloids from europeoids devise and basis of sources on this material widens it started to turn out that almost in all the anthropological systems the Saami have a number of indices bringing them together with representatives of the mongoloid race. Some features of that kind could be observed in some other groups of the former USSR north-west population, modern as well as ancient staring from the Mesolithic epoch. Soviet researchers who had gathered and studied a vast and manifold anthropological material from East Europe, pre-Ural region and Western Siberia pointed out the reinforcement of features bringing the population of this area together with Mongoloids in the direction from west to east.

[1] The Saami nowadays inhabit northern Sweden (30 000 people), northern Norway (15 000 people) and northern Finland (5000 people). About 2000 of Saami live in Russia — on the Kola Peninsula.

Basing on these facts Soviet anthropologists put forward and proved the theory of ancient groups penetration on the territory of North-West Russia and Baltic states in ancient times and of an essential influence of this penetration on the process of the anthropological type formation of the population on this territory [Vitov, *et al.* 1959; Alekseev 1969; Denisova 1975].

Mongrel conception that seems to explain the causes of origin of "Asian" features among west European population very simply and logically received wide distribution at first in anthropology and then in other sciences and humanities dealing with ethnic genesis and ethnic history, mainly in archaeology. But here it was often based not on the factological material itself which was sometimes contrary to it but on the conclusions of anthropologists. In anthropology the tendency for overstatement of the the diagnostical role of features describing profile of a facial skeleton (basic marks of differences between europeoids and mongoloids on craniological material) had led to the fact that the presence of at least one morphological element stating even a low flattening of face or bridge of nose in ancient or modern series of sculls from East Europe was sometimes considered as almost an absolute evidence of presence of mongoloid admixture in such groups.

We should mention that in Russian anthropology this mongrel theory is neither the only one nor the generally accepted one. There was put forward and proved the hypothesis stating that the similarity of some European groups with Asian groups based on features of horizontal face profile not always proves that new-comers from East took part in their genesis [Bunak 1956; 1980; Yakimov 1960a; 1960b; Gokhman 1984; 1986]. The researchers sharing this point of view on the nature of the race forming process in west part of Eurasia emphasize two main circumstances that call into question the universality of the mongrel conception.

First of all, anthropological type of populations with the "suspicion" on the mongoloid admixture is as a rule morphologically discrepant: similar to Mongoloids according to a number of features they differ from them distinctly according to other features. Secondly, features similar to mongoloid were found not only in East Europe and Baltic states where appearance of migrants in ancient times can be admitted. These features, starting from the Upper Palaeolithic, can be also found among populations of such territories as West and South Europe (Denmark, Sweden, Yugoslavia, Czech [Gokhman 1986]) and the penetration of big groups of Asian population on these territories from the geographical point of view is improbable and from the point of view of history — not valid. Basing mostly on these contradictions the authors of the second hypothesis explain the "oriental" nature of some features by the fact that the Upper Palaeolithic population of northern Europe had some morphological characteristics outwardly similar to mongoloid but not connected with them genetically. With that it is emphasized that the possibility of penetration of Asian groups of population in the Baltic area can not be entirely excluded but their participation in genesis of East-European population was scarcely essential.

Newly obtained craniological material and the material studied repeatedly according to the modern methods introduce new arguments that prove the validity of

the second hypothesis. For example, craniological collections on Karelians, Komi-Zyrians and Izhora gathered and studied by the author in 70-90 allowed to reveal among them a specific anthropological type very similar with the basic anthropological complex of the ancient north European population which must have been preserved in some areas of North-West Russia up to the present time [Khartanovich 1986; 1992; 1993]. This complex combines such discrepant (from the point of view of division of modern Europeoids and Mongoloids) features as a weak flattering of face on the upper level on one hand and sharp profile on the medium level, high nose bones distinctly projecting to the profile line, and very high cranium on the other hand. In all probability, the only feature bringing the ancient and the modern bearers of this complex of features together with Mongoloids — weakening of the horizontal face profile on the level of the nasion point — is the specific characteristic of the most ancient northern Europeoids which had formed independently from the Asian influence.

