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Early Contacts between Uralic and Indo-European: Linguistic and Archaeological Considerations

Papers presented at an international symposium held at the Tvärminne Research Station of the University of Helsinki 8–10 January, 1999

Edited by Christian Carpelan, Asko Parpola and Petteri Koskikallio

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FIN-00170 HELSINKI

Fax +358 9 635 017

tiedekirja@tsv.fi
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FOREWORD

In Finland, such research topics as the origins of the Finnish language, the history and prehistory of peoples speaking Uralic languages, and the questions concerning genetic relationships and areal contacts between the Uralic languages and the other languages of Eurasia, have had great national interest ever since the early 19th century. Starting with Matthias Alexander Castrén, many Finnish scholars have made linguistic, ethnological and archaeological explorations in Siberia. A large number of important linguistic and ethnological studies on these topics have been published in Finland, especially in the several series of the Finno-Ugrian Society, while the once well known Finnish archaeological series *Eurasia Septentrionalis Antiqua* was unfortunately interrupted in the wake of World War II and could not be revived after the death of its founder and editor, A. M. Tallgren.

In recent years a number of conferences and seminars have been arranged in Finland on Uralic or Finno-Ugric ethnohistory. Most noteworthy among them are those held at the two Zoological Research Stations of the University of Helsinki in Tvärminne and Lammi, in 1980 and 1997 respectively, with the titles "The prehistoric roots of the population in Finland" and "The roots of the Finns in the light of present day research". Both were multidisciplinary, with participants representing such fields as linguistics, history, archaeology, ethnology, geology and genetics. The proceedings of these two conferences, *Suomen väestön esihistorialliset juuret* (1984) and *Pohjan poluilla* edited by Paul Fogelberg (1999), published in the series *Bidrag till kännedom av Finlands natur och folk* (volumes 131 & 153) – the latter containing as many as 37 contributions – have become important reference works. Unfortunately they are not very accessible outside Finland, because their languages are almost exclusively Finnish and Swedish.

These meetings have clearly established the fact that Uralic antiquity cannot be properly studied without reference to IndoEuropean studies. In Indo-European studies, too, the importance of Uralic contacts has been recognised. There is a problem, however. Questions related to Indo-European antiquity are studied at many universities in Europe and the United States, but the contacts between Uralic and IndoEuropean peoples have mainly been studied by scholars specializing in Uralic studies, chiefly in Finland, Hungary, Estonia and Russia. Very few scholarly meetings have focused on the relationship between Uralic and IndoEuropean languages and peoples.

Such a meeting seemed particularly called for now when new data and conceptions are emerging in both archaeology and linguistics. We therefore proposed to arrange a threeday intemational symposium on "Contacts between IndoEuropean and Uralic speakers in the Neolithic, Eneolithic and Bronze Age in the light of linguistic and archaeological evidence". The aim was to bring together a number of eminent researchers to present fresh research and examine the results from the point of view of IndoEuropean and Uralic contacts. Methodology, too, has to be discussed: how to make archaeological and linguistic entities and sequences comparable?

The Academy of Finland accepted our proposal, and made funds available for its realization. The Department of Archaeology and the Institute for Asian and African Studies at the University of Finland also supported the project. Ten archaeologists and ten linguists were invited to participate in the symposium. One invited scholar had to cancel his participation at the last moment, but delivered the abstract ofhis proposed paper. Thus in all 21 scholars took part in the meeting, each presenting a paper and participating in the lively discussions. The symposium was held in the congenial and wellllooked-after premises of the Zoological Research Station at Tvärminne on the southernmost coast of Finland from the 8th to the 10th of January, 1999. The isolated and peaceful place made it possible to concentrate fully on the theme, while the scenic landscape, delicious meals, sauna and open fire in the evenings provided a relaxed atmosphere.

The Academy of Finland made additional funds available for the publication of the Proceedings. Petteri Koskikallio, who assisted in the practical arrangements at Tvärminne, could be hired to carry out the technical editing of the Proceedings with his usual skill. The papers by authors whose native language is not English were checked by Gerard McAlester, Robert Whiting and Margaret Stout Whiting. The paper in German was checked by Volker Rybatzki. We too read the papers and made some suggestions for changes. The final

version of each paper (excepting the abstracts) was subjected to the approval of the author.

We thank the Finno-Ugrian Society for accepting the work as a volume of its *Mémoires* series. This will guarantee that the book will find its way to many libraries specializing in the topic of its contents.

As all participants were not able to send their contributions for publication, this left some space available in the Proceedings, and we have taken advantage of this in our joint paper. It is a thoroughly revised and enlarged version of the paper presented by AP at the symposium. There is also another paper that differs from that presented at the symposium. In the symposium, E. E. Kuz'mina discussed the recent discovery of a grave with highly significant contents in Tajikistan. As this find has been published by S. Bobomulloev (1997) E. E. Kuz'mina submitted for publication here another paper, a slightly edited translation of the chapter "Indo-irantsy i finno-ugry" (pp. 248-252) in her book *Otkuda prishli Indoarii?* (Moscow, 1994).

We take the opportunity of thanking all participants for their valuable contributions. It was a great pleasure for us to have you all here, and we are happy if you enjoyed your stay and found the meeting worthwhile. It is the participants who play the chief role in symposia like ours, so if it was successful, it was thanks to you. This also applies to the publication of the symposium, and we cordially thank all the people and institutions who have helped and supported us.

CHRISTIAN CARPELAN
ASKO PARPOLA

P.S. As the reader will soon find out, there is at the moment no consensus conceming many questions dealt with in this book. This fairly reflects the present state of affairs in the field.

PERSISTENT IDENTITY AND INDO-EUROPEAN ARCHAEOLOGY IN THE WESTERN STEPPES[1]

David W. Anthony

THE PROBLEM

In the west, IE studies occupy a peculiar and somewhat suspect place. Although IE linguistics is widely respected, IE archaeology is controversial. Why is this? There are two general reasons. First, many influential archaeologists feel that the phrase "IE archaeology" contains a logical contradiction. How can the reconstructed PIE language, itself an idealized and uncertain creation, be linked to any particular group of ancient tombs and settlements? There is no necessary relationship between the way people speak and the way they make pots or stone tools. The two types of evidence are seen as incompatible. When we make statements about the linguistic affiliation of archaeological cultures, which Russian archaeologists do often, most Western archaeologists and historians raise their eyebrows.

There is a second reason for the coolness of many of our Western colleagues. The dominant schools of thought in Western history and sociology over the last 30 years (Marxism, modernism, and post-modernism) have consistently described pre-modern societies as unstable and unbounded. Even the word "society" is now avoided by some archaeologists, because it implies a concrete

1 The original title of this paper when it was presented in Tvärminne in 1999 was, "Persistent identity in the western steppes: ecological, economic, or linguistic?". My thoughts about the paper changed significantly already in Tvärminne during very stimulating conversations, and continued to change as I revised the paper for publication. As a result, this paper is quite different from the one I presented in Tvärminne. I would like to thank the conference organizers, Christian Carpelan and Asko Parpola, for the excellence of the conference itself and for their patience as I struggled to meet the publication deadline.

singularity that perhaps never existed (Shennan 1989: 6). Ancient social groups are described as polymorphous and fluid, lacking clear boundaries, and unlikely to persist for any length of time. Other than remembered genealogies and religious belief, there were no central institutions that could unify ancient people for very long. And premodern language groups are thought to have been equally fluid, characterized by intergrading local dialects rather than sharp boundaries. Benedict Anderson, Ernest Gellner, Anthony Giddens, Eric Hobsbawm, Michael Mann, and Eric Wolf – some of the most dominant figures in Western history and sociology over the last 30 years – have shared the same image. In their view, ethnicity became a central, stable aspect of political identity only after the evolution of the state. For most of them, this happened after modern nation-states appeared, or after the French Revolution. Only then, in connection with the state, was ethnicity warped into a stable and persistent phenomenon, like the state itself. Few of these eminent scholars have actually examined prehistoric ethnicity closely; none has displayed familiarity with recent archaeological discoveries. Their true interest, the central issue in modern Western historiography, was and is the modern nation-state and its implications. From this perspective, premodern kin-based societies are of only peripheral importance. Ancient ethnicity emerges from the dominant philosophy as a residual normative category, attached to rather simple and passive societies, changeable and fluid, and expressed in imagined bloodlines rather than bounded territories.

If prehistoric ethno-linguistic groups and boundaries really were so fluid and ephemeral, how can we hope to identify any ethno-linguistic territory on the basis of a few potsherds – much less the specific one that was occupied by the (supposed) speakers of Proto-Indo-European? To many of my colleagues, the entire enterprise seems intellectually naïve, or, even worse, politically motivated.

Even if these problems were solved, another would remain. Archaeological approaches to the Indo-European problem have generally been descriptive rather than explanatory. It is easier to describe the location and cultural traits of the homeland than it is to explain how or why PIE expanded. If we cannot provide a convincing explanation for at least the initial phase of language expansion, many Western archaeologists will remain unconvinced by the descriptive evidence.

THE RESPONSE

My response to these serious questions comes in four parts. First, I believe that the dominant view of prehistoric ethnicity is mistaken. Stability, or the maintenance and reproduction of cultural norms over long periods of time, is a real

phenomenon encountered by archaeologists. Stable cultural frontiers, quite possibly ethno-linguistic, did exist in some places in the prehistoric world. Some very clearly marked boundaries of this kind existed on the edges of the Pontic-Caspian steppes, where most of us would locate the Indo-European homeland. Second, the size of language territories can be correlated with material conditions – the type and riskiness of the subsistence economy (Nettle 1996; Hill 1979; 1996). This correlation can be invoked to explain why languages spoken by pastoralists in the Pontic-Caspian steppes should have been distributed over a wide geographic region, in contrast to neighboring languages. Third, the expansion of PIE can be understood in a general way on the basis of ethnographic models that demonstrate how language expansion occurred in the context of pre-modern, kin-based societies (Anthony 1995: 563; Atkinson 1989; Bentley 1981). Finally, the initial expansion of PIE can be understood in this specific case as the result of innovations in transport and economy in the area identified as the PIE homeland after 3500 BCE (Anthony 1995; Mallory 1998; Merpert 1991).

In this paper I will concentrate on the first topic: the problem of stable ethno-linguistic frontiers.

ETHNIC GROUPS AND FRONTIERS

Theoretical argument

Long-lived, stable ethnolinguistic communities of the pre-modern past have been studied by some eminent historians (Smith 1998; Hastings 1997; Armstrong 1982); the subject is less studied among social anthropologists (Spicer 1980: 33-56; Hirsch & O'Hanlon 1995). Archaeologists also have documented stable regional identities and the boundaries between them (Ehrich 1961; Kuna 1991; Stark 1998; Wells 1998; Kristiansen 1998). An example of the kind of problem they address is the linguistic frontier between the Romance-speaking and the Germanic-speaking parts of western Europe (France-Germany), which has been in one place for at least 1000 years, quite possibly 2000 years, without moving more than a few kilometers, in spite of numerous changes in political boundaries (Armstrong 1982: 250). (A "frontier" is defined as a transitional zone, often encountered in pre-modern cultural geography; while a "boundary" is a definite line, usually associated with a centralized state.) The Romance-Germanic frontier of the post-Roman period reproduced an earlier ethno-linguistic frontier between Celtic and Germanic communities in almost the same

location. Ethno-linguistic frontiers like this one can persist despite changes in the content of specific identities over time. What persists is the perception of difference, not an unchanging set of norms.

Armstrong and others have emphasized the importance of cultural frontiers in stimulating and intensifying pre-modern identities. Ancient ethnic communities probably were unaware, in many cases, of the fact that they shared a common group identity until they encountered other people who were different. They knew what they were not before they knew what they were (Armstrong 1982: 5-6; Connor 1994: 102). This transactional interpretation of identity formation, based on Barth (1969), ascribes a kind of creative tension to cultural frontiers. A second factor in the persistence of ethnic identities, emphasized by Smith (1998: 186), was the preservation over long periods of time of shared memories (particularly memories of wars, famines, and other disasters); shared patterns of speech and communication; shared symbols and the values attached to them ("proper" dress, "proper" house forms, "proper" food); and shared myths that explained the cultural meanings of such symbols.

How were persistent ethno-linguistic identities created in the absence of states? Probably in many ways, one of which was by the migration of people with one set of cultural dispositions into an area occupied by different people. Migrations often have played critical roles in producing persistent frontiers between cultural and linguistic regions. For example, a modern frontier survives today in Switzerland between the areas colonized in the Medieval period by German-speakers and French-speakers: Germans moved into the northern cantons, and the kingdom of Burgundy occupied what had been Gallo-Roman western Switzerland (Gallusser 1991). These Medieval colonization events produced a cultural frontier that has been reproduced in various forms until today, when it is an internal frontier within Switzerland, separating ecologically similar regions that continue to differ in language (German-French), religion (Protestant-Catholic), architecture, the size and organization of landholdings, and the nature of the agricultural economy. Similarly, the linguistic and cultural frontier between Wales and Anglo-Saxon England corresponds broadly with the Medieval limit of the Germanic colonization of Britain. The frontier between Brittany and the rest of France marks the limit of the Medieval Celtic colonization of that peninsula. Many other ethno-linguistic frontiers in Europe correspond with the limits of Medieval colonization events rather than the boundaries of relatively young modern nations (Armstrong 1982; Prescott 1987). In eastern North America, the folklorists Kniffen and Glassie (Kniffen 1986; Glassie 1965; Noble 1992) have identified four large cultural-historical

provinces where the four principal dialect regions, the four principal "folk housing" regions, and the four culture areas identified by Fischer (1989) broadly correspond. These ethno-dialect-housing regions were created by four separate migration streams from four different cultural provinces in Britain (Fischer 1989), and later were carried westward across North America by migrations from each of the four eastern core regions. Even in the United States, migrations that occurred centuries ago played an important role in shaping modern regions that continue to differ in dialect, architecture, voting patterns, and to some extent in values.

Migrations, particularly long-distance migrations, are important in the history of ethnolinguistic regions for two reasons. First, both recruitment in the home region and the choice of destination in the target region are often quite tightly focused, so that migration often brings a stream of culturally similar migrants from a specific origin point (in modern migrations it can even be a single neighborhood) to an equally specific destination (Anthony 1990; 1997). Second, long-distance migrations cause contact at the destination between people from quite different backgrounds. Such contacts intensify awareness of ethno-linguistic differences, leading to the production of stereotypes that then become targets for actual social and political behavior. A process like this has been identified in the formation of ethnic identities within modern nation-states (Hobsbawm 1990: 107-109). Why should it not have operated in a prehistoric tribal context?

The content of stereotypical behavior among migrants can be strongly influenced by the identity of the "first effective settlers", who often act as advisors and creditors for later migrants. They therefore leave an inordinate cultural imprint on later generations, which tend to adopt their values, at least publicly (Zelinsky 1973; Noble 1992). The advantage associated with first effective colonization explains why the English language, English house forms, and English settlement types were retained in 19th-century Ohio although the overwhelming majority of later immigrants was German (Wilhelm 1992). It also explains why East Anglian English traits (typical of the earliest Puritan immigrants) continued to typify New England dialectical speech and domestic architecture in the northeastern US even after the majority of later immigrants arrived from other parts of England or Ireland (Fischer 1989: 57-68).

The Northern Iroquois: an example of a stable ethno-linguistic frontier

I would like to conclude this section with an example of a persistent pre-state ethno-linguistic identity that is documented both archaeologically and historically. Eric Wolf argued that pre-state kin-based societies ("kinship associations") were by nature unstable and unlikely to replicate themselves over any great period of time (Wolf 1982: 95-96). He used as one example the Iroquois Indians of northeastern North America, the confederation originally called the Five Nations, or People of the Longhouse (Wolf 1982: 165-170; 1984). The Iroquois were divided at the time of European Contact into five tribes speaking at least three, perhaps five closely related Northern Iroquoian languages (Seneca, Mohawk-Oneida, and Onondaga-Cayuga). On two sides (north and east) the Five Nations occupied an ethnolinguistic frontier with tribes that spoke languages of a different family, Algonkian. The Algonkian-speakers lived in different kinds of houses, made different kinds of ceramics, had a different settlement pattern, and relied more than the Iroquois on fishing and hunting for their food (Chilton 1998).

Wolf argued that there was no stable Iroquoian identity beyond a loose association of local groups before Iroquoian Contact with European nation-states. After Contact, the Iroquois soon became something like a multi-ethnic trading company, quite different from a tribe or "ethnic group" (Wolf 1982: 167). Wolf cited 17th-century European sources that described many Contact period Iroquoian towns as consisting principally of neighboring non-Iroquois who had been adopted (Wolf 1982: 169; 1984: 394), and observed that the post-Contact situation was much more fluid and variable than the European label "Iroquois" might imply.

Wolf's interpretation seems to suggest that biological purity is a prerequisite for a stable cultural identity, a notion that is clearly false. Surely the important thing was how the adoptees behaved. Rituals of adoption insured that most of the non-Iroquoian adoptees lived, acted, and spoke like Iroquois, as detailed descriptions make clear (Richter 1992: 68-73). Those who did not assimilate faced death. Also Wolf was unaware that archaeologists have documented five distinct settlement clusters going back centuries before European contact, to at least 1200/1300 CE, in the locales where the Five Nations – or tribes – of the Northern Iroquois were living at the time of Contact (Bradley 1987; Tuck 1978; Snow 1994). The Five Nations lived in their traditional territories for centuries before most of the nation-states of Europe existed.

Together, they consistently produced a material culture, economy, house type, and settlement organization different in many ways from those of their Algonkian-speaking neighbors (Chilton 1998). The Five Nations had relatively stable regional identities in the context of a broader ethno-linguistic Northern Iroquoian identity that was equally persistent. And if Snow's (1995; 1996) recent views on Iroquoian origins are correct, that ethno-linguistic identity might have crystallized in the process of a northward migration by pioneer Proto-Northern Iroquoian maize farmers around 900-1000 CE.

American archaeologists have documented similar pre-Contact histories for other Contact-Period tribal groups in North America (Kwachka 1994 contains several such studies from the American Southeast). Equally deep regional pre-histories have been traced by archaeologists for some tribal groups in Africa (Huffman 1989). It seems clear that ancient ethno-linguistic identities, stimulated by the self-awareness that resulted from sustained contact with very different Others, existed and persisted for centuries in some parts of the pre-modern world.

ARCHAEOLOGICAL EVIDENCE OF CULTURAL FRONTIERS IN THE INDO-EUROPEAN HOMELAND

The location of the Indo-European homeland

For the purposes of this paper, I will assume that the problem of the location of the Proto-Indo-European homeland has been solved. The key elements in the solution are these:

a. Proto-Indo-European exhibits evidence of semantic borrowing and perhaps deeper archaic genetic relationships with Proto-Uralic (see other papers in this volume). It exhibits evidence of weaker but still clear contacts with an ancestor of the South Caucasian protolanguage, Proto-Kartvelian (Nichols 1997). Therefore the Proto-Indo-European homeland was located somewhere between the Urals and the Caucasus, probably closer to the Urals.

b. Proto-Indo-European contained terms for wheeled vehicles. Wheeled vehicles were not invented until after about 3500 BCE. Therefore a phase of Proto-Indo-European, probably a late phase, judging by the o-stems in the wheeled-vehicle vocabulary, existed after 3500 BCE (Anthony 1995; Mallory 1996). The dialectical PIE ancestor of Anatolian, which contains just one certain PIE wheeled-vehicle term, might have separated before this date.

c. The Proto-IndoEuropean homeland was located between the Urals and the Caucasus, a region dominated ecologically by the Pontic-Caspian steppes, probably between about 4000 and 3000 BCE, with wheeled vehicles being adopted during the late phase of PIE, after about 3500 BCE.

The archaeological cultures that occupied the Pontic-Caspian steppes between 4000 and 3000 BCE were of two different types from two chronological periods. During the earlier period, before about 3500 BCE, the Late Eneolithic cultures of the Pontic-Caspian steppes were somewhat heterogeneous. The Sredni Stog culture occupied the Dnieper-Donets region; related but somewhat different cultures of the "extended-burial" and Lower Mikhailovka type occupied the drier Dnieper-Azov steppes to the south; and the Don-Volga steppes were occupied by cultures of the Repin and Late Khvalynsk types. All these kept domesticated cattle and sheep; the role of agriculture in their economies is poorly investigated. They shared some features and seem to have communicated with each other. But they also exhibited a variety of local peculiarities in burial customs, pottery, and tools.

After about 3500 BCE, during the steppe Early Bronze Age, much of the Pontic-Caspian steppe region witnessed the emergence and spread of the Yamnaya culture (Merpert 1974; 1991). Yamnaya continued the cattle and sheep-herding economies of the Eneolithic, but seems to have adopted a much more mobile way of life. Only a few Yamanya settlements are known – none has been found east of tbe Don. The Yamnaya culture is documented largely through its cemeteries. The new, broadly shared mortuary ritual was burial in a roofed pit beneath an earthen mound, or kurgan. This form of burial was reserved for just a few important people, usually males, almost everywhere (except the Kuban steppes, where many women and children were buried in kurgans of the Novotitorovskaya type – see Gej 1990). The spread of kurgan cemeteries was associated with the adoption of wagons, the spread of an active copper and arsenical bronze metallurgy, and the adoption of a more mobile form of herding economy. Wagons, probably pulled by oxen, and horses, probably ridden, gave the Yamnaya people the ability to expand the scale of grassland herding and this led to their increased mobility. Given its geographic and chronological placement, the Yamnaya culture probably can be equated with some aspect of the Late Proto-IndoEuropean language community.

Am I making an unsupportable equation between language and material culture by equating Yamnaya with Late PIE? No. Late PIE can be placed in the Pontic-Caspian region after 3500 BCE on purely linguistic criteria. Yamnaya just happens to be in the right place at the right time. But the equation of Yamnaya

with some aspect of the Late PIE language community does help to solve other problems. First, we know in a general sense how the economy of Late PIE-speakers was structured, because the economy of the Yamnaya culture has been studied archaeologically. Second, early PIE can be equated with a pre-Yamnaya archaeological culture or cultures of the Pontic-Caspian region, before 3500 BCE. Early PIE should have been spoken among the ancestors of the Yamnaya culture. Were there were sharp, persistent cultural frontiers among the pre-Yamnaya cultures of the Pontic-Caspian region – frontiers that might reasonably be interpreted as ethno-linguistic? In fact there were.

The western boundary of the Pontic-Caspian region

In the North Pontic region, north of the Black Sea, the most stable and persistent cultural frontier in prehistoric Europe separated the cultures of the Pontic-Caspian steppes, on the east, from those of the East Carpathian piedmont, on the west (Mallory 1998: 182; Kośko 1985; 1991). The original frontier was created when Neolithic Criş-culture farmers migrated from the lower Danube valley into the East Carpathian piedmont around 5800 BCE. They moved as far east as the Prut River valley, where they met a dense and thriving population of indigenous foragers, the Bug-Dniester culture (Tringham 1971; Markevich 1974; Dolukhanov 1978; Telegin 1987; Zbenovich 1996; Lillie 1996).

The Prut frontier remained stable for several centuries. People and trade goods moved back and forth across it, but it continued to separate two cultural regions that differed in pottery traditions, house form, stone tools, economy, and history. Domesticated cereals, cattle, and pigs diffused into Bug-Dniester settlements, but domesticated sheep (non-native animals) were rejected, and Bug-Dniester people continued to rely on hunting and fishing for much of their diet. Ceramic technology was adopted from the Criş immigrants, but Bug-Dniester potters quickly created their own pottery forms and decorative motifs.

When Linear Pottery traditions replaced those of the Criş culture in the East Carpathian piedmont, about 5400 BCE, Linear Pottery villages pushed eastward to the Dniester Valley, which now became the frontier between Late Bug-Dniester societies and the farmers to the west. Finally, around 5200/5100 BCE, a complex process of ecological degradation in the Prut-Dniester region and renewed cultural interchanges between Late Linear Pottery farmers and the Late Boian societies of the Lower Danube valley resulted in the crystallization of a new cultural complex, Cucuteni-Tripolye, in the East Carpathian piedmont. Cucuteni Tripolye villages expanded eastward across the old Bug-Dniester terri-

tory to the Dnieper River valley. A new frontier was established there that lasted for 1500 years, until about 3500 BCE.

The Dnieper frontier reproduced the divide that was first established at the Prut, between Danubian societies of Gimbutas's (1991) "Old European" cycle and indigenous North Pontic societies descended from the local Upper Paleolithic population. For more than 2000 years this frontier separated fundamentally different kinds of societies at the western edge of the Pontic-Caspian region. The Cucuteni-Tripolye culture differed from those east of the Dnieper – initially Dnieper-Donets, and then Sredni Stog – in house form, settlement size, settlement organization, economic organization, ceramic forms and decoration, ceramic pyro-technology, metallurgy, burial rituals, and domestic rituals centered on female figurines. The Dnieper River emerged as the most contrastive and clear cultural frontier in all of Europe, and it remained one for 1500 years, until about 3500 BCE. To give just one concrete example: around 3800-3600 BCE, Tripolye C1 towns in the Dnieper-South Bug highlands grew to remarkable sizes, containing over 1500 large structures (many two-storied) arranged in ovoid concentric rings, covering 350-400 ha. (Shmagli & Videjko 1987; Videjko 1990). Broadly contemporary Sredni Stog settlements such as Dereivka and Moliukhor Bugor on the Dnieper contained two to three domestic structures, smaller and of much simpler and flimsier construction than Triploye houses (Telegin 1986; Danilenko 1959). Outside the Sredni Stog settlements were small cemeteries of flat graves. The Triploye people did not have cemeteries – we do not know what they did with their dead. Sredni Stog and Tripolye were dissimilar in almost every way.

With the evolution of the Yamnaya culture in the Pontic-Caspian steppes, after about 3500 BCE, the Cucuteni-Tripolye culture began a centuries-long period of transformation. Large towns disappeared, as also did substantial wattle-and-daub houses, painted pottery, and female figurines. The production of metals declined, and cemeteries appeared. By 2500 BCE the societies of the East Carpathian piedmont were not so very different from those of the North Pontic steppes.

Because it was reproduced so vividly for so long, the "Old Europe/North Pontic" frontier probably was ethno-linguistic as well as material. The western "Old European" cultures had distinct origins and histories, not just different pot types. The migrations that established Old European cultures in the Carpathian piedmont should have been a powerful stimulus to ethno-linguistic differentiation, and the principle of first effective colonization explains why later genera-

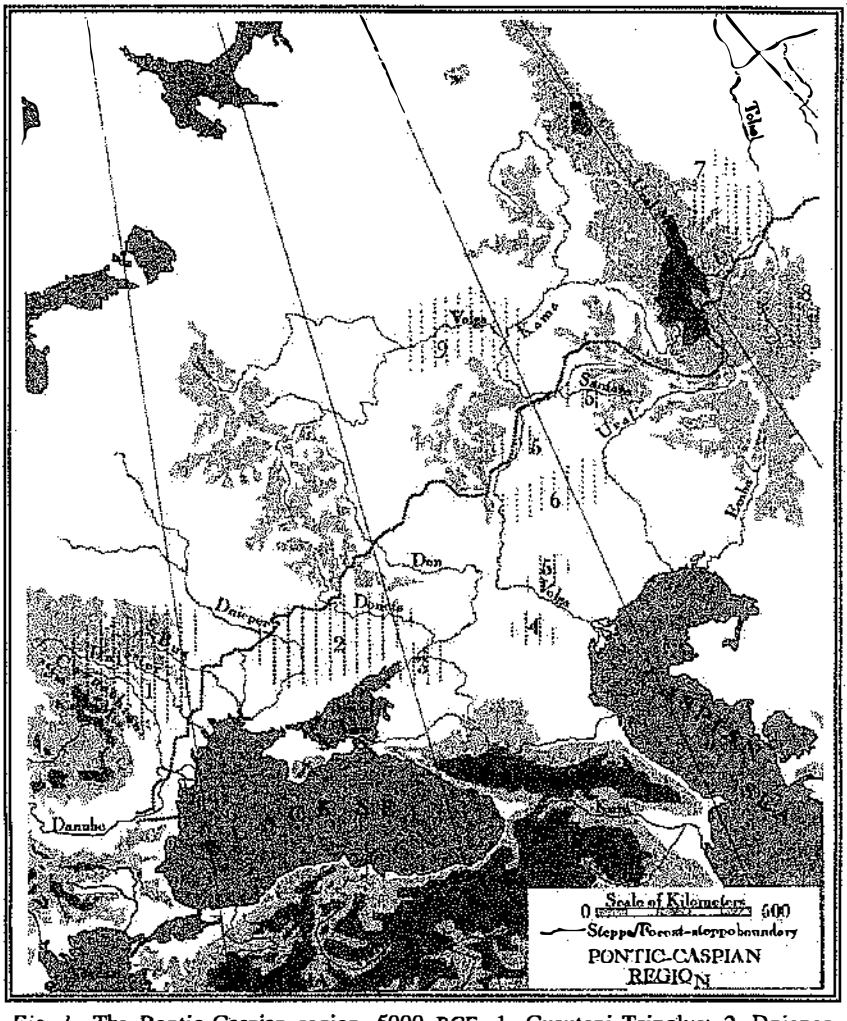

Fig. 1. The Pontic-Caspian region, 5000 BCE. 1. Cucuteni-Tripolye; 2. Dnieper-Donets; 3. Rakushechni Yar; 4. Dzhangar; 5. Khvalynsk and related groups; 6. Varfolom'evka; 7. Koshkinskij; 8. Makhandzhar; 9. Lyalovo.

tions of Tripolye farmers continued the Old European traditions of the first pioneers. The frontier itself should have continuously reinforced perceptions of difference – a realization of what we are not – which would have intensified the reproduction of distinct identities.

Given the linkages between PIE, Proto-Uralic and Pre-Kartvelian, early PIE probably was spoken on the eastern side of this cultural frontier. This observation situates PIE among the Pontic-Caspian societies east of the Dnieper.

The northern boundary of the Pontic-Caspian region

North of the Pontic-Caspian steppes there was a transitional ecological zone of open woodlands and meadows, then farther north broadleaf forests grew from the East Carpathians to the southern Urals. At the end of the last Ice Age hunters followed the retreating glaciers northward, colonizing the newly-emerged northern forests. Their descendants were the hunters and fishers of the forest zone. Among them were the speakers of Proto-Uralic. PIE and Proto-Uralic influenced each other and perhaps shared a distant common origin, as discussed in other papers in this volume.

The first and most important difference between the Pontic-Caspian cultures and those of the southern Ural forest zone was economic. A food-production economy based on domesticated cattle and sheep diffused across the Pontic-Caspian steppes, from the Dnieper to the Volga-Ural region, between about 5200-5000 BCE. In the western part of the Pontic-Caspian region, Early Eneolithic societies also cultivated some grain (wheat, barley, millet) between about 5200-4500 BCE (Pashkevich 1992). In the eastern part of the Pontic-Caspian region, no evidence for grain cultivation has yet been found among Early Eneolithic/Late Neolithic cultures (Varfolom'evka/Orlovka, Khvalynsk, Samara). But domesticated cattle and sheep were widely adopted after about 5200/5000 BCE (Vasil'ev 1981; Telegin 1987; Yudin 1988; 1998).

The hunters and fishers of the Ural region forest zone did not adopt domesticated animals until between about 2500 and 2000 BCE, almost 3000 years later than Pontic-Caspian societies (Potëmkina 1995; Kovalëva & Chairkina 1991). It is not clear why this economic frontier existed for such a long time. The explanation might be cultural rather than economic. The ceramics of the Pontic-Caspian region were somewhat different from those of the southern Ural forest zone as well. In the Pontic-Caspian Eneolithic there were several distinct regional ceramic traditions, but all included "collared" vessel forms – pots with a thickened rim, which were not common in the forest zone. The custom of cemetery burial was common in the Pontic-Caspian steppes from at least 5200 BCE, and was uncommon in the forest zone until much later. Together with the economic evidence, these contrasts suggest that the Pontic-Caspian steppes operated as a diffusion field within which customs spread relatively quickly; while the forest zone cultures participated in a somewhat separate communication network.

At the same time there were clear interpenetrations between the two zones. Some local Pontic-Caspian groups of the Early Eneolithic, such as Dzhangar in

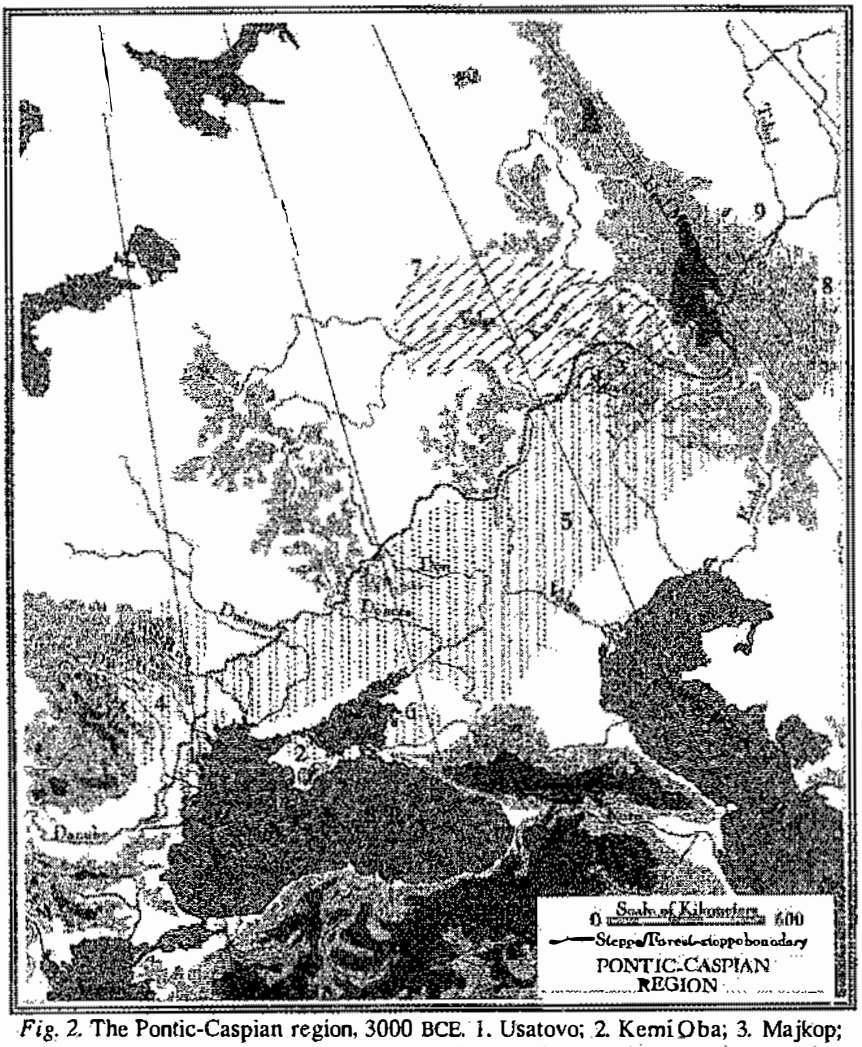

Fig. 2. The Pontic-Caspian region, 3000 BCE. 1. Usatovo; 2. Kemi Oba; 3. Majkop; 4. Late Cucuteni-Tripolye; 5. Yamnaya; 6. Novotitorovskaya; 7. Volosovo/ Garin; 8. Tersek; 9. Surtanda/Ayatskij.

the North Caspian steppes, have ceramics that look very similar to ceramics of the east Ural (Zaural) forest zone (Koshkinskij type) (Kovalëva 1993; Kovalëva & Chairkina 1991). But in general, the societies of the Pontic-Caspian steppes slowly became increasingly distinct from those of the Ural forests, beginning about 5200 BCE, with the adoption of herding economies in the steppes.

After 3500 BCE, with the evolution of the Early Bronze Age Yamnaya culture in the steppes, the cultural contrasts between Pontic-Caspian and forest-

zone cultures reached their sharpest point. In boundary regions such as the Samara River valley, sites of both types (Volosovo/Garin and Yamnaya) are found, but they remained quite distinct. Very few domesticated animal bones (one or two cattle) occur in the Volosovo sites (Petrenko 1984: 149), and they have a distinct type of pottery and ground stone tools (large polished gouges and axes). Although Volosovo people lived by hunting elk, bear, deer, and horses, and seem to have practiced a bear cult (Tsvetkova 1990), they also made pit houses, rectangular with a tunnel entry, that imply a more settled way of life than Yamnaya. No Yamnaya house has ever been found east of the Don River.

The steppe/forest economic frontier finally began to dissolve after about 2500 BCE, in the steppe Middle Bronze Age, with the appearance of eastern Corded Ware cultures (Fatyanovo, Balanovo, Abashevo) in the southern forest zone west of the Urals (Pryakhin 1980). Domesticated cattle and sheep began to appear in forest-zone sites more regularly. Around 2200-2000 BCE, during the final MBA, Potapovka evolved in the northern steppes west of the Urals and Sintashta-Arkaim east of the Urals (Vasil'ev, Kuznetsov & Semenova 1994; Zdanovich 1997; Gening, Zdanovich & Gening 1992). These cultures seem to have pulled the Ural forest zone cultures actively into the central Eurasian economy, which in the Late Bronze Age became based on the large-scale mining of copper and the production of bronze. Potapovka and Sintashta-Arkaim probably can be equated with early Proto-Indo-Iranian. Linguistic borrowings into the Uralic languages from Proto-Indo-Iranian probably date from this period. These borrowings included economic terms such as the terms for 'ewe' and 'butter' (see Koivulehto's article in this volume), reflecting the fact that domesticated cattle and sheep were widely adopted into forest-zone economies through contacts between Abashevo-Potapovka-Sintashta on the one hand and Ural-region foragers on the other, after about 2200 BCE (Kovalëva & Chairkina 1991).

The eastern boundary of the Pontic-Caspian region

The eastern boundary of the Pontic-Caspian region is defined by a series of natural barriers. From south to north, these are the Caspian Sea, the deserts of the North Caspian depression, and the southern Ural Mountains. Between the slopes of the southern Urals and the North Caspian deserts there is a corridor of grassland about 200 km wide, a natural gap through which most east-west travel and communication passes. This north-south series of natural barriers has always been a cultural frontier; today it is the nominal boundary between Europe and Asia.

The herding economies that were so quickly adopted across the Pontic-Caspian region after 5200 BCE failed to interest the people of the North Kazakh steppes, east of this boundary. An economic frontier emerged between the Volga and Ural Rivers, separating Pontic-Caspian herders of the Khvalynsk and Samara types from North Kazakh hunter-fishers of Makhandzhar and Atbasar types (Kislenko & Tatarintseva 1999). This frontier is doubly interesting because it was not ecological; a continuous east-west corridor of grassland linked the two regions. Yet herding economies remained confined to the western steppes from 5200 to at least 3500 BCE.

Volga-Ural archaeologists have identified a cultural frontier in this location as old as the Late Mesolithic, before 6000 BCE. The Late Mesolithic stone tool industries east of the Caspian and those west of the Caspian were different (Vasil'ev, Vybornov & Comarov 1996: 23). The failure of herding economies to diffuse east of this frontier might again have been caused by a separation between two ancient and persistent communication networks and diffusion fields, perhaps based on different languages or language families as well as other cultural dispositions.

Subsistence economies east of the frontier began to shift about 3500 BCE, with the sudden emergence of the Botai culture and its cousins (Tersek, Surtanda) in the North Kazakh steppes. Botai-Tersek exhibited new traits in stone tools and pottery, but these seem connected with the northern forest zone, not with the western steppes. In subsistence economy, the remarkable aspect of Botai was its unprecedented and overwhelming dependence on horses (Zajbert 1993; Logvin 1992; Levine 1999). The core of the Botai-Tersek economy was horse-hunting or horse-herding, depending on whether one sees the Botai horses as domesticated or wild. We have found wear made by a bit on the teeth of at least three Botai horses, which strongly indicates that some Botai horses were ridden regularly (Brown & Anthony 1998). It is possible that the Botai-Tersek people borrowed the idea of horseback riding from the Yamnaya culture of the western steppes. In addition, some Surtanda and Tersek sites contain a few domesticated cattle and sheep bones, although the percentages are very small (less than 5%). Despite the apparent adoption of riding, in almost all other respects Botai-Tersek-Surtanda remained quite distinct from Yamnaya, in ceramic technology, forms and decorations; mortuary rituals; house form and settlement type; metallurgy; and subsistence economy.

West of the frontier, in the Volga-Ural steppes, Yamnaya pottery and grave forms changed over the centuries, and the forms that emerged after about 2700/2500 BCE are categorized as Poltavka. Poltavka was a post-Yamnaya daughter

culture of the Volga-Ural region, quite similar to Yamnaya in many ways (Kuznetsov 1991). Some Poltavka groups finally crossed the Ural boundary. Poltavka kurgan graves have been found east of the Urals at sites such as Aleksandrovskij IV south of Chelyabinsk, near the place where the fortified settlement of Arkaim was later built (Ivanova 1995). Poltavka and Abashevo influences were fundamental in the formation of the Sintashta-Arkaim culture east of the Urals after about 2200-2000 BCE.

The Ural frontier really disappeared when Sintashta-Arkaim sites appeared south of Chelyabinsk, a clear penetration of western-steppe cultural practices into the steppes east of the Urals (Zdanovich 1997; Vinogradov 1995). Sintashta-Arkaim people lived in compact, strongly fortified settlements; drove chariots and buried them in some rich graves; buried their dead in kurgan cemeteries with elaborate sacrifices of horses, cattle, and sheep; and practiced a very active copper and bronze metallurgy. Sintashta-Arkaim, east of the Urals, was quite similar to Potapovka west of the Urals; both were outgrowths from a Poltavka-Abashevo core. Both Sintashta-Arkaim and Potapovka entered into very active relations with northern forest-zone cultures; it was at this time that these cultures adopted cattle and sheep herding as a regular part of their economy. In addition, from its core area on the upper Tobol River, Sintashta-Arkaim expanded eastward across the northern steppes into the old Botai region, where the local variant is called Petrovka (Zdanovich 1984). Later (beginning ca. 1800 BCE) Alakul-type Andronovo evolved from Sintashta-Arkaim-Petrovka origins (Kuz'mina 1994). Alakul-Andronovo sites were numerous in the former Sintashta-Arkaim region and in central Kazakhstan; they extended as far east as the Altai. Andronovo ceramics have been found in the fortified cities of Bactria and Margiana, on the edge of the Iranian plateau and at the gateway into India, in deposits dated 1800-1500 BCE. Some aspect of Andronovo almost certainly can be associated with the spread of Iranian or Indo-Iranian languages across Central Asia and into India and Iran between about 1800 and 1500 BCE – again, the material culture complex happens to be in the right place at the right time (Kuz'mina 1994; Mallory 1998; Parpola 1998).

The southern boundary of the Pontic-Caspian region

The southern boundary of the Pontic-Caspian region was defined largely by two natural features: the Black Sea and the North Caucasus Mountains. Although some boat traffic probably occurred along the shores of the Black Sea as early as the Late Mesolithic, it seems to have been strictly local. The Black Sea was a

barrier to long-distance, inter-regional movement and commerce until about 3000 BCE, when contacts between the North Caucasus (Majkop), the Crimea (Kemi-Oba), and the Danube-Dniester steppes (Usatovo) intensified, perhaps through the medium of maritime trade.

The North Caucasus mountains were home to a variety of cultures that often interacted with the Pontic-Caspian steppe cultures, but still remained quite distinct. The North Caucasus piedmont was an ecologically rich upland environment overlooking an arid steppe. It was natural for the people of the two contrasting ecological zones to seek resources from each other, and this led to cultural interaction between the two regions. Many Russian and Ukrainian archaeologists have seen the North Caucasus as a gateway through which influences from the civilizations of the Near East repeatedly penetrated the Pontic-Caspian steppes (Vasil'ev, Vybornov & Comarov 1996; Shnirelman 1992; Korenevskij 1992). Such ideas have been advanced to explain the origin of Pontic-Caspian microlithic tool traditions in the Late Mesolithic (said by some to derive from Natufian people of Palestine who migrated across the Caucasus and into the steppes); and the origin of domesticated cereals and sheep in the Eneolithic (said to derive from Near Eastern farmers who migrated across the Caucasus); and the origin of Majkop metal and ceramic types in the Early Bronze Age (said to derive from migrants from Late Uruk colonies in eastern Anatolia). There is very little actual evidence that such south-to-north migrations ever occurred. It is more likely that most of the traits in question evolved locally or, in the case of non-native species such as sheep, were diffused northward over long periods of time through intermediate Caucasian cultures.

Several competing chronological and culture-historical systems have recently been proposed for the North Caucasus region (Trifonov 1991; Nekhaev 1992; Markovin 1994). The Eneolithic cultures, prior to 3500 BCE, have been thoroughly reinterpreted and the new framework is still debated. Grave inventories from Eneolithic burials scattered between the North Caucasus and the Volga-Don steppes document an early phase of contact and interaction between the steppes and the North Caucasus, before 3500 BCE, perhaps as early as the Khvalynsk period (Kiashko 1987; Nechitajlo 1996). After about 3500 BCE the Majkop (or pre-Majkop) culture began to develop in the North Caucasus; settlements such as Galiugai represent this early Majkop phase (Korenevskij 1993). Majkop interacted with the emerging early Yamnaya culture and its southern (Don-Manych) variants (Nechitajlo 1996; 1991; Trifonov 1991). Konstantinovka, a settlement on the lower Don, has been termed a Majkop 'colony', although local steppe ceramic types are predominant there; and graves that contain

Majkop-culture assemblages are occasionally found as far north as the Elista steppes (Shilov & Bagautdinov 1998). The Late Majkop culture and its wealthy North Caucasian cousins continued to interact with steppe societies for more than a thousand years, through the first half of the third millennium BCE.

The Majkop culture was a frontier culture in several ways. Majkop burial mounds were similar (but not identical) to those of the kurgan tradition of the early Yamnaya culture, while Majkop ceramic types, settlement types, metallurgy, ornaments, and economy were distinct from those of the steppes. In these many respects Majkop was more similar to the Kura-Araxes culture of Trans-Caucasia, to the south. Some early Majkop chiefs were buried in extraordinarily rich kurgan graves, and these elite burials contained some gold and silver objects that have been compared to Near Eastern prototypes – particularly silver sheet vases with repousse decorative scenes, including the goat/tree-of-life motif; and silver grave canopy rods topped by cast golden bulls (Gimbutas 1956: 56-66, pls. 9-12). It is possible that these prestige display items reflect some kind of influence from and contact with Late Uruk colonies in upland eastern Anatolia, but these sites were quite far away, and the intermediary links in such a hypothetical chain have not been identified. (Kura-Araxes sites between eastern Anatolia and the North Caucasus do not exhibit similar southern influences.) Still, the frontier position of Majkop does seem to be reflected in its material culture, which shows possible influences from the steppes to the north, the Trans-Caucasian cultures to the south, and perhaps the higher civilizations far to the south. The wealth of the Majkop chiefs might have been based on their "middleman" position in a north-south trade system involving copper and pastoral products.

The archaeological evidence for contacts between Yamnaya and Majkop might be compared with the linguistic evidence for contacts between PIE and the Caucasian languages, particularly South Caucasian or Kartvelian. As Nichols (1997: 127) has shown, PIE borrowed some vocabulary from an ancestor or relative of Proto-Kartvelian, not from Proto-Kartvelian itself. Proto-Kartvelian probably was spoken in what is today Georgia – this is where the Kartvelian languages are spoken today. Speakers of PIE borrowed vocabulary from a related group that might be identified with some aspect of the early Majkop culture.

CULTURAL FRONTIERS AND INDO-EUROPEAN ORIGINS

Linguistic evidence suggests that Proto-Indo-European was spoken in the Pontic-Caspian region between about 4000 and 3000 BCE. Archaeological evidence indicates that the Pontic-Caspian steppes constituted a well-defined cultural region during this period, bonnded on the west, north, east, and south by quite different cultures with different historical trajectories. People, animals, and trade goods moved between these cultural regions, but upon crossing a major cultural frontier they were incorporated into a distinct structure of behaviors, traditions, and economies. One of the remarkable aspects of the Pontic-Caspian region is the persistence of these distinct regional identities and the well-defined frontiers between them over thousands of years. While the content of the various regional identities changed and evolved over time, it did so within limits established by local tradition and local history, and the frontiers between regions remained surprisingly stable.

These persistent cultural-economic frontiers might well be the archaeological reflection of ancient language families. In Medieval Europe, frontiers between major linguistic regions (Romance/Germanic, Germanic/Slavic, Celtic/Germanic) remained relatively stable over hundreds of years in spite of rapid changes in political boundaries; while dialectical frontiers within Romance or Germanic shifted more easily (Armstrong 1982: 250-272). The Northern Iroquoian/Algonkian linguistic boundary, which separated two language families, was clearly reflected in material culture boundaries for hundreds of years. Material culture cannot be equated with language as a general rule, but in the specific situation where there is a persistent cultural-economic frontier between regions that have very different deep histories, it is likely to be a linguistic frontier as well.

Recent studies by linguists (Hill 1996; Nettle 1996) suggest that the size of language territories is linked to the riskiness of the subsistence strategy. People who have a very productive, predictable economy (wealthy farmers, for example) need few external alliances and tend to speak a single, localized language; while people who are less certain of their local economy (pastoralists, poor farmers) need external alliances and tend to speak multiple dialects or languages extending over larger areas. In the Pontic-Caspian region, the early adoption of cattle and sheep herding about 5000 BCE, accompanied by some grain cultivation in Ukraine, might not have involved additional economic risks because these food production activities were added to a relatively productive foraging economy. However, during the Yamnaya period (3500-2500 BCE) there was a

widespread shift to an economy more reliant on mobile pastoralism and less reliant on localized hunting. This shift might well have brought with it increased economic volatility – the potential for both rapid increase and sudden loss that is inherent in pastoralism. Under these conditions there would have been a tendency to extend alliances and share language codes over larger areas.

Early PIE might have been a set of related dialects spoken in some localized part of the Pontic-Caspian region before the emergence of the Yamnaya pastoral economy. Management of the new, more mobile pastoral economy seems to have been linked with economic and religious integration across the Pontic-Caspian steppes after about 3500 BCE. The political management of seasonal migrations and grazing rights between neighboring groups would have been facilitated by the diffusion of shared rituals, myths, and symbols. Late PIE probably was first a prestige dialect among Yamnaya chiefs and then was adopted by local Pontic-Caspian populations through a process of political clientage and emulation (see Atkinson 1989 for a similar model).

Outside the ancient diffusion field of the Pontic-Caspian region, the expansion of PIE must be understood as a different kind of process. Expansion to the east of the Ural frontier after about 2200-2000 BCE seems to have been accompanied by chronic warfare – certainly the Sintashta-Arkaim settlements were heavily fortified and the graves seem to reflect a warrior ideology – and perhaps in this context a true ethnos emerged, an Indo-Iranian identity. Expansion to the west, into Europe, probably began earlier and followed two different tracks. North of the Carpathians there is no archaeological trace of a westward migration from the steppes, so the spread of Indo-European dialects across the North European plain probably was a gradual diffusionary process. In the Danube valley there is clear archaeological evidence of Yamnaya migrations from the Ukrainian steppes into northern Bulgaria and eastern Hungary about 2900-2700 BCE (Panaiotov 1989; Nikolova 1994). Perhaps the ancestors of pre-Proto-Celtic and pre-Proto-Italic were dialects associated with these migrations.

Much of what I have said in this paper will seem obvious to my CIS colleagues, who have been employing culture-area concepts for a long time. In the West, however, the concept of pre-state culture areas and the stable regional identities they imply has been under attack for 30 years. While it is not my intention to return to an uncritical acceptance of the culture area concept in archaeology, I do hope to encourage a dialogue about stable regional identities and persistent cultural frontiers in specific cases, specific places, and under specific conditions in the prehistoric past.

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LATE PALAEOLITHIC AND MESOLITHIC SETTLEMENT OF THE EUROPEAN NORTH – POSSIBLE LINGUISTIC IMPLICATIONS

Christian Carpelan

INTRODUCTION

The aim of this essay is to outline a scenario for the emergence of the groups of people historically identified as speakers of Uralic/Finno-Ugric languages.

In the archaeological material, it is possible to distinguish areal typological distributions or entities, such as cultures, and waves of influence between them. There is no consensus about what, exactly, an archaeological culture stands for in relation to a past reality. For the present topic, I describe an archaeological culture as a sphere of internal communication probably based on a common identity (i.e. a cultural and/or ethnic identity, although the concepts of culture and ethnicity are problematic, as is, perhaps, the notion of identity). This presumes the existence of a common language for communication and, in addition, such a sphere probably corresponds with a mating network. (Cf. Carpelan 1999a.)

A wave of influence means the diffusion of cultural traits, transmitted (1) by contacts between groups, e.g. exchange of gifts or trade, or (2) by movement of people, e.g. infiltration or migration (the notions and terminology used by archaeologists to describe different kinds of demic movement often seem inadequate). While exchange and trade spread various, often task-specific artefacts and materials, demic movement is likely to spread whole cultural contexts. In the study of demic movements it is important to find the triggering factor. However, it is often difficult to understand the character of archaeological waves of influence.

A tentative correlation of archaeological and linguistic sequences is possible assuming that archaeologically discernible waves of influence have transmitted linguistic influence as well. Linguistic influence includes loanwords referring to objects and other aspects of the material culture the remains of which are found at archaeological sites. The same waves of influence have probably transmitted genetic matter as well.

The dates quoted here are generalised radiocarbon ages before present (BP, radiocarbon years before AD 1950). The radiocarbon ages are calibrated according to the 'Original Groningen Method' based on cumulative probability analysis, included in the Cal25 computer program, to correspond approximately with calendar dates BC (calBC). For the calibration of ages beyond 15000 BP, a nomogram based on comparison with the temporal intensity variations of the earth's magnetic field was used. (Plicht 1993; Andel 1998.)

PALAEOLITHIC BACKGROUND

The Last Glacial Maximum (LGM) around 18000 BP / 22000 calBC forced the Upper Palaeolithic (*Gravettian*) settlement of Europe north of the Alps to retreat to refugia in the south-west and the south-east. Because of this, the population was divided into a Western and an Eastern Block. It appears to me that this division predetermined the broad lines of the subsequent recolonisation and the resulting genetic, linguistic, and cultural succession in northern Europe. (Otte 1990; Housley et al. 1997.)

Also, the Upper Palaeolithic settlement of East Europe had a corresponding refugium in the southern Russian plain. Representing the Gravettian technocomplex, the settlement in the southern Russian plain was a continuation of the Eastern Block mentioned above. Eastwards, the next important Palaeolithic settlement was located in the southern Ural region. (Soffer 1990; Dolukhanov 1996.)

WESTERN BLOCK

According to available radiocarbon dates, Europe north of the Alps was depopulated by 21000 BP / 24000 calBC. Around 17000 BP / 18300 calBC, in southern France, the local Gravettian and *Solutréan* cultures were replaced by a new *Magdalenian* culture. The emergence of the Magdalenian coincides with the beginning of the first Late Glacial warm period, the *Lascaux* interstadial. However, supporters of the culture slowly began to expand north of the Alps only at the end of its third phase. (Gamble 1991; Housley et al. 1997: 33-36.)

According to the results of a recently published dating program, the Magdalenian recolonisation of the abandoned territories started around 14500 BP / 15400 calBC, more than 8000 calendar years after the depopulation. The recolonisation continued towards the end of the *Pleistocene*, in spite of some serious reverses in the general amelioration of the Glacial climate. (Housley et al. 1997.)

Around 13200 BP / 13900 calBC, pioneers reached the Hamburg area in the north. There they no longer represented the Magdalenian but a new *Hamburg* culture. The rapid spread of the culture over a zone reaching Poland, southern Sweden and Britain (*Cresswell*) is connected with the onset of the *Bølling* warm period around 13000 BP / 13700 calBC. Then the area, presently covered by the waters of the North Sea, was dry land and certainly colonised, too. The pioneering phase of the colonisation of the North European Plain was followed by a residential phase 600-800 calendar years later. The subsistence of the Hamburgians was fully adapted to the mobile hunting of reindeer in an arctic environment, whereas their southern neighbours, the Magdalenians, exploited diverse fauna in a more forested environment. (Otte 1990; Fischer 1993; Housley et al. 1997.)

The spread of the *Federmesser* point around 12100 BP / 12150 calBC over the Hamburgian territories is connected with the spread of a new mode of subsistence including the full range of animals that existed during the *Allerød* warm period. In the early part of the Allerød, Hamburg-based local adaptations emerged, such as *Bromme* in Denmark and Scania around 11700 BP / 11700 calBC. Around 11000 BP / 11050 calBC, again, the *Ahrensburg* culture emerged in northern Germany and prevailed through the extremely cold *Younger Dryas* period. Ahrensburg had a specialised arctic reindeer hunting economy resembling that of the Hamburg culture. At the end of the Pleistocene, the Magdalenian in southern France was replaced by Epipalaeolithic / Early Mesolithic cultures representing alien populations.

EASTERN BLOCK

As a whole, the Upper Palaeolithic of European Russia was part of the widespread Gravettian technocomplex. During the LGM the settlement of central Russia, represented, for example, by the famous dwelling sites and burials at *Sungir*, withdraw.

The eastern refugium extended from the middle Danube in the west to the South Russian plain in the east. During the LGM the cultural development

within the Eastern Block differed from that in the West. While a new culture, the Magdalenian, emerged in the West, the Gravettian tradition continued in the Eastern Block in the form of various *Epigravettian* modifications. On the other hand, as in the West, the settlement appears to have remained immobile for a very long time before the recolonisation began. The settlement in the Don, Dnieper and Dniester drainages offer good examples of such immobility. However, beginning in the east, the settlement in this zone diminished, and by 10400 BP / 10400 calBC, in Moldavia, the last expressions of the Upper Palaeolithic settlement disappeared. Possibly environmental change, including the disappearance of the mammoth, was a triggering factor. (Sinitsyn & Praslov 1997.)

Finally, the Palaeolithic of the South Russian plain was replaced by Early Mesolithic cultures originating in the West and East respectively. They represented alien populations. On the other hand, 'Epipalaeolithic' assemblages emerged in tbe earlier abandoned zone.

In eastern Europe the northern frontier of the area populated at the closing phase of the Palaeolithic followed a line drawn between Lithuania and the Perm region. At any rate the 'Epipalaeolithic' finds in the Volga-Oka area, the middle Volga and the Kama are few, suggesting a very thin population at the close of the Palaeolithic. The settlement of the southern Ural region was not expansive during this phase. (Kol'tsov 1989; cf. Carpelan 1999b.)

Around 11000 BP / 11050 calBC, in the beginning of the Younger Dryas cold period, the *Swidry* culture emerged in Poland. The subsistence of this culture was based on mobile arctic reindeer hunting resembling that of Hamburg and Ahrensburg in the Western Block. However, Swidry may originate in the Moldavian Palaeolithic, which means that it represents the Eastern Block. Finds prove that people supporting Swidry infiltrated tbe southern Baltic and western Russia as far as the western Volga-Oka area. (Kosłowski 1990; Zagorska 1995; Sinitsyna 1996; Zhilin 1996.)

Several finds also prove that artefacts and contexts typologically representing Federmesser, Bromme and especially Ahrensburg in the Western Block found their way as far as the western Volga-Oka area. This suggests that people from the west infiltrated the region, which was already inhabited by groups representing the Eastern Block. (Kosłowski 1990; Zagorska 1995; Sinitsyna 1996; Zhilin 1996.)

TRANSITION TO THE MESOLITHIC

The Glacial and the Pleistocene ended abruptly about 10000 BP / 9340 calBC. In a decade or two the mean annual temperature rose as much as 7°C, reaching almost the same level as today. The extinction of the remaining ice sheet, then covering most of Fennoscandia, was complete by 8500 BP / 7550 calBC. At the same time the *Holocene* vegetation zones began to form. The *Boreal* forest started to expand at the expense of the periglacial steppe and tundra as fast as was biologically possible. The arctic animal populations, including the reindeer, were in due course replaced by other species adapted to life in the Boreal forest. (Lang 1994; Donner 1995; Hakala 1997.)