The situation with the anthropological characteristics of the other European folk that also reveals some features similar to Mongoloids — the Saami — formed in the other way. First of all, as it has been already mentioned above, they reveal such peculiarities almost in all the systems of anthropological features. Secondly, new anthropological data has pointed to the probability of a single migration of Siberian groups of population on the turn of the new era to the extreme north of Fennoscandia and the Kola Peninsula [Shumkin 1991]. And after all, from craniological point of view the Saami differ distinctly from the Karelians, Komi-Zyrians and Izhora [Khartanovich 1991]. Differences also appear in the features taxonomically important for distinguishing Mongoloids from Europeoids. Together with the weakening of horizontal face profile on the upper level the Saami have a weakened facial skeleton profile on the medium level, nasal bones project to the profile line evidently less (this feature reveals most distinctly in the Kola group from Chalmny-Varre), cranium is very low. All these arguments seem to give enough reasons to admit the mongrel origin of the Saami. But according to some other important anthropological indices the Saami' skulls are opposed to mongoloid ones. In craniology these features are the face height, forehead breadth, size of the nose bridge. Such a discrepant complex of features had led the researchers to the conclusion that if a certain mixture took place in the process of forming the anthropological type of the Saami, then the europeoid component of this mixture had to be corresponded not to the "classical" mongoloid form but to represent the ancient formation which differed from the modern Europeoids and Mongoloids and which was described in the Soviet anthropological school as the "Ural" race.

Thus, it is evident that the problem of the Saami' origin leaves place to discussion. Widening of the craniological material constantly used with the hope that the extension of data will sooner or later allow to receive qualitatively new results is the one of the possible ways of developing of this problem.

Close to contemporeinity series of skulls of the Saami from the Kola Peninsula were gathered in 1976-1977 by the north European paleoanthropological team of the Leningrad part of the Institute of Ethnography named after N.N. Miklukho-

-Maklai of the USSR Academy of Science (now — Museum of Anthropology and Ethnography named after Peter the Great [Kunstcamera] of the Russian Academy of Science). There was obtained quite a representative craniological and osteological material on four territorial groups from different districts of the Peninsula [Gokhman, *et al.* 1976; Khartanovich 1980]. In the process of working on this material we received new important information concerning the formation process of the anthropological type of the Kola Saami. There were distinguished some certain differences between the coastal groups of population on one hand and the groups inhabiting internal districts of the Peninsula on the other hand. Anthropological peculiarities of the coastal groups allowed to presume the presence of a later europeoid admixture in them and the features of the second type of groups — presence of populations that had the most fully preserved the peculiarities of the Saami initial anthropological complex in the central areas of the Peninsula in the XIX century.

For obtaining additional cranio-osteological material close to contemporeinity especially from the internal districts of the Kola Peninsula there was organized a joint Russian-Swedish archaeologo-anthropological expedition to the Lovozero area of the Murmansk district in 1993. Excavation works, by consent of the local Saami population, were carried out on the non-functioning Saami' cemetery in the Severnaya Salma region. The cemetery was located on the shore of the Lovozero lake at a distance of 15 km from the village of the same name. There were studied nine burials in each of which there were found bones of different levels of integrity. Six skulls appeared to be suitable for craniological analysis. Below we give their basic characteristics (Table 1-2).

Burial N1. The skull of a man aged 40-50. Good integrity. The features of sex dimorphism on the skull are distinct, on the lower jaw-bone — weak. The cranium is of a medium breadth, broad, brachycranic according to the index. Cranium height is small. Forehead bone is of medium breadth, weakly inclined. Facial skeleton is not high, broad, orthognatic according to the common facial angle mesognatic according to the index of face projection. One should also pay attention to the big values of nasomalar and zygomaxillary angles reflecting the considerable degree of the horizontal face flatness on the upper level as well as on the medium level. Eye--sockets are broad and low. Pear-like aperture is mesorhinal. The nose bridge and nose bones are low. The nose projects moderately to the profile line.