The human societies present in this process had to adapt their ways of life to correspond to the critically changing environment. An additional aspect was provided by the availability of new areas for occupation in the North. The result was a set of new *Mesolithic* cultures. Families, perhaps whole bands, possibly perished because of unsuccessful adaptation. It appears to me that the inevitable adaptation processes at the turn to the Holocene and the Mesolithic may have created 'bottlenecks' followed by 'founder effects' and 'drifts' not only in genetic but also in linguistic and cultural successions.

INITIAL COLONISATION OF THE SCANDINAVIAN PENINSULA (10300...7150 BP / 10100...6000 CalBC)

During the Late Glacial, the conditions along the coast of Norway resembled those prevailing in Greenland at present. Between the sea and the continental ice there was an inhabitable coastal strip with an arctic fauna, including reindeer and numerous birds; the coastal waters abounded in sea mammals and fish. It was an ideal environment for a hunting and fishing population. The western coastal zones of Sweden and Norway were apparently colonised at the end of the Younger Dryas by groups adapted to exploitation of both marine and terrestrial resources (Bjerck 1994; Bang-Andersen 1996; Fischer 1996; Hakala 1997.)

In South-West Norway at least one site is dated, according to shore displacement, to around 10300 BP / 10150 calBC. In addition, there are several radiocarbon dates available for an estimation of the date of the initial colonisation of the Atlantic coast of Norway. While several dates point to around 9600 BP / 8970 calBC the oldest date, around 10280 BP / 10100 calBC, surprisingly, comes from the northern end of the coast. However, for environmental reasons, it will always be difficult to find archaeological remains of the very first pio-

neers along the Norwegian coast and date them reliably. (Prøsch-Danielsen & Høgestøl 1995; Bang-Andersen 1995; 1996; Eriksen 1996; Thommesen 1996a.)

The early dates from northernmost Norway have reactivated speculation on an eastern origin of the initial coastal settlement of North Norway (the *Komsa* culture). There are, however, no typological nor chronological grounds in favour of such an origin. Instead, typological comparison suggests that the pioneers of the western coast of Sweden and Norway originated in a cultural setting resembling Ahrensburg and possibly Bromme. While the western coast of Sweden and southernmost Norway were colonised from Denmark, the colonisation of the Atlantic coast of Norway is thought to have originated in the North Sea Land, although, for obvious reasons, this cannot be proved. Norwegian archaeologists describe the initial colonisation as a rapid movement that took two or three centuries. (Woodman 1993; Bjerck 1994; Anundsen 1996; Bang-Andersen 1996; Eriksen 1996; Fischer 1996; Møller 1996; Thommesen 1996a; 1996b.)

When, by 8250 BP / 7300 calBC at the latest, the colonisation of northern Sweden began, the people apparently did not come from the south but from the west, the Atlantic coast. It was not until between 7650 BP / 6500 calBC and 7150 BP / 6000 calBC that an archaeological wave of influence from the south, characterised by handle cores and keeled scrapers and probably representing colonisation, reached northern Sweden. It is also possible that the initial colonisation of the Inari Area in northern Finnish Lapland originated in coastal northern Norway. However, northernmost Fennoscandia excluding the coastal strip but including the Finnmarksvidda and northernmost Sweden was probably colonised from another direction. (Knutsson 1993; Halinen 1994; Forsberg 1996; Carpelan 1999b.)

Referring to sites characterised by a special use of quartz for tools, Swedish archaeologists have suggested that colonists also entered northernmost Sweden from the east, i.e. Finland, although doubts have been expressed. However, the spread of the *Ostrobothnian* slate assemblage, including the *Rovaniemi pick*, along the coastal Norrbotten suggests such an activity. Other finds of probable or indisputable Finnish provenience found in northern Sweden show that some activity was directed westwards across the Gulf of Bothnia from the Finnish Mesolithic. (Hallström 1929; Moberg 1955; Christiansson 1969; Carpelan 1976; Baudou 1977; Forsberg 1996; Falk 1997.)

Summing up, the initial colonisation of northern Scandinavia appears twofold in the sense that the colonisers (two branches) mainly originated in the Palaeolithic Western Block though some may have originated in the Palaeolithic Eastern Block.

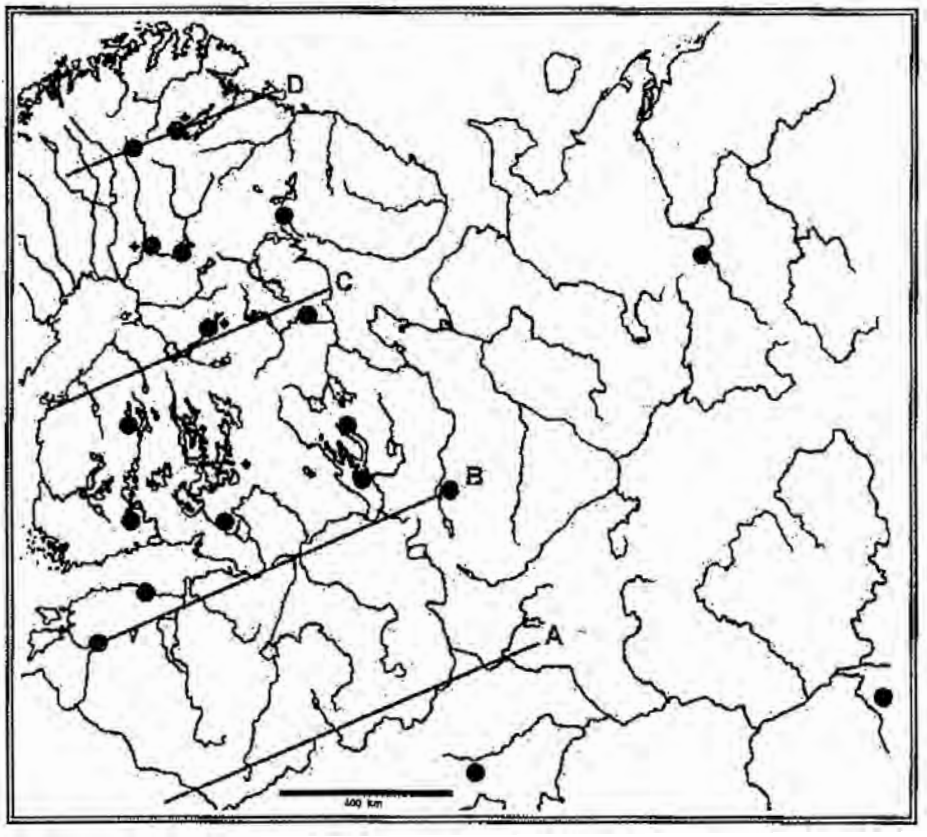
INITIAL COLONISATION OF THE BALTIC, NORTHERN RUSSIA AND EASTERN FENNOSCANDIA (9600...8320 BP / 8970...7370 CalBC)

According to A. Ya. Bryusov's classic scenario, the northern part of Russia was initially colonised from the East. At present the Bryusov scenario, however, appears most unlikely because almost all Russian specialists claim that no early Siberian expansion may be inferred from the material now available. On the contrary, the initial colonisation of the central and northern parts of eastern Europe originated in the south and west. (Bryusov 1952.)

As described above, the settlement along the northern borderline included a local 'Epipalaeolithic' element, a Swiderian element and a western, mainly Ahrensburgian element. While the Ahrensburgian influence was restricted to the western region, the pioneering phase of the Mesolithic colonisation was, above all, characterised by the spread of *Postswiderian* elements all over the area as far as Vyatka and Pechora. (Kol'tsov 1989; Vereshchagina 1989; Jaanits 1990; Kosłowski 1990; Oshibkina 1990; Sorokin 1990; Volokitin 1992; Schulz 1996; Zhilin 1996; Kol'tsov & Zhilin 1999.)

The Epipalaeolithic / Early Mesolithic adaptation led to the formation of new cultural entities in the newly occupied areas. The *Butovo* culture emerged in the Volga-Oka area, the *Kunda* culture in the Baltic and the *Veret'ye* culture east of Lake Onega, etc. The Postswiderian element was an important factor in the formation of these cultures. In the North European Plain the Early Mesolithic *Maglemose/Duvensee* complex expanded eastwards and met Kunda in North-East Poland and South-West Lithuania, where a border zone between the cultures formed. It is not possible to derive Kunda from Maglemose. At the same time, the Early Mesolithic *Romanovka-Il'murzino* culture emerged in the Kama-Belaya area in eastern Russia, and a border zone formed about Vyatka. (Indreko 1948; Siiriäinen 1981; Kol'tsov 1989; Matyushin 1989; Jaanits 1990; Sorokin 1990; Oshibkina 1990; 1997; Schild 1996; Schulz 1996; Sulgostowska 1996; Kol'tsov & Zhilin 1999.)

The Early Mesolithic finds, including both dwelling sites and cemeteries, in the area between Vologda and Kargopol' are often considered to represent a regional continuation of the Kunda culture called Eastern Kunda. I find this a loose (and false) generalisation. Kunda and Veret'ye represent different regional adaptations. Their origin is not identical, but they share some basic components. The 11 published radiocarbon dates from the important dwelling site *Veret'ye I*



Map. Borderlines indicating the successive expansion of Early Mesolithic pioneers from Central Russia to northern Fennoscandia: (A) 10000 BP / 9500 calBC; (B) 9600 BP / 8970 calBC; (C) 8970 BP / 8150 calBC; (D) 8320 BP / 7380 calBC. Dots indicate dated sites. Simplified from Carpelan 1999b.

fall between around 9600 BP / 8970 calBC and 7700 BP / 6500 calBC. The 33 published radiocarbon dates from the cemeteries fall between around 9910 BP / 9400 calBC and 5400 BP / 4250 calBC. The scatter of the dates within the cemeteries suggests caution, especially as, in some cases, it has been shown that both the early and the late dates are due to technical problems. On the basis of available radiocarbon dates, I suggest that the northern border of the Mesolithic colonisation around 9600 BP / 8770 calBC followed a line drawn through Pulli in South-West Estonia and Veret'ye I in the Kargopol' district. (e.g. Nunez 1987; Price & Jacobs 1990; Schulz 1996; Carpelan 1999b with references.)

Proceeding from this line in a north–north-west direction pioneers entered the territories of present-day Finland and Russian Karelia. This meant that the lithic technology had to be adapted to the use of quartz instead of flint, which does not occur in this region. The adaption of the lithic technology to quartz creates a typological break between the flint-using and the quartz-using cultures. Around 8960 BP / 8100 calBC, the 'wave of advance' reached 65°N latitude at a distance of 530 km from the Base Line mentioned above. Around 8680 BP / 7750 calBC, pioneers reached Rovaniemi on the Polar Circle. This is also the *terminus post quem* for a possible eastern colonisation of northernmost Sweden suggested above. Around 8320 BP / 7370 calBC, the front reached 69°N latitude at a distance of 980 km from the Base Line. In northern Fennoscandia the expanding descendants of the 'East Europeans' met with descendants of the 'West Europeans'. (Carpelan 1999b.)

SUMMARY OF LATER EVENTS WITH AN EMPHASIS ON EASTERN FENNOSCANDIA (8050...2400 BP / 7000...500 CalBC)

After the Early Mesolithic colonisation of the Baltic, northern Russia and eastern Fennoscandia, the Volga-Oka area became a region that continuously generated a surplus of population and cultural creativity. This resulted in several waves of influence that, in addition to cultural innovations, probably transmitted linguistic and genetic matter, too. This region sent strong impulses towards the north and north-west. The list includes the (1) *Upper Volga*, (2) *Lyalovo*, (3) *Proto-Volosovo* (4) *Volosovo*, (5) *Net Ware*, (6) *Sejma-Turbino* and (7) *Akhmylovo-Anan'ino* horizons. (Carpelan 1999a.)

For our topic, the Lyalovo or *Pitted Ware* wave of influence is especially important. It reached Russian Karelia around 6000 BP / 4900 calBC. Around 5100 BP / 3900 calBC *Combed Ware Style 2* developed on the basis of the Karelian Pitted Ware and fresh influences from the Proto-Volosovo culture of the Volga-Oka area. The Combed Ware represents the culture of societies that expanded over an area reaching from Latvia to the Polar Circle and from the Gulf of Bothnia to the White Sea. These groups participated in a contact network that reached from northern Sweden to the Urals and the Samara area and from the mouth of the Weichsel to Lapland. Within this network rare and valuable goods like amber, asbestos, copper, wood of cembra pine (*Pinus cembra*) as well as green and red slate were distributed. Exotic fossils from Central Asia found their way to Finland, too. (Carpelan 1999a.)

On the other hand, three waves of influence brought the inhabitants of the Baltic and eastern Fennoscandia into contact with western Neolithic and Bronze Age cultures: (1) the *Funnel-Beaker* culture met the expanding *Combed Ware* culture (5100..4650 BP / 3900...3450 calBC) at the south-east corner of the Baltic Sea; (2) carried by a demic movement, the *Corded Ware* culture (2500... 3850 BP / 3200...2300 calBC) expanded to the Baltic and South-West Finland; (3) carried by moving traders, the *Nordic Bronze Age* culture (3400..2400 BP / 1700...500 calBC) expanded to South-West Finland. (Carpelan 1999a.)

The Corded Ware Culture divided Finland in two cultural zones, a western and an eastern one, and subsequent events made this division permanent. The frontier remained fixed for almost 4000 years to the 8th century AD. The Western Cultural Zone became linked with the European agrarian entity, while the Eastern Cultural Zone remained within the entity of the traditional Boreal hunting and fishing economy, although, in the Bronze Age, the spread from the Upper Volga of the Net Ware culture introduced elementary agricultural elements there.

At the same time the Sejma-Turbino 'phenomenon' emerged along a narrow zone with one end in the Volga-Oka area and the other around the head of the Ob and in the Sayan foreland. Crossing several cultural areas, Sejma-Turbino is represented by a number of similar cemeteries with burials of armed men only. Based on this, Sejma-Turbino is interpreted as a multiethnic trading organisation. It is possible that the 'phenomenon' originated in the Volga-Kama area from where it expanded eastwards, but there is no consensus about this. However, celts of the Sejma-Turbino type are found as far west as Finland and central Sweden. (Meinander 1954; Chernykh & Kuz'minykh 1989.)

CRANIOMETRY AND GENETICS

Physical properties, such as cranial measures and genetic composition, contain information on the descent and relationships of human populations. Although the study of these properties offers information complementing that of archaeology, I shall not deal with the bioanthropological aspect at length. I merely refer the reader to some papers dealing with the origin and development of the early settlers of the northern zone of Europe.

First, it appears that neither craniometry nor genetics support an initial Postglacial colonisation from beyond the Urals. Instead, strong indications point to the Ukraina-Moldavia region as the Upper Palaeolithic 'homeland' of the initial Postglacial colonists of northern East Europe. Later, the influx of new populations and (at least partial) replacement changed the original Cromagnoid cranial

character in the south, while in the north the Cromagnoid character remained predominant. Odontometrics indicates that there probably was an ancient genetic divide between the populations representing what I above named the Western and Eastern Blocks. (Jacobs 1992; Niskanen 1998.)

On the other hand, the spread of certain haplotypes of the mitocondria and the Y chromosome, indicates a late Upper Palaeolithic influx of western elements to eastern Europe and subsequently as far as Finland. The later influx of more western elements has strengthened a more or less common European genetic composition among the Finns, for example. The Saami, again, show a distinctive genetic character probably due to later relative isolation. (Eriksson 1984; Lahermo et al. 1996; Torroni et al. 1998.)

In general, bioanthropological data appears to agree with the archaeological waves of influence/demic movements mentioned above.

LANGUAGES

The LGM divided Palaeolithic Europe into geographic blocks and initiated diverging lines of cultural and probably linguistic and genetic development. As for languages, I suggest the possibility that it was within the Western Block that the development of *Ancient European* languages with no Indo-European or Uralic affinity began. However, the history of these languages is probably complicated because of Epipalaeolithic / Early Mesolithic and later Neolithic intrusions. The development leading to the formation of the reconstructible *Proto-Uralic* (PU) and *Proto-Indo-European* (PIE) probably took place within the Eastern Block. (Concerning Ancient European, see Venneman 1993; 1994; 1995; 1996.)

Especially in the northern zone the adaptation processes at the turn to the *Holocene/Mesolithic* may have created 'bottlenecks' followed by 'founder effects' and 'drifts' in genetic, cultural and linguistic successions. I suggest that the effective development leading to the formation of the reconstructible proto-languages known at present began within the socio-economic adaptation at the turn to the Mesolithic around 10000 BP / 9500 calBC.

The groups involved in the colonisation of central and northern East Europe possibly spoke different languages. One language could have been adopted as a communication language that replaced other languages. The successful spread of Postswiderian archaeological elements all over the area is interesting as a reference in this connection. This postulated *Palaeo-PU* language would have started the Uralic line of development. Alternatively, this development could have

originated in the South Russian Plain and been the language of a sparse 'Epi-palaeolithic' population of central Russia at the turn to the Mesolithic. I do not find it possible that the language of the Ahrensburgian groups that infiltrated western Russia at the end of the Palaeolithic would have started the Uralic development, but it may have left substrate elements in the postulated Palaeo-PU. On the other hand, it is clear that the Uralic development and any spiritual elements thought to be associated with it did not originate in Siberia.

Following the Early Mesolithic initial colonisation of the Baltic, northern Russia and eastern Fennoscandia regional Mesolithic cultures emerged. The Volga-Oka area formed the creative core of the cultural development in this large region. Several times waves of influence radiated from there towards the peripheries. I suggest that it was in the Volga-Oka area that the reconstructible PU developed on the basis of one of the two alternatives suggested above. From there, Uralic linguistic elements spread all over the PU area as part of the cultural waves of influence.

For North-West Russia, East Fennoscandia and the northern Baltic area, the Lyalovo and Proto-Volosovo waves of influence around 5000...3500 calBC were the most important. They probably represented immigrants that established the form of language on which the *Proto-Finnic* development (followed by the *Finnic* and *Saami* lines of development) was based. It must have been through the connections of these cultures with the *Srednyi Stog* and *Khvalynsk* cultures that early IE words were incorporated into the language.

The initial colonisation of Scandinavia was twofold: part of the colonisers originated in the Western Block and part in the Eastern Block. I suggest that the former spoke some Ancient European language(s), while the latter may have spoken a language connected with the emergence of Palaeo-PU. However, it was not until the Early Bronze Age that a strong wave of influence probably introduced the Proto-Saami linguistic element in the area. (Carpelan 1999a.)

The expansions of alien populations into the South Russian Plain at the turn to and later during the Mesolithic indicates that the PIE cannot have Palaeolithic roots in the area. The newcomers could have been speakers of a 'Palaeo-PIE' within which the PIE line of development began. This would appear consistent with (1) observed indications of contact with an early Caucasian protolanguage and (2) especially the various indications of early and lengthy contacts between PU and PIE (sometimes thought to prove common origin). (Koivulehto 1994; Nichols 1997.)

It has turned out to be difficult (archaeologically) to follow the spread of PIE (or developed varieties) from the postulated origin in the South Russian

Plain westwards into Europe. Likewise it is difficult to follow the spread of PU (or developed varieties) from the postulated region of origin in European Russia eastwards into Asia and understand the emergence of the Samoyed linguistic entity there. As a tentative solution to the problem, I suggest that Proto-Samoyed possibly was an important communication language used by the Sejma-Turbino traders, and that they first established it in the upper Ob and Sayan region, from where the use of the language later spread towards the north. In the Sayan area Samoyed languages were spoken up to the 20th century. (Carpelan 1999a.)[1]

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1 This text was revised in December 1999. The calibrated dates were corrected in March 2001 according to Carpelan 2000. No other changes were made. Carpelan 2000 is recommendable as a more comprehensive survey of the topic. See also Carpelan & Parpola, this volume.

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EMERGENCE, CONTACTS AND DISPERSAL OF PROTO-INDO-EUROPEAN, PROTO-URALIC AND PROTO-ARYAN IN ARCHAEOLOGICAL PERSPECTIVE

Christian Carpelan
Asko Parpola

AIMS AND METHODS

When and where were Proto-Indo-European, Proto-Uralic and Proto-Aryan spoken? And when and where did they split into their main branches? These questions concerning linguistic prehistory do not extend so far back in time as to cross the limits of linguistic reconstructability, as do for example the speculations on a "Nostratic phylum". Thus it may be possible to find an answer to them with the help of archaeology and external linguistic contacts. Unlike reconstructed protoforms of languages, prehistoric archaeological cultures can usually be placed on the map and dated. But since the latter by definition have not left any readable written remains, their correlation with definite languages or language groups poses a number of problems. Correlations proposed without acceptable methodology are worthless.

Space does not allow a thorough discussion of methodology here; we rather refer the reader to the excellent expositions of Mallory (1989; this volume). Some axiomatic considerations on which this attempt is based should be clarified, however. In order to function, a human community needs both means of making a living (reflected by the material cultures of archaeology) and means of communication (in the form of languages); and the shared material culture and the shared language are both among the strongest sources of ethnic identity. If various peoples lived in isolation, their material cultures and their

languages could be expected to change only little over time (cf. the case of Icelandic), and essentially there would be continuity in both spheres. But very few peoples have lived in isolation. Contact with other communities has normally led to changes, the extent and pace of which depend on the intensity of the contact. Trade contacts may result in the introduction of new kinds of artefacts and loanwords denoting new ideas and objects. Conquests or immigrations usually lead to radical changes: a community may abandon its previous way of life or language, and adopt a new one. Language shift is realised through bilingualism, when parts of the population become able to speak two (or more) languages.

Continuities as well as cultural contacts and their intensity can usually be seen both from the archaeological record and from a language (inherited vocabulary vs. loanwords, structural changes) when analysed with the comparative method. Archaeology and linguistics both have developed their own special methods and techniques to do this. A serious attempt to correlate the results of the two disciplines should be based on the generally accepted views prevailing in each, and in cases of disagreement, if one does not possess the professional training to draw conclusions independently, follow the experts with best credentials.

Adequate dating and chronology are crucial for such a correlation. In archaeology, dating and chronology has traditionally been based on the classical typological method: relative position is determined by comparison of types and contexts (including stratigraphies) and absolute date is determined with the aid of links to historically dated material in the Near East and the eastern Mediterranean region. As a result, a fairly compact, not very flexible, chronological system has emerged. However, archaeology possesses several independent scientific methods for dating, including the radiocarbon method. Everywhere, the introduction of the radiocarbon method has shown that there may be reason for some revision of the system. While a revision is taking place little by little, this is, naturally, a source of confusion. We believe, however, that the radiocarbon method offers the only feasible basis for building a realistic prehistoric archaeological chronology in eastern Europe and western Siberia as well as elsewhere.

The survey and use of a continuously growing corpus of radiocarbon dates from eastern Europe and western Siberia has recently been made easier with the publication of date lists, in addition to scattered articles with notes on new dates. In total there are several hundred dates available today. However, in various publications, the documentation of the dates is not always satisfactory: lab code,

sample material, context etc. may be missing. Clearly, there are two major problems, the effect of old wood and the laboratory treatment of bone, which may produce anomalies in the results. However, this is not the place to examine the question more closely and the dates are here adopted at their "face values", excluding "outliers".

Furthermore, the possibilities of constructing a radiocarbon chronology for eastern Europe and western Siberia are hampered by the fact that the number of radiocarbon dates varies by region and period. On the European side, the area south of 54°N dominates the statistics, and within it, the western part. In this southern zone, the Palaeolithic, the Eneolithic (= Chalcolithic) and the Bronze Age have the largest number of dates. In the southern Urals and western Siberia mainly Bronze Age dates are available, in addition to scattered Eneolithic and Neolithic dates. North of 54°N, the dating efforts have mainly focused on the Mesolithic, Neolithic and Eneolithic of the Volga-Oka interfluve and Russian Karelia. Only scattered Bronze Age dates are available. Between the Volga-Oka confluence and the Urals a number of mainly Eneolithic dates have been published, while we know of scattered Neolithic and one or two Bronze Age dates from the area.

Finally, there is the question of the calibration of the radiocarbon ages produced by the dating laboratories to correspond approximately with calendar dates BC. As a rule, the dates given in this paper are based on radiocarbon ages before present (BP, meaning radiocarbon years before AD 1950) taken from date lists and sometimes from other sources. The radiocarbon ages are calibrated by Carpelan according to the "Original Groningen Method" based on the median of the cumulative probability of a date and the INTCAL98 calibration curve, included in the Cal25 computer program (Plicht 1993; see Carpelan 2000: 9). This method is suitable for general purposes, as here, because it gives unambiguous calibrated values with unsegmented errors, which are easy to quote. However, the error margins (often about ±100-200 years, not indicated here) generally agree with those obtained by other methods. Calibrated calendar dates are marked calBC. General references to publications with dates used here are given but no date list is appended, although this makes checking a laborious task.

Isolated correlations of one language with one archaeological culture may look plausible in some respects, but they do not allow the results to be checked. A holistic solution that covers the entire spectrum of relevant cultures and languages does make some control possible. An archaeological culture has not only its geographical and temporal extent and a specific content (e.g. the use of certain tools, plants and animals) but also specific relationships to other

archaeological cultures diachronically and synchronically. Each language, too, has similar, though often less exact parameters, particularly its genetic and areal relationships to other languages. This means that the correlation of an archaeological culture with a specific language or language group can he tested by check ing how well the implied extemal archaeological and linguistic relationships match, and whether these matches will stand if the whole web of these relationships is worked out systematically. (Cf Parpola 1988: 195; Mallory 1989: 164ff.; this volume; Anthony, this volume.)

DISPERSAL OF LATE PROTO-INDO-EUROPEAN

The earliest historical seats of the various Indo European languages are widely separated from each other (fig. 1), but these languages all go back to a single protolanguage. Is there any one archaeological culture, from which one could derive cultures that are intrusive in all (or all but one) of these widely dispersed areas? A crucial temporal clue is given by the fact that all Indo European languages possess inherited vocabulary related to wheeled transport (fig. 2). Late Proto-Indo-European had these terms before its disintegration, and the daughter languages have not borrowed them from one another after the dispersal. Therefore, the speakers of the Indo European protolanguage knew and used wheeled vehicles. (Cf. Anthony 1995a; 1995b; Meid 1994; Oettinger 1994.) Wheeled transport was first invented sometime during the second quarter or the middle of the fourth millennium BC, and then spread over vast areas within a century or two (fig. 3). The earliest evidence in Europe comes from Bronocice, a *Funnel*

Fig. 1. Early distribution of the principal groups of Indo-European languages. (Mallory & Mair 2000: 119, fig. 50.)

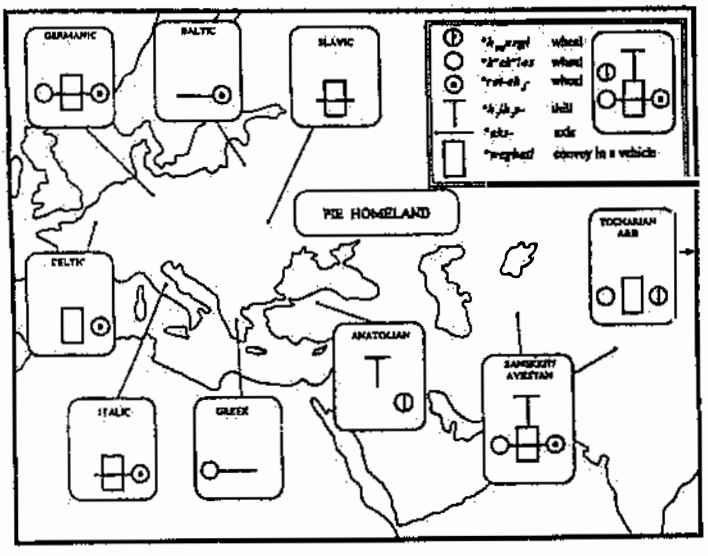

Fig. 2. Distribution of inherited terminology related to wheeled transportin Indo-European languages. (Anthony 1995a: 557, fig. 1.)

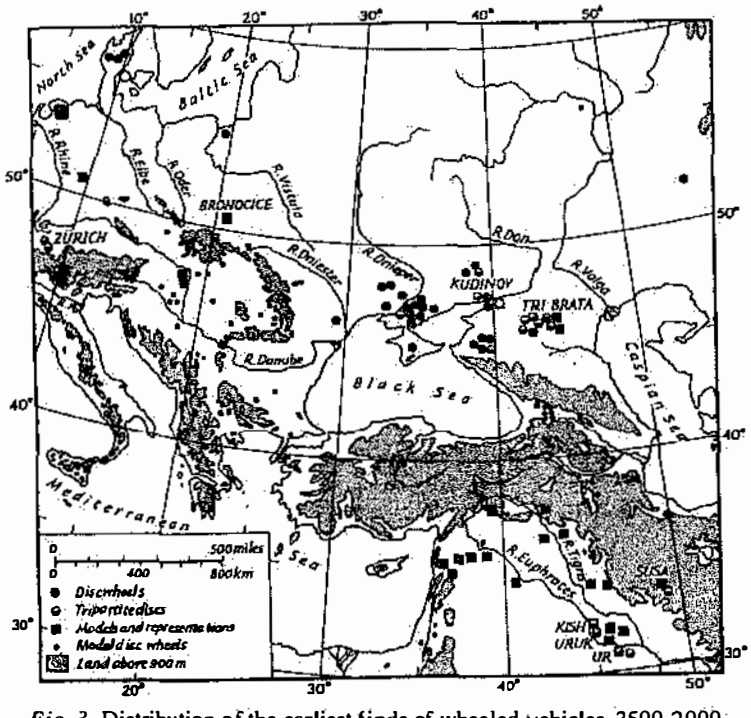

Fig. 3. Distribution of the earliest finds of wheeled vehicles, 3500-2000 calBC. (Piggott 1983: 59, fig. 27.)

Beaker culture site in Poland, 45 km northeast of Krakow (fig. 3). It is a drawing of a wagon on a clay vessel belonging to occupational Phase III which is dated to c. 3470-3210 calBC (cf. Piggott 1983: 40-42, 62-63).

The dispersal of the Indo-European protolanguage, then, cannot have taken place much earlier than 3500 calBC. Just about this time, when the ox-drawn cart or wagon with two or four solid wheels became locally available, the pastoral *Pit Grave* (alias *Yamna* or *Yamnaya*) *culture* (figs. 4 & 6), according to a number of radiocarbon dates (Chernykh, Avilova & Orlovskaya 2000), emerged in the Pontic steppe zone between the mouth of the Don in the east and the mouth of the Danube in the west and began to expand. By 3300 calBC, Pit Grave societies had settled at Zunda-Tolga in the Caucasian foreland, 600 km southeast of an assumed starting point near Rostov on the Don (early kurgans at Astakhovo). By 3200 calBC, Pit Grave societies had settled at Nizhnaya Orlyanka-I, close to Samara, east of the Volga, 900 km northeast of an assumed starting point north of the Donets (early kurgans at Privol'noe). The rate of advance appears to have been the same, about 300 km in a century. Based on this, it is possible to estimate that Pit Grave societies reached the southern Urals foreland by 3100-3000 calBC. In the end, the Pit Grave culture covered the east European steppe and the bordering forest steppe in addition to an extension east of the Ural river. A number of dates from the Dniepr-Don area indicate that the Pit Grave culture disappeared by 2200 calBC.

EARLY PROTO-INDO-EUROPEAN AND THE TOCHARIAN BRANCH

The *Afanas'evo culture* (fig. 4) appeared in the upper Yenisei area of southern Siberia by 3500 calBC (Mallory & Mair 2000: 294, 308; H.-P. Francfort in Parpola 1998: 119). On typological grounds, supported by palaeoanthropological data, it is thought that this culture was an offshoot of the early Pit Grave culture. On the basis of Gromov's studies (1997a; 1997b), the connection with the physical type represented by the Pit Grave people appears well founded. However, the early initial date makes it difficult to accept a Pit Grave origin for Afanas'evo. The distance between southern Urals Pit Grave monuments and Afanas'evo monuments is almost 2000 km. If Pit Grave communities reached the southern Urals c. 3100 BC and continued eastwards at a constant rate of 300 km/century (as estimated above) they would have reached the area about 600 years later, around 2500 BC. This, again, is the date often given for the end of the Afanas'evo culture (Mallory & Mair 2000: 294).

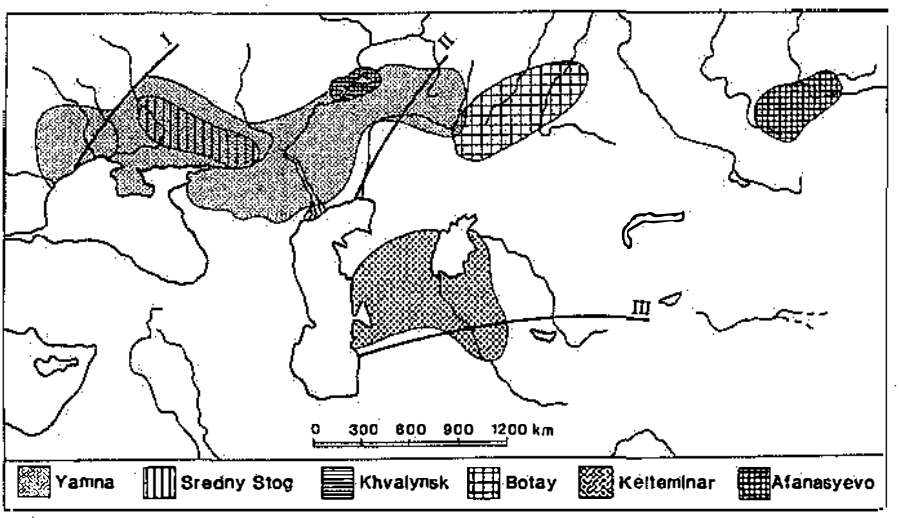

Fig. 4. The Eurasian steppe region in the fifth to third millennia BC. (Mallory 1994-95: 254, fig. 3.)

As a solution to the problem caused by the early initial date both Mallory (1998: 189) and Parpola (1998: 119) have suggested that the Afanas'evo culture originated in some Eneolithic predecessor of the Pit Grave culture, possibly the *Khvalynsk culture* (5000-4500 calBC; see figs. 4 & 8 and below). While this would cause no serious typological or palaeoanthropological contradictions, it would exclude the knowledge and use of wheeled transport. From this follows that the future Afanas'evo people has had to move on foot the more than 2500 km that separate an assumed point of departure on the Volga from the target area. If such a movement had taken place, it would have taken more time than with the aid of wagons. At a rate of 200 km/century the future Afanas'evans would have reached the target area in 1300 years (for estimates of rates of prehistoric colonisation movements, see Ammerman & Cavalli-Sforza 1979; Andel & Runnels 1995; Carpelan 1999b; Housley et al. 1997).

The future Afanas'evo people had to be numerous enough to defend themselves during the migration and at the destination. Such a Khvalynsk migration should have left some traces. Two cemeteries on the Tobol east of the Urals are said to be reminiscent of the Khvalynsk culture (Mallory 1989: 56-63, 223-226). Otherwise, next to no traces of east European Eneolithic types have been discovered between the Volga and the upper Yenisei area. On the other hand, Afanas'evo type burials appear to have been discovered west of the Altai near

Karaganda (Mallory 1998: 190) and one in the Zeravshan Valley (Uzbekistan–Tajikistan). The latter includes the remains of a wagon and is dated to the fourth millennium BC (Parpola 1998: 124). As Mallory (1998: 190) points out, "much of the intervening area is archaeologically unknown and it is at least a possibility that much of the eastern steppe was occupied by the (?Proto-)Afanasievans".

The sudden appearance of the Afanas'evo culture in the upper Yenisei area is enigmatic. However, the culture prevailed until c. 2500 calBC and later several traits related to the Afanas'evo culture and population appear in the poorly dated *Keremchi* alias *Ke'ermuqi culture* (second millennium BC) of the Jhungghar Basin (Dzungaria) between the Altai and Sinkiang, and in the *Quäwrighul* alias *Gumugou culture* (c. 2000-1550 BC) of eastern Sinkiang (Chen & Hiebert 1995: 250-257, 269-272; Kuz'mina 1998a: 66-72; Mallory & Mair 2000: 136-140, 295, fig. 158).

The question of the origin and the later influence of the Afanas'evo culture is important to the question of the development of the *Tocharian* language as an archaic member of the Indo-European stock. A Khvalynsk origin of the Afanas'evo culture and the assumed later extension of its area of influence provide the best available explanation for the presence of *Tocharian* in Sinkiang. Tocharian could hardly have preserved, as it does, the original Proto-Indo-European palatal gutturals unless it in its eastward move preceded the Aryan languages that came to occupy vast areas separating Tocharian from other "Centum languages": like the other "Satem languages" (Balto-Slavic, Armenian and Albanian), the Aryan languages have innovated by an affrication/assibilation of the Proto-Indo-European palatal gutturals. (Cf. Mallory & Mair 2000: 294ff., 314ff.) The Satem affrication probably dates from the latter part of the third millennium BC (cf. below). A consequence of a possible Khvalynsk origin is that this particular Proto-Indo-European dialect could not include a terminology for wheeled vehicles. However, the burial find from the Zeravshan Valley, with the remains of a wagon, indicates that Pit Grave connections later introduced the innovation with relevant terminology to the Afanas'evo community well before the Satem affrication.

EARLY PROTO-INDO-EUROPEAN AND THE ANATOLIAN BRANCH

In the western end of the zone they occupied, Pit Grave communities began to expand westwards following the Danube corridor as far as Hungary. A number of radiocarbon dates indicate that the movement was slightly slower in the west

than in the east. A burial located c. 300 km south of the early Pit Graves just north of the Danube delta is dated to c. 3000 calBC (Plachidol) and two others in southeastern Hungary are dated to c. 2900 calBC (Baranhat, Kétegyháza). However, there is an Early Indo-European problem reminiscent of the Tocharian one in this region, too.

If the birth of the Pit Grave culture by 3500 BC started the disintegration of the Indo European protolanguage, this protolanguage was probably spoken in the Eneolithic cultures of the Pontic steppes that preceded, and gave birth to, the Pit Grave culture. The Proto Indo European vocabulary itself suggests an Eneolithic culture that practised animal husbandry and limited agriculture (cf. Mallory 1989) (cf. fig. 5). Although the various Eneolithic cultures of the east European steppes may be of the same ultimate origin, it is possible and likely that some dialectal differentiation of the Proto-Indo-European spoken by them was already in existence. One of these Eneolithic cultures, the *Srednij Stog culture* (c. 4500-3350 calBC), emerged in the steppe zone between the Dnieper and the Don (figs. 4 & 8) next to the flourishing, agriculturally based and Eneolithic *Tripol'e culture* (c. 5500-3000 calBC), which occupied the forest steppe of Moldavia and the western Ukraine (fig. 8). Therefore the Srednij Stog culture could develop quicker than the other pastoral communities further east.

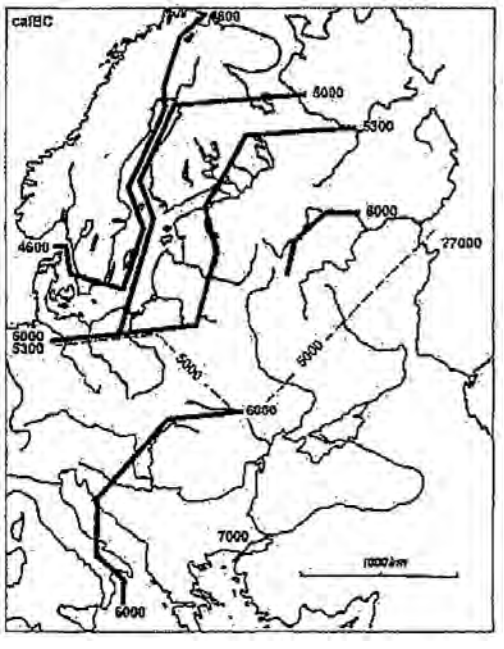

Fig. 5. Isochrones illustrating the spread of ceramic production in eastern and northern Europe. The dashed line indicates the northern border of agriculture and animal husbandry c. 5000 calBC. (Christian Carpelan 2001, published here for the first time.)

The Srednij Stog culture offers a possible solution to the dilemma posed by the *Anatolian branch* of Indo-European. Hittite possesses inherited terms associated with wheeled vehicles (cf. Oettinger 1994), which suggests that it left the Proto-Indo-European community about the time of its beginning disintegration, by 3500 BC. Yet the Anatolian branch of Indo-European including Hittite represents in some respects a much more archaic level of linguistic development than any other branch (these archaic features include the retention of a laryngeal phoneme, numerous heteroclita, and a divergent verbal system, cf., i.a., Rosenkranz 1978; Jasanoff 1994; 1998; Watkins 1995: 51, 135ff.; Mallory & Adams 1997: 131-134, 555). This suggests that the Anatolian branch should have separated itself from Proto-Indo-European considerably earlier than the other branches.

Parpola (1999: 182) has proposed a two-step solution to this dilemma. According to his scenario, the ancestor of the Anatolian branch was spoken in the *Suvorovo culture* (c. 4500-4100 calBC) of Moldavia and Bulgaria, which results from one of the first westwards directed expansions of the Eneolithic pastoralists of the east European steppe (see below; cf. Mallory 1989: 234-235; Mallory & Adams 1997: 556-557); this language would have been taken over and transmitted to Anatolia by the next wave of steppe immigrants (coming with wheeled vehicles), who formed the *Ezero culture* (c. 3300-2700 calBC) of Bulgaria. There are clear connections between the Ezero culture and the destruction layers of northwest Anatolia c. 2700 BC (see Mallory 1989: 28-29, 109, 238-239; Mallory & Adams 1997: 16).

PROTO-NORTHWEST-INDO-EUROPEAN

In the Ukraine new Early Bronze Age cultures (i.a. Gorodsk, Sofievka, Usatovo) emerged on a Tripol'e substratum in the middle of the fourth millennium BC. On the other hand, Pit Grave influence was early felt along the steppe–forest-steppe border zone and by c. 3300 calBC, at the latest, Pit Grave communities had established themselves in the forest steppe, too. On the Dnieper, the Pit Grave culture overlapped the late Tripol'e culture and the northern border of the Pit Grave culture settled a little south of Kiev.

Simultaneously with the expansion of the Pit Grave communities to the forest steppe, the *Middle Dnieper culture* emerged south of Kiev on the western side of the Dnieper (figs. 6:MD & 7:I). The kurgan (i.e. barrow) burial is characteristic of the first period of the Middle Dnieper culture. Stratigraphic evidence

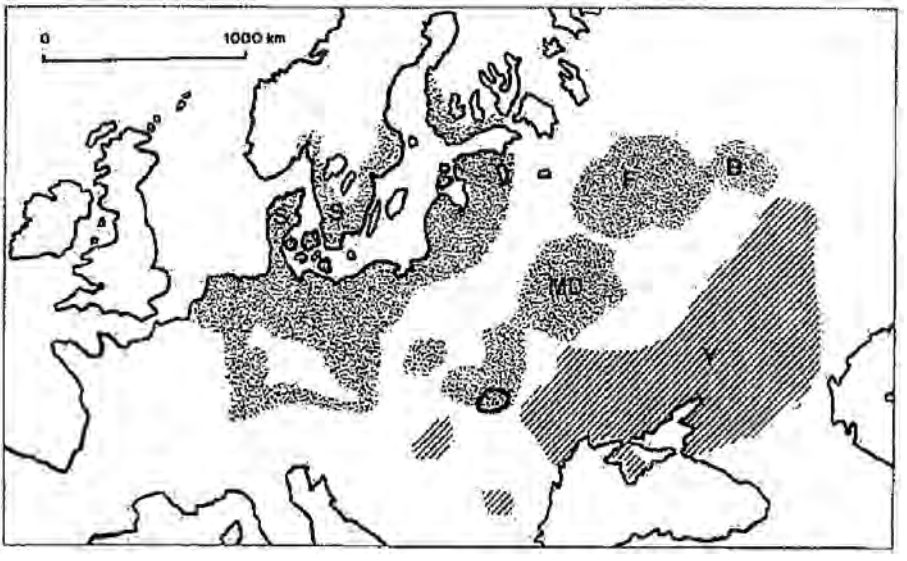

Fig. 6. The distribution of the Pit Grave (Yamnaya) culture (*Y* and diagonal lines) and the Corded Ware cultural entity (stippled). Within the Corded Ware area, the circle indicates the Sub-Carpathian group, *MD* = the Middle-Dnieper culture, *F* = the Fat'yanovo culture, *B* = the Balanovo culture and *S* = the Scandinavian Corded Ware culture. The Pit Grave culture formed c. 3500 calBC and began to give way to the Catacomb Grave and Poltavka cultures c. 2700 calBC. The Middle Dnieper culture and the Sub-Carpathian group formed by 3300 calBC, whereafter the Corded Ware Culture expanded rapidly to the eastern Baltic and Finland on the one hand, and central Europe and the North European plain on the other, but did not enter Scandinavia until c. 2800 calBC. At the same time, the Middle Dnieper culture on the one hand, and the Baltic–Belorussian Corded Ware culture on the other, expanded towards the Volga Oka interfluve forming the Fat'yanovo culture. Probably c. 2200 calBC the Balanovo culture formed on the mid-Volga as a result of movement and adaption of Fat'yanovo communities. It is necessary to remember that the Volosovo culture formed in the region as early as 3650 calBC and existed there together with Fat'yanovo and Balanovo until assimilation led to the formation of the Netted Ware culture along the upper, and the Chirkovo culture along the mid Volga, in the beginning of the second millennium BC. (The map is adapted from Rowlett 1987: 194, map 1.)

reveals that Pit Grave type burials in shafts were the earliest and that later burials were usually put on the surface with the skeletons crouched as in the majority of Corded Ware groups (Sulimirski 1970: 178). This indicates the role of the Pit Grave culture in the formation of the Middle Dnieper culture. The origin of the ceramic style appears to be a more complex matter. However, based especially on the ceramic style, the Middle Dnieper culture is counted as one of several groups among the *Corded Ware* entity.

In westernmost Ukraine the Corded Ware entity is represented by another early group, namely the *Sub-Carpathian Corded Ware group* on the upper reaches of the Dniester, the northern Bug and the tributaries of the Pripyat (Artemenko 1987: 42-47, map 3) (fig. 6). It is important to note that the kurgan burial is characteristic of the Sub-Carpathian Corded Ware group, too. The adoption of the kurgan burial as part of early Corded Ware contexts indicates Pit Grave influence. The Sub-Carpathian area may have received Pit Grave influence from two directions: overland from the Dnieper and along the Dniester from the Black Sea steppe.

There are but few radiocarbon dates available for the Corded Ware complexes of the Ukraine. A kurgan burial representing the first period of the Sub-Carpathian Corded Ware group at Bolehovitsi on the upper reaches of the Dniester is dated to c. 3360 calBC (Chernykh, Avilova & Orlovskaya 2000, tab. 13-A, B no. 2). This date indicates the early emergence of this context and may also be used as a reference for the chronological position of the first period of the Middle Dnieper culture. No radiocarbon dates are available for the beginning of this cultural expression which certainly did not form later than the Sub-Carpathian. One date, c. 2910 calBC, from a kurgan burial at Belynets near Bryansk on the upper reaches of the Desna (almost 450 km northeast of the formative area south of Kiev) represents the second period of the Middle Dnieper culture (Artemenko 1987: 41, fn.).

Furthermore, the Bolehovitsi date, c. 3360 calBC, should be compared with the date of the representation of a wagon on a clay vessel from the Funnel Beaker site at Bronocice dated to c. 3470-3210 calBC, as mentioned above. In addition to a perfect correspondence, one may note that Bronocice is situated right on a suitable communication line that continues the Dniester direction. This is an eloquent indication of how fast and far influence of ultimately Pit Grave culture origin radiated, probably adopted and transmitted by the Corded Ware culture.

The question of the origin and spread of the Corded Ware culture is one of the most intensively debated problems in European archaeology. Within a very short time, the initially uniform Corded Ware culture was introduced over a wide area of central western and northern Europe. According to available radiocarbon dates, the Corded Ware culture appeared in the Baltic countries and southwest Finland (figs. 6 & 7:B, C) between 3200 and 3100 calBC (see below) and in the Netherlands almost simultaneously. The spread to southern Scandinavia took place later, c. 2800 calBC (fig. 6:S). Between 2800 and 2600 calBC an offshoot of the Corded Ware complex expanded eastwards to the Volga-Oka interfluve

and the mid-Volga where it formed the *Fat'yanovo* and *Balanovo cultures* (figs. 6:F, B & 7:H).

Was the expansion of the Corded Ware culture brought about by demic movement or diffusion of cultural traits, and where did it begin? This is not the place for a detailed discussion of the topic. However, radiocarbon dates suggest that the origin must be found somewhere in the eastern part of the Corded Ware zone. The kurgan burial and the early presence of the wagon suggest that Pit Grave influence played an important role in the formation of the Corded Ware culture although the latter cannot be described as a direct offshoot of the former. One could probably speak of Pit Grave individuals/groups adapting to a forest environment by integrating with local Neolithic individuals/groups which were attracted by certain new cultural elements. This resulted in a new Corded Ware cultural expression and made it possible to penetrate the forest zone in a mobile manner reminiscent of that practised in the steppe.

The early Corded Ware communities were small and may have practised a "Gipsy style" way of life. They possessed technical innovations which made them attractive guests among local communities. They knew how to build wagons and how to yoke a pair of oxen to draw them. Also, they probably introduced the domesticated horse in the region. They may have traded in copper and flint and they had certainly new and interesting ideological and religious ideas and manifestations. They could settle down at places and attract local people to join them and thus establish a local Corded Ware cultural group whose elite they would constitute. So, the spread of the Corded Ware culture was probably a combination of demic movement and diffusion around local centres. The radiocarbon dates referred to indicate that the Corded Ware communities moved faster in the forests than the Pit Grave communities did in the steppes. This is possible assuming that they relied, to a considerable extent, on the services of the various local communities whose domains they visited.

As to the question of the language of the Corded Ware culture, it is possible to assume that the Pit Grave connection introduced Proto-Indo-European through elite dominance. Furthermore it is possible to assume that elite dominance established Proto-Indo-European in the Corded Ware cultural groups that formed in various parts of the zone of Corded Ware expansion. The Corded Ware culture, however, did not replace all local communities in which most people probably originally spoke non-Indo-European languages. It is likely that it took some time for these various substratum languages to exert their differentiating influence, so that in the early phase the language spoken in the Corded Ware culture was probably still widely unifonn and close to Late Proto-

Indo-European: it can be labelled *Proto-Northwest-Indo-European*. The Corded Ware culture is the common root of the later locally differentiated Bronze and Iron Age cultures that have been connected with the formation of the *Italo-Celtic*, *Germanic* and *Balto-Slavic branches* of the Indo-European language family (Mallory 1989).

Simultaneously with the formation of the Corded Ware culture the *Globular Amphora culture* (fig. 7:D) emerged in eastern Central Europe, probably northern Poland. It may also have had a mobile way of life, and, in the "back-flow" of the westward drive of the Corded Ware culture, Globular Amphora culture communities moved eastwards as far as Volhynia, Podolia, close to the Dnieper, and northern Romania. The character of the burial usages indicate that the social structure of the Globular Amphora communities differed from that of the Corded Ware communities. (On account of its underground cist constructions of huge stone slabs for collective burials, the Globular Amphora culture has often been called the *Volhynian Megalith culture* in Russian archaeology.) Finds of Globular Amphora ceramics in Pit Grave contexts reveal that this culture had connections with steppe communities (Sulimirski 1970: 133, 178). However, nothing suggests that the Globular Amphora culture would have transmitted Pit Grave cultural elements to Central Europe. The Globular Amphora culture probably played no active role in the Indo-Europeanisation of Europe.

THE PIT GRAVE CULTURE AND ITS DIFFERENTIATION: THE CENTRAL GROUP OF LATE PROTO-INDO-EUROPEAN

The above considerations leave two major branches of Indo-European over to be correlated with the Pit Grave culture which stayed in the old homeland and remained fairly uniform for a long time (c. 3500-2500 BC), namely the *Graeco-Armenian and Aryan branches*. These two branches are united by several innovations not found in other branches of Indo-European, which has suggested that they developed together for a considerable period (cf. e.g. Porzig 1954: 152-164; Mallory & Adams 1997: 555). In its late phase in the Middle Bronze Age (c. 2500-2200 BC), the Pit Grave culture continued much as before in the middle Dnieper region and some other areas, but mostly it became locally differentiated, transforming itself into the *Catacomb Grave complex* (fig. 7:G) between the lower Dnieper and the Volga (c. 2750-1800 calBC, in Dagestan with neighbourhood up to c. 1600 calBC), and the *Poltavka culture* (fig. 7:J) between the Volga

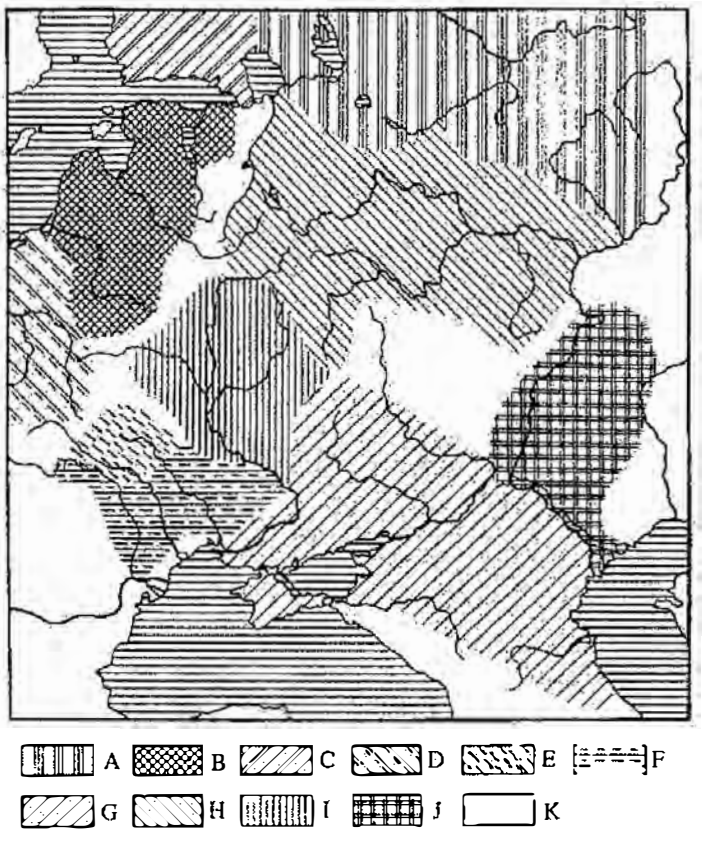

Fig. 7. Middle Bronze Age cultures in eastern Europe c. 2500 calBC. (Bader, Krajnov & Kosarev 1987: 61, map 6.) *A*: Subneolithic/Eneolithic cultures of northern Russia. *B*: The Corded Ware culture of the eastern Baltic. *C*: The Corded Ware culture of Finland. [The distribution shown in the map is too extensive: it is limited to the coastal zone, while the Subneolithic/Eneolithic zone of A extended to eastern Finland.] *D*: The Globular Amphora culture. *E*: The Early Corded Ware culture. *F*: The Late Tripol'e culture. *G*: The Catacomb Grave culture. *H*: The Fat'yanovo culture. [The Volosovo culture existed simultaneously in the same area.] *I*: The Middle Dnieper culture. *J*: The Poltavka culture. *K*: Areas not studied. The white spot in the middle of the Catacomb Grave, Poltavka and Fat'yanovo cultures is the area where the Abashevo culture emerged.

and the Ural rivers (c. 2750-2000 calBC) (cf. Chernykh 1992: 124-133). It is reasonable to link the western Catacomb Grave culture with the *Graeco-Armenian branch* (Greek most likely entered Greece by the Middle Helladic period together with the domesticated horse and the tumulus grave; the golden

death masks of the Mycenaean Greeks may continue the clay death masks of the Catacomb Grave culture, cf. Mallory & Adams 1997: 92, 244-245). Many scholars have associated the eastern Poltavka culture with the *Aryan branch*, which by this time can be assumed to have started evolving from Late Proto-Indo-European (cf. Mallory & Adams 1997: 439-440).

PRE-PROTO-INDO-EUROPEAN

The relative ease with which the Pit Grave culture spread from the Ukraine to the Urals might be due to its being closely related to the cultures and languages it encountered on the way. The Srednij Stog culture (figs. 4 & 8:III), in which Proto-Indo-European is assumed to have been spoken, and which came to an end when the Pit Grave culture emerged, probably resulted from a westward expansion of the Eneolithic Khvalynsk culture of the mid-Volga forest-steppe. We have already discussed the likely Khvalynsk origin of the Afanas'evo culture of southern Siberia, associated with the origins of Tocharian.

Recent radiocarbon datings for the *Khvalynsk culture* (figs. 4 & 8:II) fall within c. 5000-4500 calBC (cf. Agapov, Vasil'ev & Pestrikova 1990; Timofeev & Zajtseva 1997a; 1997b; Zajtseva & Timofeev 1997). This shows that it was not contemporary with the Srednij Stog culture as was believed earlier (Chernykh 1992: 42-46; Mallory 1989), but "one step" older. Moreover, the *Mariupol'* and *Chapli* type burials (fig. 8:II:1-3; c. 5000-4500 calBC, cf. Timofeev & Zajtseva 1997b: 102) in the Pontic steppe part of the *Dnieper-Donets culture* (in the areas next occupied by the *Srednij Stog culture)* and the *Decea Muresului* cemetery (c. 4500 BC) in Romania are so similar to Khvalynsk burials that they have been considered as resulting from a westward directed expansion of the Khvalynsk culture (cf. Chernykh 1992: 44). This suggests that the Khvalynsk culture and the Mariupol'–Chapli type monuments were ancestral to Srednij Stog, and that their language was the immediate predecessor of early Proto-Indo-European.

The Khvalynsk culture in turn goes back to the earlier *Samara culture* (c. 6000-5000 calBC) of the mid-Volga forest steppe, and this in turn is preceded by the *Elshan culture* of the same region, which has the earliest known ceramic of eastern Europe (cf. fig. 5), according to recently published radiocarbon dates (c. 7000 calBC; Mamonov 1995: 23; Timofeev & Zajtseva 1997: 100). However, the remarkable age of this ceramic is yet to be confirmed and its origins to be ascertained.

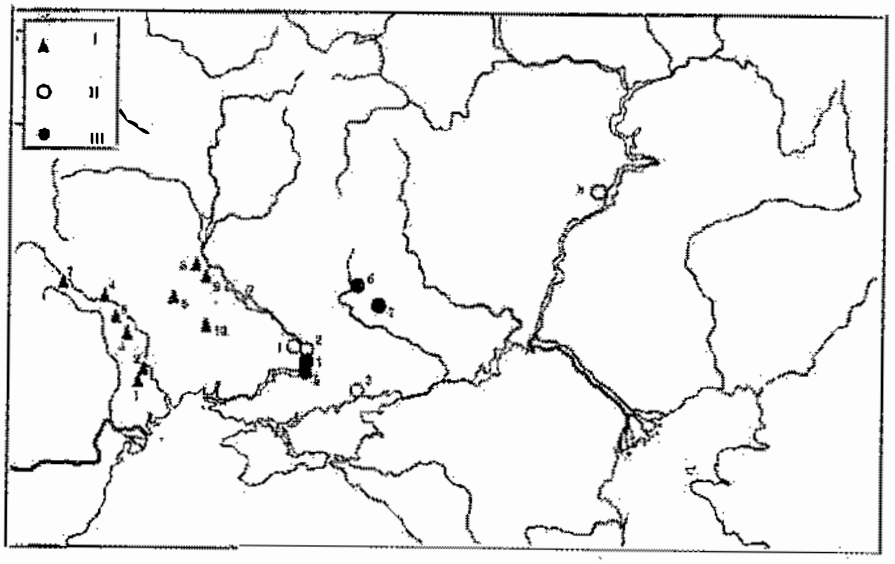

Fig. 8. Some Eneolithic cultures of eastern Europe. (Adapted from Chernykh 1992: 27, fig. 7.) *I* = Sites of the Cucuteni-Tripol'e culture. *II* = Khvalynsk culture (*8* = Khvalynsk) and Mariupol'-Chapli type sites (*1* = Nikol'skoe cemetery, *2* = Chapli cemetery, *3* = Mariupol' cemetery). *III* = Srednij Stog culture sites (*4-7*).