Burial N2. The skull of a woman aged 30-40. Good integrity. The features of sex dimorphism are distinct. The cranium is of medium length and height, broad and brachycranic. The forehead is narrow and straight. The face is high, not wide, a little flattered on the upper level in the horizontal plane and wedge-shaped on the medium level, orthognatic by the angle and mesognatic according to the index. Eye-sockets are narrow, of medium height. Eye-socket index is high. The nose is quite high and narrow. The nose bridge and nose bones are narrow and high by the absolute indexes as well as by the indices. The nose projects moderately to the profile line.

Burial N3. The skull of a woman aged 25-30. Good integrity. The features of sex dimorphism are distinct. The skull is extremely gracile which is proved by all the

Table 1

Individual measurements and indices of male skulls of the Saami of the Kola Peninsula from the Severnaya Salma cemetery

Martin and other codes	Traits	No of grave		
		g.1	g.5	g.9
1	Cranial length	182	176	174
8	Cranial breadth	150	145	138
8:1	Cranial index	82.4	82.4	79.3
23a	Horizontal circumference (ophryon)	558	551	498
24	Transversal arch (porion-bregma-porion)	325	304	297
25	Sagittal arch	384	340	347
17	Cranial height (basion-bregma)	132	122	127
17:1	Height-length index (basion)	72.5	69.3	72.9
17:8	Height-breadth index (basion)	88.0	84.1	92.0
20	Cranial height (porion-bregma)	118	107	110
5	Cranial base length	94	98	94
9	Minimal frontal breadth	97	97	95
9:8	Fronto-transversal index	64.7	66.9	68.8
32	Frontal profile angle (nasion)	83	82	88
<g-m	Frontal profile angle (glabella)	76	72	80
—	Transverse frontal angle	141	133	133
10	Maximal frontal breadth	128	119	115
9:10	Frontal index	75.8	81.5	82.6
26	Frontal arch	122	119	115
29	Frontal chord	111	105	105
sub.29	Frontal subtense	21.1	23.9	24.7
—	Frontal convexity index	19.0	22.7	23.5
27	Parietal arch	114	104	121
30	Parietal chord	122	93	108
11	Auricular breadth	130	127	128
12	Occipital breadth	118	114	113
28	Occipital arch	122	117	111
31	Occipital chord	97	90	94
sub.31	Occipital subtense	27.4	31.9	27.2
—	Occipital convexity index	28.2	35.4	28.9
40	Basion-prosthion length	93	97	95
40:5	Face protrusion index	98.9	99.0	98.9
43	Upper facial breadth	104	107	104
45	Bizygomatical breadth	137	139	127
45:8	Transversal facio-cerebral index	91.3	95.8	92.0
46	Midfacial breadth	88	107	92
48	Nasion-alveolare height	68	64	62
48:45	Upper facial index	49.6	46.6	48.8

Martin and other codes	Traits	No of grave		
		g.1	g.5	g.9
48:17	Vertical facio-cerebral index	51.5	52.4	48.8
43(1)	Biorbital chord	99	101	98
sub.n/ 43(1)	Nasion projection over biorbital chord	13.3	18.4	16.8
77	Nasomalar angle	150	140	143
zm'-zm'	Zygomaxillary chord	89	101	96
sub.ss/ zm'- zm'	Subspinale projection over zygomaxillary chord	20.4	22.7	23.7
<zm'	Zygomaxillary angle	136	132	129
72	Total facial angle	85	86	86
73	Midfacial angle	88	88	89
51	Orbital breadth (maxillofrontal))	43	45	42
51a	Orbital breadth (dacryon)	41	42	40
52	Orbital height	33	33	29
52:51	Orbital index (maxillofrontal)	76.7	73.3	69.0
52:51a	Orbital index (dacryon)	80.4	76.7	72.5
54	Nasal breadth	26	27	25
55	Nasal height	54	49	47
54:55	Nasal index	48.1	55.1	53.2
SC	Simotic chord	7.3	7.9	8.0
SS	Simotic subtense	2.7	4.4	3.4
SS:SC	Simotic index	36.98	55.72	42.50
DC	Dacrial chord	22.7	25.3	22.0
DS	Dacrial subtense	11.6	13.4	9.7
DS:DC	Dacrial index	51.10	53.98	44.09
75	Angle between nasalia and Frankfurt plane	65?	—	61
75(1)	Nasal protrusion angle	20?	—	25
60	Alveolar arch length	51	53	52
61	Alveolar arch breadth	65	60	60
61:60	Alveolar index	127.5	113.2	115.4
62	Platine length	47	47	43
63	Platine breadth	38	32	37
63:62	Platine index	80.8	68.0	86.0

measuring characteristics. The cranium is very short and narrow, subbrachicranic by the index. The vault of the skull is very low by the absolute measurement as well as in the correlation with the lengthwise and transversal diameters. The forehead bone is narrow and inclined. The face as well as the cranium is very low and is absolute in correlation with the other diameters. The cheek-bone diameter is small

Table 2

Individual measurements and indices of female skulls of the Saami of the Kola Peninsula from the Severnaya Salma cemetery

Martin and other codes	Traits	No of grave		
		g.3a	g.2	g.4
1	Cranial length	153	175	159
8	Cranial breadth	132	144	134
8:1	Cranial index	86.3	82.3	84.2
23a	Horizontal circumference (ophryon)	502	545	508
24	Transversal arch (porion-bregma-porion)	277	317	271
25	Sagittal arch	305	350	318
17	Cranial height (basion-bregma)	115	127	117
17:1	Height-length index (basion)	75.2	72.0	73.7
17:8	Height-breadth index (basion)	87.1	88.2	87.3
20	Cranial height (porion-bregma)	109	112	100
5	Cranial base length	92	91	90
9	Minimal frontal breadth	90	89	89
9:8	Fronto-transversal index	68.2	61.8	66.4
32	Frontal profile angle (nasion)	82	89	84
<g-m	Frontal profile angle (glabella)	83	80	88
—	Transverse frontal angle	131	129	129
10	Maximal frontal breadth	105	113	105
9:10	Frontal index	85.7	78.8	84.7
26	Frontal arch	100	128	104
29	Frontal chord	92	110	95
sub.29	Frontal subtense	19.8	27.8	17.2
—	Frontal convexity index	21.5	25.3	18.1
27	Parietal arch	108	110	117
30	Parietal chord	94	102	99
11	Auricular breadth	117	126	119
12	Occipital breadth	103	119	100
28	Occipital arch	97	112	97
31	Occipital chord	80	97	83
sub.31	Occipital subtense	21.6	30.0	20.9
—	Occipital convexity index	27.0	30.9	25.2
40	Basion-prosthion length	88	89	90
40:5	Face protrusion index	95.6	97.8	100.0
43	Upper facial breadth	98	94	99
45	Bizygomatical breadth	121	125	123
45:8	Transversal facio-cerebral index	91.2	86.8	91.2
46	Midfacial breadth	87	87	89
48	Nasion-alveolare height	56!	69	54!
48:45	Upper facial index	46.1	55.2	43.9

Martin and other codes	Traits	No of grave		
		g.3a	g.2	g.4
48:17	Vertical facio-cerebral index	48.7	54.3	46.1
43(1)	Biorbital chord	91	90	95
sub.n/ 43(1)	Nasion projection over biorbital chord 18.1	15.9	19.3	
77	Nasomalar angle	137	141	135
zm'-zm'	Zygomaxillary chord	86	89	90
sub.ss/ zm'- zm'	Subspinale projection over zygomaxillary chord	21.8	23.7	20.4
<zm'	Zygomaxillary angle	126	124	131
72	Total facial angle	83	89	85
73	Midfacial angle	86	93	89
51	Orbital breadth (maxillofrontal))	39	38	37
51a	Orbital breadth (dacryon)	39	36	36
52	Orbital height	32	33	28
52:51	Orbital index (maxillofrontal)	82.0	86.8	75.7
52:51a	Orbital index (dacryon)	84.2	91.6	77.8
54	Nasal breadth	23	23	24
55	Nasal height	44	51	43
54:55	Nasal index	53.5	45.1	55.8
SC	Simotic chord	10.0	5.9	10.1
SS	Simotic subtense	4.6	3.4	4.5
SS:SC	Simotic index	46.00	57.62	44.55
DC	Dacrial chord	17.1	18.9	20.0
DS	Dacrial subtense	11.9	9.9	10.1
DS:DC	Dacrial index	69.59	52.38	50.50
75	Angle between nasalia and Frankfurt plane	57?	64	62?
75(1)	Nasal protrusion angle	26?	25	23?
60	Alveolar arch length	54	55	47
61	Alveolar arch breadth	56	60	57
61:60	Alveolar index	103.7	109.1	121.2
62	Platine length	44	41	44
63	Platine breadth	33	38	35
63:62	Platine index	75.0	92.3	79.5