EARLY INDO-EUROPEAN LOANWORDS IN URALIC LANGUAGES AND THEIR CRITIQUE

In this paper we maintain that the Indo-European and Uralic protolanguages were both spoken in archaeological cultures of eastern Europe, and that even the predecessors of these cultures were in contact with each other. This is in agreement with the long established and fairly generally accepted view that the reconstructed Uralic protolanguage and its early descendants contain some very archaic Indo European loanwords, going back to the Indo-European protolanguage and to some of its descendants, the Proto Aryan, the Proto-Baltic and the Proto-Germanic; and that in a number of cases the Uralic loanword in fact represents an earlier stage of development than the respective protolanguage has in the reconstruction based on its surviving descendants. We think this is likely to be the case even with regard to the Indo European protolanguage itself, and its predecessor(s), for this seems to be a more likely explanation for those lexical convergences that some scholars have taken as evidence of a genetic relationship between the Indo-European and Uralic language families (the "Indo Uralic" and "Nostratic" hypotheses).

A brief "list of Indo-European loan-words" was included by Björn Collinder in his *Fenno-Ugric Vocabulary: An Etymological Dictionary of the Uralic languages* (Collinder 1955: 128-141). The early contacts between Indo-European and Uralic languages were discussed in detail by Aulis J. Joki in his monograph on this subject from 1973 (with 222 etyma), and Károly Rédei's *Uralisches etymologisches Wörterbuch* (Rédei 1988-91) as well as the two etymological dictionaries of the Finnish language (SKES I-VI 1955-78 and SSA I-III 1992-2000) naturally also discuss many of these etyma. Jorma Koivulehto in his recent books and articles (see Koivulehto 1999a; 1999b; 2000a; this volume, with further references) has enlarged upon and updated earlier research on this subject. Koivulehto's rare double competence in Indo-European as well as Uralic linguistics has enabled him to increase the number of early etymologies considerably, and to refine earlier proposed etymologies. He has always explained the assumed semantic developments and phonological substitutions with scrupulous care, supporting the explanations with concrete facts and parallels.

Naturally, some etymologies are more convincing than others, and, however impeccably argued, all the etymologies are not necessarily valid. While there has been a lot of debate on individual etymologies, on the whole the existence of very early Indo-European loanwords in Uralic languages has not been seriously questioned until quite recently. Juha Janhunen (1999: 212-215) has pointed to various factors that in his opinion multiply the possibility of chance similarities. One is the fundamental typological difference between the two protolanguages. While Proto-Indo-European had "an exceptionally rich consonant paradigm, elaborate prosodic and phonotactic patterns, as well as a system of ablaut", Proto-Uralic "can be reconstructed as a phonologically and phonotactically simple agglutinative language". Real or assumed linguistic borrowings from (Proto-)Indo-European into (Proto-)Uralic have therefore usually undergone phonological simplifications. Moreover, the amount of lexical material available on the Indo-European side is much larger than on the Uralic side, especially if the comparison is not restricted to the protolanguage level but is extended to individual branches on either side. Altogether, this "simply seems to make it too easy to find new technically plausible Indo-Uralic comparisons", Janhunen argues, criticizing especially the use of the Indo-European laryngeal theory in the search for Indo-European loanwords in Uralic.

Janhunen's doubts, it must be noted, are restricted to "Indo-Uralic contacts before the well-documented and probably Post-Proto-Finno-Ugric corpus of Aryan influences on Ugric, Permic and Finno-Mordvinic" (Janhunen 2000: 65). This is a significant concession, for the same typological differences that sepa-

rate Proto-Indo-European and Proto-Uralic essentially continue to prevail between the Aryan and the Finno-Ugric languages at this slightly later level. There is indeed no essential difference from the earlier level. Besides, many of the Proto-Indo-European stage etymologies have phonotactically complex sequences on the Uralic side as well. A case in point is Proto-Volga-Finnic **keštrā* 'spindle' < Pre-Proto-Aryan **ket^{s}tro-* 'spindle' (whence Old Indo-Aryan *cattra-*, *cāttra-* and Old Iranian **častra-* > Pashto *cāṣai*), from Proto-Indo-European **kert^{s}tro-* < **kert-tro-* < **kert-* 'to spin' (whence Sanskrit *kart-* 'to spin') (cf. Koivulehto 1979; 1999b: 161-168; this volume, no. 44; Mayrhofer 1992-2001, 1: 539, 316).

And is the etymology suspect, if the Proto-Uralic borrowing exhibits a reflex of a laryngeal that can be reconstructed for Proto-Indo-European on the basis of its presence in predicted positions in Anatolian? Even when etymologies involving laryngeals are excluded, a substantial number of acceptable Indo-Uralic comparisons remain. So, if the proper methods of linguistic reconstruction are applied, the likelihood of chance similarity between words with the same (or closely related) meaning does not seem to be as great as estimated by Janhunen, who admits the technical impeccability of Koivulehto's etymologies.

Janhunen's reluctance to accept Proto-Indo-European loanwords in Proto-Uralic may be due to his inclination to place the Proto-Uralic homeland in central Siberia, in the neighbourhood of the "Altaic" languages, which are typologically similar to the Uralic languages. Yet the agglutinative language type is very common all over the world, and there is no historical need to derive the Uralic language family from East Asia. According to Janhunen (2000; 2001b; this volume), the Finno-Ugric branch would have crossed western Siberia, eventually reaching eastern Europe in a differentiated state a little over 2000 years ago. This scenario is entirely theoretical, however: Janhunen makes no reference to the archaeological record, where it is impossible to find any support. Supporters of the Nostratic hypothesis, such as E. Helimski (this volume), are likewise keen to discredit the oldest Indo-European etymologies in the Uralic languages, preferring to see them as evidence of distant genetic affinity. Apart from the basic typological dissimilarity of Proto-Indo-European and Proto-Uralic, which speaks against a genetic affinity within the time frame implied by the alleged survival of lexical retentions, such distant relationships are beyond the reach of linguistic reconstruction, and a good contact etymology is always preferable. In the field of Altaic linguistics, Janhunen has long held a similar view:

> long-range comparisons ... are not a receding phenomenon in linguistics today. I have no illusions of being able to convert people who feel that it is their mission to "prove" distant relationships. I can only hope that there will also be those who continue to work on such concrete themes as internal reconstruction and areal contacts. (Janhunen 1994: 240.)

THE URALIC LANGUAGE FAMILY AND ITS MAIN BRANCHES

Uralic languages contain many loanwords from Indo-European languages, and the reconstructed protoforms of a considerable number of these loanwords imply that the Indo-European donor language was not far removed from the Indo-European protolanguage. As already pointed out, these loanwords in Uralic often constitute the earliest existing external evidence of the languages involved, this being true not only of the Indo-European protolanguage itself, but also of its Aryan, Baltic and Germanic branches. In the example quoted above, the shape of the Finno-Ugric words for 'spindle' suggest that the borrowing took place before Proto-Aryan (the only branch of Indo-European to have comparable nominal derivatives) had reached the stage reconstructed on the basis of the Aryan languages descended from it. Therefore, for the sake of the prehistory of the Uralic as well as the Indo-European languages, it would be very useful to find out exactly in which archaeological culture the Uralic protolanguage was spoken and how that culture disintegrated. The following is a very brief survey, from west to east, of the Uralic languages (fig. 9) and their known history and internal relations, as an introduction to a discussion of the homeland problem.

The *Saami* (non-native name: *Lapp* or *Lappish*) languages are nowadays spoken in northernmost Fennoscandia, in Norway, Sweden, Finland and the Kola Peninsula of Russia; but it is known from historical sources and place names (which attest to phonological changes typical of Saami) that Saami was spoken in various parts of Finland and Russian Karelia until medieval times. (Cf. Sammallahti 1998; 1999; Vahtola 1999).

The *Finnic* alias *Baltic Finnic* languages are nowadays spoken in Finland (*Finnish*, native name: *Suomi*), in Estonia (*Estonian*) and northern Latvia (*Livonian*), in Russian Karelia (*Karelian*), and in discontinuous areas from the south-eastern shores of the Gulf of Finland to Lake Lagoda (*Inkerois* alias *Ingrian*; *Vote* alias *Votyan*) and further to Lake Onega (*Veps* alias *Vepsian* and *Lude* alias *Lydic*). (On the Finnic languages and their classification, cf. Salminen 1998.)

Fig. 9. Present distribution of Uralic languages. (Pirkko Nuorminen, Department of Geography, University of Helsinki.)

Before the expansion of the Russian language from the southwest since the 8th century AD, the areas south and southwest of Votyan and Veps were undoubtedly inhabited by nowadays *extinct Finno-Ugric languages* that would have bridged Finnic with Mordvin. Medieval Russian chronicles mention such people as the *Chud'* (different peoples between Estonia and the northern Dvina), the *Merya* (on the upper Volga and in the Volga-Oka interfluve) and the *Muroma* and the *Meshchera* (who lived on the left, i.e. northern, side of Oka). (Cf. Leont'ev 1996; Ryabinin 1997; Sedov 1987.) *Mordvin* is spoken in two distinct dialects (Erzya Mordvin and Moksha Mordvin), originally on the right (southeastern) side of the Oka, while *Mari* (non-native name: *Cheremis)* is spoken on the mid-Volga (between the Oka and the Kama) and (since c. AD 1600) in present Bashkiristan; Mari, too, has two dialects (Meadow Mari and Mountain Mari). These "Volgaic" languages were previously thought to form a separate branch, but nowadays Mordvin and Mari are no longer thought to be particularly close to each other.

The *Udmurt* (non-native name: *Votyak)* and *Komi* (non-native name: *Zyryan* alias *Zyryene)* form the *Permic branch* of Finno-Ugric. The Udmurt have more or less remained in the old Permic homeland in the Kama-Vyatka interfluve on the European side of northern Russia. The Komi are divided in two groups, the *Komi-Permyak* on the upper reaches of the Kama and the *Komi-Zyryan*, who since c. AD 700 have moved northwards to their present habitats that extend up to the Pechora river.

The *Hungarian* (native name: *Magyar*) speakers arrived in Hungary by the 10th century AD. The starting point of their migration was the present Bashkiristan in the southern Urals, where Old Hungarian survived until late medieval times, when the last of its speakers adopted the Turkic Bashkir language. The nearest linguistic relatives of the Hungarians, the *Ob-Ugric* peoples of *Khanty* (non-native name: *Ostyak)* and *Mansi* (non-native name: *Vogul),* live in a wide area in northwestern Siberia between the Urals and the river Ob and its tributaries. Their former habitats included (until early 1900s) areas west of the Urals, but the arrival of Russians some 500 years ago started their eastwards move to the Irtysh and to the Ob. Proto-Ugric is thought to have been spoken in the forests and forest steppe of the southern Urals.

The *Samoyed* languages form the easternmost branch of the Uralic language family. Proto-Samoyedic is thought to have disintegrated as late as only c. 2000 years ago. On the basis of Turkic and Ketic (Yeniseic) loanwords in Proto-Samoyedic, the earliest habitats of the Samoyeds were in the forest steppe zone of Siberia between the Urals and the Sayan and Altai mountains. The now

extinct Samoyed languages *Kamassian* (with the related *Koibal*) and *Motor* alias *Mator* (with the related *Taigi* and *Karagas*) were spoken in the Sayan region partly until the early 19th century; the only surviving Samoyed language of the southern group is *Selqup* (non-native name: *Ostyak Samoyed*) spoken along the upper reaches of the Ob and Yenisei rivers. The ancestors of the *Nenets* (non-native name: *Yurak*), the *Enets* (non-native name: *Yenisei Samoyed*) and the *Nganasan* (non-native name: *Tavgi*) are thought to have arrived in northern Siberia around AD 500, the Nenets continuing westwards to the tundra areas of northeast Europe. The first historical source to mention the Samoyeds is the Old Russian so-called "Nestor's Chronicle", according to which they lived as the neighbours of the Ob-Ugrians (Yugra) in 1096. Although only c. 130 words of those c. 700 that can be reconstructed for Proto-Samoyedic go back to the Uralic protolanguage, Samoyedic in its long isolation has in many respects remained remarkably archaic, so that its comparison with the likewise archaic Finnic branch at the other end of the language family constitutes the most reliable means to reconstruct Proto-Uralic. (On the Samoyed languages and peoples, cf. Joki 1952; Hajdú 1975: 213ff.; Janhunen 1977; 1981; 1998; Helimski 2001.)

According to the conventional family tree of the Uralic languages drawn up in the latter half of the 19th century, the protolanguage first broke up into the *Finno-Ugric* and *Samoyedic* branches. The Finno-Ugric is likewise divided into two main branches, the *Ugric* in the east and the *Finno-Permic* in the west. However, as Tapani Salminen (1998; 1999) underlines, many nodes of the conventional family tree are based on rather tenuous evidence; hence he, along with several other scholars (e.g. Häkkinen), has proposed that the relationships between the individual languages should be represented with a "comb" or "bush" rather than "tree" model. Janhunen (2000: 62) on the other hand stresses that the tree model is "a perfectly plausible way to describe the break-up of the protolanguage" as "it operates with a distinction between primary (genetic) and secondary (areal) isoglosses", while the comb model tends "to ignore this distinction, a serious mistake which, taken to extremity, results in reducing the Uralic unity into a fuzzy net of isoglosses" (Janhunen 2001b: 35). The problem is – and this is admitted even by Janhunen – that the conventional reconstruction is far from certain, and several nodes require careful re-examination. In particular, the genetic isoglosses for Volgaic, Ugric and Uralic nodes are being debated. Thus Petri Kallio in a forthcoming publication will suggest that Samoyedic may originally have belonged to the Ugric branch, but has become much differentiated from it and lost a large part of its original vocabulary, because in Siberia Samoyedic assimilated substrata speaking various unrelated, now ex-

tinct, languages. László Honti (1998) in a critical examination of the linguistic evidence comes to the conclusion that the doubts expressed about the unity of the Ugric and even Ob Ugric branches are unfounded.

(On the Uralic languages and the peoples speaking them, see especially Hajdú 1975; 1987; Sinor 1988; and Abondolo 1998, where further literature can be found; cf. further Korhonen 1981; Laakso 1991; Salminen 1999. On the archaeology of early Medieval Finno-Ugric peoples in Russia, see Leont'ev 1996; Ryabinin 1997; Sedov 1987.)

THE DISINTEGRATION OF PROTO-URALIC

Thus practically all Finno-Ugric languages (including some extinct ones) appear to have been originally spoken in the forest area of northeastern Europe west of the Ural mountains. The homeland of the Finno-Ugric protolanguage has accordingly been sought chiefly in three adjacent regions: (1) the area of the mid-Volga, (2) the area between the Volga, Kama, Pechora and the Urals, and (3) the entire region between the Baltic Sea and the Urals (cf. Korhonen 1981: 6557). A survey of the archaeology of this area with an attempt to correlate the archaeological cultures with the linguistic evidence has been published recently by Carpelan (2000; as a rule not referred to later), so only some major points need to be highlighted here.

The last Glacial ended abruptly c. 9500 BC, and the remaining ice sheet, then covering most of Fennoscandia, diminished and melted off by c. 7500 calBC, giving way to the Boreal forest. The initial Early Mesolithic colonisation of Fennoscandia took place from two directions: while the pioneers of Finland and Russian Karelia originated in eastern Europe, those of the Scandinavian Peninsula (including the *Komsa culture*, c. 10000-6000 calBC) originated in western Europe. The unknown language of the latter was certainly not related to Uralic. This relict language is likely to have become the *substratum of the northern extension of Proto-Saami*, which, as suggested by Carpelan, probably started expanding to these until then aceramic regions early in the second millennium BC with the *Lovozero Ware* (1900-1000 calBC). Although Saami is now almost exclusively spoken in northernmost Fennoscandia, and known from this probably transformed northern form alone, according to place names and other indications, it was until Medieval times spoken in most of central and eastern Finland and Russian Karelia. This means that the development leading to Proto-Saami took place in the southern half of eastern Fennoscandia (see below).

The colonisation of the eastern Baltic, northern Russia and eastern Fennoscandia by Mesolithic hunters and fishers began c. 9000 calBC and was completed some 1600 years later (Carpelan 1999b). The main zone of departure for these Mesolithic colonists was central Russia (the *Butovo culture*, see Kol'tsov & Zhilin 1999; Sorokin 1990), which had become populated in the late Upper Palaeolithic from the Pontic steppe on the one hand and from Belorussia and Poland on the other. Another stream of early Mesolithic colonists originated in Lithuania and Latvia (the *Kunda culture)* and probably populated western Finland. *Northern and northeastern Europe was not populated from Siberia as was long thought.* Carpelan has elsewhere suggested that an archaic form of language spoken among Early Mesolithic communities in east Europe probably started the *Uralic* sequence, although the reconstructable *Uralic protolanguage* formed at a later stage in the Volga-Oka interfluve which, thus, could be thought of as the Uralic homeland.

Beginning in the Mesolithic, the Volga-Oka interfluve was a region that continuously created both cultural and demographic surplus. Several times in the course of Prehistory this surplus discharged especially towards the north and the northwest: eastern Fennoscandia. So, the Volga-Oka interfluve is the region where the earliest ceramics of this part of Europe are first found (fig. 5). This earliest pottery is the *Upper Volga Ware* (c. 5900-5000 calBC) from which the *Sperrings Ware* (5300-4500 CalBC), the first ceramics of eastern of Fennoscandia, was derived. The people who made these early ceramics may have spoken a language ancestral to Proto-Uralic, rather than the Uralic protolanguage itself, although for instance Janhunen (2000: 64) estimates that Proto-Uralic may date from c. 7000-5000 BC.

Temporally, the *Lyalovo culture* represented by the *Pitted Ware* (c. 5000-3650 calBC) is a better candidate for being *Proto-Uralic* speaking. It formed in the upper Volga region and soon spread to the Onega region of Russian Karelia; in the south, Pitted Ware influence was eventually felt all the way down to the forest steppe between the Dnieper and the Don which brought it to the vicinity of the Eneolithic Srednij Stog culture (c. 4500-3500 calBC) of the Pontic steppe. The Srednij Stog culture was probably Proto-Indo-European speaking (see above). The eastern extension of the Lyalovo culture approached the Kama basin, but did not reach it. Thus there is no evidence for the ancestors of the Samoyeds splitting off to Siberia at this stage, while at a later date there seems to be a possibility to explain this split (cf. below).

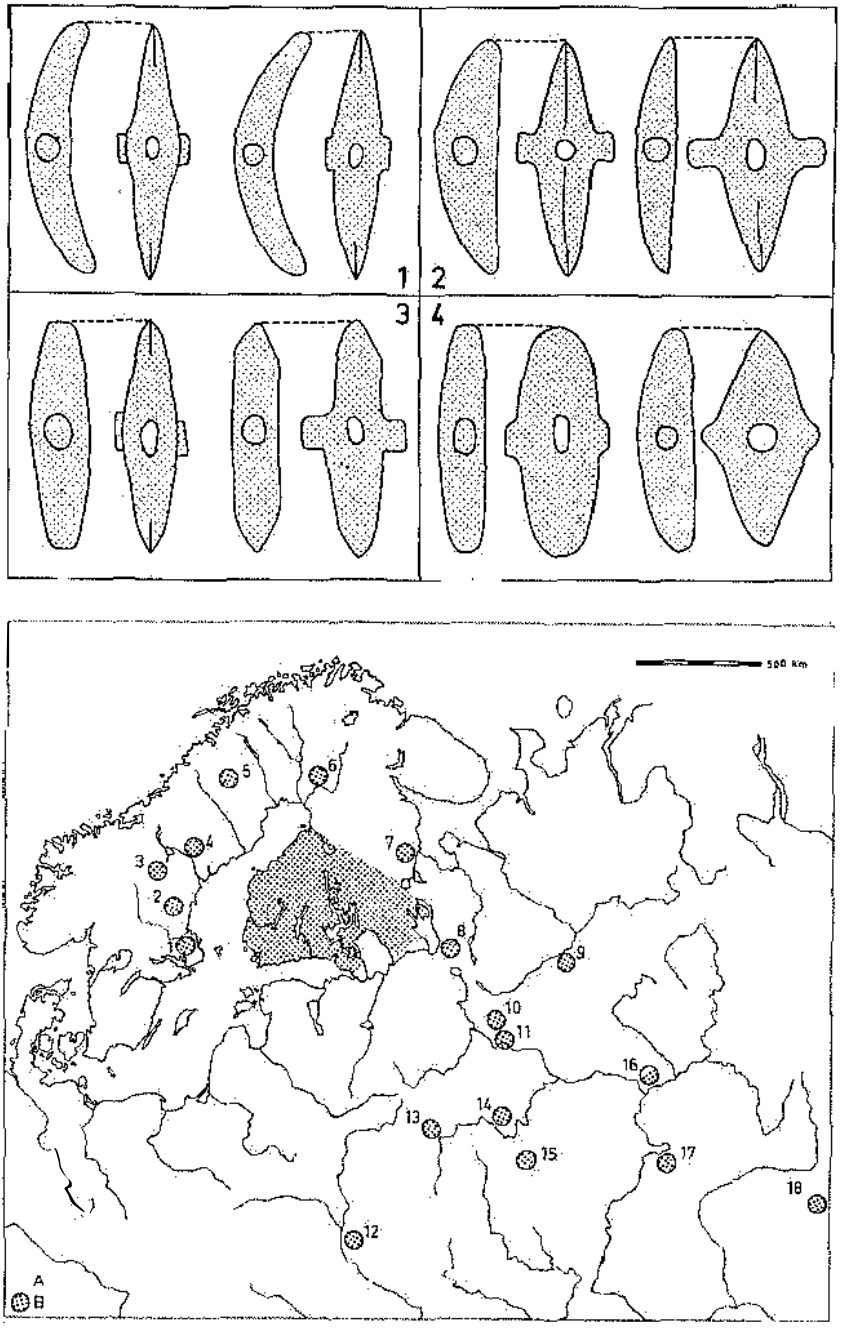

Fig. 10. Types of Mesolithic and Early Subneolithic hammer heads of stone with shafthole and lateral lugs and their distribution in eastern Fennoscandia and the forest belt of Russia (sixth and fifth millennia calBC). (Carpelan 1976: 7, figs. 1 and 18, fig. 8.)

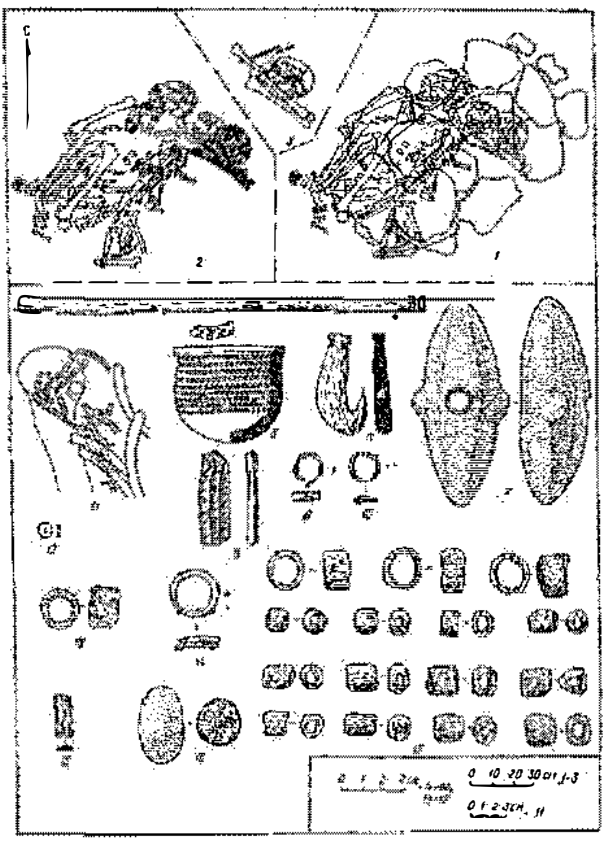

Fig. 11. A hammer head of stone with a shafthole and lateral lugs excavated in a Khvalynsk culture grave near Samara on the lower Volga (first half of the fifth millennium calBC). (Agapov, Vasil'ev & Pestrikova 1990: 114, fig. 18.)

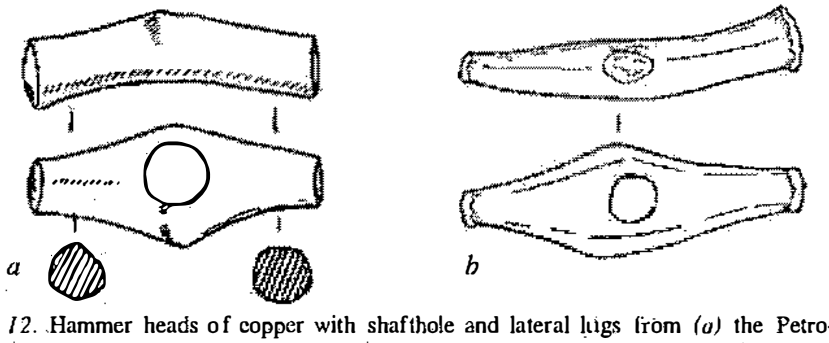

Fig. 12. Hammer heads of copper with shafthole and lateral lugs from *(a)* the Petro-Svistunovo cemetery of the Eneolithic Khvalynsk culture (Chernykh 1992: 45, fig. 13:15) and *(b)* the village of Rugudzha in Dagestan, the latter made of "a metallurgically 'pure' copper that is completely atypical for Caucasian metal" (Chernykh 1992: 47, fig. 14:1).

In the archaeological contexts of eastern Fennoscandia reliably dating from the fifth millennium BC there are no signs of connections beyond the upper Volga. Surprisingly, however, a number of hammer heads of stone with shaft-hole and lateral lugs, similar to lugged hammers of eastern Fennoscandia (Carpelan 1976) (fig. 10), have been discovered in burials of the Eneolithic Khvalynsk culture of the Samara District on the lower Volga (Agapov, Vasil'ev & Pestrikova 1990: 114, 117, 120, 154) (fig. 11). A variety of lugged hammers were in use in eastern Fennoscandia in the Mesolithic and early part of the Subneolithic and the type probably derives its origin from Early Mesolithic picks of antler (Carpelan 1976). As mentioned above, radiocarbon dates place the Khvalynsk burials in the first half of the fifth millennium BC (Agapov, Vasil'ev & Pestrikova 1990: 86; Timofeev & Zajtseva 1997b: 101). In addition to the Khvalynsk specimens, there are at least 11 finds of lugged hammers from eastern Europe (Carpelan 1976: 14-15, fig. 8). Similar hammers of copper from southern Russia are dated to the Eneolithic and Early Bronze Age (Chernykh 1992, fig. 13:15, 14:1) (fig. 12). The question requires further study.

Around 3900 calBC the *Combed Ware Style 2* rapidly spread over Finland up to the Arctic Circle in the north and the corresponding part of Russian Karelia as well as over Estonia, Latvia and the southeastern shores of the Gulf of Finland. The origin was in the Lyalovo Ware. The expansion of the Combed Ware Style 2 context over Finland reflects the infiltration of people from somewhere near the upper Volga. These immigrants probably brought the *Late Proto-Uralic language* to these regions, while the gradually assimilated earlier local populations are likely to have spoken more or less distantly related languages.

The arrival of the Combed Ware Style 2 communities caused important changes in the social organisation, which are manifested by the new large semi-subterranean dwellings. Also new was the participation in a wide exchange or trading network that transmitted valuable raw materials and objects in an area reaching from northern Scandinavia to the Urals. Various slates from different sources, huge quantities of carbonic flint from the upper Volga, asbestos from eastern Finland, as well as amber from the southeastern coast of the Baltic sea were "on the list". Copper was also part of the Combed Ware Style 2 context (Halén 1994; Pesonen 1998). Native copper was available in the northwest Onega area but the knowledge of prospecting and use must have come from communities familiar with copper, most probably from the Eneolithic communities in the Kama-Ural zone in association with newly opened eastward long distance connections.

The Combed Ware Style 2 context of Finland also includes wooden runners of the "grooved" type, probably for dog sledges (Kuokkanen 2000; Luho 1949). They are usually made of Scots Pine (*Pinus silvestris*) but in at least two cases the wood is of Cembra Pine (*Pinus cembra sibirica*). This means that the particular sledges had been transported to Finland all the way from the Urals (see Nejstadt 1957 for the natural habitat of *Pinus cembra sibirica*), although there are no recorded sledge finds of this type between the Urals and Finland. However, a grooved sledge runner discovered at Gorbunovo confirms the use of the type in the Urals (Eding 1929). In addition to copper items and some spoons of cembra wood from the Kama-Ural region, a petrified piece with fossils of Central Asian land snails (Edgren 1966: 63) may have found its way to Finland in the load of such sledges. In all, the exchange network described above must have distributed information about ideas and values as well as of economic and technical innovations.

The Lyalovo culture came to an end c. 3650 calBC and was replaced by the *Volosovo culture* (c. 3650-1900 calBC; Krajnov 1987a) in the Volga-Oka region (fig. 13). Flint arrowheads and other artefacts characteristic of the Volosovo culture, found in Finland, show that trading along the network continued even after the end of the Combed Ware Style 2 phase. Influence from the side of the Volosovo culture is also seen in the stylistic change that brought about first the *Kierikki Ware* (c. 3600 calBC) and then the *Pöljä/Jysmä Ware* (c. 3100 BC), both representing the Asbestos Ware technology. (Asbestos Ware is made with crushed asbestos mixed as filler; various types were produced by hunter-fisher communities in Finland and Russian Karelia after c. 4400 calBC and in northern Scandinavia after c. 1900 calBC; the production ended by calAD 300.) A grooved sledge runner of cembra wood, found in Finland and dated to c. 3120 calBC (Edgren 1992: 67), shows that the Ural connection continued to work. About 2800 calBC (or 2600 at the latest) the Volosovo culture was affected by the expansion to the Volga-Oka interfluve of communities representing the *Fat'yanovo culture* (figs. 6:F & 7:H), which derived its origin from the Corded Ware complex (see above and below).

CORDED WARE CULTURES IN FINLAND, THE EASTERN BALTIC AND CENTRAL RUSSIA

Around 3200-3100 calBC, the Combed Ware culture was overlaid by the intrusive Corded Ware culture (see above) in the eastern Baltic and southwest

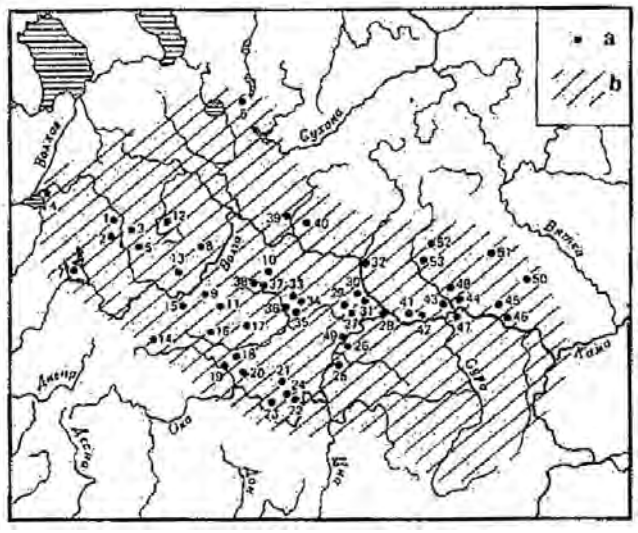

Fig. 13. The Eneolithic Volosovo culture. (Bader, Krajnov & Kosarev 1987: 12, map 1.) *a* = sites. *b* = areal distribution.

Finland (figs. 6 & 7:B, C). The immigrants, who in all likelihood spoke Proto-Northwest IndoEuropean (see above and below), were probably not numerous and, eventually, their few communities merged with the indigenous population. In a number of cases they settled down next to the aboriginals at their dwelling sites, and this may reflect cooperation between the communities. A sharp cultural boundary formed between the southern and northern parts of the original Combed Ware area in the western end of the Uralic zone. Carpelan has suggested that the southern part (in southwestern Finland and the northern Baltic), which had adopted the overt traits of the Corded Ware culture, became linguistically the *Finnic branch* of the Uralic family, while the northern part (in the rest of Finland and in Russian Karelia), evolved into the *Saami (Lapp) branch.*

The Corded Ware horizon is so early that its probably Proto-Northwest-IndoEuropean language can hardly be expected to have become much differentiated from Proto-Indo European. It is the only possible source for the Indo-European loanwords in western Finno-Ugric languages that imply a Proto Indo-European level reconstruction and have a northwest Indo-European distribution. A language shift of the Corded Ware people would best explain the influx of such words into Finnic.

Finnic also has a great number of Baltic loanwords, attesting to important economic and technological innovations, especially terms related to agriculture and animal husbandry. Older and younger layers can be distinguished in these Baltic loans: in words like Finnish *lapio* 'shovel' < Late Proto Finnic **lapiδa* <

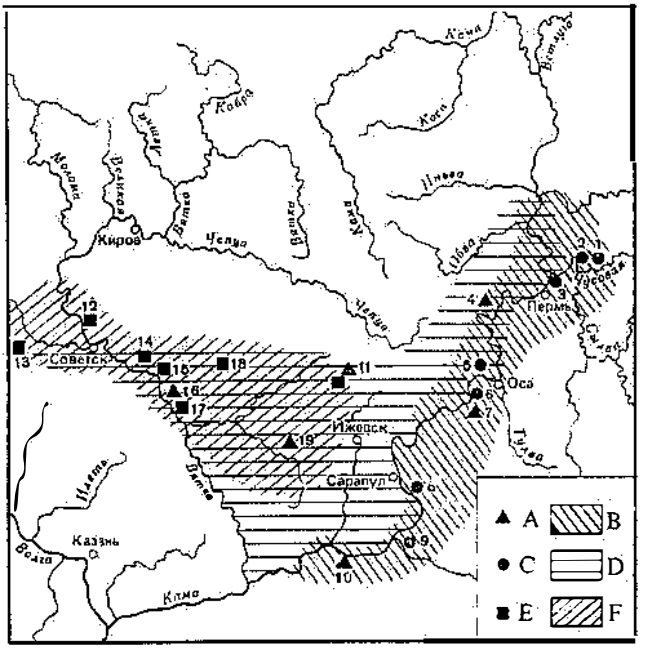

Fig. 14. Eneolithic cultures of the Vyatka and Kama Basins. (Bader, Krajnov & Kosarev 1987: 29, map 2.) *A* & *B*: Sites and area of the Novo-Ilinsk culture. *C* & *D*: Sites and area of the Garino-Bor culture. *E* & *F*: Sites and area of the Yurtik culture.

Early Proto-Finnic **lapita* from Proto-Baltic **lāpetā* > Lithuanian *lopetà* 'shovel', the vowel *a* reflects Proto-Baltic **ā* < Proto-Indo-European **ē*, while words like Finnish *vuohi* (with cognates in Estonian and Vote) < Proto-Finnic **(v)ôše* 'goat' reflect a younger stage of development, in which Proto-Baltic **ā* has become *ō* in Lithuanian but been preserved as *ā* in Latvian, cf. Lithuanian *óžỹs, óžio, ožkà*, Latvian *āzis* 'goat' or 'male goat' (cf. Koivulehto 2000b). Carpelan has suggested that the Corded Ware horizon offers the only archaeological correlate that is strong enough to match the linguistic impact of Proto-Baltic. As noted above, 3200 BC seems too early for Proto-Baltic to have developed. Besides, the Corded Ware culture included agriculture as far north as Estonia, but in Finland no evidence, neither archaeological nor palaeoecological, has been found. The Proto-Baltic influence, however, could come from the later Corded Ware cultures of the southern Baltic and Belorussia (cf. below).

Offshoots of the later Corded Ware complex expanded eastwards to central Russia where they formed the *Fat'yanovo* (figs. 6:F & 7:H) and *Balanovo cultures* (fig. 6:B). The Fat'yanovo culture settled in the Volga-Oka interfluve, precisely the territory occupied by the Volosovo culture. It is interesting to observe that while there are many remarkable cemeteries with flat graves representing the Fat'yanovo culture almost no corresponding dwelling sites are known.

Instead, Fat'yanovo material is found at Volosovo sites (Krajnov 1987b: 61-62; 1992: 322-323). Apparently the Fat'yanovians preferred to settle down next to the Volosovians at their dwelling sites and this, again, may reflect cooperation between the communities.

There are three radiocarbon dates directly connected with Fat'yanovo contexts: c. 2210 calBC from the cemetery at Turginovo, c. 2130 calBC from the dwelling site Shagara-5 and c. 2020 calBC from the cemetery at Volosovo-Danilovo (Krajnov 1987b: 71; Solov'ev 2000: 51-52), but without relevant radiocarbon dates it has been difficult to determine exactly when the Fat'yanovians appeared. However pieces of indirect evidence give some clues for dating. Two Volosovo sites also including Fat'yanovo material are radiocarbon dated to c. 2650 calBC, which could be taken as a minimum date for the formation of the Fat'yanovo culture. However, the temporal distribution of 31 published radiocarbon dates of Volosovo sites (i.a., Krajnov 1987a: 13) may provide another clue. Most of these dates fall before 2850 calBC, but 22.6% of them are younger. Assuming random sampling, this may indicate that the Volosovo settlements began to diminish at that time. Volosovians may have moved eastwards, to the mid-Volga and the Kama, giving way to expanding Fat'yanovians. Possibly the Fat'yanovo culture began to form in the Volga-Oka interfluve as early as c. 2800 calBC. Eventually connections were established between Fat'yanovo and the Catacomb Grave culture of the Pontic steppes.

On stylistic grounds, the ceramic sequence of the Fat'yanovo culture is divided into four periods. The third period, named after the cemetery at Volosovo-Danilovo which is represented by one radiocarbon date, c. 2020 calBC, is also characterised by a rich copper and bronze inventory. The Fat'yanovo metallurgy was based on the Kama-Ural copper bearing sandstone, but the inventory also includes bronze artefacts imported from remote regions (Chernykh 1992: 133-139). A socketed spearhead of a certain type representing advanced technology must have been imported from Caucasia where such spearheads were produced within the late *Trialeti culture* (Chernykh 1992: 113-114, figs. 36:4 & 37:7) the end of which is dated to the 20th century BC (Trifonov 2001). On the other hand, wide wrist bands with engraved ornaments have been compared with corresponding "cuffs" of the "Classic phase" *Únětice* (alias Aunjetitz) *culture* (c. 1950-1700 calBC, see Vandkilde 1996) in Central Europe whence it has been thought they originated (Krivtsova-Grakova 1947 and others; see Bader 1966). However, Bader (1966), following Ondráček (1961), has come to the conclusion that there is no connection between the two geographical groups of wrist bands.

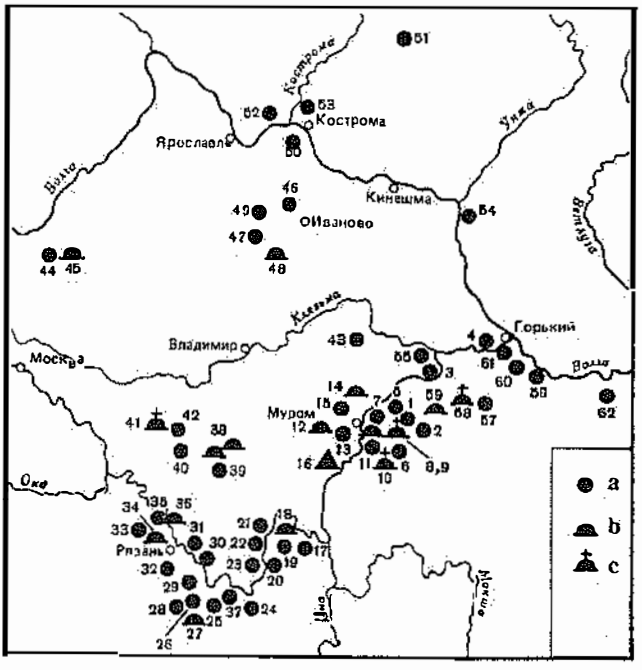

Fig. 15. Principal sites of the Pozdnyakovo culture in the upper Volga and Oka Basins. (Bader, Krajnov & Kosarev 1987: 132, map 24.) *a* = habitation site, *b* = cemetery of kurgan burials, *c* = cemetery of interment burials, *d* = hoard.

The *Balanovo culture* with a main distribution on the mid-Volga between the mouths of the Oka and the Kama rivers is usually seen as an eastern extension of the Fat'yanovo culture. The ceramics are clearly related but an important difference is found in the fact that separate dwelling sites are characteristic for Balanovo, but not for Fat'yanovo. The early Balanovo cemeteries contain underground flat graves reminiscent of Fat'yanovo graves, but soon they were replaced by kurgan burials. No radiocarbon dates are available, but in comparison with Fat'yanovo it is apparent that Balanovo emerged later. This is, i.a., indicated by the fact that metal is comparatively common from the beginning. Balanovo probably formed by 2200 BC simultaneously with the appearance of the *Abashevo culture* in this area (see below). Presumably, both parties were attracted by the possibilities for practising metallurgy here.

Both Fat'yanovo and Balanovo disappeared in the 19th century BC as a result of assimilation with Volosovo communities and under some influence on the part of the Abashevo culture. On the upper Volga, this resulted in the formation of the *Textile Ceramic* alias *Netted Ware culture* (fig. 16) (c. 1900-500 calBC), which soon experienced a wave of influence from the *Pozdnyakovo culture* (fig. 15) (c. 1800-1500 calBC), an offshoot of the *Timber Grave* alias *Srubnaya culture* (figs. 33-34) (c. 1800-1500 calBC) on the Oka (see below).

Upstream and downstream of the mouth of the Oka, the assimilation resulted in the formation of the *Chirkovo culture*. Ceramics with a rib around the upper part, reminiscent of the ceramics of the *Krotovo culture* between the Irtysh and the Ob, appeared at dwelling sites of the formative Chirkovo culture as well as at Eneolithic sites in the Kama area. The assimilation of Abashevo with local Eneolithic communities resulted in the formation of the *Kazan culture* around the confluence of the Kama.

The original superstratum language of the Fat'yanovo elites, almost certainly *Pre-Proto-Baltic*, survives in some place names in the Volga-Oka interfluve. A direct derivative of Fat'yanovo, the language of Balanovo must also have been *Early Proto-Baltic*. However, it may soon have been heavily influenced by the language of the Abashevo culture. In contacts and ultimate merger with the Volosovo community, the latter retained its language but acquired numerous loanwords from the side of both Fat'yanovo and Balanovo but also from Abashevo and Pozdnyakovo, both of which can be connected with Proto-Aryan (see below). The eastward movement of Volosovo communities, as suggested above, would explain the introduction of a new type of dwelling as well as stylistic ceramic innovations in the Kama basin where the *Garino-Bor* cultural expression emerged (fig. 14). (O. N. Bader [1957] and A. Kh. Khalikov [1986] maintained an opposite direction of influence.) This is an important factor in the explanation of how a Uralic form of language expanded to western Siberia (see below).

Textile Ceramic or Netted Ware refers to a particular innovation which includes the application of real or false fabric impressions on the sides of a clay pot before it is dried and fired. In prehistoric times such a procedure developed independently in various parts of the world, for instance, in the upper Volga region in the beginning of the 20th century BC. At the moment, there are eight radiocarbon dates said to represent Netted Ware contexts in the Volga-Oka interfluve (Krajnov, Zajtseva & Utkin 1990: 28-29; Solov'ev 2000: 92). Excluding two early outliers, they range from 1930 to 1570 calBC.

Having replaced the Fat'yanovo and Volosovo cultures, the Netted Ware culture of the upper Volga soon began to expand toward northwest and brought a whole new cultural context to Russian Karelia and the eastern cultural zone of Finland as far north as the Oulu river basin (c. 65°N) (fig. 16). The expansion probably reflects the movement of small communities practising modest swidden agriculture as indicated by signs of cultivation found in eastern Finland. Also the Netted Ware communities may have introduced a "real" bronze metal-

Fig. 16. Distribution of Netted Ware. (Christian Carpelan, 2001. Published here for the first time.) *A*: Emergence of Netted Ware on the upper Volga c. 1900 calBC. *B*: Spread of Netted Ware by c. 1800 calBC. *C*: Early Iron Age spread of Netted Ware.

lurgy into the region. As a result of the Netted Ware expansion, the eastern zone of Finland and Karelia appears to have been culturally transformed almost as fundamentally as the western zone had been as a result of the Corded Ware expansion. However, communities of the aboriginal population survived, and among them the traditional production of Asbestos Ware continued, now in a style called Palajguba 2 (Zhul'nikov 1999: 53-54, 55, 79). (Cf. Carpelan 2000: 24-25; on the Netted Ware, see also Lavento 2001.) *ProtoSaami* would have emerged after the merger of the earlier Combed Ware population and the Netted Ware superstratum, which must have brought with it a number of Proto-Baltic and Proto Aryan loanwords.

TEXTILE IMPRESSION IN ESTONIA AND SOUTHWESTERN FINLAND

The Netted Ware culture did not spread westwards to the eastern Baltic region which received the textile impression on ceramics separately from eastern Central Europe. The Late Neolithic *Kiukainen culture* (c. 2300-1600 calBC), which (with derivatives) replaced the Corded Ware culture in southwest Finland, was formed on fresh impulses from south Scandinavia and from Estonia. The influence from the latter direction included the usage of applying fabric impressions on ceramics. In palaeoecological studies the oldest indisputable observa-

tions of cultivation are precisely in this southwestern zone of Finland from about 2300 calBC, after which they appear as an unbroken series until modern times. (Vuorela & Hicks 1996.) The oldest Baltic loanwords in Proto-Finnic, which correspond to the Proto-Baltic level of reconstruction (cf. Koivulehto 2000b), very probably came to Finland during the Kiukainen culture (cf. Kallio 1998).

The archaeological material shows that the stream of influences from the Baltic countries continued also during the local Bronze Age (c. 1600-500 calBC) and reached Finland in a form filtered by Estonia (Carpelan 2000: 23; cf. Lavento 2001: 23-25, 32-36). In southwest Finland this western tradition of textile impression still occurs on Bronze Age Paimio Ware (c. 1600-700 calBC) after which it disappears.

THE NORDIC BRONZE AGE CULTURE AND FINNIC

Since 1976, Jorma Koivulehto has been arguing that speakers of an earlier phase of Finnic must have come to Finland at least as early as the Bronze Age. Koivulehto has shown that there are Germanic loanwords in Finnic that have undergone the typical phonetic changes that took place between Early Proto-Finnic and Late Proto-Finnic and therefore must have been adopted during the Proto-Finnic period. Several of these loans are attested also in Saami, most probably as very old borrowings from Proto-Finnic into Proto-Saami (for extensive documentation, see Koivulehto 1999b).

Many scholars have considered the carriers of the *Jastorf culture* of the Pre-Roman Iron Age (c. 600-1 BC) in northern Germany to have spoken *Proto-Germanic* (cf. Mallory 1989: 84-87; Mallory & Adams 1997: 321-322). But the Jastorf culture had no connections with Finland or the eastern Baltic, whereas there were lively contacts between southern Sweden and especially Finland both before and after the Jastorf culture. The contacts after the Jastorf culture, in the Roman Iron Age (first centuries AD), are too late for Proto-Germanic. The earlier contacts were in the Bronze Age, and "certainly, no major body of archaeologists would argue that the Jastorf culture was anything other than a direct descendant from the Later Bronze Age of the same area" (Mallory 1989: 87).

Thus, the Proto-Germanic loanwords in Baltic-Finnic and Saami have most likely come from the *Nordic Bronze Age culture* in southern Scandinavia (c. 1700-500 BC), which from 1600 calBC and especially in 1400-1200 BC and in 900-700 BC exerted strong influence upon coastal Finland. The influence was transmitted by elite traders, whose main aim was to procure goods (e.g. furs and train oil) to use as payment for metal purchased in Central Europe for the

Scandinavian bronze industry (Carpelan 1982); many of these traders probably became bilingual and were absorbed into the native population. According to Carpelan, the Nordic influence is not visible in ordinary households, including ceramics, and the culture of southwestern Finland is quite different from the Nordic Bronze Age culture, so it is not likely that the local population became Proto-Germanic speaking. There were direct contacts between Scandinavia and Estonia as well, but also a wave of influence from southwestern Finland to Estonia c. 1500-1000 BC; among other things, the burial caim was introduced from Finland to Estonia (Meinander 1954: 119-120, 201).

Previously, the generally accepted view was that the Finnish language was first introduced to Finland around the first century of the Christian era. At that time, a wave of influence from Estonia and another from Sweden reached the coast of Finland (Edgren 1992). The appearance of new types of cemeteries with new types of artefacts indicates small groups of moving people (about ten sites have been identified on the south coast between Porvoo and Pori). However, Koivulehto's (1976) suggestion that the Finnic language was introduced into Finland as early as the Bronze Age was early on embraced also by several archaeologists (i.a. Meinander, Salo, Edgren and Carpelan), who pointed to the remarkable continuity of occupation in spite of waves of influence including the arrival of newcomers in Finland, and this has become the view of the majority of linguists working in this field now (cf. Häkkinen 1996: 118, 146ff.). In each case, the newcomers were sooner or later incorporated with the local communities.

The traditional view is strongly adhered to by Juha Janhunen (2001a), who points out that the communities of those times were small and relatively few

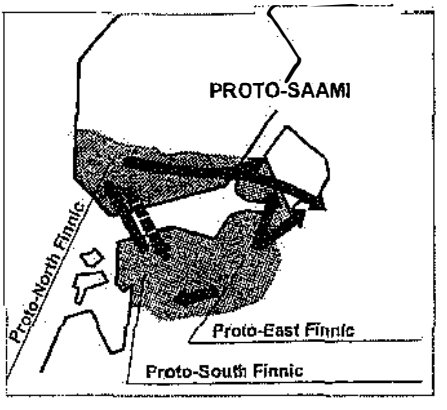

Fig. 17. Dialects of Late Proto-Finnic around the beginning of the Christian era according to Terho Itkonen. (Adapted from Itkonen 1980: 8.)

people could make a considerable linguistic impact. It is true that older handbooks maintain that southwestern Finland had become practically unoccupied in the Early Iron Age, but dozens of new Paimio/Morby sites have been discovered since the 1960s, so this is simply antiquated information. In Janhunen's opinion, Proto-Finnic could not be older than "maximally 2000 years". Carpelan, however, underlines that, since the time of the Combed Ware assemblage, the communities of Estonia and southwestern Finland had been in contact and remained sufficiently similar to each other that one may postulate that the populations understood each other's language. From time to time, there have been influences and (elite) immigrations from Estonia to Finland and vice versa, leading to integrations and also linguistic effects. The economy in Estonia early on became agriculturally based, leading to a comparatively dense population, while the small communities in Finland relied on slash-and-burn agriculture, fishing and hunting; the systems supplemented each other. This divergent development may have led to divergence of the Finnish and Estonian languages and the definitive divergent development was intensified by the political split in early medieval times, when Estonia was occupied by Germans and Danes, and Finland by Swedes. However, as late as in Post-Medieval times, connections between Finnish and Estonian communities have continued without communication difficulties (cf. Grünthal 1998).

The case of Finnic can thus be compared to Germanic. Ancestors of Germanic speakers can be assumed to have arrived at its historically attested speaking area more than 5000 years ago with the Corded Ware. At that time, the language was still practically Proto-Indo-European, evolving gradually to reach the Proto-Germanic stage in the Bronze Age. Proto-Germanic differentiated only relatively late; in spite of their divergence, the languages maintained equalizing contact, even across the sea: Danish has remained close to Swedish and Norwegian, as opposed to radically dissimilar Icelandic that separated from Norwegian only 1000 years ago but then kept fully apart.

SUCCESSORS OF THE PIT GRAVE CULTURE IN THE VOLGA-URAL REGION: (PRE-)PROTO-ARYAN AND ITS BIFURCATION

After this discussion of some principal Subneolithic and Bronze Age cultures of the forest zone of northeastern Europe, we are better informed to consider the successors of the earlier discussed Late Pit Grave cultures of the Volga-Ural steppes and forest steppes, which most probably spoke Pre-Proto-Aryan (i.e. an

Aryan language at an earlier stage of development than Proto-Aryan, the proto-language reconstructable by comparing the later known Aryan languages). In the actual steppe of the Lower Volga-Ural river region, the Pit Grave culture developed into the *Poltavka culture* (fig. 7:J) as early as c. 2750 BC, and this Poltavka then lasted until c. 2000 calBC. It must be pointed out, however, that the last mentioned and many of the following dates are only tentative due to an insufficient number of available radiocarbon dates.

THE ABASHEVO CULTURE

We have already noted that the old style Pit Grave culture continued much as before until c. 2200 calBC in some other areas, while elsewhere it developed into the Catacomb Grave (c. 2750-1800/1600 calBC) and Poltavka (c. 2750-2000 calBC) cultures. In addition to these two cultures, derivates of the Pit Grave culture, the *Abashevo culture* (fig. 18) appeared in the forest steppe occupying a zone that in total extended from the upper Donets in the west over the Volga quite far to the east, to the southwestern Urals and beyond as far as the Tobol river in western Siberia (Pryakhin & Khalikov 1987: 126). The origin of this wide-spread culture is a debated issue. Several scholars count the Abashevo culture among the Corded Ware cultures (thus Kuz'mina 1998b and Anthony, this volume), but others (including Chernykh 1992: 201) find a Pit Grave origin better substantiated (cf. also Sulimirski 1970: 291, 294).

If the Abashevo culture has a Corded Ware basis, it must have originated somewhere along an extended Oka direction; but, if we accept a Pit Grave basis, there are three alternatives (upper Don, mid-Volga, southwestern Urals). Several studies (e.g. Vasil'ev, Kuznetsov & Semënova 1994: 165; see further Pryakhin & Khalikov 1987) find the formation of the Abashevo in the mid-Volga region and the southern Urals. In the latter region it would have soon transformed to a *Sintashta-Arkaim* type of cultural expression (cf. Chernykh 1992, caption to fig. 67:II-19). The mid-Volga region remained the central area from which the Abashevo culture eventually would have expanded to the upper Don. However, there are no radiocarbon dates to substantiate this scenario and it is difficult to see the motivation for an expansion from rich metalliferous regions to the upper Don where no metal was locally available.

On the other hand, a distribution map (fig. 18) presented by Pryakhin and Khalikov (1987: 126) illustrates a zone representing the Don variant of the Abashevo culture, which extends from the upper Don latitudinally to the south-

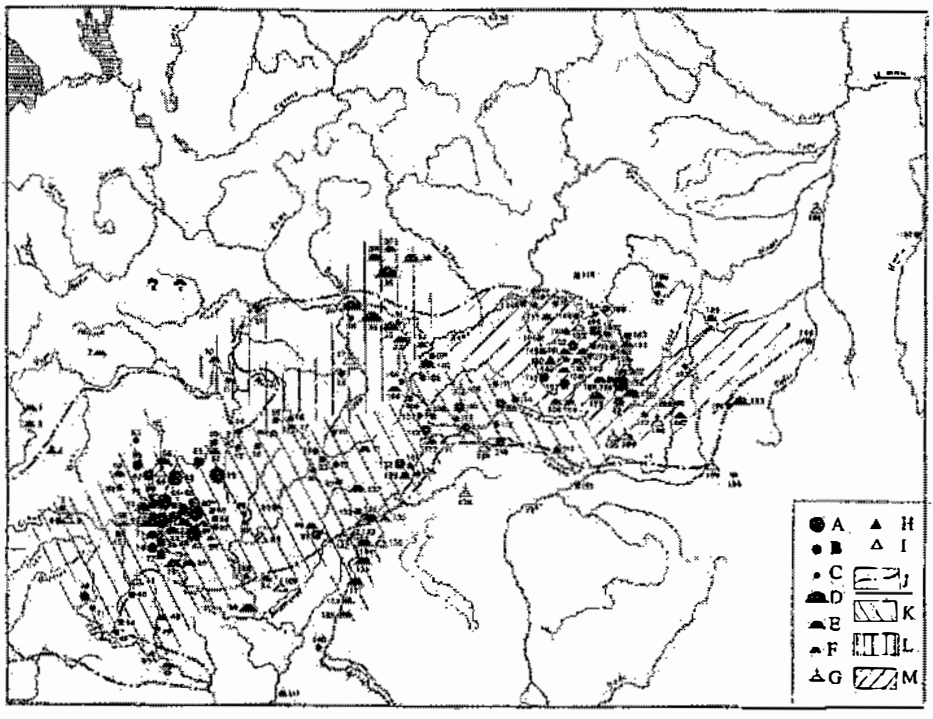

Fig. 18. Sites and area of the Abashevo cultural-historical community. (Bader, Krajnov & Kosarev 1987: 126, map 23.) *A*: a cluster of 6 to 10 habitation sites with Abashevo ceramics. *B*: a cluster of 2 to 5 Abashevo sites. *C*: a single Abashevo site. *D*: a cluster of 6 to 10 cemeteries with kurgan burials. *E*: a cluster of 2 to 5 cemeteries with kurgan burials. *F*: a single cemetery with kurgan burials. *G*: isolated kurgan burials and cemeteries with a few kurgans or burials of the Abashevo type. *H*: cemetery without kurgan burials. *I*: an isolated non-kurgan burial. *J*: the present border of the forest-steppe. *K*: Area of the Don-Volga variant of the Abashevo culture. *L*: Area of the mid-Volga variant of the Abashevo culture. *M*: Area of the southern Urals variant of the Abashevo culture.

ern Urals; the northern border of the zone coincides closely with the northern border of the former Pit Grave culture. From this zone the mid-Volga and the southern Urals variant are protruding northwards as if they represented later expansions. This supports an upper Don and, therewith, Pit Grave basis for the Abashevo culture.

The beginning date of the Abashevo culture is uncertain, but one published date from burial 2 of the kurgan at Pepkino on the mid-Volga, c. 2310 calBC (of bone; Kuznetsov 2001: 179), indicates that Abashevo existed earlier than is usually thought: it would have been contemporary with the Catacomb Grave and Poltavka cultures. In this study, the standpoint is taken that the Abashevo culture

formed in the Don forest steppe region of Pit Grave and local elements simultaneously with the formation of the Catacomb Grave and Poltavka cultures in the steppes. By the fourth quarter of the third millennium BC, Abashevo communities were heading for the southern Urals, while they had already settled on the mid-Volga. In the mid-Volga region, they came in conflict with Balanovo communities over the control of copper deposits (cf. Chernykh 1992: 6, 135, 201-203; cf. Bol'shov 1995 on Abashevo-Balanovo conflicts). It was probably the quest for metal that motivated the Abashevo expansion.

If we accept a Pit Grave basis of the Abashevo culture, then it is most likely to have been originally Aryan speaking, but, spreading to the mid-Volga and the Kama-Ural region, the carriers of the Abashevo culture are likely to have ultimately adopted the local Finno-Ugric language while participating in the formation of Late Bronze Age cultures in the area (see above). Otherwise it is difficult to explain the strong later presence of Finno-Ugric speakers in this region where, in the western part, it continues up to the present day. A similar language shift took place among the (originally Pre-Proto-Baltic speaking) carriers of the Fat'yanovo and Balanovo cultures also participating in the formation of the Late Bronze Age cultures in the area. This hypothesis would explain the early Aryan loanwords with a wide distribution in Finno-Ugric languages. The Kama area had been influenced by the probably Proto-Finno-Ugric speaking Volosovo culture which resulted in the emergence of the Garino-Bor cultural expression and presumably to the adoption of a Finno-Ugric idiom. Traditionally the area between the Kama and the Urals has been assumed to be the "homeland" of the Ugric branch (e.g. Collinder 1960: 36).

At the source of the Ural river is the gigantic mining centre of Kargaly (c. 50 x 10 km): this area has countless ancient mining work-shafts (going sometimes as far down as 90 meters), exploited from the Early to Late Bronze Age (from the Pit Grave to Timber Grave cultures), when around 1.5 to 2 million tons are estimated to have been extracted (Chernykh 1997). In the immediate vicinity of this mining centre, on the border zone of the forest-steppe and the treeless steppe in the southern Urals, the Abashevo culture was in direct contact and interaction with the Poltavka culture of the open steppe. This resulted in the emergence of the rich and powerful *Sintashta-Arkaim culture* (fig. 19), which on the hasis of parallels in ceramic and metal artefact types mainly continues the Abashevo culture. There are numerous fortified ceremonial centres and barrows containing warrior chiefs buried with their full weaponry, horses and two-wheeled chariots. These are the oldest known horse-drawn chariots, with both plank wheels and spoked wheels (figs. 32, 35, 37). (Cf.