by the absolute measurement but in comparison with the transversal diameter of the skull the face breadth should be characterized as medium. The values of angles of horizontal profile points to the wedge shape of the face on both levels. In the vertical plane the facial skeleton is orthognatic. Eye-sockets are narrow, of medium height. The pear-like aperture is very low, narrow but the nose index is high. The

nose bridge is narrow and high. Nose bones are broad and high and project weakly to the profile line.

Burial N4. The skull of a woman aged 18-20. Good integrity. The features of sex dimorphism are distinct. The skull from the burial N4 is morphologically very similar to the skull from the burial N3a which is also proved by measuring characteristics. The visual similarity is so great that it allows to assume that the individuals buried in these two interments were genetically relative. We should especially mention an extremely gracile look of these two skulls.

Burial N5. The skull of a man aged 40-45. Good integrity. The features of sex dimorphism are distinct. The skull is massive, with the distinct relief, with the small lengthwise and big transversal diameters, brachicranic and very low. The forehead is of medium breadth, inclined. The face is very low and broad, a little flattered on both levels. In the vertical plane it is orthognatic by the angle and mesognatic by the index. Eye-sockets are wide and low. The nose is low and broad. The nose bridge and nose bones are broad and high.

Burial N9. The skull of an individual aged 35-45. The skull is gracile. Good integrity. The features of sex dimorphism are discrepant but the sex should be rather distinguished as male. The cranium is short, of medium breadth, mesocranic by the index and very low. The forehead is of medium breadth, straight. The face is very narrow and low, flattered in the horizontal plane on the upper level, in the vertical plane is orthognatic by the general facial angle and mesognatic by the index of face projection. Eye-sockets are of medium breadth, low. The nose is of medium breadth, very low. The nose bridge and nose bones are of medium breadth, not high. Nose bones project moderately to the profile line.

Thus the series is formed by the three male and three female skulls. The average measurements of the skulls from Severnaya Salma are shown in Table 3. Taking into account the small size of the group we should nevertheless point out some of its basic peculiarities.

First of all both male and female skulls are very gracile, most of the lineal measurements should be corresponded to the category of small and very small units. Male craniums are brachcycranic, with small lengthwise and high-altitude but high transversal measurements. Facial skeleton is very low but broad and orthognatic by the index of face projection as well as by the general facial angle. According to the European standard the face is and nose bridge are flattered, the nose projects weakly to the profile line. Eye-sockets and the pear-like aperture are low and broad. Female craniums comparing with female ones are even more gracile and brachicranic, with smaller transversal diameters of skull and face and sharper horizontal profile. The peculiarities of female characteristics are probably distinguished by the mentioned above specific individual features of the skulls from burials NN 3a and 4.

It is obvious that such a small series can not be considered as a representative sample of the Lovozero group of the Kola Saami. For similar reasons it is doubtfully advisable to use statistical methods of analysis for its comparative study. Along with it, assuming that this series consists of the casual representatives of the population

Table 3

The average measurements and indices of the Saami skulls from the Kola Peninsula found in the Severnaya Salma cemetery

Martin and other codes	Traits	Male		Female	
		n	X	n	X
1	Cranial length	3	177.3	3	162.3
8	Cranial breadth	3	144.3	3	136.7
8:1	Cranial index	3	81.4	3	84.3
23a	Horizontal circumference (ophryon)	3	535.7	3	518.3
24	Transversal arch (porion-bregma-porion)	3	308.7	3	281.6
25	Sagittal arch	3	337.3	3	308.7
17	Cranial height (basion-bregma)	3	127.0	3	119.7
17:1	Height-length index (basion)	3	71.6	3	73.5
17:8	Height-breadth index (basion)	3	83.8	3	87.5
20	Cranial height (porion-bregma)	3	111.7	3	107.0
5	Cranial base length	3	95.3	3	91.0
9	Minimal frontal breadth	3	96.3	3	89.3
9:8	Fronto-transversal index	3	66.8	3	65.5
32	Frontal profile angle (nasion)	3	84.3	3	85.0
<g-m	Frontal profile angle (glabella)	3	76.0	3	83.7
—	Transverse frontal angle	3	135.7	3	129.7
10	Maximal frontal breadth	3	120.7	3	107.7
9:10	Frontal index	3	80.0	3	83.1
26	Frontal arch	3	118.7	3	110.7
29	Frontal chord	3	107.0	3	99.0
sub.29	Frontal subtense	3	23.1	3	21.6
—	Frontal convexity index	3	21.6	3	21.6
27	Parietal arch	3	115.0	3	111.7
30	Parietal chord	3	107.7	3	98.3
11	Auricular breadth	3	128.3	3	120.7
12	Occipital breadth	3	111.0	3	103.7
28	Occipital arch	3	116.7	3	102.0
31	Occipital chord	3	93.7	3	86.7
sub.31	Occipital subtense	3	28.8	3	24.2
—	Occipital convexity index	3	30.8	3	27.7
40	Basion-prosthion length	3	95.0	3	89.0
40:5	Face protrusion index	3	94.0	3	97.8
43	Upper facial breadth	3	105.0	3	96.0
45	Bizygomatical breadth	3	134.3	3	123.0
45:8	Transversal facio-cerebral index	3	94.0	3	89.7
46	Midfacial breadth	3	95.7	3	87.7
48	Nasion-alveolare height	3	64.7	3	59.7
48:45	Upper facial index	3	48.1	3	48.4

Martin and other codes	Traits	Male		Female	
		n	X	n	X
48:17	Vertical facio-cerebral index	3	50.9	3	49.7
43(1)	Biorbital chord	3	99.3	3	91.3
sub.n/ 43(1)	Nasion projection over biorbital chord	3	16.0	3	17.8
77	Nasomalar angle	3	144.3	3	137.7
zm'-zm'	Zygomaxillary chord	3	95.3	3	88.3
sub.ss/ zm'- zm'	Subspinale projection over zygomaxillary chord	3	22.3	3	22.0
<zm'	Zygomaxillary angle	3	132.3	3	127.0
72	Total facial angle	3	85.7	3	85.3
73	Midfacial angle	3	88.3	3	88.0
51	Orbital breadth (maxillofrontal))	3	43.3	3	38.0
51a	Orbital breadth (dacryon)	3	41.0	3	36.7
52	Orbital height	3	31.7	3	31.0
52:51	Orbital index (maxillofrontal)	3	73.0	3	81.5
52:51a	Orbital index (dacryon)	3	76.5	3	84.5
54	Nasal breadth	3	26.0	3	23.3
55	Nasal height	3	50.0	3	45.7
54:55	Nasal index	3	52.1	3	51.5
SC	Simotic chord	3	7.73	3	8.67
SS	Simotic subtense	3	3.50	3	4.17
SS:SC	Simotic index	3	45.06	3	49.39
DC	Dacrial chord	3	23.33	3	18.67
DS	Dacrial subtense	3	11.57	3	10.63
DS:DC	Dacrial index	3	49.56	3	57.52
75	Angle between nasalia and Frankfurt plane	1	61.0	3	61.0
75(1)	Nasal protrusion angle	1	25.0	3	24.7
60	Alveolar arch length	3	51.7	3	52.0
61	Alveolar arch breadth	3	61.7	3	57.7
61:60	Alveolar index	3	119.4	3	111.3
62	Platine length	3	45.7	3	43.0
63	Platine breadth	3	35.7	3	35.3
63:62	Platine index	3	78.4	3	82.3

(at least its male part) let us distinguish its morphological peculiarities comparing with other groups.