Anthony & Vinogradov 1995.) The word for 'war chariot', **rat^{h}a*, can be reconstructed for Proto-Aryan, but in the other branches of Indo-European the cognates mean only 'wheel' or 'wagon' (cf. Oettinger 1994: 68-69). The Sintashta-Arkaim culture with its technical innovations spread rapidly to the neighbouring areas in the west (the Volga steppes) and in the east (northern Kazakhstan). (Cf. Zdanovich 1997; Vasil'ev, Kuznetsov & Semënova 1994: 74-95.).

Thus the Abashevo culture contributed to the formation of the Late Bronze Age cultures in the mid-Volga-Kama zone, as mentioned above, and to the emergence of the *"Sejma-Turbino Transcultural Phenomenon"* (c. 1800-1500 calBC, see below), which was active along the forest-steppe border zone. Furthermore it contributed to the formation of the Timber Grave (c. 1800-1500 calBC) and *Andronovo* (c. 1800-1200 calBC) historico-cultural entities (fig. 33) through a stage represented by sites like Petrovka, Arkaim, Sintashta, Potapovka, Vlasovka etc. (fig. 19). This process and the dating of it are of essential importance for this study and therefore it is necessary to elaborate the issue here at some length although space does not allow a detailed review of this complex topic.

DATING THE TRANSITION FROM THE MIDDLE TO LATE BRONZE AGE IN THE VOLGA-URAL-ALTAI ZONE

A corpus of 52 radiocarbon dates of *timber* from 49 Sintashta, Petrovka and Andronovo type burials (Avanesova 1991: 117-118; Kuz'mina 1994: 372-376) makes it possible to distinguish two chronological groups bordering at c. 1530 calBC. While the later group (ending in the 12th century calBC) consists of Fedorovo, Amangeldy and Kozhumberdy type burials, the earlier group includes Sintashta, Petrovka, Alakul', Amangeldy and Fedorovo type burials (classifications according to Kuz'mina 1994). Of these, the Sintashta and Petrovka type assemblages are thought to represent a phase predating the Andronovo culture proper. If the Tsarev Kurgan burial (on the Tobol), classified as representing the Pre-Andronovo Petrovka phase, and the Subbotino burials (on the Miass), classified as representing Early Andronovo (i.e. Alakul'), represent successive phases (see Kuz'mina 1994: 38-42), the transition tentatively falls at c. 1800 calBC. In the Minussinsk area of the upper Yenisei, the Andronovo culture was followed by the Karasuk culture. Chlenova (1972: 39, 43) reports two radiocarbon dates from the Karasuk-IV cemetery (1130 and 880 calBC) which agree with the end of the Andronovo cultural complex in the 12th century calBC.

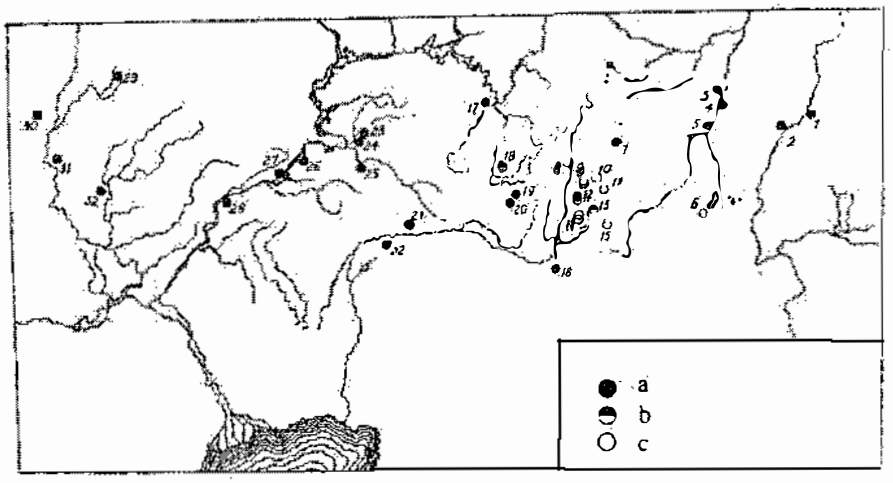

Fig. 19. Map of important Pre-Timber Grave and Pre-Andronovo sites of the Potapovka-Sintashta-Petrovka horizon (2200-1800 calBC). (Vasil'ev, Kuznetsov & Semënova 1994: 166, fig. 62.) *a* = habitation site, *b* = habitation and cemetery, *c* = cemetery. *1* = Petrovka, *3* = Tsarev Kurgan, *11* = Krivoe Ozera, *12* = Arkaim, *13* = Sintashta, *16* = Novyj Kumak, *23* = Potapovka, *25* = Utevka, *28* = Pokrovsk, *32* = Vlasovka.

It turns out that the dates of three burials at Sintashta and one at Raskatikha (of Petrovka type) fall in the Early Andronovo period. On the other hand, the scatter of old dates indicates that old timber was frequently used in the Pre-Andronovo and Early Andronovo periods. This is proved by the three timber dates from the Tsarev Kurgan burial which show a 300 year difference and by the two timber dates from the Sintashta large cemetery burial 7 with a 600 year difference. Applying a 300-600 year difference, each Andronovo burial with a "too old" date probably in reality falls within Early Andronovo and this may be true for the other Raskatikha burial (of Petrovka type), too. Applying a 600 year difference, six of the dated Sintashta burials would fall within the period 2200-1800 calBC.

There are 9 radiocarbon dates of *bone* available from 5 burials classified as representing the Pre-Andronovo Petrovka-Sintashta-Potapovka horizon (Krivoe Ozero kurgan 9, burial 1; Utevka-VI kurgan 6, burials 4 and 6; Potapovka-1 kurgan 5, burials 3 and 13; see Anthony 1998: 105-106, fn. 10; Trifonov 1997). On the one hand, dates of bone from sealed stratigraphic contexts are supposed to correspond better to the actual event of study than dates of timber but, on the other hand, certain technical problems may lead to biased results. Taking the dates at "face values", their chronological distribution is compact and falls be-

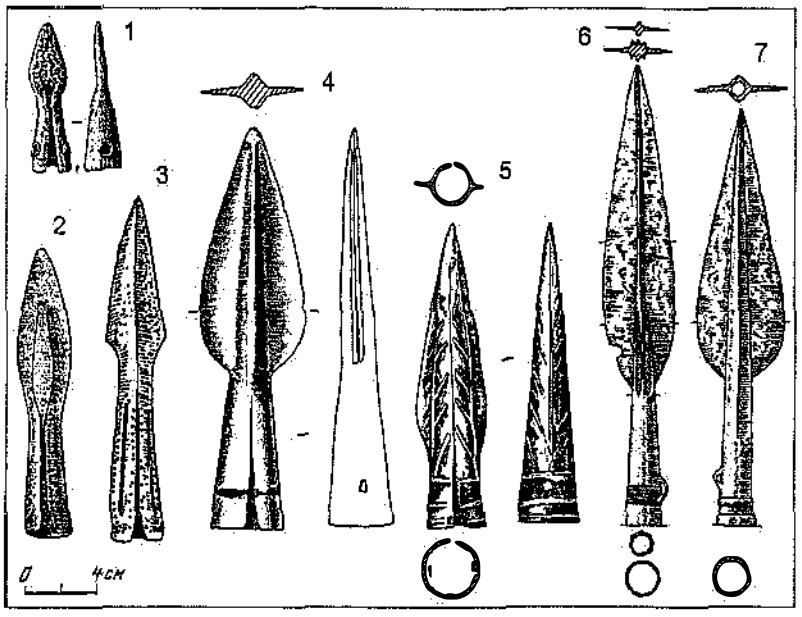

Fig. 20. Spearheads of copper and bronze as compared in the text. *1*: Spearhead of type (1) from the Balanovo cemetery (Balanovo culture). *2*: Spearhead of type (1) from Tyunino (Abashevo culture). *3*: Spearhead of type (2) from the Verkhnyj Kizil hoard (Abashevo culture). *4*: Spearhead of type (3) from the Sintashta large flat cemetery (Potapovka–Sintasht a-Petrovka horizon). *5*: Spearhead of type (4) from the Volosovo-Danilovo cemetery (Fat'yanovo culture). *6*: Spearhead of Sejma-Turbino type from Donaurovo (Sejma-Turbino complex). *7*: Spearhead of Sejma-Turbino type from Kargulino (Sejma-Turbino complex). (20:*4* is adapted from Gening, Zdanovich & Gening 1992, fig. 113, the rest from Bader, Krajnov & Kosarev 1987, figs. 41:9, 61:7, 64:14, 35:23, 45:23,24.)

tween c. 2200 and c. 1800 calBC – in agreement with the above considerations. These dates are suggested here as tentative limits for a chronological horizon represented by sites like Petrovka, Sintashta, Potapovka etc. At the same time, this is a period of strong Abashevo influence in the actual zone. On the other hand, this is the time frame of the Balanovo culture and of the closing phases of the Fat'yanovo culture.

The finds from Sintashta include three spearheads with split sockets (Gening, Zdanovich & Gening 1992, figs. 88:3, 113:1, 184:9). The types which probably were in use for a short time by 1800 BC (see below types 2 and 3) are important chronological markers. They were preceded by another type of forged socketed spearheads (type 1 below) and replaced by socketed spearheads cast as one piece. (Fig. 20.)

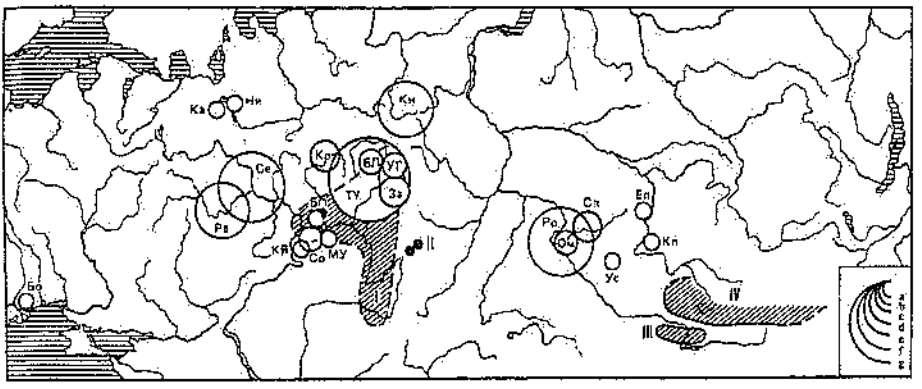

Fig. 21. Location of copper ores (*I* = the Urals region, *IV* = Altai) and the Sejma-Turbino cemeteries (*Ce* = Sejma, *Ty* = Turbino, *Po* = Rostovka, *Eл* = Elunino, *YГ* = Ust' Gajva). (Bader, Krajnov & Kosarev 1987: 87, map 13.) The size of the circular markings indicates the number of finds according to the following scale: *a* = 1-2, *b* = 2-5, *c* = 5-10, *d* = 10-20, *e* = 20-50, *f* = 50-100, *g* = more than 100 finds.

THE SEJMA-TURBINO TRANSCULTURAL PHENOMENON

As the name indicates, this cultural context is associated with the cemeteries at Sejma and Turbino on the rivers Oka and Kama respectively, in addition to a number of other cemeteries, a sanctuary, some hoards and a great number of stray finds (cf. Chernykh 1992: 216-218). (Fig. 21.) On the other hand, there are no Sejma-Turbino settlements. Consequently, it is thought to be a network of warrior-traders who distributed high-quality weapons and other metal objects along with other artefacts of precious raw materials in the border zone of the Eurasiatic steppe and forest. Their primary zone of activity extended from the upper reaches of the Ob in the east to the Oka in the west but their products were distributed in the forest zone as far as Estonia and Finland in the west. The metal of the Sejma-Turbino weapons came from the southern Urals on the one hand and the Altai region on the other (Chernykh 1992: 215-233; Chernykh & Kuz'minykh 1989).

The Abashevo metalwork tradition (fig. 22) occurs in several early Late Bronze Age cultural contexts and the Abashevo culture with its advanced metal-

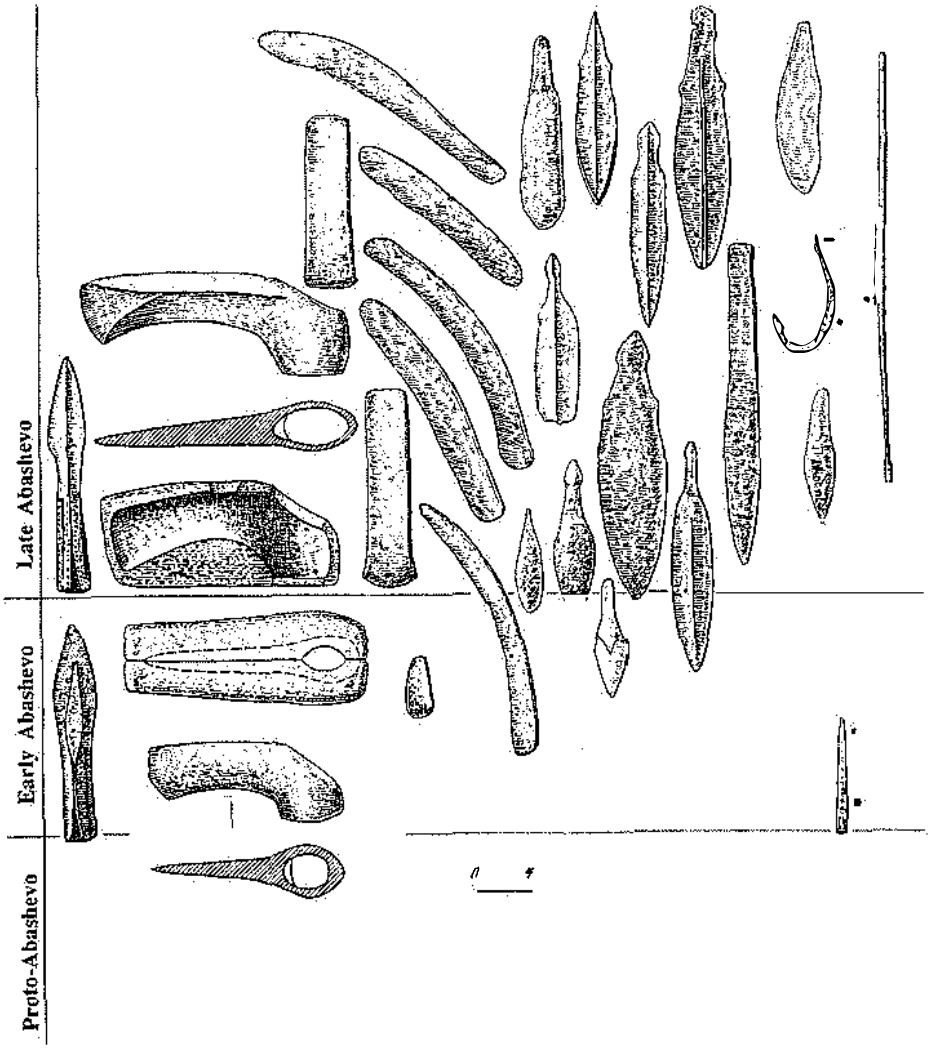

Fig. 22. Development of Abashevo metallurgy. (Bader, Krajnov & Kosarev 1987: 220, fig. 60b.)

lurgy may have been directly involved in the formation of the Sejma-Turbino Transcultural Phenomenon. Close contacts between Abashevo and Sejma-Turbino metallurgy can be observed, for instance, in the material from the Turbino burial ground on the Kama (Chernykh 1992: 203). It is possible that the

culture to which the mobile Sejma-Turbino traders primarily belonged was the Abashevo culture. The extension of the zone of influence of the Sejma-Turbino community from the southern Urals eastwards towards the Altai suggests that the purpose of this movement was to take hold of this metalliferous region, too, and that they were actively involved in getting metallurgy started at this new centre.

This is in contradiction to the scenario of the origin of the Sejma-Turbino Transcultural Phenomenon and its metallurgy presented by Chernykh and Kuz'minykh (1989: 266-277; Chernykh 1992: 215-234). According to this scenario, the Phenomenon originated in the Altai region, from which the Sejma Turbino "tribes" headed towards the southern Urals and central Russia. This is based on three main arguments:

(1) The pommels in the shape of plastic figures that decorate the hilts of certain curved knives represent mountain sheep and horses typical of the Altai mountains and foothills; in addition, plastic representations of snow leopards (*Panthera uncia*) occur on the socket of a spearhead. These species were unknown elsewhere within the zone of the Sejma-Turbino influence and, hence, these artefacts could not have been made outside the Altai region. (Chernykh 1992: 226.)

(2) The use of tin-bronze in the SejmaTurbino industry can only be associated with the Altai region; there the early use of tin-bronze in the *Okunevo* bronze industry on the upper Yenisei is seen as the source of inspiration for the Sejma-Turbino use of tin-bronze (Chernykh 1992: 224, 229).

(3) Casting of large spearheads (figs. 20:6-7 & 24) and socketed axes (fig. 23) began within the Sejma-Turbino context earlier than elsewhere in eastern Europe and western Siberia. Again the source of inspiration is seen in the Okunevo culture. This is based on a find of a cast socketed spearhead from a secondary burial in a late Okunevo kurgan at Moisheika on the upper Yenisei (Chernykh 1992: 184-185, 229, 231); no analysis of the metal is reported.

Solving the origin of the SejmaTurbino cultural context is crucial for understanding not only the archaeology of the later Bronze Age in the relevant zone of eastern Europe and western Siberia, but also the ethno-historical processes in this and adjacent areas. Therefore it is necessary to elaborate the problem here at some length, even at the risk of it appearing unproportionally extended.

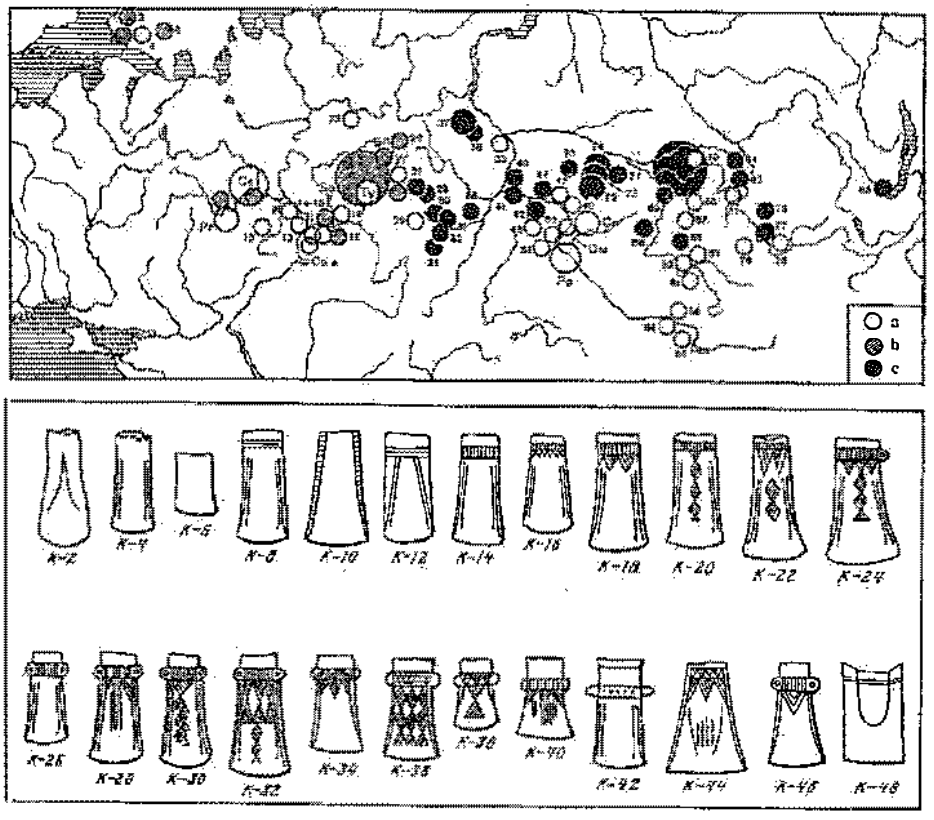

Fig. 23. Variants of socketed bronze celts of the Sejma-Turbino type and their distribution. (Bader, Krajnov & Kosarev 1987: 90, map 15.) *a* = K-14 to K-32, K-44, K-46 (Sejma-Tostovka variants), *b* = K-4, K-8, K-10 (Turbino variants), *c* = K-6, K-12, K-34 to K-42, K-48 (Samus'-Kizhirovo variants).

The core cast socket is one of the most remarkable innovations in the Bronze Age bronze industry and therefore the origin and adoption of the technique by the SejmaTurbino craftsmen is explicitly a case for careful examination. This would probably indicate where the typical Sejma-Turbino bronze industry emerged, as suggested almost fifty years ago by Childe (1954). However, Chernykh and Kuz'minykh have not presented such a study, and here it is only possible to sketch a preliminary outline.

First, it goes without saying that a spearhead frorn an undated secondary burial in a kurgan is no argument in this issue. More powerful, then, is another spearhead with cast socket, from burial 1 of kurgan 11 at Hodosovichi on the

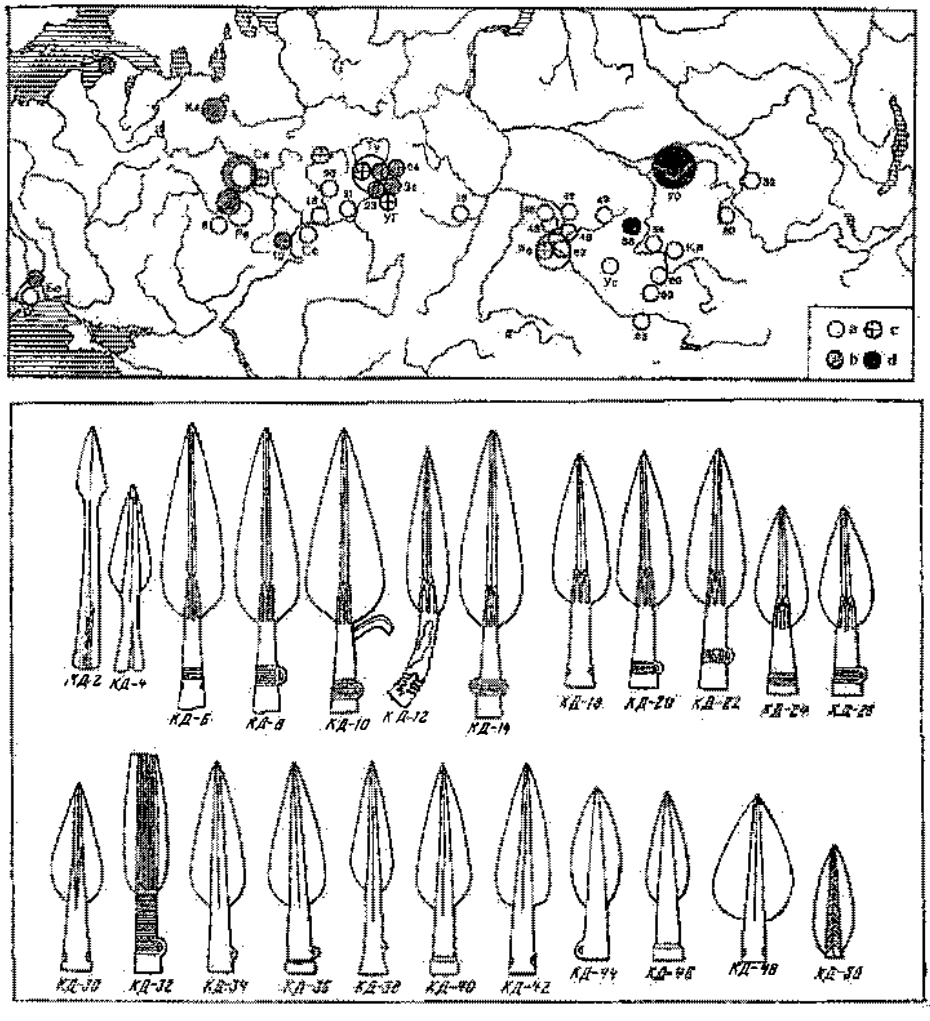

Fig. 24. Variants of socketed spear-heads of Sejma-Turbino type and their distribution. (Bader, Krajnov & Kosarev 1987: 91, map 16.) *a* = Kd-6 to Kd-30, *b* = Kd-34 to Kd-50, *c* = Kd-2 & Kd-4, *d* = Kd-32. *Bo* = Borodino.

upper Dnieper, representing the later part of the second (middle) period of the *Middle Dnieper culture* (Artemenko 1967, figs. 20:1, 47:32; 1987: 39, 41, fig. 12:11 & map 3, no. 50; this culture was mentioned earlier in connection with the Corded Ware cultural complex). No radiocarbon date is available but the general impression of the inventory points to a date of soon after 2000 BC. All but one

of the bronze artefacts found in this burial are of Caucasian arsenic bronze, including the spearhead (Artemenko 1987: 39). The presence of a spearhead is mentioned as unexpected but is not accorded a closer study (Artemenko 1967: 34; 1987). However, the composition of the metal points to Caucasia and indicates an early production of socketed spearheads cast as one piece.

In the later part of the Middle Bronze Age, socketed hooks, chisels/adzes and spearheads appear in Caucasian assemblages and soon in the Catacomb Grave culture of the steppes.

(1) In tbe first stage, the sockets are hammered out of a sheet and rolled into a tubular form (fig. 20:1-2). In addition to Caucasia, such spearheads are familiar both from Balanovo and Abashevo assemblages on the mid-Volga (Chernykh 1992, figs. 47:14-15, 68:34) on the one hand, and as far as Syria and Palestine on the other (Philip 1989: 96-98, fig. 25:1428). The subsequent development can be followed in all parts of this large area.

(2) A following stage in the development is represented by cast spearheads with a forged split socket. The blade has a more or less angular base and, in cross section, the blade has the shape of a flat diamond; the socket of an early specimen is often long compared with the blade (fig. 20:3). Such spearheads are found over the same area as those of the preceding type, i.a., in Abashevo and Sejma-Turbino contexts (Chernykh 1992, figs. 68:33, 74:19). Later sucb spearheads are produced with a proportionally shorter socket and a blade with a rounded base. In our region of interest, the latter variant is present as a small spearhead in burial 53 of the flat cemetery at Strelitsa representing the third (late) period of the Middle-Dnieper culture (Artemenko 1967, fig. 20:2; 1987, fig. 13:13 and map 3, no. 146); it is made of "Balkano-Carpathian" metal (Artemenko 1987: 40), apparently of the same age as the spearhead from Hodosovichi, mentioned above. A larger spearhead, comparable in shape with spearheads of type (3), is found in burial 7 of the Sintashta-II flat cemetery (Gening, Zdanovich & Gening 1992, fig. 184:9).

(3) Parallel with this, a variant appeared with the socket extending to the tip of the blade as a midrib (fig. 20:4). The solution represented by type (3) became widespread. Among representatives of this variant, the big spearheads from the shaft graves of Mycenae are well known (Karo 1930). According to Chernykh (1992: 113-114), the spearheads of both type (2) and (3) are forged using a labour-intensive and complex technique. Philip (1989: 88, e.g. fig. 21 left), having studied the technology of relevant

Syrian spearheads, concludes that "the blade and the lower part of the socket were *cast as one piece around a blank, resulting in a hollow casting*. The upper end of the socket was cast as a flat sheet, then rolled in position around the handle." [Our italics.] This would be the beginning of the core casting technique as applied to spearheads.

(4) A different solution is represented by a type of spearhead, the split socket of which extends to the tip of the blade as a midrib (fig. 20:5). In addition to Caucasia (Chernykh 1992, figs. 36:4, 37:7, 42:10), this type is also known, on the one hand, from Fat'yanovo and Abashevo contexts on the Volga (Chernykh 1992, figs. 47:13, 68:32), where they certainly are imported articles, and from as far as Syria on the other hand (Philip 1989, fig. 22 right). According to Chernykh (1992: 113-114, 136), these spearheads were also forged using a labour-intensive and complex technique.

In our region of interest, socketed spearheads of the above types first appear in the latter half of the Middle Bronze Age in the Trialeti culture of Trans-Caucasia (Chernykh 1992: 113) and soon they find their way to northern Caucasia from where the distribution of the early socketed spearheads of types (1), (2) and (4) extends to the mid-Volga-Kama area. Some specimens probably are direct imports from Caucasia while others are made locally. Then, spearheads of type (3) suddenly find use in a much larger region. At least 10 such spearheads are recorded from a zone extending from the Dnieper in the west to the Irtysh in the east where they occur in Sintashta, Sejma-Turbino and early Timber Grave contexts (the find spots: Poltava region; Mazurka; Pokrovsk; Sejma; Ust' Gajva; Arkaim; Sintashta; Ambar-5; Rostovka; see e.g. Chernykh 1992, figs. 69:28, 70:22, 35, 73:13, 75:14, 78:18; Gening, Zdanovich & Gening 1992, figs. 88, 113; Kostyukov, Epimakhov & Nelin 1995, fig. 21:1). The composition of the metal of these spearheads as well as their distribution, which centres in the southern Urals (with half of the finds), point to where the production took place. The appearance of type (3) is an important marker of the transition from the Middle to the Late Bronze Age in this region. There is nothing that would point to an origin elsewhere than in Caucasia.

According to Chernykh (1992: 113), socketed spearheads cast as one piece in the core casting technique appear in the Trialeti culture at the end of the Middle Bronze Age, although they remain rare. The small spearhead from the Middle Dnieper culture kurgan at Hodosovichi, mentioned above, is an import from the Caucasus. The Trialeti culture ended in the 20th century BC (Trifonov 2001) and the Hodosovichi find is in agreement with this date. So far it appears

evident that in the 20th century BC the Caucasus was the only area relevant to our study where spearheads were cast as one piece. It was from there that the inspiration to cast spearheads spread to the Volga–Kama–southern Urals zone almost simultaneously with the type (3) technique mentioned above. More labour intensive, the latter could not compete with the one-piece-casting and was soon abandoned, one may assume.

In the Volga–Kama–southern Urals zone, it was the experienced Abashevo craftsmen who were able to take up the new techniques and develop and distribute new types of spearheads. Compared with the Abashevo metallurgy, the Okunevo metallurgy, as described by Chernykh (1992: 184-185), could not provide a direct basis for the advanced Sejma-Turbino metallurgy. The Abashevans had become aware of the advantages tin would provide as an alloy and that tin, in addition to more copper, was available in the Altai. But in order to be able to exploit these resources it was necessary to organise cooperation with the local communities. It was in this situation that the Sejma-Turbino Transcultural Phenomenon, as a kind of "mafia", formed in order to achieve control over as much as possible of the "metals business". And it was in this situation that members of local communities joined the organisation, and their contacts with *Glazkovo culture* communities of the Angara-Baikal area (Chernykh 1992: 271; Okladnikov 1955), again, brought artefacts of nephrite to the assortment of goods.

As mentioned above, the adze/chisel with a forged socket was a Middle Bronze Age innovation. Later, with the invention of core casting, it was also easy to produce socketed axes cast as one piece, in addition to spearheads. It is worth mentioning that the Sejma-Turbino socketed axe is the first of its kind and that its shape, as suggested by Childe (1954: 24), may imitate the shape of contemporary stone axes of the Urals region.

Next, it is necessary to devote some attention to the daggers with pommels in the shape of plastic animal representations. The Sejma-Turbino context shows two types of daggers: one with a western and another with a mainly eastern distribution (fig. 25). The western type has a symmetrically two-edged straight blade and has often had a handle of organic material, now disintegrated. A number of such daggers with cast handles have been discovered and among them three are provided with pommels in the shape of naturalistic plastic representations of animal's heads. While the dagger of the Galich hoard has a snake's head, the dagger from the Sejma cemetery has an elk's head. Tallgren (1915: 81), already, pointed out that these sculptures were part of the age old tradition

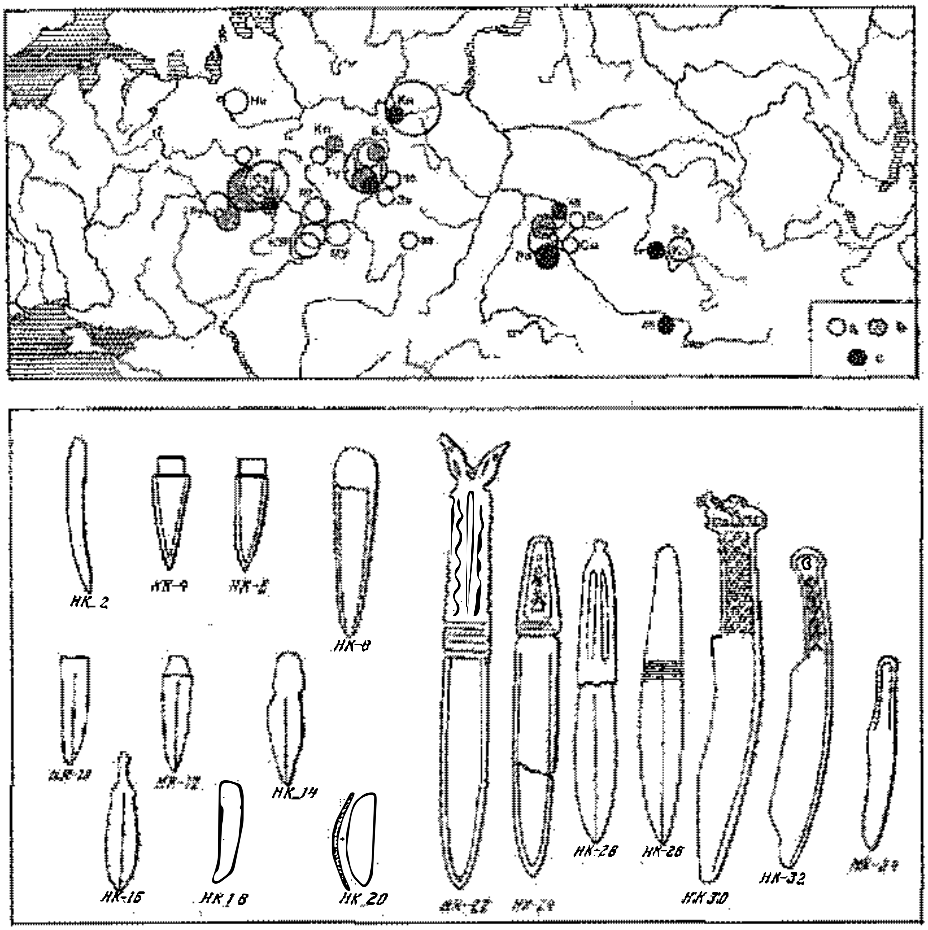

Fig. 25. Variants of the daggers of Sejma-Turbino type and their distribution. (Bader, Krajnov & Kosarev 1987: 92, map 17.) *a* = Nk-4 to Nk-8, Nk-22, Nk-24, *b* = Nk-10 to Nk-16, Nk-26, Nk-28, *c* = Nk-30 to Nk-34.

of naturalistic animal art of the forest zone of eastern Europe represented, i.a., by the well known shaft hole axes with elk's or bear's heads on the butts (see Carpelan 1974; 1975) (fig. 26). The Sejma-Turbino organisation must have included an element descended from the Volga-Kama zone Eneolithic.

The eastern type of Sejma-Turbino daggers have curved one-edged blades and cast handles. Five daggers have pommels in the shape of plastic naturalistic representations of mountain sheep and horses typical for the Altai mountains

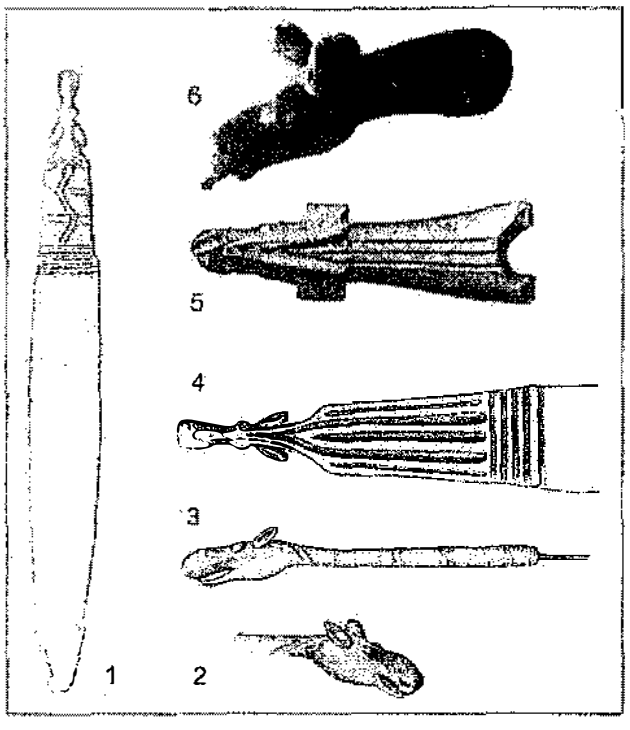

Fig. 26. Weapons with plastic elk heads representing the forest zone animal art tradition. *1*: Dagger of bronze from the cemetery at Sejma, Russia; upper side. *2-3*: Lateral views of the hilt of the same dagger. *4*: Underside of the hilt of the same dagger. *5*: Upper half of a battle axe of green slate from a multi-period dwelling site at Ravi, Russia (former Finnish Karelia). *6*: Lateral view of the same piece. Not to scale. (*1-5* adapted from Tallgren 1915, fig. 3-6, 9 and *6* from Edgren 1992, fig. on page 81.)

and foothills (Chernykh & Kuz'minykh 1989: 117-122). The Rostovka figure depicts a man taming a horse (Chernykh 1992, pl. 22; there is nothing indicating that the man would be a skier, as alleged, among others, by Chernykh 1992: 227). The prototype for the eastern Sejma-Turbino dagger is probably found in the Abashevo one-edged tool, but the animal representations are applications of the traditional local naturalistic animal art, by analogy to the application of local naturalistic animal art to Sejma-Turbino forms in the east European forest zone. (Fig. 27.) None of them provide arguments in the discussion of the Sejma-Turbino origins other than that they point to the transcultural character of the context itself.

Furthermore, the transcultural character of the Sejma-Turbino context is stressed by the fact that no specific type of ceramics is connected to the Sejma-Turbino contexts. Whenever ceramics appear they always represent a local type. This fact is a strong indication that the Sejma-Turbino groups relied, to a considerable extent, on the services of the various local communities whose domains they visited. However, Chernykh and Kuz'minykh (1989: 266-277;

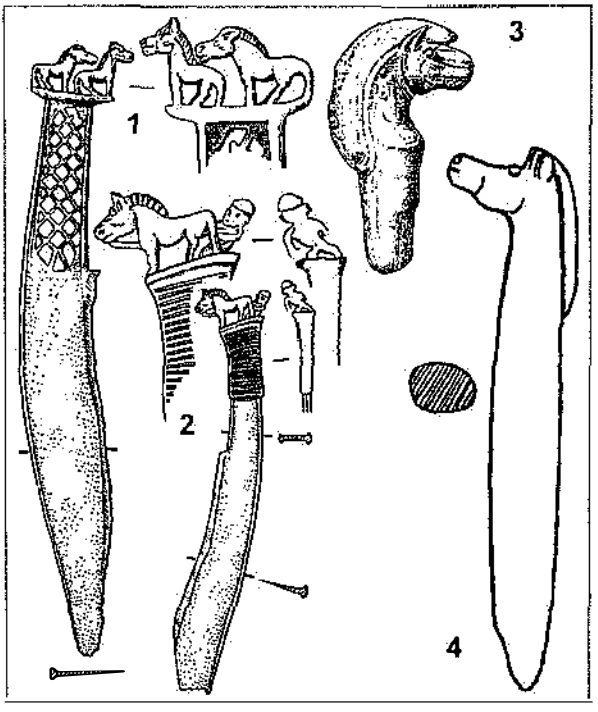

Fig. 27. Implements with plastic horse figurines representing the steppe zone animal art tradition. 1: Curved one-edged dagger of bronze from the cemetery at Sejma, Russia, with a pommel in the shape of two horses. 2: Curved one-edged dagger of bronze from the cemetery at Rostovka, Russia, with a pommel in the shape of a man taming a horse. 3-4: "Sceptres" of stone with horse heads from somewhere on the Irtysh, Russia. Not to scale. (*1-2* adapted from Chernykh & Kuz'minykh 1989, fig. 66:1,2; *3* adapted from Bader, Krajnov & Kosarev 1987, fig. 121:11, and *4* adapted from Kuz'mina 1994, fig. 55:6.)

Chernykh 1992: 215-234) speak of expanding *tribes* in contradiction to the idea of a *transcultural* character of the SejmaTurbino context. In this study, the standpoint is taken that the SejmaTurbino Transcultural Phenomenon consisted of organised trader groups acting within a network. It was founded within the Abashevo entity by an Aryan speaking elite of armed warrior-traders, dominating members of the societies within their zone of influence, who probably had important functions as guides and interpreters.

If the Abashevo culture was bilingual as suggested above, their mobility over a wide area of forest and forest steppe becomes understandable. Carpelan (1999a: 270; 2000: 25) has made the suggestion that the Siberian portion of the trader network implied by the Sejma-Turbino phenomenon may have been partly in the hands of *Pre-Proto-Samoyed* speakers. The now extinct eastemmost branches of the Samoyed languages, Kamassian, Motor etc. were spoken in the Sayan area. Parpola (1999: 195) has seconded Carpelan's idea, and Janhunen (2001b: 34), too, finds the assumption sensible. This would imply that the Samoyeds descend from that Uralic component of the Abashevo culture which proceeded further east from the Kama area and the southern Urals, while the

language of those who stayed in the Kama region and the southern Urals developed into the Ugric branch. In this case the ancestors of the Samoyeds did not break off from the Uralic protolanguage, as has been thought so far, but from Late Proto-Finno-Ugric.

The dating of the beginning of the Sejma-Turbino Transcultural Phenomenon is difficult because there are almost no relevant radiocarbon dates. However, the appearance of core cast socketed spearheads in the Caucasus c. 2000 BC provides a *terminus post quem*. On the other hand, burial 2 of the four grave cemetery at Elunino on the upper Ob in the eastern end of the Sejma-Turbino zone has yielded the so far only direct radiocarbon date of a Sejma-Turbino context: c. 1900 calBC (while burial 1 of the same cemetery has yielded one of the daggers with representations of animals mentioned above; Chernykh & Kuz'minykh 1989: 25, 121, fig. 67-2). Assuming that the distribution of Sejma-Turbino bronzes in the northwestern section of the trading zone was connected with the Netted Ware context, indirect chronological clues are provided by a couple of dates from cultural layers representing this culture. One, c. 1930 calBC, is from Ivanovskoe-III in the Volga-Oka interfluve, and another, c. 1850 calBC (Kosmenko 1996: 64-65), from Kelka-III on Lake Vodla east of Lake Onega in Russian Karelia. It is probably realistic to assume that the Sejma-Turbino Transcultural Phenomenon emerged in the 19th century BC and established itself c. 1800 BC. This is also the beginning of the Late Bronze Age in the region.

The famous Borodino hoard (fig. 24) in Moldavia (Krivtsova-Grakova 1949) includes typical Sejma-Turbino spearheads, although of silver or billon, in addition to a dagger and a pin with so called Mycenaean style ornamentation, and this would make the find parallel with Mycenaean shaft graves of c. 1700 BC (cf. Randsborg 1992: 96). However, this "wavy line" style appeared early in the steppes applied on bone horsegear and c. 1800 BC as far west as in Hungary on various metal artefacts. Thus it is possible that the Borodino hoard represents the initial expansive Sejma-Turbino activity. From the long distances between the southern Urals centre and the ends of the Sejma-Turbino zone in the Altai on the one hand and Estonia/Finland on the other it follows that the expansion of action was very rapid. This was possible because it was not a colonisation movement but a movement which exploited the services of the local communities.

According to Chernykh and Kuz'minykh (1989: 256-265; Chernykh 1992: 229), the Sejma-Turbino Transcultural Phenomenon had a short duration. However, there are even fewer criteria for the dating of the end than for the dating of

the beginning. It appears sensible to assume that, once established, the Sejma Turbino system functioned following settled practices until it broke down in the face of new economic and political trends. The latter half of the 16th century BC was a time of change not only within the Andronovo cultural context, as described above, but probably even more generally. This would give the Sejma Turbino Transcultural Phenomenon a time span of about 250 years corresponding to 12 or 13 generations (five/century).

ARYAN ETHNONYMS OF FINNO-UGRIC PEOPLES

The former presence of an Aryan-speaking elite layer in the Finno-Ugric speaking peoples of the Oka–Volga–Kama region is clearly visible in the ethnonyms of these peoples.

The name *Mari* (*Märe* in the mountain region dialect) used by the Mari alias Cheremis of themselves is also current as an appellative meaning 'man, human being'. It goes back to an earlier form **Märi*. Jordanes writing c. AD 550 in his Getica (ch. 116) mentions among the peoples conquered by the Ostro-Gothic king Hermanaric (c. AD 351-376) *Merens* and *Mordens*, with the Gothic *-ens* suffix (cf. Korkkanen 1975: 71-73, and Pekkanen 1996-97: 5-6, also for some doubt about the identification with the Mari and the Mordvin). The people called *Merya* in the Old Russian "Nestor's chronicle" lived between the Volga and the Oka. (From the point of view of Russian grammar, the name *Merya* is collective feminine singular; as the subject, it can have the predicate either in the singular or in the plural, as it denotes both the country and its people.) The name **Märi* goes back to Proto-Aryan **márya-* < Proto-Indo-European **meryo-* 'man', literally 'mortal, one who has to die'. The Mari have been in continuous occupation of the mid-Volga area, which belonged to the area of the Abashevo culture. It is quite possible that their ethnic name is of Bronze Age origin, for *marya-* is used in Mitanni Aryan of Syria (c. 1500-1300 BC) of the nobility with horse chariots, and in Vedic texts of 'young man, warrior; wooer, lover; stallion' (cf. Mayrhofer 1966: 16-17; 1974: 68; 1992-2001, II: 329-330). It is nowadays widely agreed that the Mitanni Aryan belonged to the Indo-Aryan rather than the Iranian branch, but the Mitanni evidence does not prove that the Aryan component among the ancestors of the Mari people belonged to the Indo-Aryan branch, for the word occurs with the same meanings also in Avestan and Old Persian, and it is indirectly attested through Caucasian borrowings (cf Chechen *mār*, *māri*, *majr* and Ingusian *mar* 'man, human being, husband')

for Old Ossetic as well. (Cf. Vasmer 1971, I: 348-353; Joki 1973: 280; Hajdú 1987: 86-87.)

The Mordvin have inhabited the Moksha drainage area and the Mokhsa-Tsna interfluve on the southeastern side of the Oka river. In the early second millennium BC, the Oka Valley was occupied by the Pozdnyakovo culture, an offshoot of the Timber Grave (Srubnaya) culture from which the later Scythians and Sakas seem to descend. The Aryan ethnonym of the Mordvin is synonymous with that of the Mari, but formed differently, and may thus represent a different Aryan group. The oldest form of the name of the Mordvin is **Mord* (cf. Hajdú 1987: 93). For *Mordens* in Jordanes cf. above, on the Mari. The Byzantine emperor Constantine Porphyrogenitus (913-959) tells that *Mordía*, 'country of the Mordvins', is situated between the Slavs, the Bolgars and the Pechenegs, at a distance of ten days from the last mentioned people (who at the end of the 9th century lived between the Dnieper and the Don) (cf. Pekkanen 1996-97: 6). Old Russian *Mordva* 'country of the Mordvins' has secondary *-v-*. **Mord* seems to go back to early Proto-Aryan *mórto-* (= Proto-Indo-European *mórto-*, whence Greek *mortó-*). The same word was separately borrowed into Finnic after the change *o* > *a* had taken place in Proto-Aryan, so as to yield *márta-* 'mortal, man' preserved in Old Indo-Aryan: Finnish *marras*, stem *marta-* 'dying, dead; manly, male' (cf. Joki 1973: 280-281).

The corresponding appellative reconstructed for Volga-Permic, **mertä* 'man, human being' (Mordvin E *mirde*, M *mirdä*, Udmurt *murt*, Komi *mort*), is likewise a loanword from Proto-Aryan. Earlier it was assumed that Volga-Permic **mertä* goes back to Aryan/Iranian **merta-* (cf. Joki 1973: 281), but Koivulehto (1999a: 228-229) argues that *er* substitutes vocalic *r̥* in Proto-Aryan and Old Indo-Aryan *mr̥tá-* 'mortal, man' < Proto-Indo-European **mr̥tó-*. This same Proto-Aryan word occurs as the second element of the Votyak self-appellation *Udmurt* as well. The first element *Ud*, older *Od*, is found in Mari *Odo(-mari)* 'Udmurt' and Old Russian *Oty* (plur.) 'Votyak', whence, with prothetic *v-* and with the ethnonym suffix *-yak*, Russian *Votyak*. (Cf. Hajdú 1987: 80.)

The ethnonym *Arya/Ārya*, which was commonly used of themselves by speakers of Old Indo-Aryan as well as Old Iranian, appears as a loanword in Finnish and Saami, the reconstructed original shape being **orya* (cf. Joki 1973: 297). The word *orja* denotes 'slave' in Finnish; this meaning can be explained as coming from 'Aryan taken as a war-captive or prisoner', as English *slave* comes from 'captive Slav' (cf. Parpola 1999: 197). The corresponding Saami word, meaning 'south', is assumed to have originally denoted people living

south of the Proto-Finnic speakers (cf. Joki 1973: 297). Besides **orya*, there are several other early Aryan loanwords where the labial vowel *o* (or *ō*) of Proto-Finno-Ugric corresponds to Proto-Aryan *a/ā*: Koivulehto (1999a: 215ff.) suggests that these words temporally belong together and reflect a somewhat labialized realization of *a/ā* on the Aryan side, apparently in early Proto-Indo-Aryan.

The Ugric languages share several very early Aryan loanwords (e.g. Hungarian *méh* 'bee', see below). The ethnic name *Yugra* is used of the Ob-Ugrians in the Old Russian "Nestor's Chronicle" as the name of an alien people who in 1096 lived beyond the Pechora "in the nortb with the Samoyeds". Russian Yugra corresponds to Komi *Jögra* 'Mansi and/or Khanti'. As shown by Tuomo Pekkanen (1973), this ethnic name was used of the Hungarians as well and has an Aryan etymology. Formally there is no reason why the name could not go back to the Bronze Age of the "Ugric homeland": Proto-Aryan **ugrá-* 'mighty, strong, formidable, violent, terrible, noble' occurs in Old Indo-Aryan not only as an adjective but also as tribal name and as a proper name of a god (Rudra-Śiva) and of men; in Old Iranian (Avestan), too, it is used of men as well as of gods.

Pekkanen's principal authority is the Greek historian Strabo (64 BC – AD 19), who in his Geography (7,3,17) says that the most important tribe of the Sarmatians, namely the "Royal Sarmatians" (*Sarmátai Basíleioi*), were also called *Oûrgoi*. This is a metathesis form of the word *ugra*, attested also in Scythian proper names such as Aspourgos (= Old Iranian *aspa-* 'horse' + *ugra-*) occurring nine times in the Greek inscriptions of the Pontic coast. From the passage cited, it can be concluded that these Oûrgoi were settled between the Dniester and the Dnieper; according to Strabo, they "in general are nomads, though a few are interested also in farming; these peoples, it is said, dwell also along the Ister (i.e. the Danube), often on both sides". (This textual evidence would seem to require a search for Sarmatian and Hungarian components in the Chernyakovo culture which then occupied the area between the Dniester and the Dnieper and which is usually identified as linguistically Gothic.)

Pekkanen (1973) has argued that these migrant Sarmatian Oûrgoi already comprised some Hungarians, and that Strabo's is in fact the earliest historical reference to them. He points out that in a 3rd- or 4th-century Latin inscription (CIL III, no. 5234) from Celeia, a village on the borders of Pannonia, a man "killed by the (people called) Mattzari" is mentioned. The *Mattzari* correspond to tbe *Mádzaroi* whom Constantine Porphyrogenitus mentions as living on the Volga in the 10th century, and to the *Mátdzaroi* used in later Greek sources of the *Magyars*, which is the name the Hungarians use of themselves and which appears as *Majqhari* in the 10th-century Muslim sources. (Cf. Pekkanen 1973:

46-48.) The widely accepted derivation of the name *Hungarian* via Old Slavic *ongr-* from Chuvash (Bolgarian Turkic) *onogur*, the name of a Hunnic/Bolgar tribe analysed to consist of Turkic *on* 'ten' and *ogur* 'arrow' and 'tribe' (cf. e.g. Hajdú 1987: 29, 47-48), is sharply criticized by Pekkanen (1973: 53ff.), who derives the name Hungarian from Oûggroi, another name of the Toûrkoi in several Byzantine sources (and identified with the Oûrgoi in a marginal gloss on Strabo), Ungri in Latin sources, later Ungari, and, on account of a confusion with the Huns, Hungari (cf. Pekkanen 1973: 48ff.).

THE EARLY ARYAN LOANWORDS FOR 'HONEY' AND 'BEE'

It is generally accepted that Proto-Finno-Ugric **mete* 'honey' (distributed in Finnic, Saami, Mordvin, Udmurt, Komi, and Hungarian) is borrowed from Profo-Indo-European = Pre-Proto-Aryan **medhu-* (which became **madhu-* in Proto-Aryan) (cf. Joki 1973: 283-285; Rédei 1988-91, I: 655-656; Mayrhofer 1992-2001, II: 302-303). The same Pre-Proto-Aryan vowel **e* is found in Proto-Finno-Ugric **mekše* 'bee' (distributed in Finnic, Mordvin, Mari, Udmurt, Komi, and Hungarian) which on the Indo-European side has a reasonable counterpart only in Proto-Aryan (cf. Joki 1973: 281-282; Rédei 1988-91, I: 655; Mayrhofer 1992-2001, II: 287).

Aulis J. Joki (1973: 284) observed that since the word for 'bee' in Aryan languages means both 'bee' and 'fly', and since it begins with **me-* like Pre-Proto-Aryan **medhu-* 'honey', it might originally be a compound meaning 'honey-fly'. The Dravidian languages of India support Joki's hypothesis, for in Tamil and in Malto the word for 'bee' is just such a compound, *tēn-ī*, which literally means 'honey-fly'; in Sanskrit, too, there are the compounds *madhu-makṣa-* (Kauśikasūtra 93) and *madhu-makṣikā-* (Kauśikasūtra 118); cf. further Sanskrit *madhu-lih-* 'bee', literally 'honey-licker'. In oldest Indo-Aryan, there are some rare cases where the first member of a compound loses the final vowel, e. g. *sas-pīñjara-* 'yellow like grass (*sasá-*)', besides haplological *śaṣ-pīnjara-* 'yellow like young grass (*śaṣpa-*)'. If such an elision has taken place, the resulting **medh-* 'honey' could further have lost its aspiration and voicing of the final consonant in front of a voiceless stop beginning the second member of the compound, as in Old Indo-Aryan *yut-kārá-* 'making fight (*yudh-*)'. If the Proto-Aryan word for 'bee' is reconstructed **makši-* (cf. Sanskrit *mákṣi-kā-* 'bee', Buddhist Hybrid Sanskrit *makṣī-*, and Avestan *maχšī-*, Sogdian *mwγšk-* < **maχši-ka-* 'fly') instead of **makš-*, which is the usual reconstruction on the

basis of Ṛgvedic Sanskrit *mákṣ-* besides *mákṣā-* and *mákṣi-kā-* (thus e.g. Joki, Rédei and Mayrhofer), the latter component of the assumed compound could be the Proto-Indo-European root **k^{w}(e)i-* (LIV, pp. 338-339), which in the Aryan branch alone (cf. Sanskrit *ci-*, Middle and Modern Persian *čīdan*) has a meaning very suitable to this context, namely 'to collect, hoard, pile'. The Early Proto-Indo-European consonant sequence **/TK/* (dental + velar or labiovelar) has been preserved in Anatolian and Tocharian, but in Late Indo-European it has changed into **/KT/*, realized as *[kþ]* yielding in Proto-Aryan **kš* and this in turn *kṣ* in Old Indo-Aryan and *χš* in Avestan. (Cf. Parpola 1999: 199-200.)

Irrespective of whether this new attempt to explain the origin of the Aryan word for 'bee' from a compound denoting 'honey-collector' is accepted or not, there is fairly wide agreement on its having been borrowed into Proto-Finno-Ugric before the Proto-Aryan sound change **e* > *a* took place. Fëdor Keppen (1886: 84-86, 107-113) alias Theodor Köppen (1890), Y. H. Toivonen (1953: 17-18) and Péter Hajdú (1975: 33) have rightly stressed that the Indo-European loanwords for 'honey' and 'bee' are key terms for locating the old homeland of the Finno-Ugric speakers. The honey-bee

> was unknown in Asia, until relatively recent times, with the exception of Asia Minor, Syria, Persia, Afghanistan, Tibet and China, none of which can be taken into account for our purposes. The bee was not found in Siberia, Turkestan, Central Asia and Mongolia; indeed, it was introduced to Siberia only at the end of the eighteenth century. On the other hand, the bee is found west of the Urals in eastern Europe, mainly from the northern limit of the oak ..., or from Latitude 57°-58° southwards. Moreover, the middle Volga region was known of old as a bee-keeping area. (Hajdú 1975: 33.)

Hajdú's statements conform to the latest state of research summarized in Eva Crane's extensive book, *The World History of Beekeeping and Honey Hunting* (1999). *Apis mellifera* is native to the region comprising Africa, Arabia and the Near East up to Iran, and Europe up to the Urals in the east and to southern Sweden and Estonia in the north (fig. 28); its spread further north was limited by arctic cold, while its spread to the east was limited by mountains, deserts and other barriers. Another important limiting factor was that the cool temperate deciduous forests of Europe extend only as far east as the Urals and do not grow in Siberia (cf. below). The distribution of *Apis mellifera* was confined to this area until c. AD 1600, when it started being transported to other regions. (Crane 1999: 11-14.) Thus hive beekeeping was extended to Siberia from the 1770s, when upright log hives were taken from the Ukraine and European Russia to Ust'-Kamenogorsk and Tomsk, from where it started spreading (Keppen 1886: 109-111; Crane 1999: 232, 366-367).

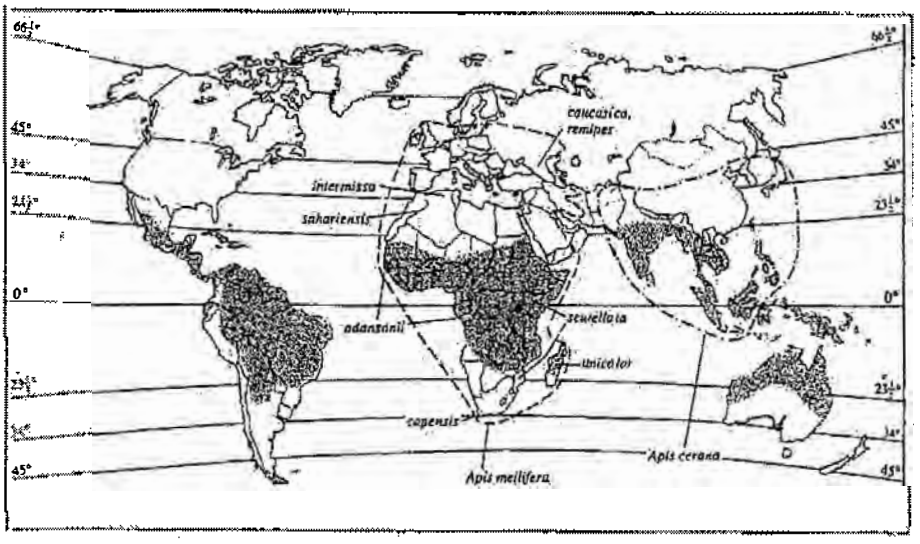

Fig. 28. Regions where cavity-nesting honey bees, *Apis mellifera* and *Apis cerana*, and (shaded) stingless bees, *Meliponinae*, are native. (Crane 1999, fig. 3.2a.)