Comparing the newly received craniological material with the skulls of the Saami from the Kola Peninsula studied previously [Gokhman, *et al.* 1976; Khartanovich 1980] we come to the following three conclusions. First of all, they lie

Table 4

Average measurements and indices of the Kola Peninsula Saami male skulls

Martin and other codes	Tratis	Groups									
		Severnaya Salma		Chalmna-Varra		Pulozero		Varzino		Uokanga	
		n	X	n	X	n	X	n	X	n	X
1	Cranial length	3	177.3	24	177.6	11	180.2	17	177.8	19	180.5
8	Cranial breadth	3	144.3	26	145.5	11	149.4	17	143.1	19	142.7
8:1	Cranial index	3	81.4	24	81.6	11	83.0	17	80.5	18	79.1
17	Cranial height (basion-bregma)	3	127.0	25	130.6	11	130.6	17	129.6	17	134.5
17:1	Height-iength index (basion)	3	71.6	24	73.5	11	72.6	17	73.4	16	73.2
17:8	Height-breadth index (basion)	3	83.8	25	89.9	11	87.5	17	90.6	17	91.3
9	Minimal frontal breadth	3	96.3	26	97.5	11	98.6	17	96.5	20	97.0
32	Frontal profile angle (nasion)	3	84.3	22	81.2	11	82.8	17	81.8	16	81.9
45	Bizygomatical breadth	3	134.3	21	135.9	10	137.7	17	134.2	17	133.1
45:8	Transversal facio-cerebral index	3	94.0	21	93.6	10	92.6	17	93.8	16	93.6
48	Nasion-alveolare height	3	64.7	19	68.0	6	69.8	15	69.6	12	69.4
48:45	Upper facial index	3	48.1	19	50.0	5	50.9	15	52.0	12	52.0
48:17	Vertical facio-cerebral index	3	50.9	18	51.9	6	53.2	15	54.0	11	53.2
77	Nasomalar angle	3	144.3	23	142.0	11	141.3	17	140.7	17	140.3
<zm'	Zygomaxillary angle	3	132.3	18	132.3	10	129.7	16	129.8	13	131.7
72	Total facial angle	3	85.7	16	87.7	10	85.2	15	85.5	12	86.2
51	Orbital breadth (maxillofrontal))	3	43.3	24	42.5	11	42.3	17	41.8	16	42.8
52	Orbital height	3	31.7	23	32.6	11	33.6	17	32.8	16	33.2
52:51	Orbital index (maxillofrontal)	3	73.0	23	76.5	11	79.6	17	78.5	16	77.8
54	Nasal breadth	3	26.0	22	25.5	11	25.3	17	24.5	14	24.5
55	Nasal height	3	50.0	22	51.4	11	51.9	17	51.8	14	50.7
54:55	Nasal index	3	52.1	22	49.7	11	48.7	17	47.5	14	48.7
SC	Simotic chord	3	7.73	23	7.97	11	8.28	17	9.09	16	8.11
SS	Simotic subtense	3	3.50	23	4.15	11	4.19	17	4.61	15	4.63
SS:SC	Simotic index	3	45.06	23	52.65	11	50.23	17	52.44	15	59.78
DS	Dacrial chord	3	23.33	20	22.33	11	21.24	17	21.29	11	20.97
DS	Dacrial subtense	3	11.57	20	12.03	11	11.70	17	12.02	10	11.58
DS:DC	Dacrial index	3	49.56	20	54.18	11	55.23	17	56.76	10	55.41
75(1)	Nasal protrusion angle	1	25.0	16	23.5	6	27.3	14	29.0	9	29.6

within the borders of individual variations of features of other territorial groups' skulls. Next, the skulls from Severnaya Salma are very similar with the series from Chalmny-Varre. And, finally, the specific features of the "Lapps" craniological complex are the most distinct on the skulls from Severnaya Salma (Table 4).