Another species of cavity-nesting honey bee, *Apis cerana*, is native to Asia east and south of Pakistan, Afghanistan, China, Korea and Japan (cf. Crane 1999: 13-14) (fig. 28). This species seems to have been present as far northwest as the Altai, where Wilhelm Radloff saw many wild bees and heard native Turkic words used for 'bee' and 'honey' (cf. Radloff 1865: 255-256; 1884, I: 367-368; G. J. Ramstedt in Hämäläinen 1935: 34; Linnus 1939: 244-245). According to Juha Janhunen (pers. comm.), the Proto-Turkic form of the word recorded for 'bee' is to be reconstructed as **(x)arygl(x)āryg* (possibly < **parygl pārygl*); its etymology is debated, but according to Sevortyan (1974: 186-187) – and Janhunen – it is not excluded that it is related to Sanskrit *alí-* 'bee'. The Turkic word for 'honey', *bal/bāl* (attested since the 11th century), and Mongolian *bal* 'honey, wax' (borrowed from Turkic), are likewise usually considered to be Indo-European loanwords, Sanskrit *madhu* and Avestan *maδu* being usually mentioned in this connection, for Turkic did not distinguish between *b-* and *m-* (cf. Räsänen 1969: 59a; Mayrhofer 1956-80, II: 571; 1992-2001, II: 302-303; Clauson 1973: 330; Joki 1973: 284; Sevortyan 1974: 47). These words are, however, also compared to Korean *bel* (*beol* in current transcription and *pel* in the Yale system) < **pelV* 'bee' and the related Japanese *hachi* < **pati* 'bee', written with the character for Chinese *feng* 'bee', all these

undoubtedly referring to *Apis cerana*. According to the Japanese chronicle Nihon-shoki, four crates of honeybees were sent in AD 647 from Kudana (Paekcho) in Korea to be kept at Miwa-yama in Japan (cf. Martin 1987: 401). Chinese *mì* < *myit* < **myit*/ **mit* 'honey' is generally connected with Tocharian B *mit* 'honey' < Proto-Tocharian **mĕt* < Proto-Indo-European **medhu* (cf. Lubotsky 1998: 379).

Tree bee-keeping is one of the oldest methods of exploiting *Apis mellifera*. Tree bee-keeping is supposed to have developed early in the area of the Oka, mid-Volga and lower Kama – areas long inhabited by Finno-Ugric speaking peoples. This zone has had rich deciduous forests with broad-leaved trees which shed their leaves before winter; the leaves foster the growth of herbs and shrubs, which together with the flowers of the trees provide forage for honey bees. This region has been particularly rich in limes, the flowers of which were the principal source of honey here; it remained the most important area of tree bee-keeping until the early 1900s, when the bee forests largely disappeared. Besides the limes and other flowering trees, the cool temperate deciduous forests of Europe had big oaks that develop large and long-lasting cavities for the bees to nest in (the bees prefer cavities having a volume around 50 litres). Large pines and spruces enabled tree bee-keeping also in such coniferous forests of northern Europe that were not too cold in the winter and had enough forage for the bees, especially in northern Russia, in the Baltic region and in Poland and east Germany. (Crane 1999: 62; 127.)

The natural habitat of the oak (*Quercus robur*) (fig. 29) and the lime (*Tilia cordata*) (fig. 30), which have been the most important trees for tree bee-keeping in central Russia, grow in Europe as far east as the southern Urals (60° E). Today, *Quercus robur* is not found in Siberia at all (cf. Hultén & Fries 1986, I: 315, map 630 & III: 1031; Meusel, Jäger & Weinert 1965: 463; Sokolov, Svyazeva & Kubli 1977: 122-125; Menitskij 1984: 43-45), but there are scattered occurrences of *Tilia cordata* in western Siberia (fig. 30) (where it grows in the spruce taiga, but also in forests mixed with the pine; cf. Hultén & Fries 1986, II: 651, map 1301; Meusel et al. 1978: 284). According to palynological investigations (cf. Huntley & Birks 1983: 391-410; Lang 1994: 109, 116 and fig. 4.3.2-1/22, 43, 4.3.2-8/22, 4.3.2-16/43; Velichko, Andreev & Klimanov 1997: 87) the lime spread to Central Russia from the (south)west in the early Boreal period (c. 8150-6900 calBC). In the favourable Atlantic conditions (c. 6900-3800 calBC), the spread of *Tilia cordata* continued to western Siberia, but in the unfavourable conditions of the Subboreal period (c. 3800-600 calBC)

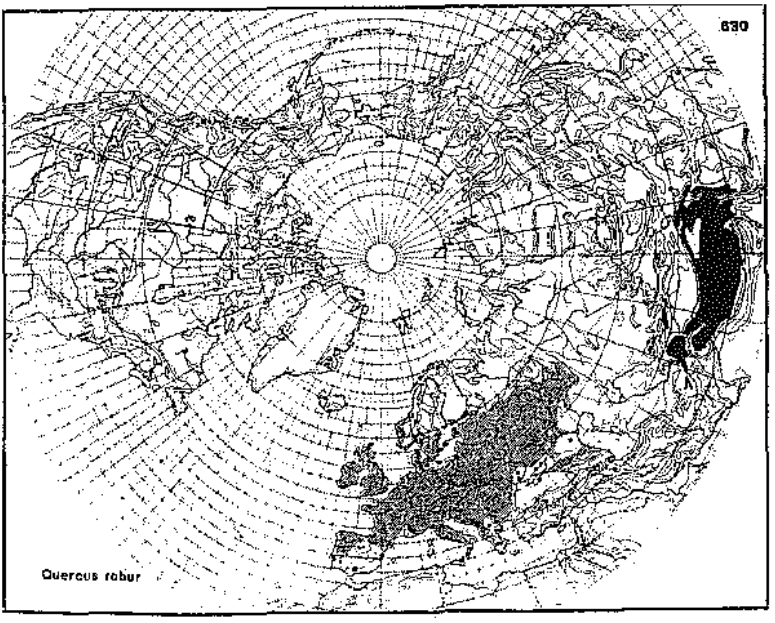

Fig. 29. Present distribution of the oak species *Quercus robur*. (Hultén & Fries 1986, I: 315, map 630.)

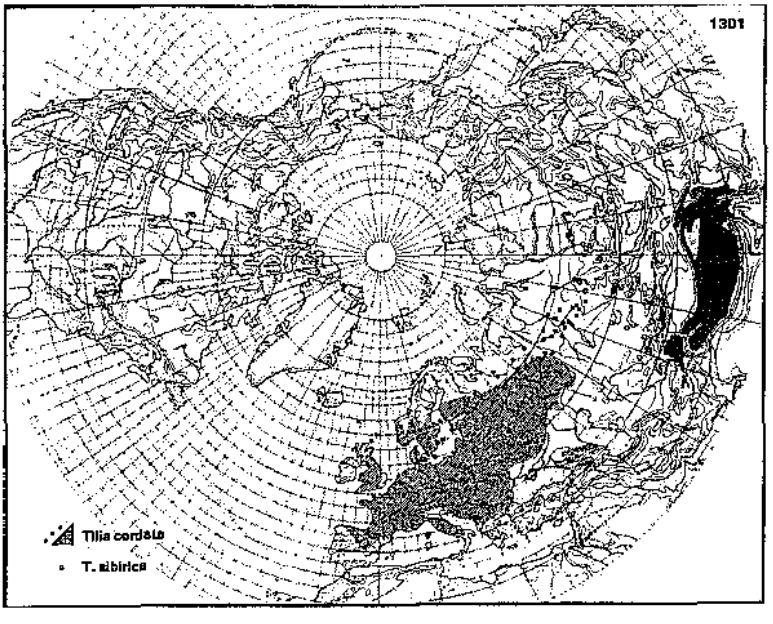

Fig. 30. Present distribution of the lime species *Tilia cordata* and *Tilia sibirica*. (Hultén & Fries 1986, II: 651, map 1301.)

a considerable reduction of elements of broad-leaved forests is seen east of the Urals leaving isolated occurrences at some favourable spots. The disjunct distribution of another species, *Tilia sibirica*, is found between the upper Syr Darya and the upper Yenisei (fig. 30). (Cf. Hultén & Fries 1986, II: 651, map 1301 [= our fig. 31] & III: 1091; Meusel et al. 1978: 284.) In any case, the scattered isolated occurrences of the lime in western Siberia cannot be compared with the dense lime forests that have long existed in central Russia, and the Siberian limes can hardly have provided a basis for prehistoric bee-keeping.

'Bee' or 'honey' are not among the meanings of those c. 700 words that are found in at least one language of both the northern and the southern group of the Samoyedic languages and can thus be reconstructed for Proto-Samoyedic (cf. Janhunen 1977). It is possible that Pre-Proto-Samoyedic did inherit these words from Proto-Finno-Ugric (from which they seem to have departed), but lost them in Siberia, because bee and honey did not exist there. There are indeed no old words for 'bee' in Samoyedic languages: Kamassian *pinėkïiʙ* 'bee' literally means 'searching wasp'. In Nenets there are four words for 'honey', but one is a native neologism literally meaning 'good-tasting water' and three are relatively recent loans: *ma* < Komi *ma*, *ńāβ* < Khanty *mav*, *ńōδ/ńot* < Russian *mëd* (cf. Joki 1973: 284-285).

Tree bee-keeping is to be distinguished from honey hunting, in which honey is simply stolen and bees may be killed, and from the later hive bee-keeping, which started in forest areas in the 12th century when trees were cut down on land taken for agriculture. Climbing the tree unaided or with the help of rope, footholds or ladder, the beekeeper on his frequent rounds tended the bee nests located either in natural tree cavities or in holes that he himself had made with axe and chisel. In either case, an upright rectangular opening to the cavity was made and furnished with a removable two-part door having small flight entrances for the bees. The entrances and the inner surfaces were kept clean, and the nest was protected against bears, woodpeckers and thieves. (Fig. 31.) During winter, all openings but one were closed and straw was tied around the trunk to insulate it. The honeycombs were harvested in spring (which is the main flowering season) and at the end of summer; with the help of smoke put into the nest, the bees were kept in the upper part, while the honeycombs were taken with a wooden ladle from the lower part; something was left for the bees. The Mari traditionally did this at full moon, with prayers said at each stage of the operation and addressed to the Great God, God of Heaven, God of Bees, Mother of Plenty, and so on. (Hämäläinen 1909; 1934; 1935; 1937; Linnus 1939; 1940; Jewsewjew 1974; Crane 1999: 127-135; Pekkarinen 2000.)

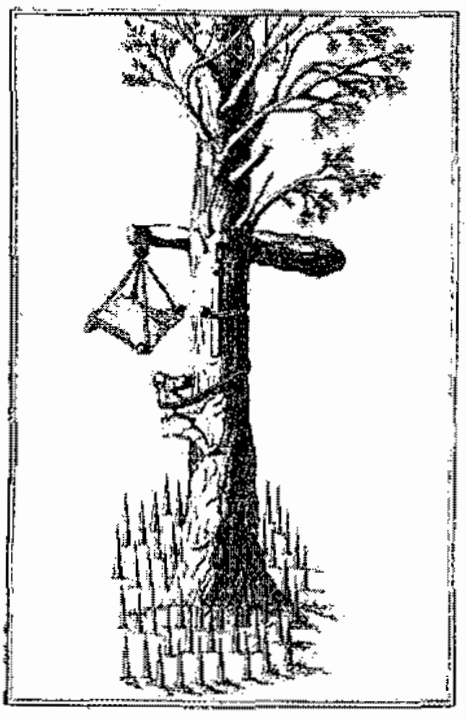

Fig. 31. A Bashkir beekeeper climbing to his honey tree, which is protected with anti-bear devices. (Lepechin 1774-83, in Linnus 1939: 319, fig. 136.)

Old Russian historical records tell that by AD 1000 or earlier, the aristocracy and monasteries owned many and often large bee woods (with 100-500 tree cavities, but only some 10-20 occupied at a time). These were looked after by a special class of peasants called *bortnik*, who could also own bee trees (usually between 100 and 200), but had to pay the landlord a rent. Cut ownership marks were put on the trees, sometimes on the back wall of the cavity. Large amounts of honey and beeswax were produced in Russia, and the honey was both eaten and used for making mead. The aristocracy needed mead for its parties in large quantities. At a seven-day feast held in AD 996 to celebrate the Russian victory over the Turks, 300 large wooden tubs or about 5000 litres of mead was drunk. Bee keeping declined in the late 17th century as Tsar Peter the Great imposed a tax on bee-keeping income and founded a sugar industry. This reduced the demand for honey, and vodka and wine were produced instead of mead, which until then had been the usual alcoholic drink in Russia. Conditions improved again when Catherine the Great abolished all taxes on bee-keeping: in 1800, there were 50 million beehives in the Russian Empire. (Crane 1999: 63, 129-135, 232-233, 515; Pekkarinen 2000.)

For the Proto-IndoEuropeans, too, honey *(*medhu)* was important as the source of mead, which was also called **medhu*: this original meaning is preserved in the Celtic, Gennanic and Baltic cognates, while the Greek cognate *méthu* has come to denote another alcoholic drink, wine, and Sanskrit *mádhu* in Vedic texts usually denotes the honey-sweetened variety of the sacred Soma drink, and in later Indian texts often wine (grown in, and imported from, Afghanistan). The ancient Aryans, however, also drank some kind of mead, for according to the Vedic manuals, an honoured guest had to be received by offering him a drink mixed with honey (*madhu-parka* or *madhu-mantha*, cf. e.g. Kauśikasūtra 90). Moreover, the Greek lexicographer Hesychios mentions *melítion* (from Greek *méli* gen. *mélitos* 'honey') as 'a Scythian drink'. The Ossetes of the Caucasus, descended from the Scythians, are said to have worshipped a bee goddess (Crane 1999: 602); Ossetic *mid/mud* has preserved the meaning 'honey', while Avestan *maδu*, Sogdian *mδw* and Modem Persian *mai* mean 'wine'.

In the Vedic religion, *madhu* as a cultic drink was connected with the Aśvins, the divine twins 'possessing horses', who function as charioteers and saviours from mortal danger (cf. e.g. Atharva-Veda 9,1). The Śatapatha Brāhmaṇa (14,1,1) relates a myth in which the Aśvins learn the secret "knowledge of the *madhu*" which enables its possessor the revive a dead person. They learn it from the demon Dadhyañc, whom the god Indra had forbidden to reveal the secret to anyone, threatening to cut off the head of the offender. The Aśvins, however, promised to revive Dadhyañc after he had taught them the secret, and replaced the head of their teacher with the head of a horse. After Indra in punishment had cut off Dadhyañc's horse head, the Aśvins replaced it with the original one and revived him. This myth seems to be connected with an earlier form of the Vedic horse sacrifice, in which a young warrior and a horse were beheaded, and their heads swapped in a ritual of "revival" (cf. Parpola 1983: 62-63).

The Vedic tradition seems to have a predecessor in the mid-Volga region in the beginning of the second millennium BC: a grave belonging to the Potapovka culture which succeeded the Abashevo culture and possessed the horse-drawn chariot, was found to contain a skeleton which was otherwise human except for the skull which belonged to a horse (cf. Vasil'ev, Kuznetsov & Semënova 1994: 115, fig. 11; cf. Anthony & Vinogradov 1995). Sulimirski (1970: 295) quotes some evidence for human sacrifice accompanied by beheaded calves and burnt cows from an Abashevo culture site in the southern Urals. There may be a reminiscence of this ancient Aryan tradition in the Finnish folk poetry incorporated in the Kalevala, where the mother of the slain hero Lemminkäinen with the help

of the bee and honey revives the body of her son, who has been cut into pieces. (Cf. Parpola 1999: 201.)

Proto-Finno-Ugric **mete* 'honey' is formed like Uralic **wete* 'water', which (along with the similar Uralic word **nime* 'name' and Proto-Finno-Ugric **sixne* 'sinew') has always been considered to be among the oldest Indo-European loanwords (cf. e.g. Hajdú 1987: 300; Koivulehto 1999a: 209-210). Perhaps they were borrowed together with the earliest Uralic word for 'pot', **pata*, when the ancestors of the later Proto-Uralic speakers learnt the technique of pottery making and the process of making mead or honey-beer from their southern neighbours, ancestors of the later Proto-IndoEuropeans. This would have taken place with the appearance of the earliest ceramics in the forest region of eastern Europe, c. 6000 BC (fig. 5). Unless the reward was something very desirable, like storing honey that constituted a very valuable food resource or social celebrations with an alcoholic drink made of honey, it is difficult to understand what could have induced hunter-gatherers – not practising agriculture – to make enormous pots that were difficult to move. It could also explain why such a basic word as 'water' would have been borrowed. However, with the arrival of the Aryan speakers of the Abashevo culture, honey-keeping apparently became more effectively organised. The bronze axes and adzes of the Abashevo culture were undoubtedly used in tree bee-keeping, to prepare new nests for captured bee-swarms and to maintain and protect them.

BEESWAX: A NEW INDO-ARYAN ETYMOLOGY FOR A VOLGA-PERMIC WORD

Beeswax, which keeps indefinitely, is easily transported, and has various technical uses, especially in metallurgy, was the second most important export article after fur in ancient and medieval Russia. Before the coming of Christianity in the 10th century AD, Russia exported much of its beeswax to Byzantium and beyond, for churches and monasteries that needed wax for candles. But as early as the 5th century BC, Scythia was one of the main exporters of beeswax. The Scythians also used wax for coating the body of their king when he died, so that it could be put on a wagon and carried around all the subject nations before the burial (Herodotus 4,71). According to Herodotus (1,140,2), the Persians, too, coated the dead body with wax before burying it in the ground. (Crane 1999: 538.)

Besides mead, beeswax in the form of a sacred candle occupied a central position in the religion of the Finno-Ugric peoples of the Oka, mid-Volga and

Kama region, who had beekeeping as one of their main occupations. The mead and wax-candle accompanied practically all of their ceremonies. Thus a candle was lighted in front of the honey vat after the honey harvest had been taken home, with prayers addressed to the God of the Bees, and to the Bee-Mother, and so on. Each clan further had its own clan candle lighted once a year, during Easter, when the dead ancestors were remembered. (Hämäläinen 1937.)

Beeswax produced in great quantities in the forest region of the mid-Volga was certainly a major incentive for the metallurgists of the early Aryan speakers to get this region under their control. The smiths needed beeswax to make moulds for casting metal (cf. Crane 1999: 529ff.). There was some metallurgy in the mid-Volga region as early as the Volosovo culture, but it reached another level in the succeeding Balanovo and Abashevo cultures.

Estonian and Finnish *vaha* < **vakša* 'beeswax' is derived from Proto-Baltic **vaška-* (Lithuanian *vãškas*, Latvian *vasks* 'wax'), which like Old Slavonic *vosku* and Russian *vosk* comes from Proto-Indo-European **wosko-*; Proto-Germanic **waχsa* comes from the variant **wokso-*. (Cf. Mallory & Adams 1997: 637; SSA III, p. 388.) Another word for 'beeswax' in Finno-Ugric languages, Estonian *kärg*, Mordvin *k'eras*, Mari *kārāš*, *karaš*, *karas* and Udmurt *karas*, is likewise of Baltic origin, cf. Lithuanian *korỹs* 'honey-comb', Latvian *kāre(s)* 'honey-comb': the vowel of the first syllable can only come from Baltic **ā*, not from **ē* in Greek *kērós* 'wax', *kērïon* 'honey-comb', and Latin *cera* 'wax' (which is a loanword from Greek), whence Irish *cēir* 'wax' and Welsh *cwyr* 'wax'; the Turkic languages of the Volga region have borrowed the word from Finno-Ugric: Kazan *käräz*, *käräs*, Bashkir *kärä-*, Chuvas *karas* 'honey-comb' (cf. Räsänen 1969: 256).

In the Volga-Pennic languages there is yet another appellation for 'beeswax' that has been thought to be the old native Finno-Ugric word, apparently because no external etymology has been proposed for it so far (cf. Linnus 1939: 474; Toivonen 1953: 17-18; Paasonen 1948: 122): Mordvin (Moksha dialect) *šta*, (Erzya dialect) *kšta*, *šta*, Mari *šište*, Udmurt *śuś* < **śuśt*, Komi *śiś* (*śišt*, *śišk*, *śiś-*), *ma-siś*; all these words denote 'beeswax', but in Komi the usual meaning is 'wax candle, light' (the word *ma* in the compound *ma-siś* means 'honey'). Heikki Paasonen (1903: 112) reconstructed the protoform as **šikšta* or **šiks[']ta*. Károly Rédei in his *Uralisches etymologisches Wörterbuch* (1988-91, II: 785786), summarizing twelve scholars' studies of these words (references are given) gives as the reconstruction **šikšta*; he notes, however, that while it is possible to derive the forms of all the languages from this reconstruction, its *k* is based on the Mordvin dialectal variant only, and this *k*

may be just an epenthetic glide that has come into being inside the word; moreover, the *ś* in the middle of the word has caused an assimilation **š* > *ś* at the beginning of the word in Permic languages, while in the Komi compound *ma-siś*, a dissimilation **ś* > *s* has taken place; and the change **i* > *u* in Udmurt is irregular. But the assimilation **š* > *ś* in Permic may have taken place in the middle of the word as well as at the beginning, because in Mari **ś* always became *š* at the beginning of a word and inside the word, *š* in front of voiceless stops, while original **š* was preserved in these positions (cf. Bereczki 1988: 335). In the Mordvin words the vowel has first been reduced in the unstressed first syllable and then dropped, cf. E *kšna*, E M *šna* < **šękšnə* < **šukšna* 'strap' (cf. Itkonen 1945: 168; Bereczki 1988: 321). In this Baltic loanword the *-k-* is etymological (cf. Lithuanian *šikšnà*, Latvian *siksna* 'strap'), but in the 'wax' word it may be due to the analogy of this "very similar" word (cf. Jacobsohn 1922: 166). Thus it seems that the reconstruction of the word for 'wax' could equally well be **šišta*. That no extra-Uralic etymology for this word has been suggested is not surprising, because Indo-European etymological dictionaries refer, if at all, only to Albanian *huall*, *hoje* 'honey-comb' and *dyllë* 'wax' in addition to the two etyma mentioned earlier (**wokso/*wosko* and **kār-/*kēr-*).

In Indian sources, a formally and semantically perfect match can be found for Proto-Volga-Permic **šišta* 'beeswax', namely Sanskrit *śiṣṭá-* < Proto-Aryan **šišťá-*, preterite participle regularly formed with the suffix *-tá-* from the verbal root *śiṣ-* 'to leave (over)'. In Rāmāyaṇa 5,60,10, 'beeswax' is called *madhu-śiṣṭa*, literally 'what is left over of honey' and in some other texts synonymous terms *madhūcchiṣṭa* (with the preverb *ud-* added to *śiṣṭa*, which is usual when in the meaning 'to leave over') and *madhu-śeṣa* (*śeṣa* 'leftovers, remainder' being a noun derived from the root *śiṣ-*). *Śiṣṭa-* is used as a neuter noun meaning 'remainder, remnant' in Vedic texts (cf. Śatapatha-Brāhmaṇa 11,5,4,18: interestingly, this passage speaks of eating honey). Sanskrit *śiṣṭa-* has become *siṭṭha-* 'left over, remainder' in Middle Indo-Aryan; its cognates in Modern Indo-Aryan languages usually mean 'dregs', but in Oriya also 'sediment at bottom of oil pot', in Punjabi 'expressed sugarcane', in Pahari 'remains of pressed oil-seed', and in Singhalese 'wax' (cf. Turner 1966, nos. 12478 and 12480).

There is an exact correspondence even between the Sanskrit compound *madhu-śiṣṭa-* 'beeswax' and the Komi compound *ma-siś* 'beeswax', for Komi *ma* corresponding to Udmurt *mu* goes back to Proto-Permic **mo* and Proto-Finno-Ugric **mete* 'honey', just as Komi *va* corresponding to Udmurt *vu* goes back to Proto-Permic **wo* and Proto-Uralic **wete* 'water' (cf. Itkonen 1953-54: 319-320).

Besides, there is the following undoubtedly related etymon in Indo-Aryan: Sanskrit *śiktha-*, *siktha-*, *sikthaka-* n., Middle Indo-Aryan *sittha-*, *sitthaka-*, *sitthaya-* n., Kashmiri *syothu* m. and Lahnda and Punjabi *sitthā* m., all meaning 'beeswax' (cf. Turner 1966, no. 13390). This variant suggests contamination by Sanskrit *siktá-* (Middle Indo-Aryan *sittà-*, whence Khowar *sit* 'silt, dregs', cf. Turner 1966, no. 13388): the latter is the past participle of the verb *sic-* 'to pour (out) (something liquid)', which is used also of 'casting liquid metal' (cf. Atharva-Veda 11,10,12-13; Taittirīya-Saṃhitā 2,4,12,5; 2,5,2,2; Aitareya-Brāhmaṇa 4,1; all these texts speak of casting the demon-destroying thunderbolt-weapon). Beeswax plays a central role in the lost-wax method of metal casting, which was used in Abashevo metallurgy. If the contamination of **śi.šta* and **sikta* took place in the (Pre-)Proto-Indo-Aryan language of the Abashevo culture, it offers yet another possibility to explain the epenthetic *-k-* in the Erzya Mordvin variant *kšta* 'beeswax'.

The formal and semantic match between these Volga-Permic and Indo-Aryan words for 'beeswax' is so close that there can hardly be doubt about this etymology. It is particularly significant, because these words, like the very root *śiṣ-* < **ćiś-* 'to leave (over)' (possibly < PIE ** ḱ(e)i-s-* 'to leave lying') with all its verbal and nominal derivatives, are missing in the entire Iranian branch. Thus the Volga-Permic word can hardly be from an early Iranian language, and strongly suggests that the Abashevo culture was dominated by Aryans belonging to the 'Indo-Aryan' branch. Several Finno-Ugric loanwords have previously been suspected to be of specifically Proto-Indo-Aryan origin (cf. Koivulehto 1999a: 227), but the new etymology narrows the Proto-Indo-Aryan affinity down to the Abashevo culture. Among the other early Proto-Indo-Aryan loanwords is **ora* 'awl' < Proto-Aryan **ā́rā* = Sanskrit *ā́rā* 'awl' (cf. Koivulehto 1987: 206-207), which is likewise not found in the Iranian branch at all. Also Proto-Finno-Ugric **vašara* 'hammer, axe' (cf. Joki 1973: 339) on account of its palatalized sibilant is from Proto-Aryan or Proto-Indo-Aryan rather than Proto-Iranian, where depalatalization took place (cf. Mayrhofer 1989: 4, 6), cf. Sanskrit *vajra* 'thunderbolt, weapon of Indra the god of thunder and war' versus Avestan *vazra* 'mace, the weapon of the god Mithra', possibly from the Proto-Indo-European **weǵ-* 'become powerful' (LIV, pp. 601-602). The bronze awl and axe are tools which certainly became common in the middle Volga area with the Abashevo culture.

In Proto-Volga-Permic **śišta* 'beeswax', the Proto-Finno-Ugric palatal sibilant **ś* corresponds to the Proto(-Indo)-Aryan palatal affricate **ć* or palatal sibilant **ś*. In a personal communication, Jorma Koivulehto has pointed out that

this does not necessarily imply that the satemization had already taken place in the donor language, because Proto-Finno-Ugric (Proto-Uralic) *ś already substitutes the palatalized velar stops *ḱ and *ǵh of the Indo-European proto-language (PIE * ǵ has been replaced with the Proto-Uralic semivowel *j, cf. e.g. *aja- < PIE *aḱ- 'to drive'): with one uncertain exception (PIE *leǵ- / *loǵ-: Finnish *lukea*), there are no examples of the Proto-Indo-European palatalized velar stops being substituted with Proto-Uralic/Proto-Finno-Ugric *k. This observation makes us wonder whether the satemization of the Baltic and Aryan branches was triggered by the substratum of the Finno-Ugric majority language in the area of the Fat'yanovo/Balanovo and Abashevo cultures, and spread from them to the other cultures speaking Proto-Baltic and Proto-Aryan languages. (Cf. also Kallio, this volume, pp. 226-227.)

On the other hand, the second affrication of velars before a front vowel has not yet taken place in the Aryan donor language of Saami *geavri* < **kekrä* 'circular thing' (actual meanings in Saami: 'ring, circular stopper of the ski stick, shaman's circular drum') and Finnish *kekri* < **kekräj* 'ancient pagan new year feast', which go back to early Proto-Aryan **kekro-*, whence through the intermediate form **cekro-* Proto-Aryan (and Sanskrit) *cakrá-* 'wheel, circle, cycle of years or seasons' (other branches of Indo-European do not have the development *r < *l from Proto-Indo-European **kʷekʷlo-* 'wheel, cycle') (cf. Koivulehto, this volume, no. 42). These words have probably come to Saami and Finnish through the Netted Ware culture, the ruling elite of which seems to have come both from the Abashevo culture (assumed to have spoken early "Proto-Indo-Aryan") and from the Pozdnyakovo culture (assumed to have spoken early "Proto-Iranian").

What the Volga-Permic reconstruction **šišta-* 'beeswax' does suggest is that the RUKI rule was already functioning when the word was borrowed: Proto-Indo-European *s became *š after *i (and after *r, *u and *k) in Proto-Aryan (and in varying measure in Proto-Balto-Slavic, cf. Porzig 1954: 164-165).

EARLY INDO-EUROPEAN AND ARYAN LOANWORDS IN PROTO-SAMOYEDIC

In a search for early Indo-European loanwords in Proto-Samoyedic, Juha Janhunen (1983) singled out six words, two of which have clearly been taken over from a Middle Iranian language possibly spoken in the Tagar culture of Siberia; they do not concern us here. Proto-Samoyedic **sejt³wə* < **sejptə*

'seven' which Janhunen with a query derives from Proto-Tocharian (cf. Tocharian A *śpät, śäptä*, B *śukt*) represented by the Afanas'evo culture of Siberia, is much more likely to come from early Proto-Aryan **septa*, whence also Proto-Ugric **säptä* (cf. Joki 1973: 313). Comparing Proto-Samoyedic **wərkə* 'bear' with Avestan *vəhrka* 'wolf', Janhunen with a query derives the word from Proto-Iranian, which he thought might have been the language of the Andronovo cultures of Siberia; this word, too, is more likely to be from Proto-Aryan **vṛka* = Old Indo-Aryan *vṛka* 'wolf'.

Northern Samoyedic **jäə* 'meal, flour', the reconstruction of which is uncertain, may have had the same form in Proto-Samoyedic, and may have come from Middle Iranian **yao* 'grain'; the same word is found also in Proto-Finno-Permic, where the word can be reconstructed as **yüwä* < **yewa* or **yewä* 'grain' and derived from early Proto-Aryan **yeva* < Proto-Indo-European **yewo* 'grain', but it is difficult to reconcile the Samoyedic and Proto-Finno-Permic forms into an Uralic etymology (cf., in addition to Janhunen 1983: 123-124, also Joki 1973: 265-266 and Koivulehto 1999a: 223).

Proto-Samoyedic **wesä* 'metal, iron', which according to Janhunen might have been borrowed in Siberia from Proto-Tocharian (cf. Tocharian A *wäs* 'gold', Tocharian B *yasa* 'gold'), may also go back to earlier **wäśä* and this in turn to Proto-Uralic **wäśkä*, although the matter is complicated by the fact that part of the Finno-Ugric languages suggest the reconstruction **waśki* (cf. Janhunen 1983: 120-121). Native copper was available on the northwestern side of Lake Onega, in the mid-Volga region and in the Urals. The exchange network initiated during the Combed Ware Style 2 phase extending from the Baltic Sea through the assumed Uralic homeland to the Urals, among other things, distributed copper (see above). The Proto-Uralic alternative (for which a Proto-Indo-European etymology has been suggested) is made more likely by the fact that Proto-Samoyedic has preserved seven other Proto-Uralic etyma, which very probably are loanwords from Proto-Indo-European or its immediate predecessor, including words for such cultural activities as 'giving, selling, exchanging', 'twisting, plaiting, spinning' and 'boring, drilling' (cf. Koivulehto 1999a: 209-210; this volume, pp. 236ff.). If Proto-Uralic **wäśkä* 'metal' ends in a Uralic suffix **-kaɬ-kä*, Proto-Aryan and Old Indo-Aryan *vā́śī* 'bronze axe or adze' (as a *vṛddhi* derivative from **vaśa* '*bronze') might be related to it.

SUMMARY

The following scenario summarizes the results of the archaeological correlations presented in this paper for the emergerce and disintegration of the Indo-European, Uralic and Aryan protolanguages. The results are put forward as theses for further substantiation or falsification. Undoubtedly, many details need adjustment and are subject to correction. However, this is a holistic attempt to fit together several interacting factors, and it seems difficult to find any other archaeological model which in general could equally well explain the areal and temporal distribution of the Indo-European and Uralic languages and the internal contacts between them at different times and in different places. This applies especially if the invention of wheeled transport is taken as the *terminus post quem* for the dispersal of Late Proto-Indo-European.

The parent language that immediately preceded and gave birth to Proto-Indo-European was spoken in the Eneolithic Khvalynsk culture (5000-4500 calBC) of the mid-Volga forest steppe, descended from the Samara culture (6000-5000 calBC) of the same area. Like its predecessors, the Khvalynsk culture interacted with the Subneolithic hunter-gatherers occupying the forests of the upper Volga region. Here the Lyalovo culture (5000-3650 calBC) spoke an early variety of Proto-Uralic, which with the Pitted Ware typical of Lyalovo culture soon spread to Russian Karelia in the north, to the forest steppe between the Dnieper and the Don in the southwest and almost to the Kama basin in the east. A later variety of Proto-Uralic spread rapidly with new immigrants arriving around 3900 calBC (with Combed Ware Style 2 and semisubterranean houses) from the Lyalovo culture of the upper Volga to Finland and Russian Karelia up to the Arctic Circle as well as to Estonia and Latvia; the entire area up to the Urals was united by an efficient exchange network.

The Khvalynsk culture expanded both east and west along the border of the steppe and foreststeppe. In the east, Khvalynsk immigrants, after a long trek, eventually reached southern Siberia and founded the Afanas'evo culture (3600-2500 calBC). In the west, the expansion of the Khvalynsk culture created the Mariupol' and Chapli type burials (5000-4500 calBC) in the Pontic steppe part of the Dnieper-Donets culture, in the area next occupied by the Srednij Stog culture (4500-3350 calBC).

The Khvalynsk influence reached even further west, being represented by the Decea Muresului cemetery of Romania (4500 calBC). The Suvorovo culture (4500-4100 calBC) of Moldavia and Bulgaria probably belongs to the same wave of immigration, for it has been considered as resulting from an early

Srednij Stog expansion to the west. Thus both the Afanas'evo culture of central Siberia, which is considered to be related to the Quäwrighul culture (2000-1550 calBC) of Sinkiang, the region where Tocharian was later spoken, and the Suvorovo culture of Bulgaria would both have preserved the Pre-Proto-Indo-European language of the Khvalynsk culture. This more archaic language would have largely prevailed in the subsequent fusions with later Proto-Indo-European speaking immigrants, who arrived at both areas with wheeled vehicles after the Srednij Stog culture was transfonned into the Pit Grave culture around c. 3500-3350 calBC. The Ezero culture (3300-2700 calBC) of Bulgaria, which resulted from the fusion with the early Pit Grave immigrants, took this Pre-Proto-Indo-European language in a somewhat changed fonn into Anatolia 2700 calBC, where it became Hittite, Luwian, etc.

The Indo-European protolanguage was spoken in the Srednij Stog culture (4500-3350 calBC) of southern Ukraine, an offshoot of the Khvalynsk culture with a Dnieper-Donets culture substratum. It developed in interaction with the non-Indo-European speaking prosperous Tripol'e culture (5500-3000 calBC), but had contact also with the early Proto-Uralic speaking Lyalovo culture (5000-3650 calBC) which extended to the forest-steppe between the Dnieper and the Don. After acquiring wheeled transport around 3500 calBC, the Srednij Stog culture started expanding and disintegrating. It was first transformed into the Pit Grave (Yamnaya) culture (3500-2200 calBC) distinguished by kurgan burials. Expanding northwards to the forest-steppe zone, early Pit Grave culture participated in the fonnation of the Middle Dnieper culture by 3300 calBC and thus contributed to the fonnation of the new Corded Ware cultural complex, which quickly spread over wide areas of central and northern Europe, appearing in the Baltic countries and southwestern Finland 3200-3100 calBC and a little later in the Netherlands. The language of the Corded Ware culture, Proto-Northwest-Indo-European, was still close to Proto-Indo-European, but started to diverge into Proto-Italo-Celtic, Proto-Gennanic and Proto-Balto-Slavic under the influence of the local substratum languages. In southwestern Finland and in Estonia, the Corded Ware superstratum was absorbed and integrated in the local population, which spoke late Proto-Uralic. This created a cultural boundary between the (southwestern) Corded Ware area and the rest of Finland and Karelia, and led to the differentiation between Finnic and Saami.

The Corded Ware culture of the southern Baltic and Belorussia, whose language had become (Pre-)Proto-Baltic, expanded to central Russia around 2800 calBC. Here it fonned the Fat'yanovo culture (2800-1900 calBC) in the Volga-Oka interfluve and the Balanovo culture (2200-1900 calBC) in the mid-

Volga region. These cultures lived in symbiosis with the Proto-Finno-Ugric speaking peoples of the Volosovo culture (3650-1900 calBC), which had succeeded the late Proto-Uralic speaking Lyalovo culture (5000-3650 calBC). The Volosovo people, who continued having exchange relationships with their linguistic relatives in Finland and Russian Karelia, eventually absorbed linguistically these Proto-Baltic speakers, whose language and culture deeply influenced the Finno-Ugric languages and cultures of the northwest. A cultural border (similar to that between Finnic and Saami) formed between the Proto-Volgaic speakers in the west and the unmixed Proto-Permic speakers in the east. Possibly under the pressure of the Fat'yanovo-Balanovo culture, part of the Volosovo population moved east to the Kama Valley, participating there in the development of the Garino-Bor culture and becoming the linguistic ancestors of the Ugric branch of the Uralic family.

From northern Germany the Corded Ware culture expanded also to southern Scandinavia about 2800 calBC, around which time (Pre-)Proto-Germanic came into being. Proto-Germanic loanwords in Finnic languages are likely to date from 1600 calBC onwards, when the Nordic Bronze Age culture (1700-500 calBC) started exerting a strong influence on coastal Finland and Estonia. Proto-North-Saami speakers, expanding to northern Fennoscandia with the Lovozero Ware (1900-1000 calBC), eventually came into direct contact with Proto-Germanic.

The main sources of the earliest Aryan loanwords in Finnic and Saami are the Abashevo and Sejma-Turbino cultures (representing the Indo-Aryan branch) and the Pozdnyakovo culture (representing the Iranian branch), all to be discussed further. In the 18th century BC, both the Abashevo and the Pozdnyakovo culture contributed to the development of the probably Proto-Volgaic speaking Netted Ware culture of the upper Volga, which in turn exerted a strong influence on eastern Finland and Russian Karelia.

The main area of the Pit Grave culture (3500-2200 calBC) comprised the Proto-Indo-European homeland of the preceding Srednij Stog culture, with some further penetration in the west to the Danube, and an eastern extension from the Pontic and forest-steppe to the southern Urals, which was reached by 3000 calBC. Thus the Pit Grave culture came to occupy much the same area as the Eneolithic Khvalynsk culture that we have suggested was linguistically Pre-Proto-Indo-European speaking. Hence the Late Proto-Indo-European languages of this central group are not likely to have had non-Indo-European substrata and consequently preserved their inherited structure and vocabulary much better than many other groups. The differentiation of the Pit Grave culture into several

subcultures started 2800 calBC and was undoubtedly accompanied by linguistic differentiation, so that Proto-Graeco-Armenian developed in the Catacomb Grave culture of the Pontic steppes, and Proto-Aryan in the Poltavka culture of the Volga-Ural steppe and the Abashevo culture of the upper Don forest steppe.

The dialectal differentiation of Proto-Aryan into its two main branches seems to have started with this early cultural divergence in the eastern Pit Grave culture, so that people of the Poltavka culture in the southern treeless steppe spoke Pre-Proto-Iranian, while the language of the Abashevo culture in the northern forest-steppe was Pre-Proto-Indo-Aryan. The Poltavka culture was throughout in closer contact with the Catacomb Grave culture, which probably spoke Proto-Graeco-Armenian, while the Abashevo culture, in its quest for the copper of the mid-Volga region, first established contact with the more northerly Fat'yanovo-Balanovo and Volosovo cultures of the forest zone, where (Pre-)Proto-Baltic and Proto-Finno-Ugric respectively were spoken. Early Aryan loanwords in Proto-Finno-Ugric connected with honey and wax industry, which has flourished especially in the mid-Volga region, strongly suggest that the elite language of the Abashevo culture was Aryan, and the here proposed new etymology for a Proto-Volga-Permic word for 'beeswax' narrows the identification to Pre-Proto-Indo-Aryan.

The differences between the languages of the Poltavka and Abashevo cultures are likely to have remained on a dialectal level until 1800 calBC. The period of the Sintashta-Arkaim cultural expression (2200-1800 calBC) seems to be the last phase of the relatively unified Proto-Aryan speech. Both Poltavka and Abashevo participated in the creation of this powerful and dynamic culture in the southern Urals which appears to have developed the horse-drawn chariot (figs. 32, 35, 37). The profound influence that radiated from Sintashta-Arkaim into both Poltavka and Abashevo horizons is likely to have had some unifying effect. This could have included the transference of "satemization", possibly triggered by the Proto-Finno-Ugric substratum influence upon the Pre-Proto-Indo-Aryan spoken in the Abashevo culture, over to the Pre-Proto-Iranian spoken in the Pre-Timber Grave horizon of the Late Poltavka/Potapovka and Pozdnyakovo cultures. Yet the palatal affricates or sibilants resulting from the satemization in Pre-Proto-Indo-Aryan seem to have lost their palatalization in Pre-Proto-Iranian which did not have a "palatalizing" language as a substratum. (For very early Finno-Ugric loanwords from Pre-Proto-Iranian attesting to this depalatalization, cf. Koivulehto 1999a: 224-226; 2001: 49; this volume, pp. 252ff.) Archaeologically, the Pre-Timber Grave horizon in the west does not yet essentially differ from the Pre-Andronovo horizon in the east, which in addition to the Sintashta-

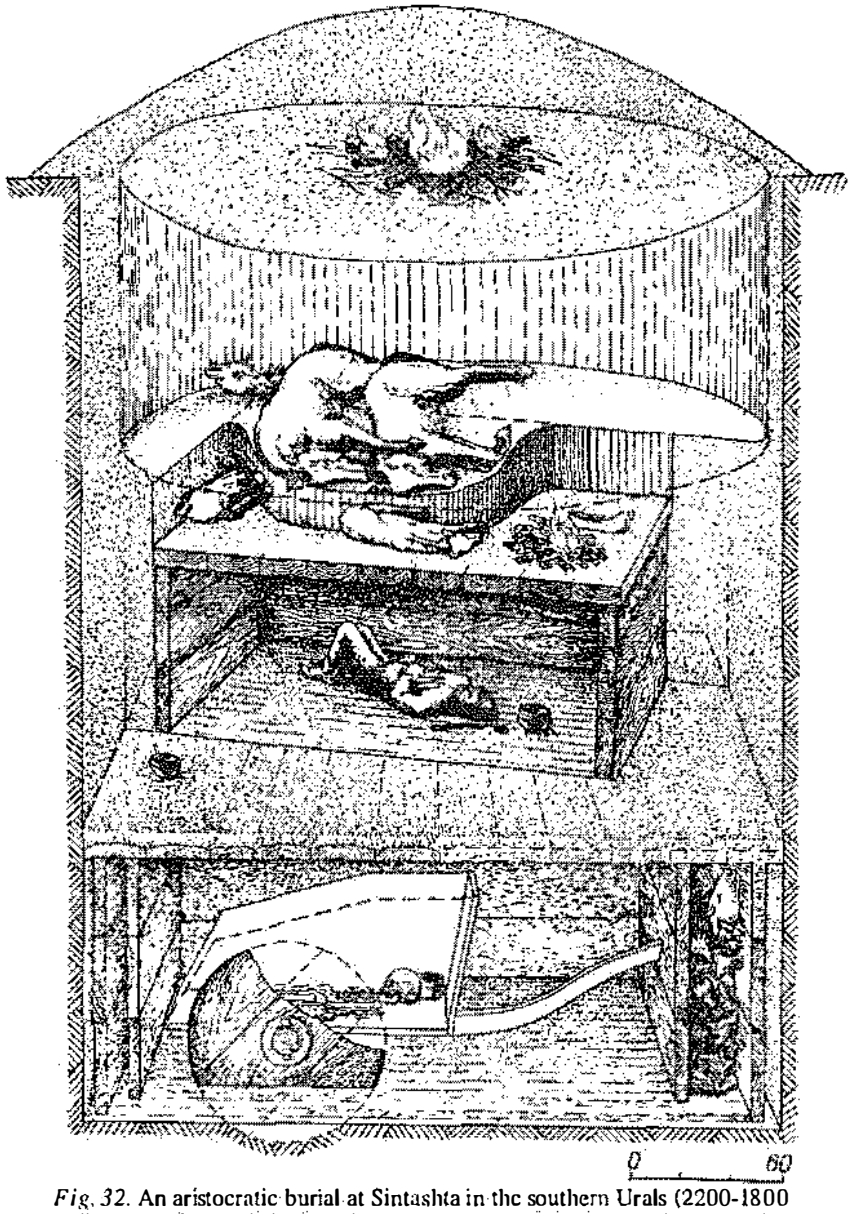

Fig. 32. An aristocratic burial at Sintashta in the southern Urals (2200-1800 calBC). The warrior lies in the chariot with solid wheels, beneath two horses accompanied by the groom or charioteer. (Gening, Zdanovich & Gening 1992: 154, fig. 72.)

Arkaim itself (succeeded in the southern Urals by the Alakul' culture of the Andronovo complex), includes the Petrovka cultural expression in northern Kazakhstan.

Proto-Greek did not become a Satem language, while Proto-Armenian did. In our estimate, the most likely of the various alternative scenarios presented by different scholars for the coming of the Proto-Greek speakers to Greece (cf. Mallory & Adams 1997: 243-245) is the violent break in the archaeological record between Early Helladic II and III, c. 2200 BC; tumulus burials and the domesticated horse are found in Greece in the succeeding Middle Helladic period. This suggests that Proto-Greek descends from the Proto-Graeco-Armenian language of the early Catacomb Grave culture. After the separation of Proto-Greek, the Catacomb Grave culture was transformed into the Multiple-Relief-band (Mnogovalikovaya) Ware culture (c. 2000-1800 calBC) and its Proto-Graeco-Armenian language into (Pre-)Proto-Armenian, which became a Satem language due to its contact with Proto-Aryan. The Multiple-Relief-band Ware culture extended from the Don up to Moldavia, and was eventually overlaid and assimilated by the Proto-Iranian speaking Timber Grave (Srubnaya) culture (1800-1500 calBC). The Armenians are assumed to have come to Anatolia from the Balkans in the 12th century BC, being possibly the invaders called Muški in Assyrian sources (cf. Mallory 1989: 33-35; Mallory & Adams 1997: 26-30). Can the gap remaining between these two hypotheses be bridged? This is an interesting question, but it cannot be pursued in the present study.

The final split of Proto-Aryan into its "Indo-Aryan" and "Iranian" branches appears to have taken place around 1800 BC, when the Ural river more or less became the border between Proto-Iranian spoken to the west of it in the Timber Grave (Srubnaya) culture (which evolved from the earlier Pre-Timber Grave cultures), and Proto-Indo-Aryan spoken to the east of it in the Andronovo cultural complex (which evolved from the earlier Pre-Andronovo cultures) (fig. 33). (Cf. Parpola 1998.) Excepting some interference in the immediate neighbourhood of the border area, the two branches stayed apart and expanded into opposite directions until the 15th century BC. The early Andronovo phase (1800-1500 calBC), principally represented by the Alakul' Ware of the southern Urals and western Siberia but also by early Fedorovo Ware, which in Siberia reached as far as the upper Yenisei, was succeeded by the late Andronovo phase (1500-1200 calBC), the Fedorovo horizon proper, which in the southeast reached as far as the Tien-shan mountains.

Some of the principal sound changes differentiating Proto-Iranian from Proto-Indo-Aryan (which in these respects agrees with Proto-Aryan) seem to have resulted from the substratum influence of the languages spoken in the areas into which the Timber Grave culture expanded. (Cf. Parpola, in press a & b.)

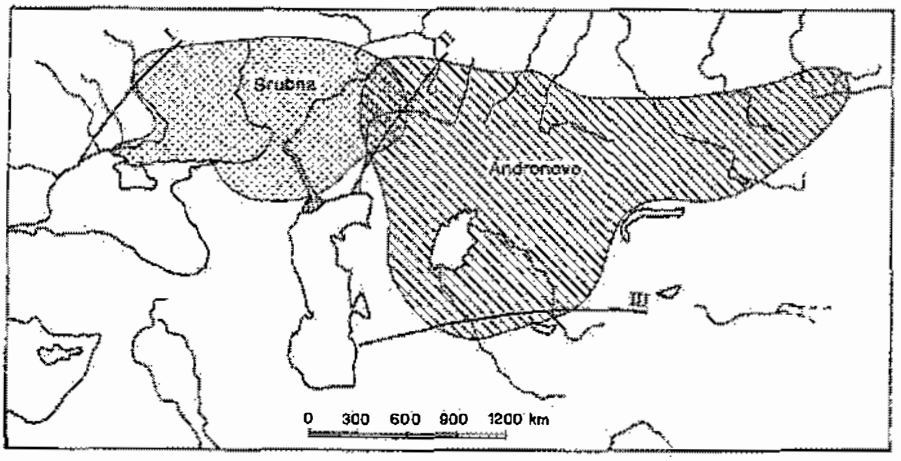

Fig. 33. Distribution of the cultures belonging to the Timber Grave (Srubnaya) and Andronovo horizons. (Mallory 1994-95: 252, fig. 1.)

It has long been observed that the change $*s > h$ in similar phonic contexts (between vowels and word-initially before a vowel, and in some other contexts but not before and after stops) is a significant isogloss connecting Greek, Armenian and Iranian languages; moreover, it has taken place in all these languages before their earliest historical records came into being. Yet from the point of view of Proto-Indo-European it is a relatively late change, being in Iranian posterior to the RUKI change of $s > š$. (Cf. Meillet 1908: 86-88.) We now know that in Greek the $*s > h$ change predates even the Mycenaean texts. It was proposed by Karl Hoffmann (1975: 14) that this Proto-Iranian sound change was still productive when the first Iranian languages arrived in the Indo-Iranian borderlands in the neighbourhood of the Ṛgvedic tribes sometimes around the 15th century BC, changing the Vedic river name *Sindhu* into Avestan *Hindu*, Vedic *Sarasvatī* into Avestan *Haraxva'ti* and so on. Temporally and areally this coincides with the introduction of the Yaz I culture (1500-1000 calBC) into southern Central Asia (cf. Hintze 1998). If the Catacomb Grave culture spoke Proto-Graeco-Armenian, it is difficult to believe that its $*s > h$ change is independent from that of Proto-Iranian. The Catacomb Grave culture was transformed into the Multiple-Relief-band Ware culture (2000-1800 calBC) and its language into Proto-Armenian. The Multiple-Relief-band Ware culture was 1800 calBC overlaid and assimilated by the Timber Grave culture (fig. 34:5), the derivative of which from 1500 calBC onwards spread to southern Central Asia with the Simple Relief-band (Valikovaya) Ware (fig. 34).

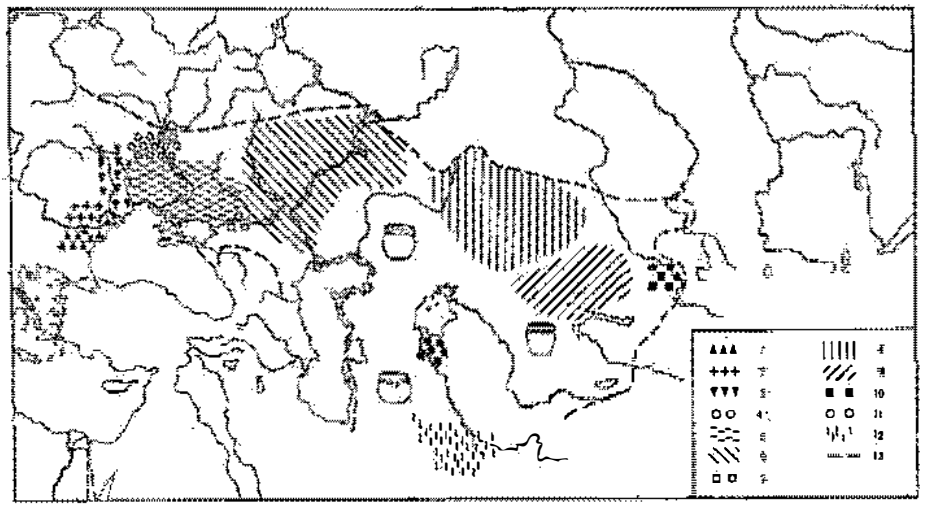

Fig. 34. Distribution of cultures distinguished by the Single Relief-band (Valikovaya) pottery. (Chernykh 1992: 236, fig. 79.) *5* = Sabatinovka and Belozerka (occupying the area formerly occupied by the Multiple Relief-band culture), *6* = Timber Grave culture, *12* = Yaz 1 culture.

Similarly, the deaspiration of voiced aspirates is an isogloss connecting Iranian with Balto-Slavic (as well as with Albanian and Celtic, cf. Meillet 1908: 75). In Iranian it might have been triggered by the absorption of late Corded Ware cultures into the Timber Grave culture in the more northerly parts of eastern Europe.

The Sintashta-Arkaim culture appears to have mainly continued the Abashevo culture, which pushed eastward into the Siberian forest steppe in order to take possession of the important metal ores in the Altai region. This led to the formation of the Sejma-Turbino Transcultural Phenomenon, which mediated new types of high-quality metal tools and weapons along a zone connecting the Altai mountains over the Urals with northeastern Europe. The *Andronoid cultures* and the *Samus' cultural expression* emerged in the forest zone of western Siberia under the influence of the Andronovo and Sejma-Turbino complexes. The language of the Sejma-Turbino complex and the Andronoid cultures continued the Finno-Ugric speech of that part of the bilingual Abashevo community which crossed the Urals and headed towards the Altai mountains, becoming the ancestors of the Proto-Samoyed speakers. If this is correct, the Samoyed branch originally belongs to the same group of Volosovo people who came to the Kama basin as the Proto-Ugric speakers, although the future

Samoyed speakers did not stay on the Kama and there develop common innovations with the Ugric branch.

After the Timber Grave culture had developed horseback warfare, the Proto-Iranian speakers became very mobile and expanded from the Pontic-Caspian area also east of the Ural river into the Asiatic steppes, overlaying and assimilating there the earlier Andronovo cultures. They seem to have come to southern Central Asia with the Yaz I culture (fig. 34) and to southern Siberia in the 13th century BC in the closing Fedorovo phase of the Andronovo cultural complex. Here the Andronovo culture was succeeded by the at least partly genetically related *Karasuk culture* (1200-1000 calBC), which flourished around the upper Yenisei, Mongolia and the Ordos region of China. The Karasuk culture preceded the transition from the Late Bronze Age to the Early Iron Age or the "Scythian Age", when the extensive use of the saddled horse, the composite bow and the "animal style art" had become integral parts of steppe life (cf. Askarov, Volkov & Ser-Odjav 1992). Around 1000 BC, the Eurasiatic steppes from Mongolia to Hungary became more or less uniform culturally, and for the next thousand years and more Old and Middle Iranian *Scythian/Saka* languages were spoken there; descendants of these languages survive now only in the Ossete language of the Caucasus and the Wakhi language of the Pamirs, the latter related to the Saka once spoken in Khotan. The varieties of Old Iranian that in the late second millennium BC came from the northern steppes to southern Central Asia and Afghanistan – the regions where the Avestan language is assumed to have been spoken – seem to have given rise to most of, if not all, the other Iranian languages of today. (On the Iranian languages, see especially Schmitt 1989.) Cuyler Young (1985) derives the *Late West Iranian Buff Ware*, which c. 950 BC appears in the regions where Median and Old Persian were first attested, from the *Gurgan Buff Ware* (c. 1100-1000 BC) of southern Central Asia.

The fate of the Indo-Aryan branch beyond Central Asia lies outside the scope of the present paper, but a few observations on this topic may be made in conclusion (this theme is dealt with extensively in Parpola, in press, a & b). It has been noted several times above, that the horse-drawn chariot was probably developed in the Sintashta-Arkaim culture (figs. 32 & 35). The Proto-Indo-Aryan speaking rulers of the Mitanni kingdom in 1500-1300 BC were famed for their horse-chariotry (cf. Mayrhofer 1966; 1974). The Mitanni Aryans in all likelihood came to Syria from southern Central Asia and northern Iran, where a cylinder seal with the image of a horse-drawn chariot (fig. 36) was discovered

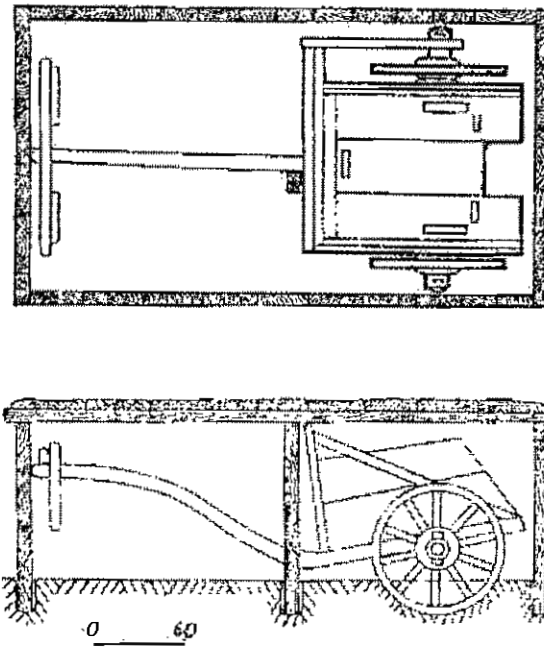

Fig. 35. Reconstruction of a spoke-wheeled chariot from a funeral chamber at Sintashta. (Gening, Zdanovich & Gening 1992: 184, fig. 94.)

Fig. 36. Cylinder seal made of alabaster from Tepe Hissar III B, northern Iran, showing a spoke-wheeled horse-drawn chariot. (Photo University Museum, Philadelphia.)

from Tepe Hissar III B (cf. Ghirshman 1977). Tepe Hissar III B-C represents an extension of the Bactria and Margiana Archaeological Complex (BMAC) (cf. Hiebert & Lamberg-Karlovsky 1992; Hiebert 1994: 177). The rich, semi-urban, agriculturally based BMAC had local roots, but its rule seems to have been taken over by Aryan speakers coming from the northern steppes. (Cf. Parpola 1988; Hiebert 1993; 1995.) The Proto-Indo-Aryan expansion to northern Iran and Syria may have been triggered by the tin trade with Central Asia in which the Assyrian merchants of Cappadocia were engaged in 1920-1850 BC:

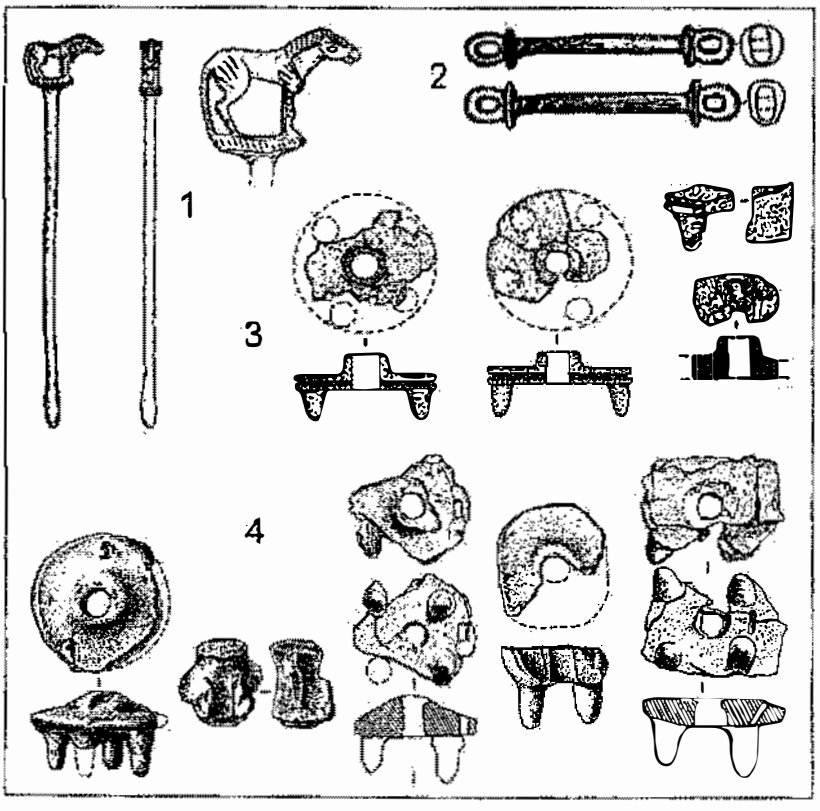

Fig. 37. A horse-headed "sceptre" pin of bronze *(1)*, two horse bits of bronze *(2)* and fragments of cheek-pieces of bone *(3)* from an aristocratic burial at Zaidcha Khalifa in Zeravshan Valley, Tajikistan. (Bobomulloev 1997: 126, Abb. 3:14 [= *1*] and 3:12-13 [= 2] & 128: Abb. 4:1-4 [= *3*]. The horse-headed "sceptre" has close parallels in the steppe (see fig. 27), and the cheek-pieces are of the same type as those found at Sintashta *(4)* (Gening, Zdanovich & Gening 1992: 133, fig. 57:7-8, 10-12.) Not to scale.

the glyptic evidence suggests that the BMAC, too, was directly involved in this trade (cf. Collon 1987: 41, 142). An aristocratic grave recently discovered in the Zeravshan Valley of Tajikistan contained typical BMAC pottery (cf. Sarianidi 2001: 434), but also horse furnishings, including two bronze bits and two pairs of Sintashta-Arkaim type cheek-pieces, as well as a bronze "sceptre" topped with the image of the horse (cf. Bobomulloev 1997). This find (see fig. 37) heralds the coming of Proto-Indo-Aryan speakers to the borders of South Asia, where the horse-drawn chariot played an important role in the culture of the Vedic Aryans (cf. Sparreboom 1983).

ACKNOWLEDGEMENTS

In trying to fit the results of archaeological and textual-linguistic evidence together, each of the authors has long been endeavouring to gain a more holistic understanding of what happened in the past. Prehistory of the Aryan languages has been one focus of AP's researches, and the archaeology of northern and eastern Europe CC's. In recent years our interests have been merging to a considerable extent.

The present paper is a jointly rewritten and enlarged version of the paper read by AP at the Tvänninne symposium. It results from intensive discussions that we have had after the symposium on many issues, especially where our views have differed, and from brainstorming sessions to solve some outstanding problems. Although we have resolved these problems to our mutual satisfaction, the paper still has the nature of a first sketch, and we hope to return to the subject in a not too distant future in collaboration with other colleagues.

The summary part of this paper, along with parts of the introduction and the discussion of Aryan loanwords in early Finno-Ugric, will be published with the title "The cultural counterparts to Proto-Indo-European, Proto-Uralic and Proto-Aryan: Matching the dispersal and contact patterns in the linguistic and archaeological record" in Edwin Bryant and Laurie Patton (eds.), *The Indo-Aryan Controversy. Evidence and Inference in Indian History.* (Richmond: Curzon Press, 2002.)

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THE ARCHAEOLOGY OF PROTOHISTORIC CENTRAL ASIA AND THE PROBLEMS OF IDENTIFYING INDO-EUROPEAN AND URALIC-SPEAKING POPULATIONS

H.-P. Francfort

The present paper deals with the problem of the archaeological identification of linguistic groups in Central Asia in the Bronze Age. The question of identifying archaeological remains of Indo-European-speaking populations in Central Asia has been one of the main questions that has occupied a number of linguists and historians for many years.

The complex interrelations between languages, peoples and material cultures have received various explanations, and of course the actual situations may well have been various. However, when written records are not available, a reconstructed time-space framework is generally used to indicate which archaeological culture is to be selected in order to substantiate the reconstruction with some relevant illustrative material. The linguistic attributes are mapped onto archaeological correlates: artefacts are selected, like the chariot, as well as ecofacts, like agriculture, or whole archaeological cultures (material assemblages). The archaeological correlates become some sort of labels or tags that one may employ in order to trace the supposed Indo-European-speaking populations. But in fact, very little of the illustrative archaeological material actually exhibits specific Indo-European or Indo-Iranian traits; a question therefore arises: what is the relevance of archaeological material if any sort of assemblage present at the expected or supposed time/space spot can function as the tag of a linguistic group?

Moreover, one can notice a widespread weakness in the representation of non-Indo-European-speaking populations in the published data and reconstructions. The focus of these seems to regard the Indo-European-speaking popula-

tions as isolated groups moving from a nuclear region in an otherwise uninhabited Central Asia.

We shall present two cases that we consider representative of such problems: the Oxus Civilization and the Afanas'evo/Okunevo sequence.

THE OXUS CIVILIZATION

Territory, origins, evolution, end

The Oxus Civilization (also called the Bactria-Margiana Archaeological Complex = BMAC) extended over a vast territory between ca 2500 and 1500 BC: Afghanistan (Dashli) (Sarianidi 1977) down to Seistan (Nad-i Ali) (Besenval & Francfort 1994), Turkmenistan (Gonur, Togolok, Kelleli, Namazga VI) (Sarianidi 1998), southern Uzbekistan (Sapalli, Djarkutan) (Askarov & Shirinov 1993; 1996), Tadjikistan, eastern Iran up to the Lut desert (Shahdad) (Hakemi 1997), Baluchistan (Sibri, Mehrgarh VIII) (Jarrige 1995; Jarrige & Hassan 1989). In the light of the analysis of sites such as Mundigak (Casal 1961), Taloqan (Afghanistan) and Sarazm (Tadjikistan) (Isakov 1996), it took shape during the first half of the third millennium under influences from Proto-Elamite Iran, the Turkmenistan Namazga IV culture, the Baluchi pre-Harappan and Harappan Indus civilizations, and some steppe elements. After this formative phase, we can distinguish a mature phase, between ca 2400 and 1800 BC, characterized by a proto-urban type of civilization, and a post-urban phase between ca 1800 and 1500 BC. After 1500 BC, a major transformation took place, but by then the Oxus Civilization was over.

Indian, Iranian and steppe connections

During all its phases, there were relations between the Oxus Civilization and India, Iran and the steppes. The Baluchistan influence has been noted for the formative phase, but it also continued during the mature phase with the probable borrowing of pottery forms from the mature Indus culture and with the foundation of Shortughai in Bactria (a mature Indus settlement on the Oxus excavated by the Mission Archéologique Française en Asie Centrale) (Francfort et al. 1989) and of Sibri-Mehrgarh VIII-Quetta in Pakistan (an Oxus related settlement in Baluchistan excavated by the Mission de l'Indus). The Proto-Elamite relation noted above for the formative phase of the Oxus Civilization continued with an

Elamite connection during the mature phase, as has been beautifully demonstrated several times by P. Amiet (1986).

The steppe connection is obvious, at least after 2000 BC during the mature and late phases of the Oxus Civilization, with the Andronovo (possibly Fedorovo) culture group studied in detail by E. Kuz'mina (1994). But the important point to notice here is that in Sarazm (period II, before 2500 BC) there is not only Kel'teminar pottery (Lyonnet 1996), but also a funerary stone circle that could only be related with the Afanas'evo culture burials of the steppes, even if the material found with the deceased is of the local agricultural type (Isakov 1996). The steppe connection is less easy to discern between ca 2500 and 2000, depending upon the choice of chronological framework.

The time-space location and possible subsequent ethno-linguistic attributions

After the most recent studies, apart from a few exceptions (notably V. Sarianidi), nobody any longer considers that the mature phase is Indo-European or Indo-Iranian. The standard theory is that the Indo-Iranians/Indo-Aryans took the Oxus Civilization with them as a stage on their way to India.[1] The standard theory has been vividly summarized in the "Kulturkugel" metaphor by J. Mallory (1998).

In short, apart from the time-space expectations, there is not much in the archaeological material that could be taken as tags for tracing the Indo-Iranians/Indo-Aryans: steppe material, cremations at Bostan VI (Avanessova 1995; 1996), stone kurgans in the Vakhsh culture (Lyonnet 1994; P'iankova 1996), fireplaces (called fire altars) at Gonur (Sarianidi 1986; 1990) or Djarkutan (Askarov & Shirinov 1996), a svastika in a Bishkent culture grave at Rannyj Tulkhar (Mandel'shtam 1968). But no one of these archaeological correlates is beyond question. However I shall not discuss them in detail here. Briefly, not only have they nothing strictly Indo-European or Indo-Iranian or Indo-Aryan in them, but if we look closely at them in their general cultural context, they appear to be selected isolated traits, not always compatible with each other and not reflecting the domination of an elite infiltrating the Oxus Civilization. A north-south move is indisputably attested (see the horses and horsemen in Pirak around 1700 BC (Jarrige & Santoni 1979), but there is just as clearly a move-

1 See A. Parpola on the Dāsa and Indo-Aryan phases (Parpola 1993; 1998); E. Kuz'mina (1994) on the Andronovian Indo-Aryans; F. Hiebert (1998) on the old theory of V. Masson of a migration from Turkmenistan.

ment to the North (Oxus Civilization pottery in the steppes, Oxus Civilization stone weights in Ferghana, etc.). The steppe connection, in the form of steppe material, remains throughout the history of the Oxus Civilization; neither the Andronovo pottery nor the stone kurgans cross the Kopet-Dagh-Hindukush-Pamir-Tarim line. Cremations, fireplaces and svastikas are attested in various cultural contexts, not all necessarily Indo-European. In the Indian subcontinent, the archaeological assemblages considered to reflect the coming of the Aryans by various authors (PGW, Gandhara Grave, Cemetery H, Jhukar, OCP, Pirak, etc.) do not provide any stable or consistent picture either (Francfort et al. 1989).

Thus we are left with the question of the archaeological correlates of the appearance of Indo-Iranian/Indo-Aryan/Iranian languages. In my opinion, the first reliable archaeological basis is the huge cultural change that took place after 1500 BC: the appearance of cultures with painted handmade ceramics (Tillia Tepe in Afghanistan, Kuchuk-Tepe in Uzbekistan and Yaz-Depe in Turkmenistan) and the simultaneous complete absence of any sort of tomb or burial structure in the oases of Central Asia for nearly 1000 years, actually until the coming of the Greeks (Francfort 1994b). This is most probably an indication of Iranisation and of the Zoroastrian-type of rituals, consistent with the time-space predictions of linguistics. But let us look at the consequences of the critique of the archaeological correlates.

The iconography and the symbolic systems: pointing to non-Indo-European worlds

The iconic symbolic system of the Oxus Civilization is expressed in numerous images depicted on sculptures, seals and metal vases. This symbolic system, which we have been able to reconstruct, is hierarchical (Francfort 1992; 1994a). Briefly, it has the following appearance. The dominant deity is a goddess, linked with animals (caprids mainly), she is probably a fertility-fecundity goddess. She dominates a monster, which assumes various animal aspects (snake, lion, scorpion) and attacks herbivores. But the monster is fought (though not killed) by an eagle deity or hero. This symbolic system is not consistent with the Indo-European or Indo-Iranian hypothesis simply because, according to the linguistic and mythological evidence, this kind of hierarchical structure is not attested in early Indo-European documents. More strikingly, a dominating female deity rather provides evidence for the non-Indo-European character of the system. It is generally known and explained by Indo-Europeanists that the various Indo-European pantheons were largely dominated by male gods, and that many im-

portant goddesses were adopted from non- or pre-Indo-European populations: see for instance studies by Dumézil, Gimbutas, Haudry and Sergent. This is not surprising, since there are clear links between the Oxus Civilization and the Indus and Elamite worlds right from the beginning, and since both are supposed to belong to the Elamo-Dravidian world (Amiet 1998; Vallat 1989). But this, as we shall now see, necessitates a reconsideration of the Afanas'evo question.

AFANAS'EVO CULTURE (THE AFANAS'EVO-OKUNEVO COMPLEX/SEQUENCE)

The territory and the chronological sequence

We shall here concentrate upon the early phase of the steppe culture, the Afanas'evo/Okunevo complex/sequence (from the late fourth to the early second millennium BC) and leave aside the Andronovo and the Karasuk-Beghazy-Dandybaj-Tagisken-Irmen' (second millennium) periods, since they require special attention.

The Afanas'evo culture dates mostly from the third millennium. It was widespread in westem Mongolia, northern Xinjiang, southern Siberia (notably the Minusinsk basin), Eastem and central Kazakhstan (Karaganda), with connections or extensions in Tadjikistan (Sarazm) and the Aral area (Kel'teminar, Tumek-Kichidjik). Masked and other figures of the Afanas'evo-Okunevo type have been recorded in the upper Indus Valley in Pakistan (Jettmar 1982; Jettmar & Thewalt 1985). In the Minusinsk basin, after 2500 the Afanas'evo culture was replaced by or coexisted with the Okunevo culture until ca 2000 BC (Martynov 1991; Sher 1994; 1995).

The Afanas'evo culture, though clearly distinct, offers similarities with the Yamnaya culture of the European part of the steppes. They were cultures of herdsmen and hunter-gatherers, they buried dead persons in circular (Afanas'evo) or rectangular (Okunevo) funerary enclosures; typical as well is the interment of the dead in a supine position, frequently with flexed legs.[2]

[2] On Afanas'evo, see Alekhin, Gal'chenko & Demin 1997; Borodovskij 1995; *The Altai Culture*; Evdokimov & Loman 1989; Gryaznov 1980; Kiryushin & Kiryushin 1997; Kovalëv & Rezepkin 1995; Kubarev 1988; Kudryatsev 1992; Lyonnet 1996; Matyushchenko 1995; Molodin 1992; 1997; Posrednikov & Tsyb 1992; Reva 1995; Savinov & Podol'skij 1997; Semënov 1997; Shul'ga 1997; Stepanova 1997; Vadetskaya, Leont'ev & Maksimenkov 1980; Wang & Wang 1996.

The time-space location and subsequent possible ethno-linguistic attributions, archaeological correlates in context, physical anthropology

The time-space predictions and the formal similarities with the Yamnaya culture made the Afanas'evo culture a good candidate for an Indo-European label in Central Asia, and it was suggested that it could have been the culture of speakers of an early (Pre- or Proto-)Indo-Iranian, or an even more ancient language, that of the ancestors of the Tokharian speakers of Xinjiang. Apart from this, there are no clearly Indo European properties in the archaeological material. An anthropological difference between the Afanas'evo and the Okunevo supported the claim that the former were Indo-European and the latter non-Indo-European, but the cultural attribution of the skeletal remains is disputable, and apparently the distribution of the anthropological types between the two cultures (i.e. between the "Okunevians" of the Tas-Khazaa graves and the Chemovaya IV, VI, VII sites and the Afanasevians) is not so simple (Gromov 1997a; 1997b), and both apparently have an ancient local Neolithic basis (Chikisheva 1997).

Chariots, and earlier wagons, generally considered as carried by, or carrying, IndoEuropean populations across the steppes have been recorded on stelae and rocks at Znamenka, Chernovaya VIII, Tunchukh and Ust'-Tuba (Savinov 1997; Sher 1994; 1995). This is considered a strong argument for identifying the Afanas'evo-Okunevo as Indo-European. But we can observe that the transfer of the attribute "IndoEuropean" to the chariot (object or image) is, from the simple logical point of view, a circular argument, a tautology (Francfort 1998). It is only if we presuppose that the cultures in question that used chariots were Indo-European that we can use the linguistic reconstruction of Indo-European and later vocabulary as an argument. We know that Indo European cultures used

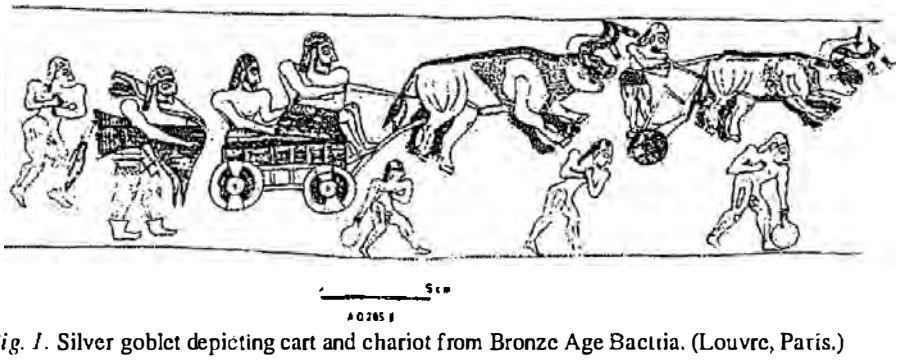

Fig. 1. Silver goblet depicting cart and chariot from Bronze Age Bactria. (Louvre, Paris.)

Indo-European words for the chariot, but no more. The silver vase depicting a Bactrian chariot and a cart (fig. 1), like the Afanas'evo images (fig. 2), prove nothing about the language of their owners. Otherwise we would have to admit that the Bronze Age Chinese were Indo-European. The same also applies to the later Bronze Age chariots and images of chariots (Andronovo).

Iconography and symbolic systems: pointing to non-Indo-European worlds, possibly Uralic or Altaic

Having shown the lack of consistency of the usual arguments for the Indo-European nature of the Afanas'evo-Okunevo sequence, we shall now try to examine the possibilities offered by its rich iconography. Surprisingly, the large number of images that are available have been to a great extent neglected by scholars. The reason for this, as we shall soon see, is that it refutes the standard Indo-European theory, which uses a few selected items.

First, a very ancient iconic community is represented by the elk and boat images, widespread from the Altai mountains, across the Ob, Lena, Angara, Tom', Yenissei and Irtysh rivers to Scandinavia (Martynov 1991 and works of Okladnikov): it is unnecessary here to argue the accepted fact that it is rooted in the Upper Palaeolithic art of such sites as Buret' and Malta (Abramova 1995). In Siberia, it continues down to the fourth and third millennia, and is called the

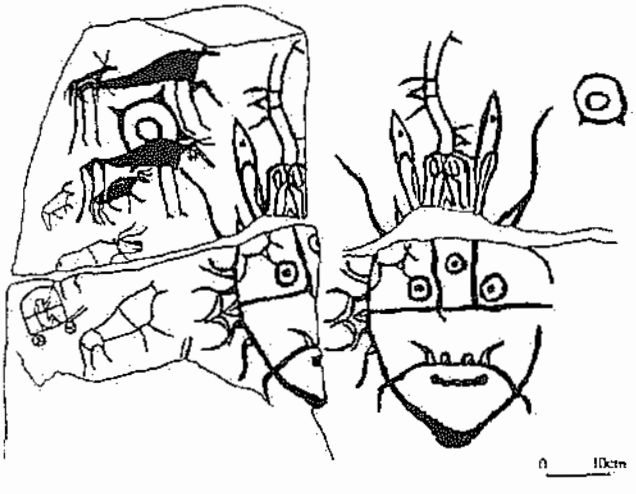

Fig. 2. Znamenka stele: Afanas'evo cart, Okunevo masked figure. (After Sher 1994.)

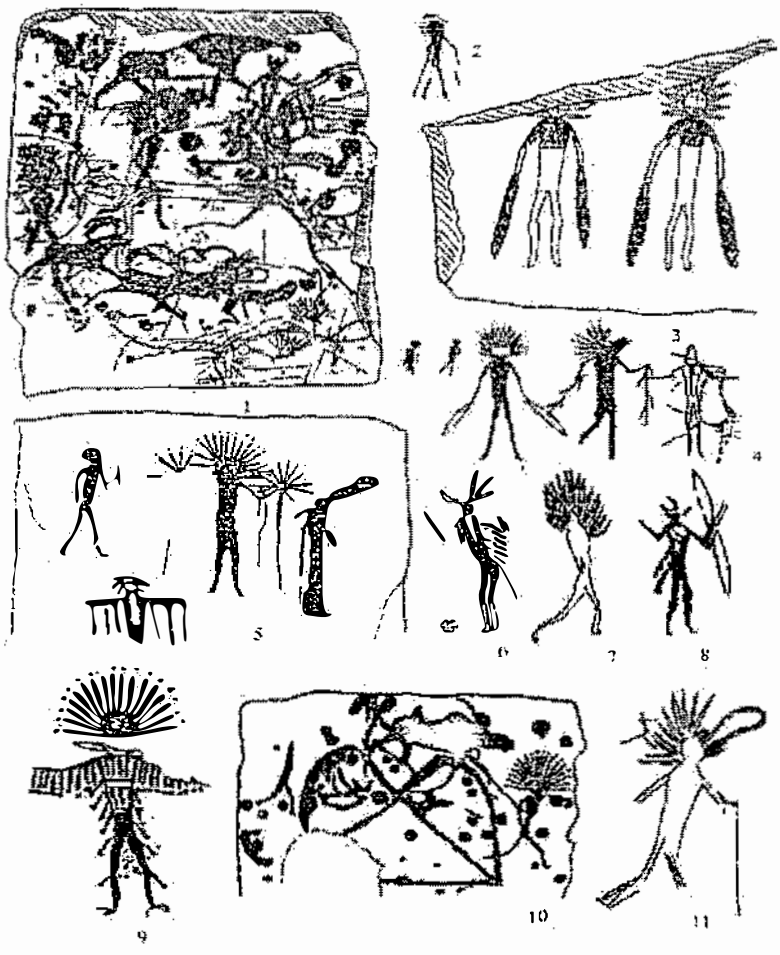

Fig. 3. Karakol tomb slab: Afanas'evo feathered anthropomorphic images, elks in Angara style, masked figure. (After Savinov 1997.)

Angara style. This style has nothing to do with any Indo-European source, and it is present on Afanas'evo tomb slabs in Karakol' in the Altai mountains (Kubarev 1988) (fig. 3).

Another very ancient style is the Minussinsk style, with images of deer, aurochs and horses, formally reminiscent of the European Upper Palaeolithic animal style: its earliest occurrence cannot be dated, but it lasted down to the Afanas'evo time (Sher 1980; 1994; 1995; Sher et al. 1994). The main point to note here is that the deer or aurochs of this style are frequently associated with female images, sometimes with birth-giving, as effectively demonstrated by

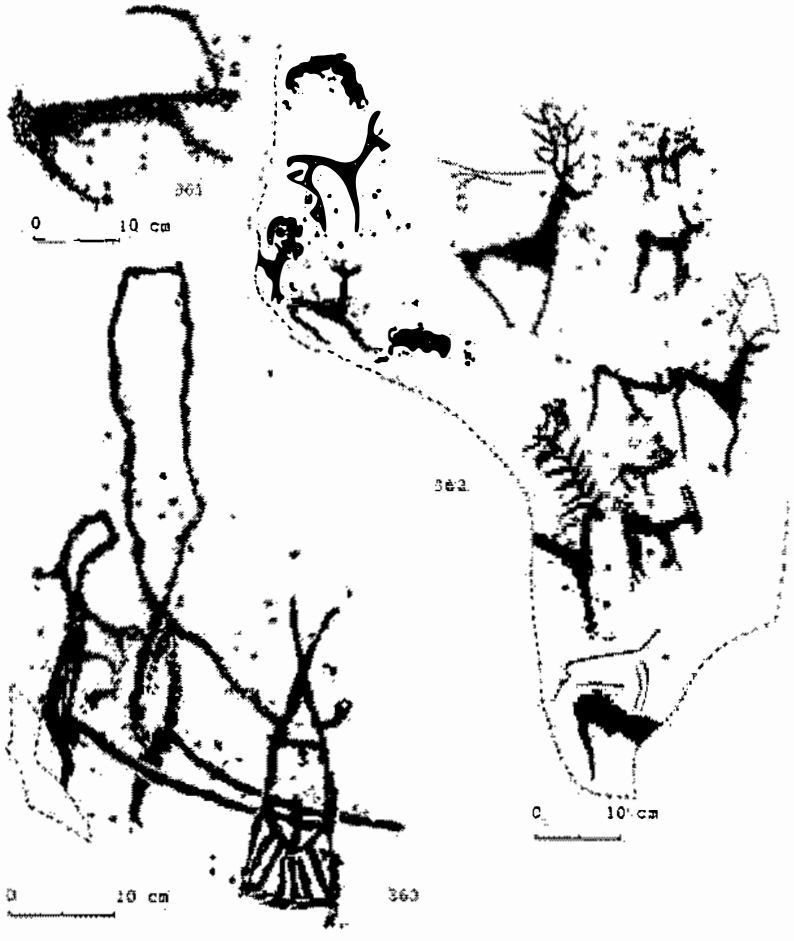

Fig. 4. Kalbak-Tash: female figure and animal contemporary to Afanas'evo-Okunevo. (After Kubarev & Jacobson 1996.)

E. Jacobson in the Altai mountains (Kalbak-Tash) and Mongolia (Jacobson 1993; 1997; Kubarev & Jacobson 1996) (fig. 4). The association of a fertility deity or spirit with animals is, again, non-Indo-European and rather of the shamanistic type found in Siberia. Masks and masked, feather-headed or bird-headed anthropomorphic figures connected with monsters are quite frequent in the Afanas'evo-Okunevo iconic system, and this is coherent with a vast complex of Asian cultures using masks (E. G. Devlet 1996; M. A. Devlet 1997a; 1995; 1996; 1997b; Francfort 1998). This is linked to a shamanistic type of religion and peoples speaking non-Indo-European languages (fig. 5). Some

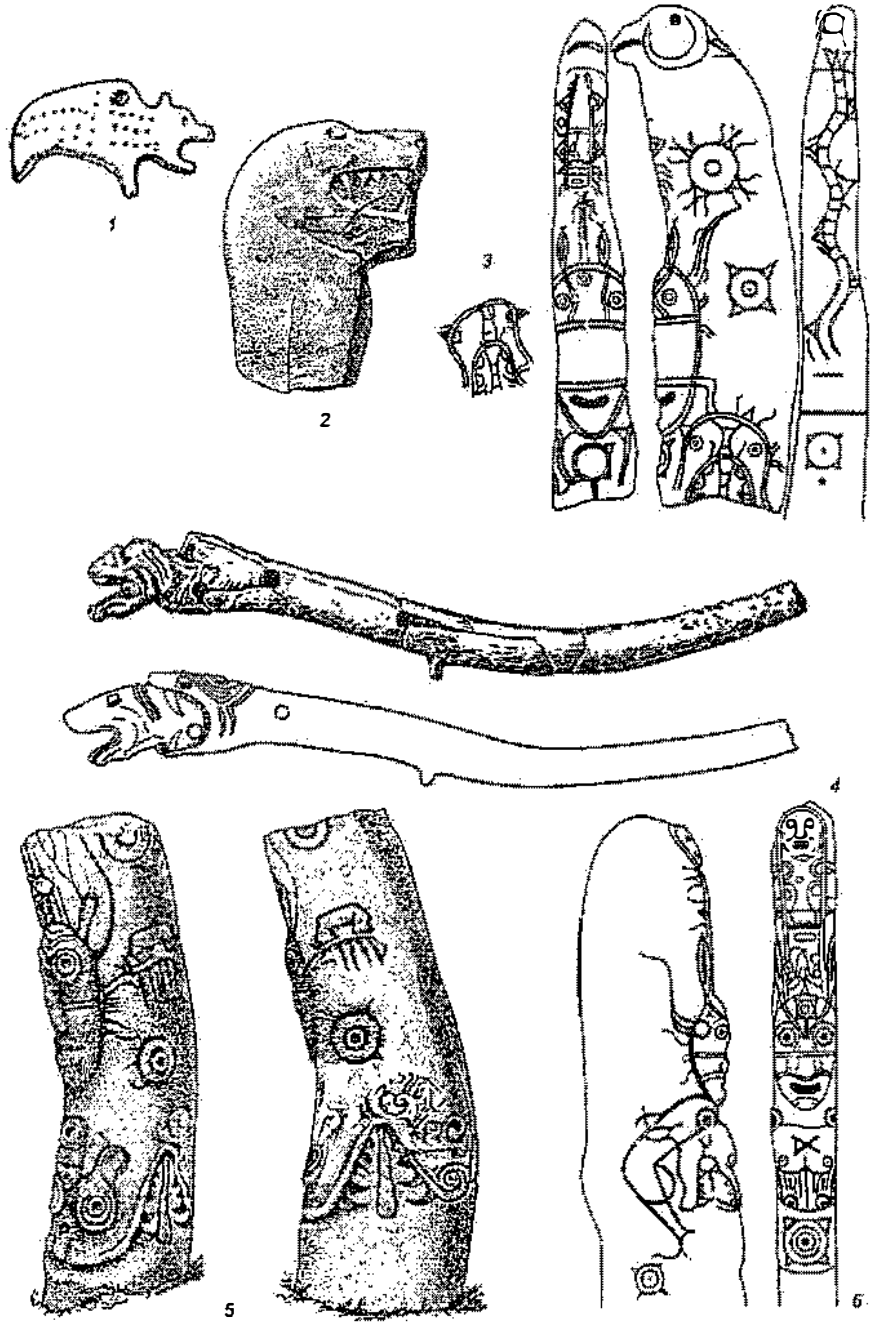

Fig. 5. Okunevo masks and monsters. (After Savinov 1997.)

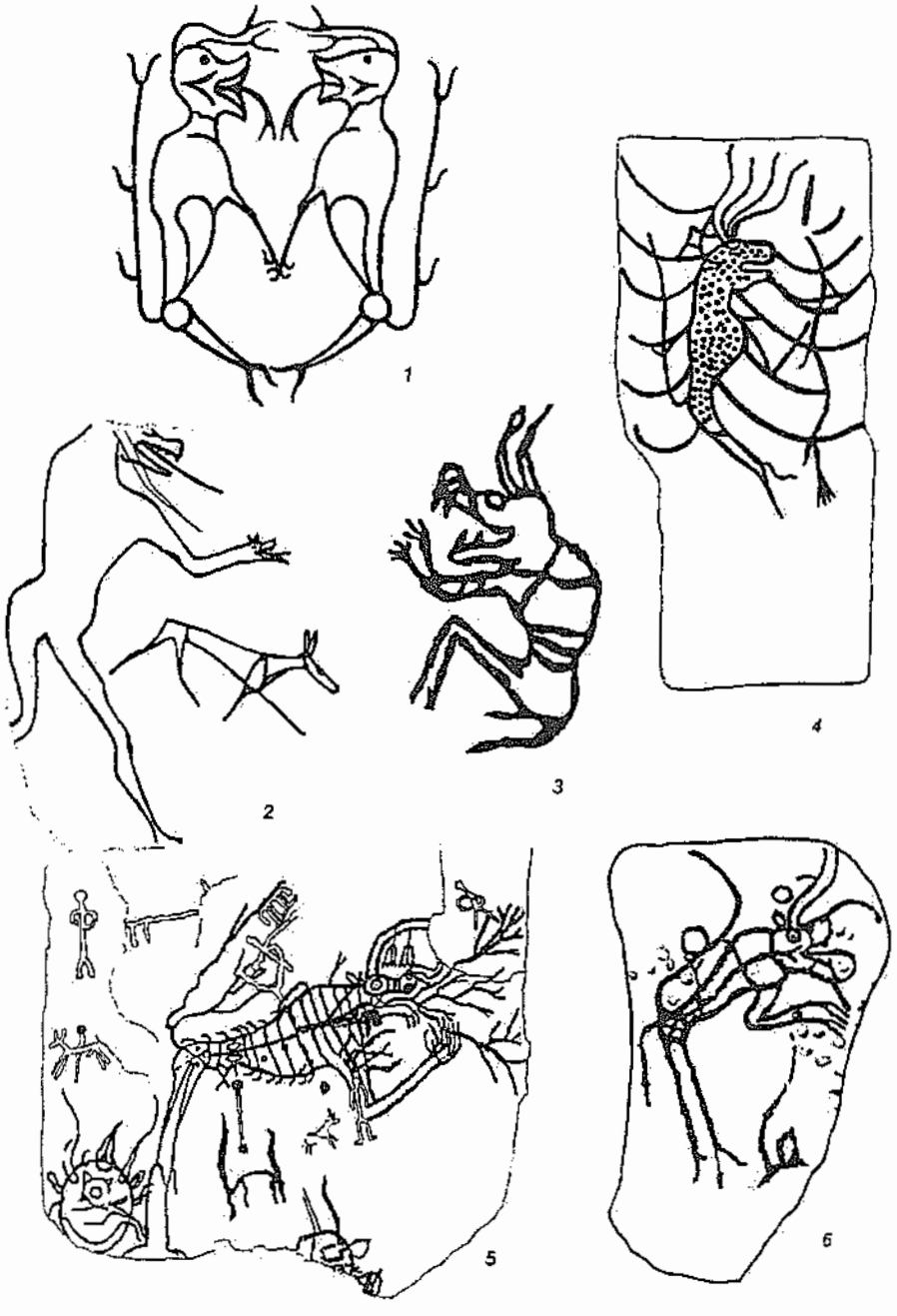

Fig. 6. Okunevo masks and monsters. (After Savinov 1997.)

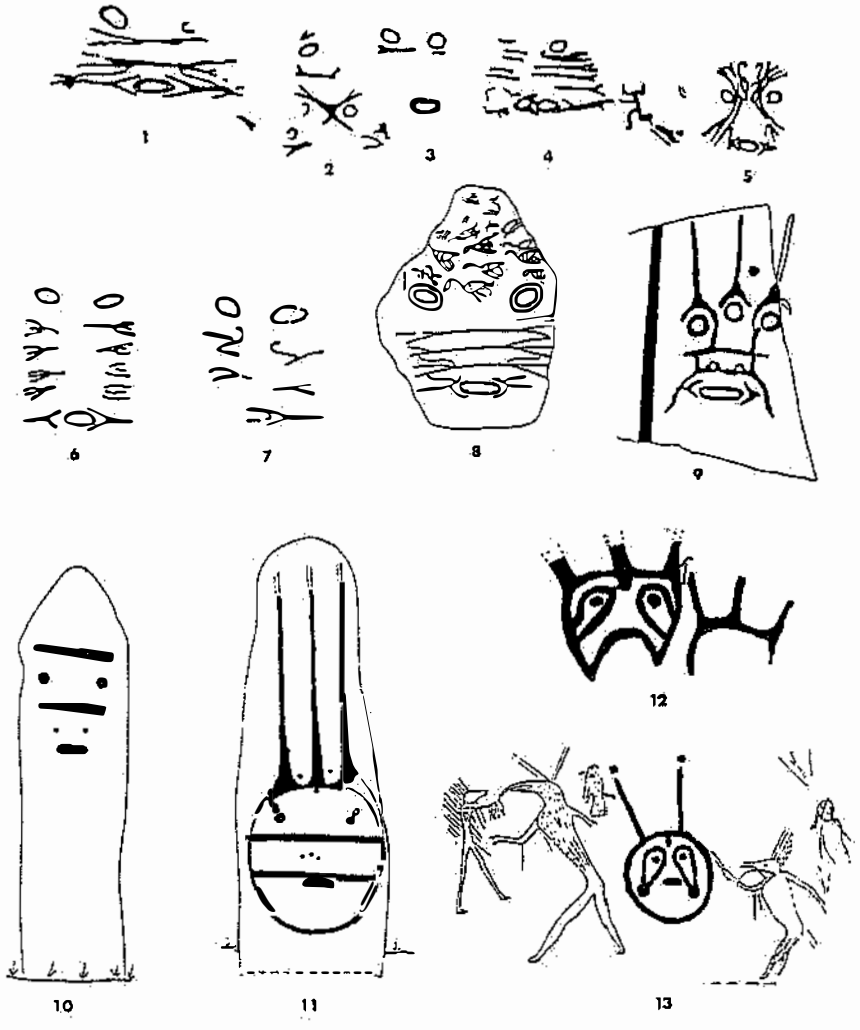

Fig. 7. Masks on Afanas'evo and Okunevo steles and petroglyphs. (After Sher 1995.)

images (especially in the Okunevo culture, but also in Afanas'evo) are made in the typical "split representation" style, widespread in the Asiatic and circum-Pacific area but devoid of any Indo-European associations (fig. 6). The Okunevo images were definitely formed in the Afanas'evo tradition (Savinov 1997), and therefore it is not possible to argue that the world of representation and the symbolic system of the former were very different from those of the latter (fig. 7). To sum up, the symbolic system of the Afanas'evo and Okunevo cultures is not consistent with the Indo-European hypothesis.

However, it is possible to imagine that a non-Indo-European symbolic system was adopted by Indo-European speakers, or that a part of the Afanas'evo group (the steppe one that did not make any images) spoke an Indo-European language, while another part (all those groups who created images) spoke non-Indo-European languages. But if we reason thus, we are back to the simple linguistic space-time argument for locating the speakers, in which case a study of the archaeological record is useless since anything goes. Consequently, we have to reject all attempts to reconstruct any Indo-European linguistic-mythological-symbolic system, unless it is attested *hic et nunc* by written documents found *in situ*. Alternatively, we can accept both that the Afanas'evo-Okunevo were not Indo-European, and that possibly (but not necessarily) they spoke Altaic or Uralic languages. If this is so, a consequence is that we would have to admit that the Tokharian language was formed elsewhere.

If, then, in the third millennium the archaeological material says nothing certain about the spoken language, and if the iconographic analysis, from Bactria to the Altai mountains, is oriented towards non-Indo-European symbolic systems, how is it possible to maintain a pro-Indo-European archaeological argument? We may surmise waves of peoples, the borrowing of myths or images, and all sorts of scenarios, but there is no factual evidence apart from the linguistically reconstructed time-space predictions. This is not an exceptional case: the same also applies to the Mediterranean Minoan and Mycenaean civilizations: the archaeological material sequence and the iconography do not constitute reliable data for the reconstruction of ethno-linguistic events. There is no point in trying to illustrate ethnolinguistic theories by irrelevant or uninterpretable archaeological material.

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PREHISTORIC FINNO-UGRIC CULTURE IN THE LIGHT OF HISTORICAL LEXICOLOGY

Kaisa Häkkinen

In this article, I shall examine those elements of vocabulary which most probably represent the oldest lexical stratum common to the Uralic languages, whether originally indigenous or borrowed. The words under scrutiny are studied in terms of their distribution between various lexical domains, and it is thus possible to evaluate the information which they provide concerning the extralinguistic environment in which they were earlier used. This examination yields abundant evidence from the earliest lexical strata of hunting cultures, e.g. terms for hunting and fishing equipment and for game animals. By contrast, there is no Uralic or Finno-Ugric vocabulary whatsoever which unambiguously refers to the cultivation of crops, and only a few lexical items which putatively refer to the keeping of domestic animals. The terms referring to agriculture typically have a narrow regional distribution, with cognates traceable only in those related languages spoken in geographically adjacent areas (Häkkinen & Lempiäinen 1996). In strikingly many cases, the agricultural vocabulary can be shown to consist of loanwords. The linguistic ancestors of Finnish, for example, appear to have begun to practise agriculture in the region surrounding the Baltic Sea, and to have acquired this activity through the mediation of their Indo-European-speaking neighbours.

1. DEFINING THE AGE OF THE LEXICAL MATERIAL

The oldest written documentation which throws light on the historical evolution of the Finno-Ugric languages dates only from the Middle Ages (e.g. Stipa 1990: 72ff.), and in practice, the only method by which linguistic materials shared by

related languages can be dated, and the oldest lexical strata identified, is by means of a comparative lexicological study of languages linguistically related and/or geographically adjacent. Some simple default rules can be applied in dating: words found with a wide distribution, but restricted to Finno-Ugric languages, can be assumed to he both of early origin and indigenous; terms with a wide distribution but also occurring in languages from other language families are assumed to be early borrowings; words with a narrower distribution are later neologisms, either indigenous or loanwords depending upon the languages in which they occur. The narrower the distribution of a particular word, the younger it can usually be presumed to be.

The "width" or "narrowness" of distribution is not conventionally defined simply on the basis of the number of languages of occurrence, but in terms of the "family tree" hypothesis. According to this theory, originally formulated by Otto Donner more than a century ago (1879) and established in use by E. N. Setälä (1926), the languages of the Uralic family became differentiated from each other in sequence: the first branch to separate and evolve into distinct languages consisted of (1) the Samoyed languages, followed by (2) Ugric, (3) Permic, (4) Volgan, (5) Saami (Lappish), and finally (6) the Baltic Finnic group. The age of a lexical item is therefore postulated upon the closest protolanguage stage shared by the languages in which it occurs. The oldest stratum of lexis, therefore, consists of words found both in the Samoyed languages and in at least one other branch of the language family; and the second-oldest stratum is assumed to include materials with cognates in at least one Ugric language and at least one language in the Finno-Permic branch.

In order for the family tree model to serve as a defining criterion for dating vocabulary and differentiating between historical lexical strata, the following conditions need to be met: the family tree model must accurately describe the actual sequence of separation of different branches despite possible confusion caused by later contacts; and the distribution of materials inherited from the original protolanguage must have persisted unchanged, subsequent to the languages' separation. The linguistic evidence of our day, however, does not conform to this assumed model of divergence (Häkkinen 1984). The features identified as specific to the language family are not actually shared by all its languages, but constitute dissimilar, intersecting isoglosses which it is impossible to reconstruct in ways coherent with the postulated family tree (e.g. Hajdú 1975). The etymologies of most words are "defective" in the sense that cognates cannot be traced in all the languages assumed to derive from the same protoform. Moreover, words may equally well be missing within the central structure

of the family tree, or at its edges. It can be demonstrated beyond question, from historical sources (e.g. Jussila 1988: 210-214), that words can disappear when for some reason they become redundant. There is thus no reason to assume that the present-day distribution of cognate lexis shared by related languages should reliably reflect its original distribution.

Nonetheless, the family tree hypothesis has been mechanically applied to the Uralic languages, both in elucidating their historical phonological development (e.g. Itkonen 1946; 1954) and in some etymological dictionaries (e.g. the *Uralisches etymologisches Wörterbuch*). From the perspective of the Finnish language, this method does not raise any serious problems, since the languages classified as genetically distant from Finnish are also distant on other relevant parameters, geography in particular, and the risk of subsequent contact contamination is thus largely eliminated. In the case of languages classified as genetically remote, but occurring in geographical proximity, on the other hand, the genetic method is of dubious validity. Komi and Mansi, for instance, are genetically as distant from each other as Mansi and Finnish, and words shared by Komi and Mansi have therefore been attributed to Proto-Finno-Ugric. In geographical location, however, the Komi and Mansi communities are relatively close, and were even closer in former times, when there were Mansi speakers living west of the Ural Mountains (Kannisto 1927), and some Komi speakers who moved east of the Urals to escape Christian missionary conversion into areas inhabited by speakers of Ob-Ugric and Samoyed (Stipa 1990: 171-172). This shared history is confirmed by many loanwords (Rédei 1970). In the dating of words with a narrow geographical distribution, therefore, it must always be actively borne in mind that a word apparently of early origin according to the genetic theory method may in fact be a later, regional innovation.

2. THE OLDEST COMMON LEXICAL STRATUM OF THE URALIC LANGUAGES, AND ITS USE AS SCHOLARLY EVIDENCE

The pioneering Finnish work in linguistic palaeontology is Otto Donner's study of the common cultural stock of Finns and Mordvinians (1882). One of the frequently used ways of describing the evolution of the Uralic language family, particularly in popular presentations, has been to list words which can be traced back to various distinct protolanguage phases, and to interpret subsequent lexical additions as cultural innovations (Setälä 1926; Itkonen 1961). Most such hypothetical proto-glossaries, however, do not explain what kind of research they are

based upon, nor how reliable the etymologies of individual words are. The reader is likely to assume that such descriptions represent reliable, up-to-date scholarship, but this is not necessarily the case. In many cases, even the research itself is dated; Pekka Sammallahti has calculated that the number of generally accepted Uralic lexical parallels has shrunk since the beginning of the 20th century from around five hundred to less than two hundred lexemes (Sammallahti 1979; 1980: 61-62). Among the items which have been rejected or challenged, there are many which are cited in earlier studies as firm evidence concerning the evolution of the Uralic languages.

There are at present two dictionaries which address the oldest common Uralic lexicon. The first of these, Björn Collinder's *Fenno-Ugric Vocabulary* (FUV), first came out in 1955, and a revised edition was published in 1977. A much more detailed treatment of the common Uralic lexicon is however provided in the *Uralisches etymologisches Wörterbuch* (UEW), produced under the leadership of Károly Rédei, originally issued in fascicle format but collated during the 1980s into a three-volume edition (completed in 1988). Volume I covers the oldest common lexical strata, i.e. the Uralic and Finno-Ugric material as defined on the basis of the family tree model. The second volume contains etymologies confined to the Finno-Permic, Finno-Volgaic or Ugric languages (excluding lexical stock shared only by the Baltic Finnic languages or by Baltic Finnic and Saami), and addenda; volume III consists of an index of individual words. The dictionary proper lemmatizes the words as reconstructions of the forms posited for the protolanguages, and each entry also includes, as far as is possible, a reconstruction of the original meaning, the attribution of the word to the appropriate stratum (U = Uralic, FU = Finno-Ugric), and an assessment of the degree of certainty for the etymology (a boldface symbol indicates a confident dating).

3. THE LEXICAL DOMAINS OF THE OLDEST COMMON VOCABULARY

For my own research, I have chosen to work on Volume I of the UEW, concentrating on those etymologies for which the Dictionary reports definitely confirmed instances in at least one of the languages in the Finno-Permic branch and in the Samoyed languages (U) or Ugric languages (FU). For the purposes of this enquiry, I have not separated borrowed items from indigenous stock, since the aim here is simply to collate the vocabulary attributable to the earliest traceable stratum of the language family, irrespective of the words' origin, and to

explore the lexical domains which can thus be identified as familiar to speakers in the earliest stages of these languages' history. I shall return to the question of loanwords later.

The selected words have been arranged roughly by lexical domain. On this basis, the oldest common lexical stratum as reported in the UEW can be classified as follows:

Domain	Total	U	FU	Finnish
time	12	4	8	7
sensations	14	4	10	9
fauna				
a) names of animals	60	24	36	27
b) terminology relating to animals	15	7	8	7
human society	2	1	1	1
flora				
a) names of plants	27	13	14	11
b) parts of plants, etc.	22	10	12	13
trade	2	1	1	1
transport, traffic, motion	32	17	15	15
quality	49	13	36	18
quantity, measurement, value	13	1	12	9
nature				
a) land and landscape	27	10	17	14
b) water and water systems	10	5	5	5
c) materials, surface	19	8	11	10
d) atmosphere, sky	14	3	11	9
hunting & fishing	18	9	9	8
form, posture	8	2	6	5
pronouns	16	11	5	13
processes and states				
a) life & health	13	5	8	6
b) emotions & perceptions	5	1	4	1
c) miscellaneous states & changes	27	6	21	8
buildings, constructions, equipment	14	6	8	7
construction processes, materials, pieces	10	5	5	7
nourishment				
a) eating & drinking	8	5	3	6
b) foodstuffs	10	2	8	6
c) dishes, preparation of food	12	4	8	3

the body				
a) parts of the body	77	35	42	41
b) bodily functions, etc.	12	5	7	5
speech, thought	6	1	5	3
family & personal relationships	27	16	11	14
relations in space & time	21	10	11	14
activities & processes	60	2	48	29
fire, the handling of fire	3	2	1	2
work, tools, working materials	59	22	37	20
religion, beliefs	7	–	7	2
clothing	7	2	5	2
miscellaneous other items	5	2	3	4
TOTAL	743	284	459	357

The category "miscellaneous other items" includes the auxiliary verb of negation (*e-*), the nouns *nimi* 'name' and *väki* 'force', and two lexemes corresponding to modal auxiliary verbs: the root **kelke-* ('must') (attributed as an Indo-European loanword; not occurring in Finnish), and *voida* 'can'. (In this article, if the lexeme in question occurs in present-day Finnish, I have cited the Finnish form.) The auxiliary *voida*, however, is classified in the *Suomen kielen etymologinen sanakirja* (Etymological Dictionary of Finnish, SKES) as found only in the Baltic Finnic languages, and its status in relation to the oldest stratum of the language is therefore questionable.

On the basis of genetic distribution, for almost all domains the table records noticeably more words for the Finno-Ugric level than for Uralic. The most striking exception to this pattern is found in the fields of pronouns and of family relationships, where Uralic material predominates. In the fields for expressions relating to hunting and fishing, time and space, flora, and transport, the distribution ratios are roughly balanced. Insofar as breadth of distribution can be taken as a mechanical dating criterion, therefore, pronouns and family relationship terms can be identified as some of the very oldest extant vocabulary.

Domains particularly strongly represented include those denoting parts of the body, fauna, and work and other activities. There is also a surprisingly high number of terms denoting quality (cf. Itkonen 1966: 226), represented today in most cases by adjectival forms, and lemmatized in the UEW as a reconstructed basic adjectival function, though many quality terms are multifunctional root forms which may also be found today as nouns or verbs.

Domains strikingly poorly represented include those denoting social status or social differentiation: examples of the few such terms include a root denoting 'thief' (represented in present-day Finnish by the stem *sala-* 'secret'), and terms of Aryan origin referring to a lord or prince (e.g. Mordvin *azor*). All in all, this finding suggests that the structures of these early societies were based more on family relationships than on the hierarchical stratification of social power. The only term which could be classified as occupational is *noita*, 'shaman' (in present-day Finnish 'witch'), but this has here been classified under the heading of religion and beliefs. Early terms relating to trade include the Aryan loan **wosa*, identified as the root from which the Finnish verb *ostaa* 'to buy' derives. Another term which could be classified in this economic domain is the root **arwa* (also of Indo-European origin), originally probably denoting 'price' and/or 'value' (and represented in present-day Finnish by *arvo* 'value'). In the table, however, this word has been classified under quantity and measurement; most of the other items in this category are numerals. Other terms which could be interpreted as describing trading commodities include *vaski* 'copper/bronze' and **wolnə* 'tin' (not found in present-day Finnish), but these have been classified under the heading of work, tools and working materials.

The table contains virtually no words relating to cultivation, the keeping of domestic animals, the production of cloth, or clothes made of cloth. The only colour term is that for 'grey', **ć'erə* (classified here under quality), which is represented by forms occurring in languages from Udmurt to Hungarian. It is worth noting that this lexical material thus does not include terms for the colours identified in comparative studies by Brent Berlin and Paul Kay (1969) as universally primary (white, black, red, and green/yellow). One possibility, however, is that words denoting items characterized by a particular colour may have been used to refer to the colour as well (e.g. *veri* 'blood' for 'red').

The vocabulary for foodstuffs includes two terms which may refer to the utilization of grain crops: **pus'nə* or **puc'nə* 'flour' and **rekkə* 'porridge'. Both words are relatively narrow in distribution today, however: the former has cognates in Udmurt, Komi, and Mansi, and the latter in these and also in Khanty. The editors of the UEW gloss the former word as probably denoting flour prepared from a wild grain, and therefore not implying cultivation; for the latter term, it must be noted that porridge-like foodstuffs can be prepared from non-grain foodstuffs. Neither of these terms therefore necessarily implies either the cultivation of grain crops or even familiarity with their use. The flora terms include the item **šäntə*, denoting an unspecified grain plant; corresponding words can be found from Mari to the Ugric languages, but their historical

evolution is problematic both etymologically and phonologically. This lexeme is not recorded at all in the languages from the western end of the family.

Other early food terms include *mesi* 'nectar/honey' (long known to be a borrowing from Indo-European), and suspected to denote not only honey but also a honey-derived drink ('mead'). Similarly, the fauna category includes *mehiläinen*, 'bee', i.e. the producer of honey; this too has been identified as being of Indo-European origin. Both *mesi* and *mehiläinen* are often cited as examples indicating early contacts between speakers of Uralic and Indo-European languages, and have also been used in support of a location for the origins of the Finno-Ugric speakers on the River Volga, where honey production has been practised for a very long time and where contacts between different populations could well have taken place. There is however no necessary reason why these words must be associated with the Volga valley, as has been widely assumed since the late 19th century. It is also impossible to say whether the words initially denoted bee-keeping or the gathering of wild honey.

The fauna category includes one lexeme regarded as beyond question: the term for a mother sheep, *uuhi* 'ewe'. In their gloss on this item, however, the editors of the UEW comment that it cannot be taken necessarily to imply the pastoral domestication of sheep, but merely familiarity with some sheeplike animal. On the other hand, the etymology proposed for this word by Jorma Koivulehto (1991: 108-109) derives it as a loanword from Indo-European source languages, where it evidently did refer specifically to sheep. It must be left to the archaeologists and zoologists to decide at what stage we can assume that sheep were familiar to the populations of the Finno-Ugric language area.

Another term possibly relating to domesticated animals is the root **poča*, possibly related (despite the irregular phonological link this implies) with the present day Finnish term *poro* 'reindeer'. It is impossible to determine from the word, however, how domesticated an animal it refers to or in what way it may have been used. The cognate terms found in various languages today refer to semidomesticated reindeer, reindeer calves, or wild deer. Words with a somewhat similar phonological structure are also found in some Asian languages belonging to other language families, denoting elk or roedeer.

An item classified here under fauna is the root **koj(e)ra*, from which both *koira* 'dog' and *koiras* 'male animal' are derived in modern Finnish. This word is itself derived from the Uralic root **koje*, however, which originally denoted 'male human' or simply 'human', and **koj(e)ra* was evidently not initially used to refer specifically to dogs but to any male animal. One term of older provenance denoting man's ancient friend appears to be the root **pene* (represented in

present-day Finnish by *peni(kka)* 'puppy'), but since no reliable cognate can be identified in the Ugric or Samoyed languages, it has not been included among the materials listed in the table.

4. EVALUATING DISTRIBUTION AND CERTAINTY OF ETYMOLOGY

Although all the words used for the table are listed by the UEW as definite Uralic or Finno-Ugric etymologies, not all of them are necessarily represented in all the languages in the family. There are, in fact, only 18 items with 100% etymological certainty, meaning that an etymologically equivalent form can be traced in Baltic Finnic, Saami (Lappish), Mordvin (Erza/Moksha), Mari (Cheremis), Udmurt (Votyak), Komi (Zyryan), Mansi (Vogul), Khanty (Ostyak), Magyar (Hungarian), and in at least one of the languages in the Samoyed branch, and that the equivalence is recognized beyond question in the major etymological reference works, both the UEW and the SKES, and (for words in the alphabetical range A-P) in the SSA. The elements in modern Finnish corresponding to these 100% etymologies are: *ala-* 'under-', *kadota* 'to disappear', *ku(ka)* 'who' (personal interrogative pronoun), *maksa* 'liver', *me* 'we' (1st person plural pronoun), *mi(kä)* 'which' (impersonal relative/interrogative pronoun), *minä* 'I' (1st person singular personal pronoun), *niellä* 'to swallow', *nimi* 'name', *nuoli* 'arrow', *nuolla* 'to lick', *pesä* 'animal's nest/den', *punoa* 'to weave', *silmä* 'eye', *suoni* 'vein', *sydän* 'heart', *tuo* 'that' (distant-reference demonstrative pronoun), and *uida* 'to swim'. The items with 90% certain etymology, i.e. items for which an equivalent form is missing or dubious in only one of the languages or language family branches listed, include: *e-* (the auxiliary verb of negation), *jää* 'ice', *kaksi* 'two', *kolme* 'three', *kuolla* 'to die', *kusi* 'urine', *kuusi* 'six', *kuusi* 'fir tree', *kyynär* 'elbow', *käsi* 'hand/arm', *mennä* 'to go', *neljä* 'four', *pelätä* 'to fear', *sarvi* 'horn/antler', *sata* 'hundred', *syli* 'lap', *talvi* 'winter', *tämä* 'this' (near-reference demonstrative pronoun), *vaski* 'copper/bronze', *veri* 'blood', *viisi* 'five', *voi* 'fat/grease', and *ydin* 'core'. A strikingly large proportion of both of these very limited groups consists of pronouns (*kuka, me, mikä, minä, tuo*) and parts of the body (*maksa, silmä, suoni, sydän*: 'liver, eye, vein, heart').

There are many words here which have been identified or at least proposed as Indo-European loanwords (*nimi, pelätä, punoa, sarvi, sata, suoni, vaski, veri, voi*): some have long been known to be borrowings, while others have been identified as loan-derivations more recently (for details see Joki 1973;

Rédei 1986; Koivulehto 1994; Häkkinen 1996). Loanwords, however, may belong to the oldest stratum of a language family just as well as indigenous coinages, and an external origin is therefore not in itself suspect. There are, however, problems associated with words such as *sata* 'hundred', whose distribution puts them in the same category with borrowings from Proto-Indo-European, but whose phonology clearly indicates a later stage of development within Indo-European (in this case, an Early Proto-Aryan or Pre-Aryan form; see Koivulehto in this volume). There can be little doubt that loanwords were absorbed over a long period of time, despite the impossibility of demonstrating chronological stratification in the Uralic material on the basis either of distribution or of the phonological evolution within the Uralic family. An example of the semantic problems is *vaski* 'copper/bronze', which would appear to indicate a very early familiarity with metal. It has been established that copper ore was sometimes cold-forged even in the Stone Age, and the word could conceivably therefore refer to familiarity with and the use of crude copper. On the other hand, it could also be a word acquired as a result of later trading contacts (e.g. Joki 1973: 339-340). The meanings now associated in the different languages with this word and its cognates range from 'ore' or 'metal' in general to 'silver', 'iron', or 'money', and this variety of meanings renders it extremely difficult to draw any conclusions as to the meaning with which the word may originally have entered these languages. Anyway, the high proportion of borrowings is strong evidence that the Uralic and Indo-European peoples were close neighbours in prehistoric times.

APPENDIX

Lexical domains of the oldest Uralic/Finno-Ugric vocabulary as reported in Uralisches etymologisches Wörterbuch

NB! To make the list as short as possible, only the first one of the reconstructed proto-forms in the dictionary is cited here. Some items have been mentioned twice in the list but they have been counted only once. The secondary occurence has been parenthesized.

ɜ = undefined vowel

ə = undefined back vowel

ə̈ = undefined front vowel

Time **ärɜ* Jahr, **eje* Nacht, **ilɜ* Abend, (**jikä* Alter, Jahr,) **jitɜ* Abend; Nacht, **kuδɜ* Morgen, (**kuŋe* Mond; Monat,) **oδe* Jahr, **purkɜ* Zeit, **sikśe* Herbst, **suŋe* Sommer, **tälwä* Winter, **towkɜ* Frühling; ?fluten, steigen.

Sensations **äne* Stimme, Laut, (**ćärke-* brechen (intr., tr,), Schmerzen haben, weh tun), **ipɜ* Geschmack, Geruch, **jälke* Spur, Fleck, **kule-* hören, **mälɜ-* fühlen, tasten, **muja-* anrühren, tasten, **näke-* sehen, schauen, **oća* sehen, **śoje-* Ton, Laut; tönen, lauten, **tumte-* fühlen, anrühren, tasten, betasten, **utka* Spur, **wäntɜ-* sehen, schauen, **wića-* sehen, schauen, **woppe-* sehen, besichtigen, anschauen.