Indeed, the series from Severnaya Salma is brachicranic, the most gracile, with the smallest cranium height not only by the absolute measurements but also with reference of this measurement to the lengthwise and transversal diameters. The facial skeleton is the lowest and the broadest in the general facial part as well as in the nasal and eye-sockets parts according to the absolute measurements and indices[2]. The face, nose-bridge and nose bones flatness is the highest on the upper and medium levels.

The nose projects moderately to the profile line. As it is known, these features (brachicrania, gracileness, low head and face, horizontal face and nose bridge flatness) are the specific features of the "Lapps" craniological complex.

Naturally, there rises the question how to explain such distinctness of this complex in the Severnaya Salma group. As it was already said before this could be a corollary of the fact that this group is very small and not casual. But, from our point of view there could be another explanation. Other series of skulls of the Kola Saami correspond to the XIX — beginning of the XX centuries. At that time the Saami performed intensive contacts with other ethnic groups. Opposite to that the material from Severnaya Salma dates back for about 200 years and, thus, corresponds to the time of more isolated period of the Saami community's existence. Taking this fact into account we can assume that it is these skulls that reflect the most essential and peculiar features of the Lapps' initial craniological type free from admixtures of other anthropological variants.

If this assumption is true and the average values of variables of the Severnaya Salma sample are determined not by the extreme variants but characterize the general totality of at least the Lovozero group of the XVIII century Saami precisely enough, then the peculiarities of the complex of features distinguishing the Saami from the European population as well as from the Asian must have been expressed more distinctly in the "pure" early groups than in the populations closer to our times.

Naturally, the skulls from Severnaya Salma are the most flattered among all the Saami' skulls and are similar to Mongoloids according to these taxonomically important features. On the other hand, this group is the most low-faced one and Siberian Mongoloids are notable for their very big face height. Such a low face also can not be found among European groups of population.

Thus, the newly received skulls of the Saami from the Kola Peninsula, prove the anthropological originality of this folk in relation with europeoid populations as well as with the "classical" (Siberian) mongoloid populations. An extremely specific and discrepant complex of craniological features of the Severnaya Salma series, from our point of view, adjusts with the hypothesis suggesting that the factors of the Lapps' anthropological type formation were not exhausted by mixture of Mongoloids with Europeoids. Most likely the Saami also preserved in their anthropological appearance the features of the ancient formation that differed from the modern representatives of the European and Asian race types.

[2] The absolute measurement of the malar diameter is not the biggest one in the group but the face broadness is expressed in the comparative characteristic of this measurement in relation to the skull breadth.

These are the basic results of the examination of the skulls from Severnaya Salma. They bare a preliminary character and prove the necessity of the further more wide and detailed comparative analysis, involving the data on the Saami' groups from the whole area of this folk spreading. Along with that, the complicity of the "Lapps problem" brings out the question of the actuality of the complex study of the Fennoscandia and north-west Russia population craniology (the territory where the question of the "Lapps" substratum is constant) basing on new methodical and informational data.

Translated by the author

ABBREVIATIONS

AR	– Archeologicke rozhledy, Praha.
AP	– Archeologia Polski, Wrocław.
AJPA	– American Journal of Physical Anthropology, New York.
CA	– Current Anthropology, Chicago.
KSIA	– Kratkiye Soobshcheniya Instituta Arkheologii Akademii Nauk USSR, Moskva.
KSIA (Ukraine)	– Kratkiye Soobshcheniya Instituta Arkheologii Akademii Nauk USSR, Kiev.
KSOGAM	– Kratkie Soobscheniya Odesskogo Gosudarstvennego Arkheologicheskogo Muzeya, Odessa.
MASP	– Materialy po Arkheologii Severnogo Prichernomorya, Kiev.
MIA	– Materialy i Issledovaniya po Arkheologii, Moskva.
SA	– Sovetskaya Arkheologiya, Moskva.
SAA	– Sovet Anthropology and Archaeology, Moskva.
SE	– Sovetskaya Etnografiya, Moskva.

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