Fauna: names of animals **aŋɜ* Schneehuhn, Eisente, Polarente; Harelda glacialis, Anas hiemalis, **ćonča* Floh, **čečɜ* Wildente, **(j)ipɜ* Eule, Uhu, **kaćɜ* eine Art Wildente, **kaja (ka)* Möwe; Larus, **kala* Fisch, **kećä* eine Fischart, **kertɜ* eine Art Wildente, **kije* Schlange, **koje* Motte, Wurm, **kučɜ* Ameise, **kulɜ (kɜ)* Rabe, **kunčɜ* eine Art Wurm, **kunta* wildes Rentier, **kuńće* Ameise, **kəlɜ* (Eingeweide) Wurm, **kərnɜ* Rabe, **kötrɜ* Birkhuhn; Tetrao tetrix, **lujɜ* Marder; Mustela martes, **luna* wilde Gans? Vogel?, **lənćɜ* Bremse, Fliege, **ləppɜ* Schmetterling, **lɜmɜ* kleine Fliege od. Mücke, **mekše* Biene; Apis mellifica, **mənktɜ* eine Art Fisch, **ńepłɜ* Rentierkalb, **ńoma(-łɜ)* Hase, **ńukše* Zobel, Marder, **omča* eine Art Insekt, Käfer, **ončɜ* Njelma Lachs; Coregonus njelma, **paδ'tɜ* Auerhahn; Tetrao urogallus, **päćkɜ* Schwalbe, **perkɜ* Wurm, **piŋe* Haselhuhn; Tetrao bonasia, **poča* Rentier(kalb), **pojta* Hermelin; Mustela erminea, **pujɜ* Wasservogelart, **pəłɜ* Bremse, **repä(-ćɜ)* Fuchs, **säpɜ* Eichhorn, **särkä* eine Fischart, ?Leuciscus rutilus, ?Acerina cernua, **säwnä* eine Fischart, **sɜŋćɜ* Eidechse, **śarta* Elentier, (junges) Rentier, **śäkä* eine Fischart, ?Wels, ?Silurus glanis, *śäkće* eine Art Raubvogel: Fischadler, ?Möwe, **śiŋe-le* Igel; Erinaceus europaeus, **śoδka* eine Entenart, **śurme* wildes Tier, **śurɜ* Hecht, **šiŋe-re* Maus, **tarɜ kɜ* Kranich, **täje* Laus, **tokta* Taucher, Seetaucher; Colymbus arcticus, **totke* Schleie; Cyprinus tinca, **uče* Schaf, **wajće* eine Art Ente, **warɜ* Krähe, **wälɜ* irgendein grösseres Tier.

Fauna: terminology relating to animals **aŋɜ* Horn, **apta-* bellen, **ćaδa* das Laufen, das Rennen; die Brunst der weiblichen Tiere, laufen, rennen; brünsten, **kipsɜ* Fell von den Pfoten, Beinen der (Pelz)Tiere, **koj(e)-ra* Männchen, (**kuδe-* laichen), **kupe(ŋa)* Fischblase, **muna* Ei; Hode, **pančɜ* Schwanz, (**pešä* Nest), **pijra* Tiermagen; Kropf **pol'a* Schwanz, Schweif, **purɜ* Rogen, **śŋme* (Fisch)Schuppe, **śorwa* Horn, **śurɜ* Herde, Rudel (von Rentieren), **tulka* Feder, Flügel.

Human society **aśərɜ* Herr, Fürst, **sala* verstecken, verhehlen, stehlen; Dieb.

Flora: names of plants **äŋɜ-ćɜ* Himbeere, **δ'ęme* Traubenkirsche, Ahlkirsche, **jäwje* Bastflechte, Bartmoos, **juwɜ* Kiefer, Föhre; Pinus silvestris, **kŏčɜ* Wacholder, **kośmɜ* zwiebelartige Pflanze, **kojwa* Birke, **kuſuiĺćɜ* Birke, **kuse* Fichte, Tanne; Picea excelsa, **moĺ'ɜ* Beere ingendeines Strauches, **mura* Sumpf-, Torf-, Schell-, Multbeere; Rubus chamaemorus, **nakrɜ* Zedernuss, **näŋɜ* Lerche; Larix sibirica, **ńulkɜ* Weisstanne, Edeltanne; Abies, **osa* Beere, **pajɜ* eine Salix-Art, **pićla* Vogelbeere, Vogelbeerbaum; Sorbus aucuparia, **pojɜ* Espe, **pola* Beere, **puwe* Baum, Holz, **pönɜ* Fichte, **soksɜ* Zirbelkiefer; Pinus cembra, **suŋ(ɜ)lɜ* eine Art Lilie; Lilium martagon, **śala* Ulme, **śśine* Zünder, Baumschwamm, **šäntɜ* Getreideart, **woĺ'ɜ* Porsch; Ledum palustre.

Flora: parts of plants etc. (**älɜ* Baumsaft,) **jarɜ* Maserholz, -knorren, **jälŋɜ* Baumstumpf, -stamm, (**kamɜ* Schale,) **kənta* Baumstumpf, **kere* Rinde, (**koja* Rinde, Schale), **kośćkɜ* Bast, Baumrinde, **lelɜ* harte, spröde Seite des Nadelbaums, **lŋppɜ* umgefallener Baum, Treibholz, auf dem wasser treibende Schutt, **mərɜ* Knollen, Knorren, **ńila* etwas schlüpfriges; Baumsaft, Schleim, Splint; schlüpfrig sein, sich ablösen, ablösen, schinden, **ńəlɜ* etwas schlüpfriges; Baumsaft, Schleim, Splint; schlüpfrig sein, sich ablösen, ablösen, schinden, **pakśa* Knoten, Knollen, Knorren; Auswuchs (an Bäumen), **päkɜ* Zapfen, **piška* Baumharz, **pućke* hohler Stengel der Pflanzen, **puŋka* Knollen, Beule, Unebenheit, **sije* Jahresring des Baumes; Faser, Fiber, **śuka* Rinde, Bast; Fell, Haut, **śurɜ* Harz, **tiŋe* Stammende, dickes Ende des Baumes, **tojɜ* Birkenrinde, **wəćɜ* dünner, biegsamer Ast, Zweig, **wačɜ* Wurzel.

Trade (**arwa* Preis, Wert), *kačɜ* Geschenk, schenken, (**miγe-* geben, verkaufen, **tenɜ* Preis, Wert), **wosa* Ware, Handel.

Transport, traffic, motion **aja-* treiben, jagen, **aške(ləɜ)* Schritt, **ašksɜ* Schlitten, **čančɜ* schreiten, gehen, **čijɜ-* laufen, **jakka-* gehen, gelangen, geraten, **jomɜ-* gehen, sich auf dem Weg machen, **junča* Einschnitt; bezeichneter Weg, Pfad, **juta-* gehen, wandern, **jərɜ-* sich verirren, **kaδ'a-* lassen, verlassen, bleiben, **kanta* Last, Traglast, Bürde?; tragen, **kälä* waten, (**kujrɜ* (ausgehöhltes) Gefäss; Trog, Boot), **kulke-* sich bewegen, gehen, **läkte-* weggehen, hinausgehen, **likke-* sich bewegen, **mene-* gehen, **mulɜ-* vorübergehen, vorbeigehen, vergehen, **pučɜ-* laufen, weglaufen, **pukta-* hüpfen, laufen, **sajɜ(kɜ)* Schneeschuh; Schneeschuh od. Ski laufen, **soŋe-* hineingehen, eindringen, **suγe-* rudern, **sukse* Schneeschuh, **śona* Schlitten, **šärɜ-* kommen, gelangen, reichen, erreichen; sich verbreiten, **šilkɜ-* fliegen, schweben, **terɜ-* Raum od. Platz haben od. Finden, hineingehen, **tule-* kommen, **uje-* schwimmen, **walka-* hinabsteigen, hinabgehen, **wanča-* überschreiten.

Quality **äsɜ-* heizen; sehr heiss, warm sein, **ćerɜ* grau, **čama* gerade, aufrecht, Verstärkungswort zum Ausdruck irgendeiner Entlegenheit in Zeit und Raum, **čemɜ* sauer; sauer werden, gären, **čukkɜ* dicht, dick, **čupa* dünn, mager, **eĺ'ɜ* feucht, nass, **enä* gross, viel, **erɜ* gross, viel, **jäkšɜ* kühl, kalt; kühl, kalt werden, **jikä* Alter, Jahr, **karwa* bitter, scharf; bitter sein, brennen, prickeln, **kawka* lang, **kämä* hart, fest, **kepä* leicht, **kerä* rund, rollend; sich drehen, drehen, wenden, **kilɜ* glatt, schlüpfrig, **kise* dick, **kośćɜ* lang, **kumte* breit, **kunta* Geschlecht, Sippe, Gemeinschaft, **kurɜ* krumm, schräg, schief; krümmen, schräg od. schief machen, **kuška* trocken; trocken werden, (**lamte* niedrig, tief; Tiefland, **lappɜ* flach, platt; Fläche), **lońća* weich, **l'ekkɜ* dicht, eng, **ńačkɜ* nass, feucht, roh, **ńončɜ* gestreckt, lang gestreckt; lang gestreckt sein, ausstrecken, sich ausstrecken, **ńulɜ* abschüssig, steil, **oma* alt, vorig, vorherig, **ona* kurz, **ońɜ* zahm, nicht scheu, **päwe* warm; warm sein, **piδe* hoch, lang, **pil'me* dunkel; dunkel werden, **soŋkɜ* alt; alt werden, **śiwa* sauber, **šorɜ* eng; eng werden, sich verengen, **šürɜ* undicht, offen, frei, **šorwa* dünn, spärlich, undicht,

**täwδe* voll, **temɜ* voll; stopfen, fülllen, **teppɜ* dicht, **tire* voll, **tiwä* still, ruhig, **wajɜ* wild, scheu, **wäl'ɜ* glatt, **wekkɜ* dünn, **wuδ'e* neu, **δčɜ* warm, heiss; wännen.

Quantity, measurement, value *arwa* Preis, Wert, (**enä* gross, viel, **erɜ* gross, viel), **jowkkɜ* Haufen, Menge, **kakta* zwei, **kolme* drei, **kuśɜ* zwanzig, **kutte* sechs, **luke* Zahl, Anzahl; zählen, rechnen, **ńeljä* vier, **sorɜ* Spanne, **śata* hundert, **tenɜ* Preis, Wert, **weńćɜ* ganz, all, **witte* fünf.

Nature: land and landscape **aŋe* Öffnung, Einschnitt, Vertiefung, **arɜ* wässerige, sumpfige Stelle, grasbewachsene Niederung, **čiŋkä* Hügel, **ćukkɜ* Hügel, Spitze, **jakkɜ* Kiefer-, fichtenwald, **jäŋkä* Moor, sumpfige Stelle, **kača* Höhle, Höhlung; Behälter, Gefach (aus Holz), **katɜ* Weide; weiden, **kirkɜ* Inneres, Höhlung, **kolɜ* Ritze, Riss, Spalt, Zwischenraum, **kurɜ* Vertiefung, vom Wasser ausgegrabener Hohlweg, Pass zwischen zwei Bergabhängen, **kčɜ* Sand; sandige Stelle, **lamte* niedrig, tief; Tiefland, **lappɜ* flach, platt; Fläche, **maŋe* Land, Erde, **mäke* Hügel, Berg, **mäkte* Rasenhügel, Hügel, **mećä* Rand, Seite von etwas, **ńorɜ* Sumpf, **ńurme* grasbewachsene Stelle, Wiese, **oŋte* Höhle, Höhlung, **paśɜ* Loch, Öffnung, Spalt, Riss, **umɜ* Vertiefung, Höhle, Hohlraum, **wamta* Wald, **weŋe* Berg, **woŋke* Höhle, Gruhe, **wujɜ* Gegend, Seite; Ende, Grenze.

Nature: water and water systems **iptɜ* hoher Wasserstand; zunehmen, steigen (Wasser), **joke* Fluss, **kälɜ* (versumpfter) See, Bucht, **kumpa* Welle, **kupla* Schaumblase; Blasen werfen, **šerɜ* Bach, **towɜ* See, Teich, **uŋa* Strom; strömen, **waδ'kɜ* kleiner Fluss; Krümmung bzw. Strecke des Flusses zwischen zwei Krümmungen, **wete* Wasser.

Nature: materials and surfaces **ćaka* Treibeis; dünnes Eis, **ćäke(rɜ)* harter Schnee; abgeweidetes, fest getretenes Land im winter, **jäŋe* Eis, **kama* Schale, **kärnä* Rinde, Kruste, **kiwe* Stein, **koja* Rinde, Schale, **kumɜ* dünner Schnee, **kura* Reif, feiner Schnee, **liwa* sand, **l'omćɜ* (gefrorener) dünner Schnee, **l'upša* der Tau, **paľa* Eiskruste, Frost; frieren, gefrieren, **pičɜ* Reif, Tau, **sula* geschmolzen, aufgetaut; schmelzen, tauen, **śarɜ* (gefrorener) Schnee, Eisrinde auf dem Schnee, **śawe* Ton, Lehm, **šojwa* Ton, Lehm, **śuδ'a* Reif, Rauhfrost.

Nature: atmosphere, sky **ćeŋke* Dampf, Dunst od. warm, Wänne, **čiŋɜ* Nebel, Rauch, **iće* Schatten; Schattenseele, **ilma* Himmel, Wetter; Gott, **kintɜ* Nebel, Dampf, Rauch, **koje* Morgenröte, **kumɜ* Wolke, **kuńčɜ* Stern, **kuŋe* Mond; Monat, **mińɜ* Himmel, **pilwe* Wolke, **ratɜ* Dampf, Nebel, **säŋe* Luft, **śala* Blitz; blitzen.

Hunting and fishing (**jaka-* teilen, scheiden, trennen, **jälke-* Spur, Fleck, **jänte* Sehne), **jäpše* spitze Stange, Speer, *joŋ(k)sɜ* Bogen, (**junča* Einschnitt; bezeichneter Weg, Pfad), **kalɜ* Netz, **keje* Balz; balzen, *koke-* sehen, besichtigen, finden, **kuδ'e-* laichen, *kulta-* fischen, *kunta-* fangen, (eine Beute) finden, (**lewe-* werfen, schiessen), **muŋkɜ* Klumppfeil, Pfeil mit Keule, **näδ'ɜ* Falle (für kleine Tiere), **ńele* Pfeil, **ńoŋδa-* (Spuren) verfolgen, (**oŋtɜ* Stachel, Spiess), **paδɜ* Damm, Wehr, Fischfangsperre, **pekše* Pfeil (mit stumpfer Spitze?), **tulkɜ* Zugnetz, **ulke* Stange, **watta-* aufspüren, die Spur verfolgen; folgen, nachjagen, **woča* Zaun, Fischzaun; mit einem Wehr Fisch fangen.

Form, posture **kećɜ* Kreis, Ring, Reifen, **kečä* Kreis, Ring, Reifen, **kerä* Bündel, Knäuel, **kere* Kreis, Ring, Reifen, **kuma* gebeugte, umgestürzte Lage; sich beugen, **minɜ* Biegung, Krümmung; sich beugen, sich biegen, sich krümmen, **pečɜ* Reihe, Schicht; drehen, winden, schichtweise aufeinander legen, **šiŋe* Biegung, Krümmung.

Pronouns **će* dieser, der, jener, **e* dieser, -e, -es, **ke* wer, **ku-* wer, welcher, ?was, **mu* ander(er), ?dieser, jener, **mä* ich, **mä* wir, **mɜ* was; Sache, **o* jener, -e, -es, **sö* er, sie, es, **ta* der hier, dieser da, **tä* dieser, **to* jener, **tö* du, **tö* ihr, **-ä* ob

Processes and states: life and health **čačɜ-* geboren werden; wachsen, **čäkkɜ-* ersticken, ertrinken, **elä-* leben, **jama-* krank sein, sterben, **kičɜ* Krankheit, **kola-* sterben, **kuse* Husten; husten, **lewlɜ* Atem, Hauch; Seele, **mučɜ* irgendeine Krankheit, **puwɜ-* ersticken, **pǟčɜ-* gefühllos werden, absterben, **śure-* sterben, **śur(e)-ma* Tod.

Processes and states: emotions, mental processes **kurɜ-* sich fürchten, erschrecken, **kurɜ* Zorn; zürnen, **oδa-* schlafen, liegen, **oδa-mɜ* Schlaf; Traum, **pele-* fürchten, sich fürchten.

Processes and states: miscellaneous states and changes **ćənɜ-* (sich) vermindern, (sich) verkleinern, eintrocknen, **ećɜ-* fallen, **jäntɜ-* erstarren, Gefrieren, erkalten, **kiče-* glühen, ohne Flammen brennen, **kil'e-* kitzeln, **kirke-* fallen, stürzen, **kujɜ-* liegen, **kulɜ-* ende nehmen, enden, vergehen, aufhören, **kupsa-* löschen, erlöschen, **le-* sein, werden, leben, **ləŋkɜ-* sich spalten, **nujɜ-* sich strecken, sich dehnen, **ńuŋɜ-* ruhen, rasten, **pakka-* bersten, aufplatzen, **poča-* nass, feucht werden, **pučɜ-* sich vermindern, **salkɜ-* stehen, **saŋča-* stehen, **säje* Eiter, Fäulnis: eitern, verfaulen, **säle-* sich setzen, einsteigen, **sośɜ-* nass werden, **śarɜ-* trocknen, trocken werden, **šoppɜ-* trocknen, **šorwa-* trocknen, trocken werden, **taje-* sich beugen, sich neigen, brechen, **waja-* sinken, einsinken, untersinken, **wole-* sein, werden.

Buildings, constructions, equipment **aδ'ɜ* ein mit etwas bedeckter, zum Liegen (Schlafen) geeigneter Platz: durch Bedecken einen Platz zum Liegen/Schlafen bereiten; betten, **čačɜ* eine Art Pritsche, **kilä* Wohnung, **kota* Zelt, Hütte, Haus, **läppɜ* Deckel, Dach; decken, bedecken, **l'apćɜ* Wiege, **ńile* auf einem Pfahl stehender Speicher, **owe* Tür, (**paδɜ* Damm, Wehr, Fischfangsperre), **pele* Pfosten, Stange, **pesä* Nest, **račɜ* Loch, **šarma* Rauchloch eines Zeltes, **tuktɜ* Querholz, Querleiste (im Boote), **uδɜmɜ* Schlafzelt, Mückenzelt.

Construction processes, materials, pieces **aśe-* stellen, setzen, legen; ein Zelt errichten, **čučɜ* Stange, **mura* Stück, Krümchen: zerbröckeln, zerbrechen, **pala* Bissen; fressen, **pälɜ* Brett, **räčɜ* Stück, Bissen, Teil, **śalkɜ* Stange, Stab, Stecken; Baumstamm, **śawŋa* Stab, Stange, **tärjä* Latte, Lattenreihe, **wole* Stange.

Nourishment: eating and drinking **ime-* saugen, **irɜ-* trinken, **juγe-* trinken, **ńele-* (ver)schlucken, (ver)schlingen, **ńole-* lecken, **pure-* beissen, **sewe-* essen, **šomɜ* Hunger, Durst.

Nourishment: foodstuffs **älɜ* Baumsaft, **jəlɜ* Fett (des Tieres), **kuje* Fett, **leme* Saft, Suppe, **mete* Honig, aus Honig gerührter Trank, **puśnɜ* Mehl, **rekkɜ* Brei, Grütze, **rokka* Brei, Suppe; aus dem Wildbret des Waldes oder Wassers gekochte fette Speise, **śilä* Fett, Speck, **woje* Fett, Fettstoff.

Nourishment; dishes, preparation of food **ćuppɜ* Gefäss, Töpfchen (aus Birkenrinde), ** δ'äŋɜsɜ* eine Art Gefäss aus Birkenrinde, **keje-* kochen, gekocht, gar, reif werden, **kičɜ* Gefäss aus Birkenrinde, **kujrɜ* (ausgehöhltes) Gefäss; Trog, Boot, **kurɜ* Korb, Fass aus Rinde, **pata* Kessel, Topf, **peje-* kochen, sieden, **peńɜ* Löffel, **pišä-* braten, kochen, **sätɜ-* (aus dem Topf, Kessel) schöpfen, herausnehmen, **sokta-* umrühren, mischen.

The body: parts of the body **apte* Haar, **äŋɜ* Kinn (backen, -lade), **ćiklä* Warze, **čamče* Hautschicht, **čänčä* Rücken, **ike(-ńe)* Gaumen; Zahnfleisch, **jalka* Fuss, Bein, **jänte* Sehne, **kalma* Leiche; Grab, **kal'wɜ* Häutchen, Membran, Schuppe, **käme(ne)* die flache Hand, die hohle Hand, Handteller, **käte* Hand, **keδ'e* Haut, Fell, Leder, Schale, **kele* Zunge, Sprache, **kinče* Nagel, Klaue, **kińä* Ellenbogen, **komɜ(rɜ)* hohle Hand, **konɜ* Achselhöhle, Armhöhle, **konɜ* [+ irgendein Kasussuff.] rücklings, auf den Rücken, **kopa*

Haut, Rinde, **kul'ma* Stelle über od. neben den Augen: Augenwinkel, -hügel, -braue, Schläfe, Stirn, **kunɜ* Bauch, **kurɜ* Körper, **kuttɜ* Rücken, **läppɜ* Milz, **luwe* Knochen, **maksa* Leber, **mälke* Brust, **muŋkɜ* Körper, **mɔlɜ* Brust, **mɔrɜ* etwas erhabenes, Hervorragendes, Ausgebauchtes (irgendein Körperteil), **nere* Nase, **ńaŋkće* ?harter Gaumen, ?Kieme(n), **ńarma* Leiste, **ńarɜ* Fell od. Leder ohne Haar, **ńälmä* Zunge, **ńerkɜ* Knorpel, **ojwa* Kopf, Haupt, **omte* (Brust-, Bauch-) Höhle, **ońća-rɜ* Hauer, Hauzahn, **oŋlɜ* Kinn(backen, -lade), **paŋka* Achsel, Flügel; Schulterbein, **päŋe* Kopf, Haupt, **peδpä* Schulterblatt, **peljä* Ohr, **perɜ* Haut, Rinde, **pikkä* Magen, Bauch, Ausbauchung, **pikkɜ* Nabel, **piŋe* Zahn, **piŋse-me* Lippe, **piŋɜ* flache Hand, hohle Hand, **polwe* Knie, **poŋe* Busen, **poske* Backen, Wange, **puna* Haar, **säppä* Galle, **särɜ* Ader, Faser, Wurzel, **sene* Ader, Sehne, **sile* Schoss, Klafter, **soja* Arm; Armel, **suδ'ɜ* Finger, **šäŋe* Haar, Haarflechte; flechten, spinnen, **šäŋkɜ* der Hintere, Arsch, **šeδ'mä* Niere, **šepä* Hals, Nacken, **šiδä (-mɜ)* Herz, **šilmä* Auge, **šola* Darm, **šuwe* Mund, Maul, **täwe* Lunge, **turja* Nacken, Hinterkopf, **ukɜ* Kopf, **wamśɜ* Kruppe, Lende, Kreuz, **wenčɜ* Geschicht, **wiδɜ (-mɜ)* Knochenmark, Gehirn, **wire* Blut, **wolka* Schulter. (+ UEW II, Nachtrag **šule* Mund, Lippe.)

The body: bodily fuctions **kerɜ-* rülpsen, aufstossen, **kińe(-lɜ)* Träne, **kuńa-* die Augen schliessen, blinzeln, **kuńće* Harn; harnen, **ńolke* Speichel, Schleim, Rotz, **pućka* dünner Kot; laxieren, **pɔnɜ* Furz; furzen, **sitta* Dreck, Scheisse, Kot, Mist; seine Notdurft verrichten, scheissen, **šarɜ* Dreck, Scheisse, Kot; scheissen, **šil'ke* Speichel, Spucke; speien, spucken, **wajŋe* Seele, Atem, **wćɜ-* gähnen.

Speech, thought **ečkɜ-* loben, preisen, **jerɜ* Fluch; (ver)fluchen, schimpfen, **kačɜ-* verstehen, wissen, können, **kućɜ-* rufen, nennen, **šarna* Zauberspruch; Rede, Gespräch, **torɜ* Streit, Ringen; streiten, ringen.

Family, personal relationships **anɜ(-ppɜ)* Schwiegermutter, **aña* Frau eines älteren Verwandtes (des Bruders, des Onkels); ?Mutter, **appe* Schwiegervater, **apɜ* ältere weibliche Verwandte: Tante, ältere Schwester, **äćä* Vater, **ećä* Onkel, **ećɜ* jüngerer Bruder, jüngere Schwester, **ekä* älterer (männlicher) Verwandter: Vater des Vaters, älterer Bruder des Vaters, Onkel, **emä* Mutter, Weib, **ewkkɜ* alte Frau; Grossmutter, **ičä* Vater, **imɜ* alte Frau, Grossmutter, **irkä* Mann; Sohn; Knabe, **kaća* junger, unverheirateter Mann, **kaδ'wa* Weibchen, weiblich, **koje* Mann, Mensch, **koj(e)-mɜ* Mann, Mensch, **koska* eine ältere Verwandte: Grossmutter, Tante, ältere Schwester (?mütterlicherseites), **miŋä* Schwiegertochter, junge Frau, **naje* Frau, weib; heiraten, **natɜ* jüngere Schwester des Mannes od. der Frau, Schwägerin; jüngerer Bruder des Mannes od. der Frau, Schwager, **nejδe* Mädchen, Jungfrau, Tochter, **niŋä* Frau, Weib, Weibchen, **orpa(sɜ)* Waise, verwaist; Witwe, verwitwet, **pojka* Sohn, Knabe, **säće* Schwester (des Vaters od. der Mutter), **wärje* Schwiegersohn, Bräutigam.

Relations in space and time **ala* Raum unter etw., Unter-, das Untere, **alka* (vordéres od. hintéres) Ende, Anfang; anfangen, beginnen, **eδe* das Vordere, Raum vor etw., Vorder, **jotka* Zwischenraum, Mitte, **kitɜ* Mitte, Zwischenraum, **luwe* ?Ost(en), ?Süd(en), **miŋä* Raum hinter etwas, **mučɜ* Ende, **nu* der obere Teil, das Obere, **nuŋɜ* das Obere; Himmel; Gott, **pačkɜ* durch, hindurch; durchgehen, **pälä* halb, Hälfte; Seite, **perä* Hinterraum, Hinterteil, **pertɜ* Rand, Seite, **pučkɜ* Inneres, **pujɜ* Hinterteil, **rakka* nahe, nahe gelegen; nahen, sich nähern, **šerɜ* Reihe, Ordnung, **taka* Hinterraum, das Hintere, **tarɜ* Nähe, Umgebung, **wilä* Oberfläche, Ober-, das Obere.

Activities and processes **ama-* schöpfen, **amta-* geben, **emɜ-* sitzen, **aŋa-* lösen, öffnen, aufmachen, **arɜ-* reissen, abreissen, zerreissen, **äktɜ-* schlagen, hauen, schneiden, **älɜ-* heben, tragen, **ämɜ-rɜ-* schöpfen, **čäŋkɜ* brechen, **čärke-* brechen (intr., tr.), Schmerzen haben, weh tun, **ćolme* Knoten, Bündel; binden, **čaŋɜ* schlagen, **ićɜ-* drücken, pressen, drängen, **jaka-* teilen, scheiden, trennen, **jekkɜ* Tanz; tanzen, **jorkɜ-* drehen,

winden, wickeln, **kaja-* werfen, **kajɜ-* anrühren, tasten, **kalɜ-* übernachten, (**kanta* Last, Traglast, Bürde?; tragen), **kanɜ-* streuen, schütten, werfen; graben, **kattɜ-* dringen, (vorwärts)gehen, rücken, **kenčɜ-* suchen, **kerä-* bitten, **keśɜ-* reissen, **kijɜ-* folgen, verfolgen, **kuja* Sitte, Gewohnheit, Art, Weise, **kure-* binden, schnüren, **kurɜ-* graben, **laćke-* lassen, ent-, weg-, loslassen, **lewe-* werfen, schiessen, **likkä-* stossen, schieben, **loŋe-* werfen, wegschieben, **mänɜ-* loswerden, sich retten, **miγe-* geben, verkaufen, **nikkä-* stecken, stossen, **ńikɜ-* reissen, rupfen, **pajńa-* drücken, **pane-* legen, stellen, **panče-* aufmachen, öffnen, **peksä-* schlagen, **pelɜ-* stechen, **pentɜ-* zumachen, **pilkɜ-* (sich) baden, **pitä-* halten, **pućɜrɜ-* (aus)drücken, pressen, **puńća-* drücken, pressen, auspressen, **puske-* stechen, stossen, **pušɜ-* blasen, **puwɜ-* blasen, **pŏrkɜ-* drehen, sich drehen, (**sala-* verstecken, verhehlen, stehlen; Dieb), **surmɜ* Falte, Runzel; falten, runzeln, **śurwa-* stossen, **teke-* tun, machen, **tekɜ-* stossen, **toγe-* bringen, holen, geben, **tuna-* sich gewöhnen, lernen, **turke-* drängen, hineindrängen, dringen, stopfen, hineinstecken, **weδɜ-* töten, **wetä-* führen, leiten, ziehen, **wiγe-* nehmen, tragen.

Fire, the handling of fire **äŋɜ* Feuer; brennen, **śiδ'e* Holzkohle, (**täŋkɜ* irgendein Zündstoff; Moos, Grasart), **tule* Feuer.

Work, tools, working materials **akta-* aufhängen, -stecken, -stellen (Falle, Netze), **äjmä* (Näh)Nadel (aus Knochen od. Holz), **ćorkɜ* eine Art Schneidewerkzeug: Axt, Beil, Messer, **čeŋkɜ* Keil, **čočɜ* (abwischen); (ab)reiben, fegen, **δ'imä* Leim, **jenɜ-* schneiden, schnitzen, **jutta-* ansetzen, anstückeln, hinzunähen, verbinden, (**kanta* Last, Traglast, Bürde(?); tragen), **kanɜ-* streuen, schütten, werfen, graben, **kälɜ* Bindfaden, Strick, Schnur, **kärɜ-* binden, schnüren, fädeln, **kečɜ* Messer, **keskɜ-* schleifen, wetzen, schärfen, **kitke-* binden, **koδ'ɜ-* abhäuten, abschälen, **končɜ* Stickerei, Muster, Buntheit: Striche ziehen, stricken, zeichnen, **kora-* schinden, abschälen, **korɜ-* schaben kratzen, reiben, **kure-* binden, schnüren, **kurńa* Kerbe, Furche, **kurɜ* Messer, **läćɜ* Riemen, Seil, **muśke-* waschen, **nappɜ* Last, Bürde, Bündel, **niδe* Griff, Stiel, Schaft, **niwa-* enthaaren, **nusɜ-* (Fell) abschaben, **ńećɜ-* zupfen, reissen, **ńujɜ-* schinden, die Haut od. das Fell abziehen, **oŋɜ* Stachel, Spiess, **ora* Ahle, Pfriem, **parɜ-* schneiden, schaben, aushöhlen, **päjɜ* Ranzen, Beutel (aus Rinde), **pänɜ* Wetzstein; wetzen, **pečkä* schneiden, **piksɜ* Seil, Strick, **pitɜ-* schnüren, binden, **poδ'ɜ* Span; spalten, splittern, **puna-* spinnen, flechten, **puńa* Windung, gedreht; wickeln, winden, **pura* Bohrer, bohren, **pŏjćɜ* Axt, Beil, **rokɜ-* schneiden, teilen, **sapśe* Netznadel, Spule, Weberspule, **śäktɜ-* flechten, flicken, **śälä-* schneiden, **šurɜ-* schneiden, teilen, **täŋkɜ* irgendein Zündstoff; Moos, Grasart, **terä* Schneide, Spitze, **titkɜ-* spannen, ausspannen, **tosɜ* irgendein Behälter; Gefäss, Kiste, Kasten, **tuδ'ka* etw. Hervorragendes, Spitze, **wačɜ-* schaben, kratzen, reiben, **waśke* irgendein Metall, ?Kupfer, **watka-* entrinden (ein Baum), schälen, **wäŋćɜ* Messer; schneiden, **wole-* schnitzen, schnitzeln, schaben, hobeln, **wolnɜ* Zinn, **wol'ɜ-* (ein Baum) abschälen.

Religion, beliefs **alɜ-* Zauberworte hersagen, verzaubern, **eskɜ-* glauben, **iće* Schatten, Schattenseele, (**ilma* Himmel, Wetter; Gott, **jerɜ* Fluch; Ver(fluchen), schimpfen, **kalma* Leiche, Grab), **kolja* böser Geist, (**lewlɜ* Atem, Hauch; Seele), **musɜ* Opfergebet, Zauber; beten, zaubern, **nojta* Zauberer, Schamane; zaubern, (**nu-mɜ* das Obere, Himmel; Gott, **śarna* Zauberspruch; Rede, Gespräch), **šuŋe* Seele (von Verstorbenen), Geist.

Clothing (**äjmä* (Näh-)Nadel (aus Knochen od. Holz)), **älɜ* Schoss (des Kleides), **jäje* Gürt, Gürtel, **kićɜ* Knopf, Knoten, Band (am Kleide), **peśɜ* Fausthandschuh, (**soja* Ärmel), **śapa* ein herdartiges Kleidungsstück, **wiŋä* Gurt, Gürtel, **workɜ-* nähen.

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EARLY INDO-URALIC LINGUISTIC RELATIONSHIPS: REAL KINSHIP AND IMAGINED CONTACTS

Eugene Helimski

1. This paper is based on one simple and natural assumption: there may be many riddles but no wonders in linguistic prehistory. Therefore the problem of early relationships between Indo-European and Uralic in its various aspects should be treated within the framework of the existing, sufficiently rich experience of historical linguistics, and the explanatory scenarios of prehistoric events suggested on the base of linguistic evidence must fit the criteria of experiential plausibility. It seems necessary to put this trivial claim forward again: all too often the early prehistory of languages is viewed as a *terra incognita* with its own unknown rules (which are therefore invented by some scholars freely and with vivid imagination).

But the leading role of linguists in the study of prehistoric epochs, and even the very fact of their professional participation in such study, are justified only if the phenomenon called "human language" underwent no principal changes at least since Upper Palaeolithic / Mesolithic times, so that:

- its structural types lay within the typological limits of variation attested in the contemporary world;
- the processes of its evolution did not differ from those attested in the contemporary world.

There are many reasons for assuming the validity of these restrictive clauses. The currently available typological and diachronic documentation covers geographically and culturally totally distinct regions, including those where the internal development has never reached the Neolithic stage, like aboriginal

Australia or Amazonia.[1] The time span of c. 15,000 years (or even of c. 6000 years, if we deal only with Proto-IndoEuropean or Proto-Uralic issues) is also relatively short in comparison with even the minimal estimates of the age of Homo sapiens and of its language (c. 50,000 years). It must be stressed in this connection that the problem of language origins (rise of articulatory organs, formation of grammatical means, creation of roots...) belongs, in my opinion, to biology and anthropology rather than to linguistics, and even within this latter (cf Décsy 1977-81) it has nothing to do with the discipline called comparative and historical linguistics.

The inductive principle in prehistoric research advocated here means in practice:

(a) accepting only such claims and explanations which can be confirmed with exact analogies from the current experience of diachronic studies;
(b) disregarding any assumptions which cannot be confirmed by this experience (even if they cannot be definitely refuted)[2].

2. The experience of diachronic studies provides us with examples of only two types of language kinship.

2.1. The first and undoubtedly the most common type is *direct kinship* determined by *divergent evolution*. It is always created according to the same universal pattern, for which the development of the Romance languages serves, due to complete historical attestation of all stages, as the best illustration:

1 Not long ago it could still be claimed that e.g. the Australian languages exhibit abnormal patterns of historic development hardly accountable for by the comparative reconstruction procedure, or that they are strongly aberrant in some other respects (c.g. Boretzky 1984 or my own, perhaps too cautious, comments in Helimski 1986: 258). It becomes clear in the light of more recent research that "Australian languages change in a regular fashion, in the same way as IndoEuropean and other families" (Dixon 1990: 398).

2 This principle has naturally also other significant consequences. For example, available experience proves that good correlation between linguistic and genetic data is rather an exception than the rule, and most surely there exist no genes or gene-combinations responsible for using a certain language. Therefore even if the contemporary fashion of the co-operation between linguists and geneticists in prehistoric studies is sensible, the results obtained in each of the disciplines should be kept strictly apart. This remark (cf. also Janhunen 1998: 9) is addressed first of all to the international team of "root-finders", whose variegated and often extravagant ideas have been summarised in Künnap 1998 and who tend, on the contrary, to overestimate the relevance of genetic and even of geological and gynaecological (Künnap 1998: 59) research for the Uralic studies. In their practice the proclaimed co-operation leads too often to a failure to distinguish between the origins ("roots") of the population of Finland and the origins of the Finnish language. Cf. Napol'skikh 1990; Klima 1996; Hasselblatt 1998.

- one relatively uniform language spoken on a relatively small territory (Pre-Classical Latin of Latium, then Classical Latin of Central Italy);
- special historical premises favouring the spread of this language far beyond the original territory (geopolitical energy and partly also technological superiority of Rome, its policy of conquests which led to the creation of the Roman Empire);
- export of this language to new territories in its dialectally and sociolectally differentiated forms constituting together a linguistic continuum (Vulgar Latin = Proto-Romance in its regional variants);
- new historical situation interrupting or undermining the former socio-political and (relative) linguistic unity (fall of the Roman Empire, new states in Pax Romanica);
- independent evolution of each of regional variants (rise of French, Italian, Rumanian, etc.).

The numerous less abundantly documented linguistic histories repeat (to the extent they are known) this general scheme up to minute details. Cf. such groupings and families as Slavic (Common Slavic somewhere between Vistula and Dnieper; Slavs as allies of Avars, Avaro-Slavic conquests in South-Eastern and Central Europe; spread of Slavic idioms across the Avar Khaghanate; decline and fall of the Avar Khaghanate, Hungarian conquest, later also Catholic-Orthodox schism; rise of Polish, Bulgarian, Russian, etc.), Mongolic (Common Mongolic in Western Mongolia; Chinggis Khan; spread of Proto-Mongolic/Middle-Mongolic dialects in Central Asia; disintegration of the Mongol Empire; rise of Khalkha, Buryat, Oirot, Monguor, etc.), Permic (Common Permic at Lower Kama; migration to Upper Kama and further northward; Proto-Permic dialectal continuum in all these regions; Volga-Bulgarian conquest and penetration of Slavs to the Upper Kama; rise of Udmurt and Komi). This list of examples can be continued with those from e.g. Germanic, Indo-Aryan, Bantu, Samoyedic, Turkic, Polynesian, etc. (to quote only the most evident and better investigated cases).

Accompanying circumstances (substratum, secondary interaction after the breach of unity but before the disappearance of mutual comprehensibility, and spread of a *koiné* across the individual regions which disguises the traces of the original continuum) are no less universal, but they do not introduce any major changes into the picture of kinship. Therefore the notion of the genealogical tree (with necessary refinements) was and remains fully valid.

2.1.1. Direct kinship is in principle traceable in the daughter languages. The more distant this kinship is, the less numerous and obvious such traces are and the more they are concentrated only in the most stable fragments of the language system:

- main grammatical markers (if not swept away by reduction and typological drifts);
- pronouns;
- numerals (if the protolanguage existed after the introduction of decimal counting: in Eurasia c. 5000-6000 years ago);
- basic vocabulary.

2.1.2. The above statement concerning the numerals calls for a few special comments. The problems related with the origin of numerals, their etymological transparency, and their role in proving linguistic kinship have been reviewed in detail and persuasively discussed in Honti 1993: 25-37, and I can only echo the author's reserved and moderately pessimistic estimates of the perspectives of the etymological research in this domain[3].

However, the well-known fact that all Finno-Ugric languages have common numerals ('2'-'6', '10', '100', partly also '1' and '7'), while the common Samoyedic numerals are entirely different (with the exception of PU **kekta* '2'[4]) seems to be non-accidental. According to the prevailing (and well substantiated, both linguistically and historically) dating, PU time ended c. 6000 years ago, while PFU is about 1000 years younger. Exactly this difference in time seems to be significant: as far as I know, there are no language groups or families of the Northern and Central Eurasia aged 5000 and less which do not exhibit common numerals, and there are no families aged 6000-7000 years and more which do. It must be added that normally the common numerals of a language family or group are perfectly preserved in all daughter languages as an entire system. Later replacements affect usually only the numerals for '8'-'9', '1', '7', as well as derived and compound numerals; the situations when e.g. the words for '3' and '5' are original, while the word for '4' is innovative, are abnormal. My observations are reflected in the following table[5]:

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3 Cf. Honti 1993: 26: "Ich bin überzeugt, daß die Zahlwörter der heute gesprochenen Sprachen und der nur aus ihrer Schriftlichkeit bekannten ältesten Sprachen des Altertums nichts mehr von der Entstehung und Entwicklung dieser Kategorie verraten".

4 I reconstruct this proto-form as dishannonic.

5 There is regretfully no possibility to argue here for individual dates and estimates used in this table, but (a) they are mutually calibrated insofar as such calibration is possible, and (b) it can be hoped that most specialists on individual families would find them reasonable rather than voluntary.

Family / group of languages	Approximate age (years)	Presence of common numerals
Finno-Ugric	5000	+
Samoyedic	2000	+
Uralic	6000	– (but cf. **kekta* '2')
Mongolic, Turkic, Tungusic	between 800 and 2500	+ (in each of the groups)
Altaic	(much?) more than 6000	–
Late Indo-European	5000-6000	+
Indo-Hittite	6000-7000	± (cf. Hitt. *me(i) u-* '4')[6]
Semitic	6000	+
Chukchi-Kamchadal	(much?) less than 5000	+
Dravidian	5000	+
Elamite-Dravidian	6000 or (much?) more	– ? (at least '3' is not common)[7]
Yeniseic	2500	+
West Caucasian	relatively young	+
East Caucasian	probably older than IE	± (partly very problematic)[8]
North Caucasian	probably much older than IE	– (no reliable counterparts)[9]

6 The phonetic shapes of most IE numerals are not attested in Hittite texts and other Anatolian sources, or the etymological identifications are problematic (see Gamkrelidze & Ivanov 1984: 844-848; Mallory & Adams 1997: 397-405). At least Hitt. *têri* '3' belongs to the Late IE system of numerals, and at least *me(i)u-* '4' does not.

7 See McAlpin 1981: 118. Most Elamite numerals are not attested.

8 The *North Caucasian Etymological Dictionary* (Nikolayev & Starostin 1994) suggests the common origin of most East Caucasian numerals. In some cases, however, the comparison runs across serious and only tentatively solved problems ('4', '6'), and – in view of the fact that usually numerals are preserved as an entire system – the lack of Nakh correspondences for '2' and '3' looks very suspicious. On the other hand, the word for '20' is apparently common!

9 Nikolayev & Starostin 1994 attempted to identify the following West Caucasian numerals with their East Caucasian semantic counterparts: '1', '2', '3', '5', '6', '10', '100'. In most cases, however, this identification requires comments like 'phonetically irregular' or 'complicated case' – which, taking the predominantly monosyllabic stem structure of West Caucasian into account, signals the Procrustean character of the comparison. I would suggest abandoning the attempts to reconstruct the Proto-North-Caucasian numerals (with the exception, perhaps, of the word for '1') and assuming that the branches of North Caucasian diverged too early to have common numerals.

The dependence between the time depth and the presence of common numerals probably indicates that some major change in counting practices – perhaps the introduction of decimal counting – spread throughout Eurasia some 5000-7000 years ago and led to establishing the new, and since then very stable, systems of numerals. There are therefore little (I would perhaps dare to say: no) chances of reconstructing numerals for the protolanguages which disintegrated much earlier, like Altaic, Nostratic, or Sino-Caucasian.

This cultural innovation seems to originate, like most other innovations of the Neolithic, from the Near East and North-Eastern Africa: the common vocabulary of Semito-Hamitic, which was probably sufficiently older than Semitic, includes several numerals (preserved in Semitic, Berber, Egyptian, partly also in Chadic).

I am naturally aware of the attempts to reconstruct the Altaic numerals or to find Nostratic cognates for the Uralic ones (most recent being Blažek 1996/97; 1997; 1999). For the most part, the highly questionable etymological comparisons which result from such wishful attempts (on a line with some very interesting marginal comments)[10] confirm, in my opinion, the above statement rather than refute it. On the other hand, accepting this statement means that the criterion of having common numerals[11] simply loses any relevance when dealing with the oldest protolanguages, so that the effort can be effectively spared.

2.1.3. Due to the fact that the number of common elements in two or several languages of the same origin, as well as the external similarity of these elements, tends to diminish steadily in the course of time, their genetic kinship becomes less and less transparent[12]. This loss of transparency manifests itself directly in the spread of doubts concerning the validity of the corresponding genetic identification and in the loudness of critical voices.

The following table illustrates, with selected examples, the transparency of genetic kinship as dependent on the distance between the nodes of the genealo-

10 No more lucky was an attempt to trace the origin of numerals in Samoyedic (Joki 1975, being perhaps the least successful scholarly contribution of this outstanding etymologist).

11 This criterion is not infrequently used by the opponents of the Altaic and Nostratic theories, cf. e.g. Doerfer 1966: 100-101.

12 However, I would not side with J. Janhunen in claiming that this kinship disappears (Janhunen 1989: 29: "language change is really so rapid that genetic relationships inevitably fade away in a relatively short span of time [so that] the maximum lifespan of any language family is some 10,000 years") – just as I would not say that my distant cousin (whom I may have never met and will never recognize when meeting) is not my relative. At best, one can distinguish between the "practically important" and the "practically negligible" genetic kinship.

gical tree (= *relative* age of the common protolanguage) as well as on the choice between group comparison and binary comparison.

	less than 3000	3000-6000	6000-9000	9000-12,000
Cluster of languages	obvious even to non-specialists *Slavic; Germanic; Ob-Ugrian; Samoyedic; Bantu; Turkic; Yeniseic*	clear to specialists *IndoEuropean, Uralic; Chadic; Austronesian*	traces *Semito-Hamitic; Uralo-Yukagir; Altaic; Nostratic* with proto-language reconstructions	? *Indo-Uralic / Nostratic* without proto-language reconstructions
Two languages	clear to specialists *Greek* and *Sanskrit; Finnish* and *Lapp*	traces *English* and *Hindi; Nenets* and *Cheremis; PIE* and *PU* on the base of reliable proto-language reconstructions	? *Estonian* and *South Yukagir; Yakut* and *Manchu; Korean* and *Japanese*	??? *Hungarian* and *English* without protolanguage reconstructions

2.2. The second, much less common type of language kinship is *lateral kinship* or grafting, determined by relexification and observed in the case of *"mixed" languages*. It seems that all known cases of lateral kinship also fit a single pattern.

The sociolinguistic prerequisite of lateral kinship consists in a situation, in which the representatives of an ethnic or a social group want or need to speak the target (ancestral, titular, prestigious) language but, being adults grown up with another language, are not in a position to cope with the target grammar. Therefore they achieve their aim – partly at least – by relexifying their first language from the target language (case of Anglo-Romani[13], Ma'a or Mbugu[14]),

13 See Thomason & Kaufman 1988: 103-104: "its grammar is simply that of English".

14 See Goodman 1971; Porkhomovskij 1982: 215-216; Thomason & Kaufman 1988: 223-228. According to the last mentioned book (and to some previous studies on "the strange case of Mbugu"), the typically Bantu grammar – rather complicated, with word classes, etc. – of this language is borrowed from the Bantu surrounding. Lexical borrowings (to any extent, up to entire relexification, as in the case of secret languages) are natural processes, but I fail to see how an entire grammar can be "borrowed". Obviously the relexification of a Bantu language with a Cushitic lexicon can be the sole explana-

possibly adding also some simpler grammatical elements from this language (case of Copper Island Aleut)[15], or by superimposing the lexical stock of the target language on an appropriate and very simple grammatical framework partly resembling that of their first language (case of most pidgins and creoles, see Holm 1989). A linguist should not necessarily evaluate the results of such creative attempts in the same way as the speakers of the corresponding idiom. They naturally tend to view their aim as achieved and to identify their idiom with its target idiom, but there are usually more reasons to treat it on a line with "secret languages" and argots, which also normally preserve the grammatical structure of the starting language intact.

In any case, these processes:

(a) produce only new languages in which grammar and vocabulary are of different origin;
(b) produce in each case one "mixed" (relexified) language rather than a new family;
(c) are due to abnormal and therefore rare sociolinguistic situations;
(d) rarely become independent of these situations and are therefore mostly shortlived.

The recent studies devoted to the above problem do not contain any essential data which do not fit the above pattern – even if they abound in assumptions and guesses aimed at questioning its universal validity. If we leave aside the trivial statements ("all languages are mixed") or clumsy attempts to qualify such loanword-saturated languages as Yiddish or Hungarian as mixed (rather than as belonging to the Germanic, respectively to the Ugric group), the category of mixed languages appears to be in most parts of the world very small and relatively homogenous as far as the sociolinguistic and structural mechanisms of their rise are concerned. It can be added that the data from the technologically backward linguistic areas (like Australia) do not appear to suggest that the phenomenon of lateral kinship was in the early prehistoric past more widespread than in the contemporary world.

tion of this strange case. The data on the social background of Ma'a ("resisters of total cultural assimilation to their Bantu-speaking milieu", who sought isolation "so that they could continue to follow their own customs") confirm the assumption that their language arose as an answer of assimilated Ma'a (who already shifted to Bantu) to the demand to restore their non-Bantu linguistic and cultural identity.

15 See Asinovskij, Golovko & Vakhtin 1983; Thomason & Kaufman 1988: 233-238; Golovko & Vakhtin 1990; Vakhtin 1998.

2.2.1. A mixed language that survives may constitute a problem for genetic linguistics insofar as its lateral kinship with the target language can be mistaken for a direct kinship with it (especially if a study is mostly confined to the vocabulary: that is why some of my colleagues, like Sergei Starostin, insist on the genetic identification of mixed languages with their targets).

2.3. The much-discussed notion of "contact kinship", or "areal affinity"[16], is, from the viewpoint of inductive experience, a mere phantom. Even in the case of the most intensive areal interactions (Romano-Germania, the Balkans, Volga-Kama, Upper Yenisei, India, the Sino-Thai region, aboriginal Australia) the convergency processes result only in far-reaching typological similarities and in abundant borrowings in non-basic vocabulary. A *Sprachbund* producing an effect similar to those detennined by direct or even by lateral kinship (serial cognates among inflectional and main derivational morphemes, including pronouns and other grammatical words; similarities in the domain of irregular and suppletive forms; unity of basic vocabulary or traces of such unity) has never been attested.

The lengthy reflections on how non-cognate languages could have been transformed into a language family due to prolonged and intensive contacts are a poor substitute for examples that are lacking.

Absence of examples does not prove that "contact kinship" due to areal convergencies is impossible. But the above formulated inductive principle of research into linguistic prehistory permits us to dismiss this notion as purely speculative.

2.3.1. Attempts to view the relationships between languages through the prism of convergent rather then divergent patterns have a long history – from Hugo Schuchardt via Giuliano Bonfante and especially Nikolay Trubetzkoy (1939) to contemporary Anti-Altaicists and "rebel" Uralists ("root-finders"). Still, the above-mentioned predecessors overtly rejected the classical comparative and historical linguistic methodology of the Junggrammatiker.[17] I would suggest their contemporary spiritual heirs do the same. A borderline or even a schism be-

16 Other designations or similar concepts: language diffusion, allogenetic relationship, (Hung.) *rokonságszerű kapcsolat*, protolanguage as *lingua franca*, etc. (see Helimski 1986: 253-260).

17 A consequent adherent of "language convergencies" must inevitably finish with stating that e.g. French and Spanish existed as such on corresponding territories from times immemorial, and acquired their present Romance shape due to mutual convergency under the aegis of Rome.

tween different schools of linguistic thinking is preferable to a misleading pseudo-unity.

3. The admission of *direct kinship between PIE and PU* (K. B. Wiklund, B. Collinder, V. M. Illich-Svitych) is the logical consequence of the inductive principle. The comparison of PIE and PU provides us with a picture which corresponds most exactly to the theoretical expectations: the scanty and well known stock of cognates (see Collinder 1965; Illich-Svitych 1971-84, I: 6-37) is found mainly among the most stable elements of both protolanguages.

3.1. An excellent opportunity to demonstrate the direct relationship between the stability of words (stems) and their occurrence in the common vocabulary of several Eurasian language families is provided by the paper presented at this symposium by Kaisa Häkkinen. Evaluating the distributional certainty of Uralic etymologies as they are reflected in contemporary etymological dictionaries, she singled out a group of 18 items "with 100% etymological certainty", meaning that their counterparts can be traced throughout the Uralic family, and another group of 23 items "with 90% certain etymology", meaning that their counterparts are missing or dubious in only one of 10 relevant languages or branches (Häkkinen, this volume).

The criteria of selection are purely fonnal (so that some of the most popular and absolutely certain Uralic etymologies, like those for Fi. *kala* 'fish' or *vesi* 'water', remain outside the list only because of the loss of corresponding words in Permian, Saami or Ostyak), but the results are by no means accidental: belonging to the first group means that an item was capable of being preserved in the course of c. 37,000 years[18], and belonging to the second group means withstanding potential replacements in the course of c. 33,000 years. It is natural to expect that the items which proved their stability in "Post-Uralic" times possessed this quality also earlier, in the "Pre-Uralic" period.

It appears that among the 18 items of the first group 12 have IE and other Nostratic parallels according to Illich-Svitych 1971-84 (in 9 cases in IE[19], in 3

18 This approximate figure reflects the sum of lengths (in years) of all branches of the family tree connecting the nodes for the 10 relevant Uralic languages/groups.

19 The Uralic proto-forms of Fi. *ala-* 'under' (IE **Hel* 'deep', Alt. **ala* 'under', Yuk. *al*), *ku(ka)* 'who' (IE **kᵘo*, Alt. **qa-/*qo-*, Yuk. *xadi*, etc.), *me* 'we' (IE **me-s*, Alt. **bä/*män-*, Yuk. *mit*, etc.), *mi(kä)* 'which' (IE **mo-*, Turk. **mi-*, etc.), *minä* 'I' (IE **me/*mene-*, Alt. **bi/*min-*, Yuk. *met*, etc.), *nimi* 'name' (IE **nem-*, **nōm-n-*, Yuk. *niu*), *punoa* 'to weave' (IE **spen-*, Drav. **puɳa-*, etc.), *suoni* 'sinew' (IE **sneH(u)-*, etc.), *tuo* 'that' (IE **to-*, Yuk. *tuŋ*, etc.)

cases only in non-IE Nostratic[20]; in 10 cases these parallels are accepted and mentioned also in the UEW[21]), and 2 more are supplied with indications of non-Uralic parallels in UEW[22].

The second group includes, among 23 items, 6 numerals, none of which (with the exception of *kaksi* '2'[23]) has Samoyedic counterparts and none of which has Nostratic parallels (this confirms that the subgroup of numerals appeared and acquired absolute stability only in Finno-Ugric times, cf. above, 2.1.2). The situation with the remaining 17 items resembles that of the first group, though the figures are a bit lower: 8 Nostratic parallels (6 also in IE[24], 2 only in non-IE Nostratic[25]) plus 5 indications of external parallels (which mostly cannot be viewed as Nostratic cognates) in the UEW.

The extraordinary high concentration of words with evident (and semantically exact) external parallels in the most stable strata of the Uralic vocabulary[26] fully corresponds to the theoretical expectations outlined in 2.1.1.

Needless to say, treating the above items as "borrowings" (from IE or Altaic into Uralic, or vice versa, or from Uralic into Yukagir, etc.; see also below, 4.1) creates an absolutely improbable picture of a language which borrows all crucial and most stable elements of its lexical (and morphological) structure from a foreign source.

> Borrowing on such a scale is practically equivalent to borrowing the entire structure of the language, to switching to another language, and this leads us again to admitting the genetic relationship of the protolanguages in question (Illich-Svitych 1971-84, I: 5).

20 *kadota* 'to disappear' (Alt. **qala-*, etc.), *sydän* 'heart' (? Alt.), *uida* 'to swim' (Tung. **uju-*).

21 Exceptions: *mi(kä)* and *sydän*.

22 *maksa* 'liver', *nuoli* 'arrow' (but the Alt. parallels are very problematic and can hardly be viewed as pieces of Nostratic evidence).

23 This word must actually belong to the first group. The reason for lowering its certainty are the two question marks put by K. Rédei in the UEW before the Samoyedic counterparts of *kaksi*. However, none of the statements which substantiate his doubts (UEW, p. 139: "Die Zugehörigkeit der sam. Wörter ist unsicher, weil ihr anlautender Konsonant sowohl einem **k* als auch einem **ć* entsprechen kann. Die Vertretung der ursprünglichen inlautenden Konsonantenverbindung ist unregelmäßig") can be accepted.

24 *kuolla* 'to die' (? IE **g'e(H)l-*, Drav. **kol-* 'to kill', Kartv. **q̇wil-* id.), *kyynär* 'elbow' (IE **ĝenu/ĝneu* 'knee', etc.), *käsi* 'hand' (IE **ĝhes-*, Drav. **kac-*, etc.; cf. Helimski 1990a), *mennä* 'to go' (? IE **men-* 'to step upon'), *pelätä* 'to fear' (IE **pelH-*, Alt. **pēlɨ-*, etc.), *tämä* 'this' (IE *te-*, Alt. **tä-*, Yuk. *tiŋ*, etc.).

25 *e-* negative verb (Alt. **e-*, etc.), *veri* 'blood' (? SH **br-*).

26 On the whole, the share of PU and PFU stems with external parallels (in Illich-Svitych 1971-84 and UEW) hardly exceeds 10-15%, and very often they are extremely problematic, especially in comparison with the majority of cases from the preceding footnotes.

3.2. A lateral kinship between PIE and PU is hardly imaginable, since:

(a) the similarities are found both in grammar and in vocabulary;

(b) nothing in the linguistic structures of PIE or PU implies their "mixed" past;

(c) the scenario of lateral kinship is statistically rare. (However, I would not completely exclude a version of this scenario in the case of Uralic-Yukagir kinship.)

3.3. Postulating the Indo-Uralic (and wider) genetic kinship is referred to here as the Nostratic theory. I feel obliged to remark, however, that accepting this theory is not the same as accepting uncritically the entire etymological material contained in Illich-Svitych's works and especially in recent Nostratic research[27] (many critics of Nostratism – cf. Doerfer 1973; 1993; Reinhart 1988 – prefer to disregard this distinction). The core of the problem lies in the contradiction between the subjective wish to find new proofs of the prehistoric kinship and the objective scarcity of comparable data (see 2.1.1).

4. The reasons for rejecting some alternative treatments of the set of PIE-PU cognates are provided by the same inductive principle.

4.1. The similarity between some lexical items in PIE and PU is so obvious that this material cannot be simply discarded by the opponents or doubters of the genetic kinship. The idea of borrowing from PIE into PU therefore suggests itself.

K. Rédei, who advocates this approach, restricts the lexical evidence to a group of 7 words which he treats as PIE loans in PU. The PU words in question are (the reconstructed forms and meanings are quoted after Rédei): **miγe-* 'geben; verkaufen', **muśke-* (**mośke*) 'waschen', **nime* 'Name', **sęne* (**sōne*) 'Ader; Sehne', **toγe-* 'bringen, holen, geben', **waśke* 'irgendein Metall, Kupfer', **wete* 'Wasser' (Rédei 1986: 40-43). J. Koivulehto, who essentially shares this viewpoint[28], adds the following PU items to this list: **pele-* 'fürchten, sich

27 I suspect that many "long-ranger" studies will not withstand the procedure of imitative absurd etymologizing as suggested and applied in Helimski 1987 and 1989.

28 He adds, however, a criterion according to which close phonetic similarity and/or regular phonetic correspondences between PIE and PU forms serve as evidence of borrowing. This criterion is not fulfilled by "Gleichungen, bei denen (bisher) keine genaue lautliche Übereinstimmung erreicht werden konnte; unter diesen letzgenannten Fällen könnten sich theoretisch urverwandte, indo-uralische Wörter finden" (Koivulehto 1994: 137). The list of these provisionally unexplained and therefore provisionally related words includes PU **nime* 'name' (the laryngealistic reconstruction of IE **h₁neh₃men-* does not fit the

fürchten', **puna-* 'spinnen, flechten', **pura* 'Bohrer; bohren' (Koivulehto 1994: 137-139; this volume, nos. 1, 2 and 7).

The semantic spectrum of presumed loanwords is in itself the strongest, most scathing argument against the version of borrowing.

The inductive basis of studying loanwords is rich and uniform: in all situations of language contact, the words to be borrowed first and foremost are "useful borrowings" – technical and other cultural terms as well as the terminology of local natural milieu. If the contacts are long and especially intensive, the penetration of some elements of the basic vocabulary – of "useless borrowings", because they serve only as replacements for the words which already existed – can be observed and expected; but these always remain quantitatively overshadowed by the "useful" ones. No known cases of "bilingualism in adjoining regions" or "motivation through the economic and cultural prestige" (Rédei 1986: 21) produce a different effect.

Here we are faced, on the contrary, with a list including four verbs with the most basic semantics – "give" (the meaning "sell" in Uralic is obviously derived, see UEW, p. 275), "bring", "wash", "fear", with three nouns of a no less basic nature – "sinew", "name" (in no human language can the idea of naming be a cultural innovation, contrary to Rédei 1986: 41), "water", and two notions which ceased to be technical novelties long before the PIE and PU epoch – "spin" and "drill". No "useful" borrowings, which abound e.g. in the well-known lists of Indo-European (Pre- and Early Aryan) loanwords in Finno-Ugric and Finno-Permic (Rédei 1986: 43-64), are present in the list.[29]

Therefore, in accordance with the inductive principle, this list (in its present form, at least) can be safely discarded from consideration as evidence of language contacts between PIE and PU. The parallels in question can testify either to a genetic relationship or (if the adversaries of the Nostratic theory prefer this) to erroneous etymologizing.

4.2. Other attempts to prove such contacts deal with more or less the same lexical set, occasionally enlarging it by adding e.g. personal, demonstrative, and interrogative pronouns (the corresponding items are partly presented in the footnotes to 3.1). K. Rédei, on the other hand, excluded this material from con-

author's ideas of IE laryngeals as being reflected and preserved in Uralic as **k* or **š*), see Koivulehto 1994: 140.

29 The only potential *Kulturwort* of the set, "metal", must have originally denoted "ore (as a special type of stone)" and have belonged to the same group of the basic vocabulary as "stone", "sand", "pebble", "clay", etc. On the other hand, this parallel can be viewed only in the context of contacts between Samoyedic (or some other later branch of Uralic) and Tocharian, and not as a piece of earliest Indo-Uralic evidence (Szemerényi 1988: 172).

sideration entirely, since for him "die lautliche Ähnlichkeit der uralischen und indogermanischen Pronomina beruht aller Wahrscheinlichkeit nach auf Lautsymbolismus" (Rédei 1986: 19). This view is expressed also by G. Doerfer (1973: 84; 1993: 25). The morphological parallels between PIE and PU (e.g. *-*n* of the genitive and *-*m* of the accusative) receive a similar treatment.

The idea that pronouns are of phonosymbolic origin ("theory of elementary kinship") belongs obviously to the domain of glottogony. Even in this case, however, it does not explain the fact that the "primary elements" *m* (Sg1), *t* (Sg2), *k* (interrogation), *t* (deixis) systematically occur in these functions only in the languages for which the Nostratic kinship is postulated, while in other languages they fulfil these functions no more frequently than other consonants. On several occasions I asked the adherents of this idea, whether the fact that in so many branches of Nostratic the elements *m* (1Sg) and *t* (2Sg) are followed by *n*, especially in oblique pronominal forms, should also have a phonosymbolic meaning – but never managed to get an intelligible answer. There is therefore every reason to insist that the theory of elementary kinship as an explanatory model finds no support in the experience of diachronic studies.

4.3. According to the most likely localisation of the proto-homelands, PIE before its disintegration was spoken somewhere to the north of the Black Sea (and/or of the Caspian Sea), while the PU habitat was restricted to western Siberia and the north-eastern corner of Europe, which leaves no possibility for any direct contacts between the speakers of the two idioms (they were only two widely-spaced areas on the variegated linguistic map of the eighth-seventh millennium B.P., in no way suggesting the future spread and glory of their descendants)[30]. The search for PIE loanwords in PU, or vice versa, is probably deemed to be continued, but I would qualify this occupation as lacking in perspective.

5. Somewhat similar considerations (stemming from the same inductive principle) also argue for the rejection of the majority of the etymologies suggested by J. Koivulehto and his followers (together with the newly rewritten pages in the history of Indo-Uralic, Germanic-Fennic, etc. contacts).

In Helimski 1995 (cf. also 1990b: 29-33; 1997) I have attempted to summarise those features that distinguish these newly coined etymologies from more traditional results in the study of IE loanwords.

[30] Very different views on the ethnic and linguistic prehistory of western Eurasia are being developed e.g. in Pusztay 1995; Sammallahti 1995; Julku 1996; 1998; Carpelan 1998, as well as in some papers of the present symposium.

Lexical scope: the loan etymologies of verbs and adjectives occur almost as frequently as the etymologies of nouns; the designations of qualities and properties, abstract notions and valuations are numerically superior; in too many cases the loan etymologies are proposed for the names of universally known objects and elementary actions.

Semantics: the meanings of the FU words and their presumed IE sources often differ, so that intermediate semantic shifts which are not attested must be postulated (the rich experience of IE linguistics makes the demonstration of the possibility, in principle, of such shifts a too-easy task).

Stem structure: quite often the presumed sources differ from the words which are actually attested in the IE languages in the presence or absence of a suffix, in their *Ablautstufen*, etc. (here, too, the rich potential of studies on IE stem-formation is exploited).

Phonetics: in addition to long-established rules the author makes use of new ones, which, however, can be illustrated only with other etymologies belonging to the same author.

Each of these features is suspicious in itself; their combination deprives the corpus of etymologies obtained with such methods of any cognitive value (which certainly does not exclude the acceptability of some – relatively few – new etymological findings).

More recent publications by J. Koivulehto (e.g. 1994; 1997; this volume) demonstrate once again his brilliant inventiveness in coining etymologies and his highest technique in dealing with IE materials, but give no reason to change this position. The following example of his newer etymological findings can be quoted:

> FM **veneš* 'boat' (> Finn. *vene(h)* 'boat', Lapp. Mord. id.)
> ← IE/Pre-Aryan/Early Indo-Aryan **wen-(e/o-)* > Olnd. *vā́n-* (root noun) 'wood', *vā́na-* (n.) 'wood, tree; timber; wooden vessel'. – **veneš* was an "Einbaum": a dug-out stem used as a canoe/boat/vessel (quoted after the first version of J. Koivulehto's symposium paper, no. 43; cf. this volume, no. 47).

The reflections on the circumstances under which this borrowing could have occurred inspired me to compose the following sketch:

5.1. A Pre-Finno-Mordvinian comes to a neighbouring Proto-Indo-European village and looks around in bewilderment.

– What are you looking for here? – someone asks him (a Pre-Aryan, as it turns out later – though there are also many Pre-Greeks, Pre-Slavs, Pre-Balts and especially Pre-Germans dwelling in the same village).

– Oh, I'd like to borrow a word for boat... – the guest answers.
– What are you speaking about? Do you want to borrow one of our boats?
– Why should I? We have plenty of boats ourselves. In fact, we are a long way ahead of you in boat-making! How else could we become skilled fishermen? I only need your *word* for boat!
– Don't you have your own word for it?
– Surely we do! But you know, nowadays it's all the rage – to use Indo-European loans!
– Well, – the pre-Aryan scrunches up his brow. – Naturally we do have a name for boat. It is **nāus* – everybody, except these stupid and stubborn Pre-Slavs and Pre-Balts, knows and uses it! But I just cannot lend this word to you! I need it for myself, and for my Old Indic offspring, who will call boats *nāu*, and for my Ossetic descendants, so that they could call them *naw*! No, you won't get this precious lexical item!
– What shall I do then? I cannot come back empty-handed. Maybe you will find for me something less valuable or little needed, if you have such a thing? And you must have, Pokorny tells us that your language is so rich in stems!
– He is right, we do have some other boat-names, **aldhu-*, **(s)kolmos*, and **ploŭos*, for example. But lending them is out of question, forget it! We Indo-Europeans need these items for ourselves, if we are going to have our languages spread over all continents!
– Have pity, give me something, at least! – moans the poor creature.
– I've had enough of your begging! Here, take the word **wen-(e/o-)* – this is the only one I can give you! At present nobody really uses it here – this word will emerge only in Sanskrit as *vána-* and in Avestan as *vanā-*, without any Indo-European etymology and without any trace of the vowel *e*. So nobody will now notice it is missing. But I must warn you, this word does not really denote a boat! It is a word for tree, or for wood, or for timber. At best you can refer to a chunk of wood or a wooden vessel, like a bucket or a trough, with this name...
– No matter, our boats are after all no less wooden then troughs! You know, sometimes we just use dug-out stems as canoe boats! That will suit me! Thank you very much indeed, now I can head home with this wonderful new loan!
– Hey, wait a moment! You cannot borrow **wen-(e/o-)* just so as it is. What if one of our guys hears and recognises it? He'll take it back, and I'll get into trouble for squandering words! You must disguise the loan. Look, you

may add some unusual non-Indo-European suffix to it. For example, *-š* – this will be a proper disguise.

– What a wise idea! I will do so. Many thanks again, it was so kind of you!

And the happy Pre-Finno-Mordvinian leaves the village whispering: "**Veneš, *veneš*! How sweet these Indo-European words are!"

5.2. I do not think that the etymological proposal by J. Koivulehto is much more realistic than the above dialogue.

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INDO-URALIC AND URAL-ALTAIC: ON THE DIACHRONIC IMPLICATIONS OF AREAL TYPOLOGY

Juha Janhunen

It is well known that the Uralic and Indo-European language families represent two different typological complexes, which in the early history of linguistic taxonomy were labelled "flective" and "agglutinative", respectively. Although a typological generalization at the level of language families is always liable to be superficial, the fact remains that, especially when we consider the two protolanguages, Uralic and Indo-European are in many respects fundamentally different. Since both the postulation of an Indo-Uralic genetic relationship and the assumption of very early protolanguage-level borrowings between Indo-European and Uralic presuppose an intimate areal adjacency, the typological discrepancy of the two protolanguages is rather surprising.

On the other hand, it is well known that Uralic shows systematic similarities with the languages conventionally termed Altaic. Although these similarities are still occasionally explained in the framework of a Ural-Altaic genetic relationship, it is increasingly widely recognized that Altaic itself is an example of an areal conglomeration of genetically diverse languages. Against this background, it would be natural to place the earliest phases of Uralic somewhere in the immediate neighbourhood of the area where the Altaic language type evolved. At the same time, the original location of Uralic would seem to have been rather far away from the areal complex to which Indo-European belongs.

The present paper surveys the implications which the typological differences and similarities among the languages of Northern and Central Eurasia have, or should have, for the attempts aiming at locating the prehistorical homelands of Uralic and Indo-European, as well as, in the typological sense, Altaic.

To put the problem very simply: there is a fundamental contradiction between the Indo-Uralic and Ural-Altaic frameworks. To deal with this contradiction, we have to revise or refine the geographical and chronological assumptions made about the Uralic and Indo-European protolanguages and their speakers.

1. THE INDO-URALIC TYPOLOGICAL DISCREPANCY

The typological discrepancy between Uralic and Indo-European is generally recognized and will not need much elaboration here. It is, nevertheless, useful to review (here mainly following Comrie 1998) some of the actual differences that separate the early forms of the two language families from each other. These differences cover almost every aspect of linguistic structure. However, they are perhaps most obvious in *phonology*, for it would be hard to imagine two phonologically more different languages than Proto-Uralic and Proto-Indo-European. Most of the phonological features common to both protolanguages are negative trivialities, such as the absence of clicks or tones, while the actual positive features are for the most part diametrically opposite.

So, Proto-Indo-European is reconstructed as a language with few distinct vowel qualities (the estimates vary from 1 to 5 depending on the type and depth of analysis) and many consonants (close to 30, with the actual number varying depending on the interpretation of some crucial details). The same basic vowel paradigm is valid for any syllable within the word. There is, however, a system of paradigmatic vowel alternations (Ablaut). There is also a free and morphologically mobile accent. Among the consonants, there is an intricate system of stops, differentiated according to five distinct places of articulation and three or four series based on the parameters of voice and aspiration. At least at the level of internal reconstruction – that is, Pre-Proto-Indo-European – there are also perhaps as many as three "laryngeals" (uvular to pharyngeal to glottal stops or spirants). The consonant phonotactics is complicated, and allows clusters of up to three segments (CCC) in different positions of the word.

In contrast to this, Proto-Uralic seems to have been a language with many distinct vowel qualities (normally put at 8) and rather few consonants (probably no more than 17). The occurrence of the vowels within the word is regulated by positional neutralizations, including a progressive vowel harmony, which allows only two distinct qualities (low vs. high, or perhaps full vs. reduced) to be distinguished in non-initial syllables. There is no distinctive accent, though there seems to be a regular non-distinctive patterning of words into disyllabic rhythmic entities with initial stress. Consonant clusters are not allowed either initially

or finally, and even medially they are confined to sequences of two segments (CC) only. In the consonant system, only four places of articulation are distinguished, and there are no distinctions based directly on voice or aspiration. There is only one consonant that may be classified as a "laryngeal" (*x, perhaps it was nevertheless some kind of velar fricative or glide).

As far as *morphology* is concerned, there are some very general features which unite Uralic and Indo-European. These include the predominance of suffixal morphology and a certain parallelism between the morphosyntactic categories (such as the dual number, and verbal personal conjugation). It seems also that both language families basically belong to a mixed head-marking/dependent-marking type of alignment (in the sense of Nichols 1992). The differences are, however, many more and, as it seems, more fundamental. The canonic lexical morpheme in Indo-European is typically composed of a single syllable and functions in the lexicon as a verbal root, from which derivatives are formed by affixation and flexion (including Ablaut). Although the principle of radical etymology dominating comparative Indo-European studies can be criticized on methodological grounds, the processes of Indo-European morphology (including derivation) are complex and exhibit many types of phenomena (including prefixation, infixation, and reduplication). Even the suffixes are often fusional and multifunctional. Among the morphological categories there is a system of grammatical gender, though it is generally explained to represent a secondary innovation.

The typical Uralic lexical morpheme, on the other hand, is a disyllabic noun or verb, or, in rather many cases, a nounverb (nomen-verbum), from which grammatical forms and derivatives are obtained through the process of mechanical suffixation (no prefixation or infixation). The suffixes are typically unifunctional, and many actual words therefore contain accumulations of several consecutive suffixes. With the exception of a possible stem-final process of non-low vowel elision (in the so-called consonant stems), there is little evidence of productive morphophonology. Also, there is no grammatical gender, but there is a system of personal possession, which, when applied to verbal conjugation, allows a distinction to be made between a definite (topical) and an indefinite object (the so-called objective conjugation). It is true, by internal reconstruction, the personal affixes can be shown to be secondary, suggesting that they were not present in some earlier phase of Pre-Proto-Uralic.

Compared with both phonology and morphology, *syntax* involves many general problems of reconstruction, which make it difficult to establish how different, or how similar, the Uralic and Indo-European protolanguages may have

been in this respect. For instance, the information that can be obtained from the patterns of clause structure and word order remains inconclusive. It is possible that both Uralic and Indo-European originally have the SOV (subject-object-verb) type of clause structure, but in Indo-European the type SVO is also widespread and apparently ancient. Similarly, the regular Uralic nominal phrase has the structure GAN (genitive-adjective-noun), while for Indo-European both GAN and NAG have been reconstructed. Both language families show agreement for number and person between subject and predicate, but Indo-European, unlike Uralic, also shows agreement for number and case between an adjectival attribute and its nominal headword. Also, both language families are of the nominative-accusative type, though there are indications on the Indo-European side (such as the morphological marking of the nominative case) that the original type may have been ergative-absolutive (or active-inactive).

It may be concluded that the syntactic similarities between Uralic and Indo-European may well be secondary. Indo-European seems originally to have been more different from Uralic than it was at the level of the actual protolanguages. In any case, the extant similarities are vague, and their typological weight is small against the considerable and unambiguous differences that can be established in the realms of phonology and morphology. Altogether, it seems that the differences between Uralic and Indo-European are more primary than the similarities, and some of the apparent similarities are likely to be due to secondary areal interference between the two language families. The diachronic trends have, however, been complex and often contradictory, so that convergence and divergence can both be observed in the typological data.

One specific region where the Indo-European languages have continued to develop on lines very different from Uralic is Western Europe. Even the original Indo-European typological patterns have undergone great changes here. In many European languages of Indo-European affiliation there is clearly a trend of evolution towards morphological isolation, including the loss of inflexion and the increased use of adpositions, as in Germanic and especially English. On the Uralic side, on the other hand, especially in the central parts of the geographical range of the language family, there is a tendency of maximizing the agglutinative principle, as in Permic and Hungarian. Due to this *divergence*, we might say that modern Hungarian and modern English are typologically even more different than the Uralic and Indo-European protolanguages were.

The most typical areas of typological *convergence* between Uralic and Indo-European are the Baltic region and European Russia. Some Uralic branches and languages in the west, notably Saami (Korhonen 1969), Estonian and Livonian,

have developed a highly fusional system of inflexion, well comparable with that of Proto-Indo-European. Also syntactically and morphosyntactically, Finnic and Saami have become very similar to the typological complex of Indo-European. At the same time, some Indo-European languages in the north, notably Lettish and Russian, have adopted syntactic and morphosyntactic features reminiscent of the Uralic languages. These developments suggest an intricate system of areal influences. In terms of a simple scheme, we might say that Lettish and Russian have a Uralic (mainly Finnic) substrate, while Finnic and Saami have a European (though perhaps not only Indo-European) substrate. It goes without saying that the actual picture is more complicated.

To summarize the typological relationships of Uralic and Indo-European we may note, first, that at the earliest reconstructable level of *pre-proto-languages* the two genetic units were typologically almost as different as they could possibly be. This discrepancy was still more or less unaltered at the level of the *protolanguages,* reconstructable from the comparative evidence within each family, and it has only continued to grow in some geographical areas. In the most active contact zone, however, some languages of the two families have become more similar, with typological traits infiltrating in both directions.

2. THE URAL-ALTAIC TYPOLOGICAL PARALLELISM

Due to the tradition of the UralAltaic genetic comparisons, still persistently carried out especially in the Nostratic framework, the typological parallelism between Uralic and the so-called Altaic languages is even more widely known than the lack of parallels between Uralic and Indo-European. In fact, in the almost total absence of good material points of comparison, such as lexical items, much of the Ural-Altaic comparative tradition is based on typology. There seems to be a consensus that the Ural-Altaic parallels have diachronic implications (cf. e.g. Róna-Tas 1983; Sinor 1988), but what these implications are is open to different interpretations. In spite of the triviality of the topic, we should therefore take a brief look at the actual features involved.

Especially when viewing the Altaic phenomenon from the Uralic side, we may say that there are two categories of Altaic languages. To the first category belong the three language families conventionally included in the classical, or minimal, version of the Altaic Hypothesis (Micro-Altaic): Turkic, Mongolic and Tungusic. In the second category we find the two language families of Koreanic and Japanic, which are identified as Altaic only in the framework of the extended, or maximal, version of the Altaic Hypothesis (Macro-Altaic). In spite of

this gradation, all the language families concerned are typologically very similar to Uralic at all levels of linguistic structure.

Thus, all the basic features of the Uralic *phonology*, such as a simple consonant paradigm and a complex vowel paradigm, with vowel harmony regulating the combinations of vowels, are also peculiar to the Altaic languages. Most of the observed deviations from this typological pattern can be explained as secondary, as is the case with, for instance, the relatively complicated consonant paradigm and phonotactics of Korean. From the diachronic point of view the most aberrant language of the Altaic type is Japanese (Japanic), which lacks some of the regular Ural-Altaic features, including vowel harmony. Japanese also shows a monosyllabic root structure otherwise atypical of Altaic (Janhunen 1997), though this monosyllabism could also be secondary, as it is in some Uralic languages (Permic, Hungarian). Another feature of Japanese is its relatively original system of tonal distinctions. Tones (pitch accent) are also present in Korean, but there they are secondary (Ramsey 1991) and may well be due to Japanese (Japanic) influence. All of this points to a certain west-to-east transition within the entire Ural-Altaic typological complex.

A similar west-to-east transition has also been noted in the realm of *morphology*, in that the bond between stem and suffix tends to be stronger in the western parts of the Ural-Altaic belt than in the east (Austerlitz 1970). Nominal case suffixes, for instance, are represented by more or less independent postpositions in the easternmost Altaic languages, especially in Korean and Japanese, but also in Manchu and Mongolic. Nevertheless, the system of the morphological categories expressed by suffixes or postpositions is very much the same throughout Ural-Altaic. To mention some more specific points, the presence of a regularly conjugated negative verb is shared by two or three Ural-Altaic families (Uralic, Tungusic, and perhaps Mongolic), while the presence of a negative noun is even more common (lacking only in Finno-Ugric). The phenomenon of a suffixally formed negative conjugation is likewise widespread, though invariably secondary. A certain internal division is connected with the status of adjectives, which in Uralic and the western families of Altaic (Turkic, Mongolic, Tungusic) are mainly nominal, while in the eastern families of Altaic (Korean, Japanese) they are verbal, a feature occasionally also encountered in Uralic (Samoyedic and Proto-Uralic).

On the *syntactic* side, the Ural-Altaic parallels are particularly obvious (Fokos-Fuchs 1962), though they are best explained in an areal framework without any implication of a genetic relationship (Bisang 1998). The Altaic languages share the Uralic clause structure SOV, as well as the nominal phrase

structure GAN. The use of the nominal (infinitive and participial) and adverbial (gerundial or converbial) forms of the verb follows uniform patterns throughout the Ural-Altaic belt. Unfortunately, it is often difficult to establish how original the Ural-Altaic syntax of a given language is, for the syntactic features concerned can have been reinforced by secondary areal contacts (especially with Turkic, as between Chuvash and Mari in the Volga region). On the other hand, clear deviations from the Ural-Altaic patterns (as in Finnic and Saami) are due to the areal influence of other typologies. This is probably true even of those occasional non-Ural-Altaic features whose alien source cannot immediately be identified (as in the case of the Khanty ergative system).

3. URALIC IN THE EURASIAN CONTEXT

The typological facts reviewed above clearly suggest that Uralic belongs to the areal context of Altaic, or Ural-Altaic. Nothing in the original Uralic typology points to a particularly close connection with Indo-European. On the other hand, parallels for many features of the Indo-European typology can be found in the Caucasian language families, as well as Semitic. Although typological parallelism does not automatically imply geographical adjacency, the absence of typological parallels between Uralic and Indo-European rules out the possibility of any close areal interaction between the early stages of the two language families. Clearly, Proto-Uralic and Proto-Indo-European belonged to two very different and geographically separate linguistic areas.

The typological parallels (not elaborated here) which exist between Indo-European, Semitic, and the Caucasian languages, suggest that the linguistic area to which Proto-Indo-European belonged was located in the Near East (West Asia), more exactly, in the region comprising Anatolia, Mesopotamia, and the Caucasus. This location is supported by lexical parallels, among which there are at least some items borrowed from Semitic and Caucasian into Pre-Proto-Indo-European (Dolgopolsky 1988; Klimov 1991). On archaeological grounds, the Indo-European homeland is normally placed in the Pontic steppes, north of the Black Sea (Mallory 1989), an assumption which, though perhaps still contestable, is compatible with the Near Eastern origin of Indo-European. Chronologically, Proto-Indo-European seems to have been restricted to this location until its dissolving some time between 6500 and 4500 BP.

It is somewhat more difficult to locate the original geographical center of the Ural-Altaic typological complex. This is mainly due to the shallowness of the language families involved in the Altaic comparisons. At the relatively recent

level of around 2000 BP, however, all the currently known Altaic entities were located in the northern part of the Far East (East Asia), more exactly, in the region comprising Mongolia, Manchuria, and Korea (Janhunen 1996: 229-233). At this time, Uralic was already fully differentiated into a chain of branches extending from the Yenisei-Baikal region (Samoyedic) in the east to the Baltic Sea (Finnic and Saami) in the west. The typological variation within Uralic was already considerable and was partly due to the impact of Indo-European, which likewise was represented by several very distinct branches, ranging from Germanic and Baltic in the west to Iranian and Tocharian in the east. In view of the small number of Common Uralic lexical items, it appears likely that the diffusion of Proto-Uralic began even earlier than that of Proto-Indo-European, perhaps as early as 8000 BP.

In spite of the chronological difference, the typological parallelism between Uralic, on the one hand, and the Altaic complex, on the other, can best be explained by assuming a single original area of Ural-Altaic typology. Since Uralic forms the westernmost member of the Ural-Altaic belt, and since the western branches of Uralic, as compared with Proto-Uralic, show a conspicuous increase in non-Ural-Altaic features, it is tempting to assume that Uralic diffused from the east, from a location not too far from the documented Altaic homelands in Mongolia and Manchuria. The alternative that the preprotoforms of the Altaic type of languages, or the Ural-Altaic typology itself, would have spread towards the east is less likely, especially since the Altaic languages form no genetically coherent group. Where, exactly, lay the Uralic homeland is still impossible to say, but any location east of the Urals would seem to be compatible with the Altaic typological connection. What is clear from the typological facts is that there is no reason to place the Uralic homeland in Europe.

In parallel with the westward spread and cumulative branching of Uralic, Indo-European diffused both to the west and to the east. At some stage, the two language families must have met. The crucial question is when and where this first contact took place. The general genetic coherence of the Indo-European family, as compared with Uralic, suggests that the western branches of Uralic may already have reached Europe as independent entities at a time when Indo-European was still represented by a continuum of relatively undifferentiated idioms close to the protolanguage. With the continuing differentiation of both families, a chain of locally more restricted areal relationships was formed, extending from the Baltic region in the west through the Volga and the Urals to Western Siberia in the east. The eastern expansion of Indo-European (Tocharian,

Iranian) continued even beyond the known eastern limit of the Uralic family (Mallory 1998).

Although the above conclusions are based on the typological relationships between Indo-European and Uralic, they correspond well to the material evidence provided by the loanword corpus, which, in reflection of the general direction of cultural flows in Eurasia, consists mainly of items borrowed from Indo-European into Uralic. Already the conventional understanding of this corpus (Joki 1973) suggests that most of the lexical contacts took place between the individual branches of Indo-European (Germanic, Baltic, Slavonic, Iranian) and Finno-Ugric (Saami, Finnic, Mordvin, Mari, Permic, Ugric). This picture has not basically changed with the introduction of new etymologies (summarized in Koivulehto 1999), though there are indications that the western branches of Uralic may have come under an Indo-European impact even earlier than had been assumed before. Many of the "Pre-Germanic" loanwords in western Finno-Ugric (Saami, Finnic, Mordvinic) are still controversial, but *if* they turn out to be real, they only confirm the chronology of the typological facts. In particular, they seem to show that the differentiation and westward diffusion of Uralic started considerably earlier than the eastward expansion of Indo-European.

It is less easy to assess the Indo-European impact on the eastern branches of Uralic. This is mainly due to the fact that the earliest eastern branches of Indo-European are extinct and largely (with the exception of Tocharian) even undocumented. The basic corpus of Indo-European loanwords in (Ob-)Ugric (Korenchy 1972) derives clearly from Iranian and represents a relatively recent period of contact, especially when compared with the increasingly ancient datings now given to the contacts in the west. It is, nevertheless, possible that Ugric, like Samoyedic (Janhunen 1983), also contains an earlier layer of Tocharian (or Pre-Proto-Tocharian) influences. The Pre-Iranian Indo-European impact is also visible, though still disputed, in Turkic (Róna-Tas 1974) and Chinese (Pulleyblank 1996), suggesting that there was, indeed, a sizeable and culturally influential Indo-European-speaking population in Eastern Central Asia in the early protohistorical period, perhaps as early as 4000 BP.

4. A FRAMEWORK FOR FUTURE STUDY

Since there seems to be no way to reconcile the typological discrepancy between Uralic and Indo-European, the presence of a major areal gap between the two language families and the corresponding protolanguages has to be recognized as a fact. This gap, on the other hand, is a serious obstacle to several assumptions

made about the prehistorical locations and relationships of the two language families. For one thing, the common claim that Uralic and Indo-European are somehow mutually related, either with Altaic (Sinor 1944) or without it (Collinder 1954), is difficult to substantiate. In any case, a genetic relationship would imply that at least one of the language families would have undergone a complete typological change after the dissolving of the common protolanguage. While such a typological change can never be either proven or unproven, it would seem to take the Indo-Uralic relationship beyond the scope of comparative linguistics, making any quest in this direction futile.

Second, and more importantly, the typological discrepancy also seems to rule out the possibility of protolanguage-level areal interaction, especially lexical contacts of the type recently postulated on the basis of Proto-Uralic data (Koivulehto 1999: 329–358 passim). Most of the items claimed to have been borrowed from Proto-Indo-European into Proto-Uralic are typically basic words, which, if really borrowed, would imply a very intimate connection between the two ancient speech communities. Such a connection would, however, also have to be reflected in the typological patterns, while in the absence of any typological similarity between the two protolanguages it is absurd to assume the borrowing of basic vocabulary. Moreover, the recent Indo-Uralic lexical comparisons are invalidated by methodological problems, which derive from the very fact that the two protolanguages were typologically so different (Janhunen 1999). The method used to extract these "parallels" is simply too strong.

Thirdly, there is little reason to assume that the homelands of Uralic and Indo-European were anywhere close to each other. Both homelands have been placed in a wide range of regions, but recently there has been tendency to move the Uralic homeland towards the west, as far as northern Germany (Kalevi Wiik, unfortunately with no coherently published argumentation). At the same time, there has been a suggestion that Indo-European originally diffused from a relatively eastern location, anticipating the subsequent Turkic and Mongolic expansions in Central Asia (Nichols 1997). Both of these assumptions could potentially imply that Proto-Uralic and Proto-Indo-European were spoken close to each other. The problem is, however, that this is not congruent with the typological facts, nor with the results of etymological research, when conducted in a sufficiently critical framework.

A fourth consequence of the typological situation is that we should not believe in illusory continuities in the archaeological material. In the last few decades, there has been a growing tendency among archaeologists to assume that the apparent continuity of local cultures in regions like Finland and northern

Russia implies also an ethnic and linguistic continuity. This approach has been adopted by linguists, who claim that Uralic reached its historically documented western extension already in the Neolithic, perhaps as early as 5000 BP (Koivulehto 1999: 229-244). Such conclusions ignore a number of very basic circumstances: the general ethnic vagueness of the archaeological material, the diffusion of cultural innovations across linguistic boundaries, and the actual linguistic diversity of prehistorical populations. Northern Europe, including northern Russia, is an immense region, which originally must have contained *many* language families in addition to the two – Uralic and Indo-European – which happen to have survived until modern times.

As a framework for future research it may be proposed that the Indo-Uralic linguistic interaction should be treated as a phenomenon with a chronological limit. The two language families started interacting only when they met in the course of their prehistorical expansion from two geographically separate regions. The first contact apparently took place between the northern margin of Proto-Indo-European and the early western branches of Uralic. Since Uralic was diffusing from the east, it may well have been Indo-European that first reached the regions today covered by the westernmost branches of Uralic. The large number of Indo-European loanwords in these branches (Finnic and Saami) imply a profound and prolonged Indo-European impact with a mixture of substratal, adstratal, and superstratal elements. Even so, the original linguistic diversity was more complex, and there is no reason to think that every single Uralic lexical item necessarily has an Indo-European etymology.

* * *

The conclusions suggested above are based on the claim that adjacent languages tend to develop similar typologies, while typological differences between adjacent languages suggest a relatively recent contact. Since Uralic and Indo-European are so fundamentally different typologically, they cannot have been originally adjacent. Since the typological difference is particularly marked at the level of the two protolanguages, there is no reason to assume that Proto-Uralic and Proto-Indo-European were spoken in the same area. Since the protolanguages are unlikely to have been adjacent to each other, it is also unrealistic to assume protolanguage-level lexical contacts between them. This does not, of course, rule out the possibility of isolated cases of distant indirect borrowings (*Wanderwörter*).

As indicated above, a revision of these conclusions would become necessary only if it could be proven that either Proto-Uralic or Proto-Indo-European had undergone a complete typological reorientation due to geographical relocation. One theoretically thinkable scenario would be that both Pre-Proto-Uralic and Pre-Proto-Indo-European were originally relatively western languages, characterized by the typological complex later known from Indo-European and its West Asian neighbours. Pre-Proto-Uralic would then have been relocated towards the east, where it would have undergone a process of "Altaicization" under the impact of its new eastern neighbours, representing the Altaic typology. This would still mean that the source region of the Uralic expansion would have had a relatively eastern location.

Another possibility (suggested by Fredrik Kortlandt, oral communication in August, 2000) would be that Indo-European was originally spoken in the east, where it would have shared the Ural-Altaic typological complex. A secondary relocation along the Eurasian steppe would have placed Indo-European in the neighbourhood of a different typology somewhere in the Caucasus or the Black Sea region. This is in many respects a tantalizing scenario, which would also seem to correspond to the general conception of a relatively eastern Indo-European homeland (Nichols 1997). However, the question is whether there is any *linguistic* material to support this hypothesis. The alleged loanwords from Proto-Indo-European into Proto-Uralic (Koivulehto) cannot serve a purpose here, since they operate with the classic Indo-European typological arsenal.

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PHONETIC URALISMS IN INDO-EUROPEAN?

Petri Kallio

In this article[1], I shall deal with phonetic features in Indo-European languages which may have been due to Uralic influence. As our main purpose is to deal with contacts which occurred earlier than three millennia ago, I shall, for example, omit phonetic Uralisms in already well-studied modern Balto-Slavic languages such as Latvian (Zeps 1962) and Russian (Veenker 1967). Instead, I shall deal with possible phonetic Uralisms in their reconstructed ancestor, namely Proto-Balto-Slavic, which is often dated to the second millennium BC (e.g. Shevelov 1964: 613-614; Kortlandt 1982: 181). Similarly, Proto-Germanic, Proto-Indo-Iranian and Proto-Tocharian will be taken into consideration, but not their daughter languages.

METHODS

First of all, however, I would like to draw attention to some general points concerning phonetic influence. Basically, it is simply the question of pronunciation errors which we make when we speak foreign languages. For instance, when I as a Finn speak English, my phonetic Uralisms can be heard without difficulty. While it is one matter to hear pronunciation errors here and now, however, it is quite another to hear pronunciation errors made by ancient Uralians thousands of years ago.

On the other hand, it is not as hopeless as it may sound, because there are Indo-European loanwords in Uralic languages. When words are borrowed, they can be pronounced either "correctly" or "incorrectly". To be precise, alien sounds unknown to borrowers can be either imitated or replaced by the phonet

1 I would like to thank J. Koivulehto, F. Kortlandt, A. Lubotsky and P. Schrijver for their comments on earlier versions of this paper.

ically closest native phonemes (Coetsem 1988: 7-10). The closer contacts are, the more usual the former alternative is. Because of the great number of Indo-European loanwords in Uralic languages, it is somehow surprising that the latter alternative has always been much more usual. In any case, the phonetic shape of loanwords tells us how Indo-European sounds were pronounced by ancient Uralians (see Table 1).

In principle, pronunciation errors in borrowing situations and in language shift situations are very similar to one another. When foreign languages are spoken, they can similarly be pronounced either "correctly" by imitating their alien sounds unknown to speakers or "incorrectly" by replacing these with the phonetically closest native phonemes (Coetsem 1988: 10-12). The latter alternative constitutes simply a case of externally conditioned sound changes which have two effects on the phonological system of target languages. First, target languages receive phonemes which occur in source languages. Second, target languages lose phonemes which do not occur in source languages. Note that I prefer the concept of "source language" in this connection, because the use of the concepts of "superstrate", "substrate" and "adstrate" presupposes non-linguistic evidence, which I am not going to handle until my summary.

Therefore, when a phoneme substitution in Indo-European loanwords in Uralic languages matches a roughly simultaneous Indo-European sound change, the latter can be suspected to be a phonetic Uralism in Indo-European. The phoneme substitution and the sound change do not necessarily need to match one another completely, as long as they are similar, because there may have been different pronunciation errors in different places and at different times. Naturally, the Uralians who borrowed Indo-European loanwords were not the same as those who abandoned a Uralic language for an Indo-European one. Thus Uralic influence on Indo-European can also be suspected when Indo-European receives phonemes which occur in Uralic, and when Indo-European loses phonemes which do not occur in Uralic.

It is easy to suspect that certain sound changes were due to foreign influence. How can we prove it? Strictly speaking, we can never finally prove it because at least in theory all sound changes can occur internally (Thomason & Kaufman 1988: 112). And even if we were able to prove that certain prehistorical Indo-European sound changes were caused by external factors, we would never be able to prove that they were due to Uralic influence, because there could also have been extinct non-Uralic source languages with phonetic features typical of Uralic. Therefore, we must accept the fact that the probative force of

Table 1

Phoneme Substitutions in (Late) PIE loanwords in PU/PFU/PFP[2]

(Kallio 1997, mainly based on Koivulehto 1991)

Stops		Other non-syllabics		Syllabics	
IE	U	IE	U	IE	U
p	*p*	*s*	*s/š*	*a*	*å/ä*
b^h	*p*	*h*$_1$	*x/k/š/Ø*	*e*	*e*
t	*t*	*h*$_2$	*x/k/š/Ø*	*o*	*o*
d	*t/d*	*h*$_3$	*x/k/š/Ø*	*i*	*i/i*
d^h	*t/d*	*m*	*m*	*u*	*u/ü*
ḱ	*ć/ś*	*n*	*n*	*m̥*	*Vm/mV*
ǵ	*j*	*r*	*r*	*n̥*	*Vn/nV*
ǵ^h	*ć/ś/x*	*l*	*l*	*r̥*	*Vr/rV*
k	*k*	*y*	*j*	*l̥*	*Vl/lV*
g	*k*	*w*	*w*		
g^h	*k*				
k^w*(e)*	*k(u/ü)*				
g^w*(e)*	*k(u/ü)*				
g^{wh}*(e)*	*k(u/ü)*				

[2] The fact that these sound correspondences are loanword substitutions and not Indo-Uralic sound laws is supported by the following reasons:

1. The sound correspondences above are typical loanword substitutions, where alien sounds are replaced by the phonetically closest native phonemes. In the case of linguistic affinity, there should be indisputable examples where this did not happen.

2. The Indo-European phonemes above represent the late Proto-Indo-European stage, with e.g. three non-high vowels (i.e. **a*, **e*, **o*), which can be shown to be recent (cf. e.g. Gamkrelidze & Ivanov 1995: 131-167; Schmitt-Brandt 1998: 128-151). In the case of linguistic affinity, Proto-Uralic should look less like late Proto-Indo-European and more like early Proto-Indo-European.

3. The words with the sound correspondences given above can occur in all Uralic branches as well as in only one Uralic branch. As it is improbable that the latter words were Proto-Uralic, they were hardly Proto-Indo-Uralic either but rather borrowings from Indo-European into Uralic. For this reason, the former words with the same sound correspondences should also be considered borrowings in spite of their wide distribution among Uralic languages, because it is not to be expected that loanword substitutions between Indo-European and Uralic were exactly the same as Indo-Uralic sound laws.

phonetic evidence alone is insufficient. However, we do not need to give up our argument, because phonetic as well as all other non-lexical influence is always preceded by lexical borrowing, which makes it possible to identify source languages from loanwords (Thomason & Kaufman 1988: 113).

I shall, therefore, not be dealing with southern Indo-European dialects, which have had no provable lexical contacts with Uralic. Instead, I shall deal with northern Indo-European dialects such as Indo-Iranian, Balto-Slavic and Germanic. Their lexical contacts with Uralic have been commonly accepted for a long time, although it has not been proved until recently that these have continued without any breaks since the Proto-Indo-European stage (Koivulehto 1993). I shall also deal with Tocharian, although its lexical contacts with Uralic were much more restricted in time. In the following, I shall consider certain sound changes between the Indo-European protolanguage and its subgroups mentioned above, and the manner in which these may have been due to Uralic influence.

Unfortunately, it is impossible to establish how probable it is that certain sound changes may have been caused by external factors, because different generations of linguists have held widely different opinions on this problem. On the other hand, it is possible to establish the probability that certain sound changes which were caused by external factors may have been due to Uralic influence. In practice, we just have to find out how common certain phonological features typical of early Uralic languages are among languages in the world. The more usual these are, the less probable it is that certain early Indo-European sound changes were due to Uralic influence.

RESULTS

(Late) Proto-IndoEuropean stops had three manners of articulation and five places of articulation, whereas ProtoUralic stops had one manner of articulation and three places of articulation (see Table 2). In this case, it is not necessary to deal with the Indo-Europeanist Glottalic Theory (see the bibliography in Salmons 1993). As there was only one Uralic plain voiceless stop series, glottalized stops were no more alien to Uralians than traditional voiced or aspirated stops were. In loanwords, for example, every Indo-European series of three manners of articulation was usually replaced by a Uralic series of one manner of articulation (i.e. IE **T*, **D*, **D^h* → U **T*). Therefore, the Tocharian coalescence of the three manners of articulation (i.e. IE **T*, **D*, **D^h* > T **T*

Table 2

Indo-European and Uralic/Finno-Ugric Phonemes[3]

Proto-Indo-European Phonemes (Beekes 1995: 124-125)					**Proto-Uralic/Proto-Finno-Ugric Phonemes** (Sammallahti 1988: 480-494)				
p	t	$\acute{k}$	k	k^w	p	t			k
b	d	$\acute{g}$	g	g^w					
b^h	d^h	$\acute{g}^h$	g^h	g^{wh}					
							$\check{c}$	$\acute{c}$	
	s	h_1	h_2	h_3		s	$\check{s}$	$\acute{s}$	
						d		d'	x
m	n				m	n		$\acute{n}$	η
	r					r			
	l					l		l'	
					w			j	
u		i			u	$\ddot{u}$	$\ddot{u}$	i	
o		e			o			e	
$\bar{o}$		$\bar{e}$			$\mathring{a}$			$\ddot{a}$	

3 To be precise, Proto-Uralic vowels and Proto-Finno-Ugric consonants are given above. In my opinion, the idea that every Proto-Uralic word should always occur in Samoyed should be abandoned. In Indo-European linguistics, for example, no scholar thinks that every Proto-Indo-European word should always occur in Anatolian, although most agree that it was the first branch to separate from the rest of Indo-European. Therefore, Proto-Finno-Ugric words should also be considered Proto-Uralic. This being the case, there is no reason why the so-called added sounds in Proto-Finno-Ugric (i.e. *$\acute{c}$, *$\acute{s}$, *l') should not be considered Proto-Uralic, too.

[except IE *d > T *ts]) can most plausibly be considered a phonetic Uralism, because no more than 15.8% of languages have only one manner of articulation (Maddieson 1984: 26).

On the other hand, it is not impossible that Uralians could have learned the easier contrast of voiceless and voiced and that they may not have learned the more complicated contrast of plain, aspirated and/or glottalized. Therefore, for instance, the dialectal Indo-European loss of aspiration (i.e. IE *D^h > dial. IE *D; Kortlandt 1978) could be considered, although very cautiously, a phonetic Uralism because its possible source language may also have been non-Uralic for the following two reasons. First, this deaspiration occurred in every Indo-European subgroup except for Indic, Greek, and Italic. Second, only 28.7% of languages have the contrast of plain and aspirated (Maddieson 1984: 27).

It would be far-fetched to think that Uralic influence could have given rise to consonants which never occurred at any early Uralic proto-stage, such as voiceless aspirated stops in Indic (i.e. IE *TH > Ind *T^h), and voiceless non-sibilant fricatives in Iranian (i.e. IE *TH > Ir *Θ) and in Germanic (i.e. IE *T > G *$Þ$). On the other hand, Verner's law in Palaeo-Germanic (i.e. *T/*D, *s/*z; see Vennemann 1984, Kortlandt 1988) is so similar to the so-called qualitative gradation in Proto-Finnic (i.e. *T/*$Đ$, *s/*z) that these very probably had something to do with one another. However, the gradation arose later than the Finno-Saamic proto-stage (Sammallahti 1998: 3), so that it must also be dated later than Verner's law. Thus, Verner's law was rather the source of the gradation (see Posti 1953, Koivulehto & Vennemann 1996), although it would not be impossible that both of them were due to the same extinct source language (family).

I would conclude that only Tocharian passes my first test concerning manners of articulation of stops. My second test concerns places of articulation of stops, and Indo-European labiovelar stops can be treated first. They were replaced by Uralic velar stops in Indo-European loanwords (i.e. IE *K^w → U *k). The reason, of course, was the fact that there were no labiovelar stops in Uralic. Thus, the delabialization of labiovelar stops in all *satem*-languages (i.e. IE *K^w > *s*-I *K) could plausibly be considered a phonetic Uralism. However, the source language may also have been non-Uralic, because only 6.3% of languages have labiovelar stops (Maddieson 1984: 31-33).

However, there are also other features in *satem*-languages which can be considered possible phonetic Uralisms. Even satemization (i.e. the affrication and assibilation of palatal stops) could be suspected of being a phonetic Uralism. In loanwords, again, Proto-Indo-European palatal stops were replaced by Uralic palatal affricates, sibilants and even semivowels (i.e. IE *$\acute{K}$ → U *$ć$, *$ś$, *j).

This could be compared with the fact that Indo-European palatal stops became palatal affricates in Proto-Indo-Iranian (i.e. IE **Ḱ* > II **Ć*; Beekes 1997: 8-9) and palatal sibilants in Proto-Balto-Slavic (i.e. IE **Ḱ* > BS **Ś*; Kortlandt 1989: 46). On the other hand, we must always remember that affrications and assibilations of palatal(ized velar) stops as in satemization are typologically so trivial that they can easily occur without external factors. For this reason, once again, we cannot do more than offer a mere conjecture.

Another sound change shared by all *satem*-languages did not affect stops but sibilants: their retraction (i.e. IE **s* > *s*-I **ṣ*) after velar stops (i.e. **K*), trills (i.e. **r*) and high vowels (i.e. **i*, **u*) (Kortlandt 1989: 43, Beekes 1997: 16). Although there was nothing like this so-called *ruki* rule in Proto-Uralic or in Proto-Finno-Ugric (e.g. FU **ks* was as possible as **kš* (and **kś*, too); see Sammallahti 1988: 492-494), it is hardly a pure coincidence that *satem*-languages such as Indo-Iranian and Balto-Slavic lost many stops and adopted many affricates and sibilants which are very typical of Uralic languages. This admittedly rough tendency indicates that contacts between Uralic and *satem*-languages have been long-lasting, albeit not necessarily the most intensive.

On the other hand, developments in *centum*-languages such as Germanic and Tocharian are very different. Their labiovelar stops were not delabialized (i.e. IE **Kʷ* > *c*-I **Kʷ*), whereas their palatal stops were depalatalized (i.e. IE **Ḱ* > *c*-I **K*). As was noted earlier, there were no Uralic labiovelars, but there were Uralic palatals. We can forget the labiovelars because naturally the fact that certain sound changes did not occur proves nothing. On the other hand, the development of the palatals is more probative, because depalatalizations of palatal(ized velar) stops are typologically unexpected. It is not far-fetched to think that they are mostly due to source languages without palatal(ized) consonants, which are, however, typical of Uralic. The source language of this so-called centumization cannot therefore have been Uralic.

To sum up, Germanic has already failed two of my tests. Tocharian, which passed the first test, failed the second one. As prehistorical Tocharian was spoken by nomads, it was very probably influenced by different languages in different places and at different times. Note that centumization was one of its earliest sound changes. Therefore, its earliest contacts were hardly with Uralic but rather with some language without palatal(ized) consonants. Interestingly enough, the palatalization of consonants was later to become one of the most characteristic phonological features of Tocharian, which may well have been due to another source language which had palatal(ized) consonants. For this reason, there were probably at least two different contact layers.

The palatalization of consonants by front vowels shared by Tocharian and all *satem*-languages has always been one of the most popular phonetic Uralisms (see e.g. Bednarczuk 1997: 94-95). In fact, however, reconstructed Proto-Uralic is no more "palatalized" than, for example, Proto-IndoEuropean. The main problem is that phonetic features cannot be reconstructed as easily as phonological ones, so that we cannot know whether Proto-Uralic consonants followed by front vowels were phonetically palatalized. Similarly, the possible existence of phonetically palatalized consonants in Proto-Balto-Slavic cannot be proved, although there are phonologically palatalized consonants in most modern Baltic and Slavic languages.

In any case, the palatalization of consonants by front vowels could be shown in Proto-Indo-Iranian, where all velar stops followed by front vowels became alveolar affricates (i.e. IE $*K$ > II $*\check{C}$; Beekes 1997: 8). As a result, in Proto-Indo-Iranian and Proto-Finno-Ugric the places of articulation of affricates were identical. It is unusual for languages to have only alveolar and palatal affricates (e.g. Maddieson 1984 has only one example, which is the Finno-Ugric [!] language Komi). It is therefore probable that one way or another the rise of Proto-Indo-Iranian affricates was due to Uralic influence.

The palatalization can even more clearly be seen in Tocharian, which is full of alternations and oppositions between non-palatal and palatal consonants (e.g. *k/ś*, *t/c*, *ts/ś*, *s/ṣ*, *n/ñ*, *l/ly*). As a matter of fact, its amazingly Finno-Ugric-looking consonants (see Table 3) were simply due to this palatalization of consonants by front vowels and the coalescence of stop series mentioned earlier. It is most tempting to think that they were due to Uralic influence (see e.g. Ivanov 1985), because many highly convincing non-phonetic Uralisms in Tocharian have also been suggested (see e.g. Krause 1951; Windekens 1962).

Still, the similarity of consonants in Tocharian and in Uralic may also be due to pure coincidence. Typically Finno-Ugric consonants could also occur in languages which probably had no contacts with any of the Uralic languages. For example, consonants in Southern Amerindian Pano-Tacanan languages such as Cashinahua and Chacobo (for their consonants see Maddieson 1984: 398-399) can be viewed as Finno-Ugric-looking as in Tocharian. Still, the fact that Tocharian consonants formerly were different and later became almost identical makes Uralic influence most probable. Admittedly, the consonant systems of Tocharian and Uralic were very similar phonetically although not phonotactically. For example, initial consonant clusters were possible in Tocharian but impossible in Uralic.

Table 3

Tocharian and Uralic/Finno-Ugric Phonemes[4]

Tocharian (A & B) Phonemes (Ringe 1996: xix-xxiv)					**Proto-Uralic/Proto-Finno-Ugric Phonemes** (Sammallahti 1988: 480-494)				
p	*t*			*k*	*p*	*t*			*k*
	ts		*c*				*č*	*ć*	
	s	*ṣ*	*ś*			*s*	*š*	*ś*	
						d		*đ*	*x*
m	*n*		*ñ*	*ṅ*	*m*	*n*		*ń*	*ŋ*
	r					*r*			
	l		*ly*			*l*		*ĺ*	
w			*y*		*w*			*j*	
u	*ä*		*i*		*u*	*ɨ*	*ü*	*i*	
o	*a*		*e*		*o*			*e*	
	ä				*å*			*ä*	

Moreover, the vowel systems of Tocharian and Uralic were very different from one another. However, the Tocharian system was still comparatively close to the late Proto-Indo-European system at the time of the palatalization mentioned earlier, because the reduction of certain short vowels (e.g. IE **e*, **i*, **u* > T **ä* [= **ə*]) and all long vowels (i.e. [Late] IE **V̄* > T **V*) did not occur until later (Penney 1978). As a matter of fact, very similar reductions also occurred in eastern Uralic branches such as Samoyed and Ugric (Sammallahti 1988: 484-485, 500-501). As reduced vowels were secondary in both language families,

4 See footnote 3.

their possible source language was rather some third party. In any case, these reductions in Tocharian were later than its possible Uralisms, which could be dated to the period when its vowel system as a whole does not seem to have changed markedly.

Similarly, the vowel systems in Proto-Indo-Iranian, in Proto-Balto-Slavic and in Proto-Germanic did not change markedly except that all three non-high vowels merged in Indo-Iranian (i.e. [Late] IE *e, *o, *a > II *a), whereas only the two non-high back vowels merged in Balto-Slavic and in Germanic (i.e. [Late] IE *o, *a > BSG *a). Even if these mergers had been caused externally, the source language could not have been Uralic, which had four non-high vowels, two of which were back. In general, it is most questionable to attribute any mergers of vowels in Indo-European languages to Uralic influence because there were many more vowels in Proto-Uralic than in Proto-Indo-European. For this reason, it is no wonder that vowels never merged in Indo-European loanwords borrowed by Uralians.

In this connection, I shall not deal with consonantal nasals, liquids and semivowels because their change in the Indo-European branches under consideration was minimal. Similarly, the dissolution of syllabic nasals and liquids can be ignored, as this sooner or later occurred almost everywhere and can easily be explained by internal factors. For the same reason, I shall not deal with Indo-European laryngeals because their loss sooner or later occurred everywhere except for Anatolia, which is areally more favourable to back consonants than the rest of Indo-European speech areas are. In any case, the fact that the laryngeals faded out very slowly suggests that their loss was not caused by external factors.

Finally, I shall move on to my last test, which concerns accentuation. As is well-known, Proto-Uralic had an initial accent (e.g. Janhunen 1981: 27; Sammallahti 1988: 480), whereas Proto-Indo-European had a mobile accent (e.g. Beekes 1995: 148-154). As there was also an initial accent in Indo-European loanwords borrowed by Uralians, possible Uralic influence should logically cause the accent to shift to the initial syllable. However, there was no initial accent in Proto-Balto-Slavic, in Proto-Indo-Iranian or in Proto-Tocharian, which have already passed most of my earlier tests, whereas there was an initial accent in Germanic, which did not pass any of them. On the other hand, an accent shift also occurred in Celtic and in Italic, which did not even have direct contacts with Uralic. In my opinion, therefore, even if the Germanic accent shift had been caused by external factors, it would rather have been due to extinct non-Uralic source languages with an initial accent. It is not too daring to assume the pre-

vious existence of such languages as 18.6% of modern languages have an initial accent (Salmons 1992: 50).

DISCUSSION

The following conclusions concerning prehistorical phonetic Uralisms in the Indo-European languages of the Stone and Bronze Ages can be reached:

1. Proto-Germanic

As plausible phonetic Uralisms in Proto-Germanic cannot be identified, the hypothesis that Uralic was spoken in northern Central Europe and in southern Scandinavia before Indo-European (Dolukhanov 1989) must be rejected. Phonetic similarities between Germanic and western Uralic languages such as Finnic and Saamic can often be considered secondary in both language families. Therefore, it is not impossible that they were caused by some extinct language (family) spoken in the Fennoscandian area before the arrival of Uralic and Indo-European.

2. Proto-Balto-Slavic

Enough phonetic Uralisms in Proto-Balto-Slavic can be suggested in order to support the idea already indicated by lexical evidence that Uralic and Balto-Slavic languages have been spoken in close proximity to one another continuously since the Proto-Indo-European stage. Archaeologically, Pre-Balto-Slavic could therefore be connected with the eastern Corded Ware territory (e.g. Gimbutas 1963; 1971). The northern part of this area had earlier been populated by the Combed Ware people, who probably spoke Uralic. The region east of the Baltic Sea was possibly bilingual, until Balto-Slavic prevailed in the south and Finnic in the north. The idea that Uralic was spoken in the Baltic Sea region before Indo-European can be supported by the fact that Balto-Slavic features in Finnic are mostly lexical (i.e. typical superstrate features), whereas Finnic features in Balto-Slavic are mostly non-lexical (i.e. typical substrate features).

3. Proto-Indo-Iranian

Possible phonetic Uralisms in Proto-Indo-Iranian are similar to those in Proto-Balto-Slavic, which clashes with the traditional idea that there were only adstrate contacts between the forest zone Uralians and the steppe zone Indo-Iranians. The case of Proto-Balto-Slavic suggests that Proto-Indo-Iranian was also spoken

deeper in the Uralic speech area. As the centre of the Proto-Indo-Iranian speech area was probably in the Lower Volga region (during the Middle Bronze Age about 3000-2200 BC), possible bilingual communities where Indo-Iranian and Uralic were spoken side by side could have existed in the Middle Volga region, for example. Moreover, the Upper Volga region was possibly even trilingual during the Fat'yanovo culture (about 2500-1900 BC): at least Volga-Finnic and Balto-Slavic, but probably also Indo-Iranian, were spoken there (Parpola 1999).

4. Proto-Tocharian

Maybe the most obvious phonetic Uralisms can be found in Proto-Tocharian. Non-Uralisms, which must be dated both earlier and later than the Uralisms, can also be shown. Therefore, we could assume at least three consecutive contact layers: non-Uralic, Uralic, and non-Uralic. Although there is not much lexical evidence of direct contacts between Uralic and Tocharian, this is not an insuperable problem. Firstly, the Tocharian corpus is limited. Secondly, Tocharian may have had contacts with some extinct Uralic branch spoken south of Samoyed and Ugric. In any case, phonetic evidence suggests that Uralic contacts with Tocharian were briefer but also more intensive than those with Balto-Slavic and Indo-Iranian.

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THE EARLIEST CONTACTS BETWEEN INDO-EUROPEAN AND URALIC SPEAKERS IN THE LIGHT OF LEXICAL LOANS

Jorma Koivulehto

1. EARLIEST INDO-EUROPEAN LOANWORDS IN URALIC/FINNO-UGRIC

The distribution of many early Indo-European (IE) loanwords in Uralic (U) languages covers a large area, i.e. the loanwords are represented in most Uralic languages, in some cases including also the Samoyed branch. Since the etymologies require that both the Indo-European source word (original) and its Uralic counterpart be reconstructed on the level of the respective protolanguages, i.e. Proto-Indo-European (PIE) and Proto-Uralic (PU), we must conclude that the linguistic contacts reflected by these loans took place between the two protolanguages concerned. Furthermore, in most cases – above all in the earliest loans including Samoyed – the reflexes of the Proto-Uralic counterpart in later Uralic daughter languages do not show any internal irregularities which would point to borrowings transmitted from one secondary Uralic dialect/language to another. It is therefore probable that these loans, especially those with a distribution in Samoyed, were adopted at a period when the speech area of Uralic was rather small, having an expanse, say, not exceeding 1,000,000 square kilometres.

Some of the most obvious examples of these earliest Indo-European loans are given below. The etymologies are presented in a relatively short form, mainly for three reasons: (1) the scope of this article does not permit a more detailed discussion; (2) some of the etymologies are well-known, established cases (nos. 5, 6, 9, 10, 11); (3) I have discussed most of the more recent ones

more thoroughly in other publications (cf. Koivulehto 1983a; 1983b; 1994b, and especially 1991; see now also Koivulehto 1999b: 295-364).

The explanations for the established etymologies have been corrected or specified. The present Saami (S) (= Lapp) words are written according to the present North Saami orthography (according to the practice in SSS: see p. x, and Sammallahti 1998, see especially p. 48). The reconstructed Proto-Samoyed forms are given according to Janhunen (1981).[1] When the distribution covers also the Samoyed branch, the term PU (= Proto-Uralic) is used before the reconstructed form; the term PFU (= Proto-Finno-Ugric) applies to words which have no Samoyed counterpart.

1. S **balla-** 'to fear', Proto-Samoyed **pij-* id., etc. < PU ***pele-** 'to fear'

   ← PIE ***pelh$_1$-** > Gr. *pele-m-ízō* 'I shake, cause to tremble', Goth. *us-fūl-ma* 'frightened' (OHG *felm* 'fear' = PIE **pelh$_1$-mo-*); lengthened grade: Old Norse (ON) *fæla* 'to frighten', Swed. dial. *fäla vid* 'to be frightened'. The Indo-European laryngeal shows here, as expected, no reflex in Uralic (U *-lx-* is unknown, i.e. a possible U *-x-* has left no trace in postconsonantal position). As for U *-x-* see nos. 2, 5, 7 and Koivulehto 1991: 52-67.

   Finn. **pelkää-** < **pelkä-tä-* 'to fear' would seem to be a later/parallel loan, with *-lk-* for PIE *-lh$_1$-*: see nos. 3 and 4.

2. S **botni-** 'to plait, to spin', Finn. *puno-* 'to plait', Proto-Samoyed **pân-* id., etc. < PU ***puna-** 'to plait, to spin'

   ← PIE ***pn̥H-e/o-** > Lith. *pìnti*, *pinù* 'to plait', Russ. *pyat'*, *pnu* "anspannen"; zero grade of **(s)pen(H)-* 'to plait, to spin'.

   As for the Proto-Uralic reflex of a Proto-Indo-European syllabic resonant (zero grade) in labial (*-p-*) context cf. also no. 7 (cf. Koivulehto 1994b: 138).

3. S **galga-** 'shall, (of hearsay) to be said to, must, to have to', Hung. *kell-* 'shall, must; need; to please', etc. < PFU ***kelke-** 'shall, must'

[1] Well-known facts, i.e. the word material in different Finno-Ugric and Indo-European languages etc., are given in accordance with basic etymological dictionaries and other relevant literature (e.g. IEW, EWAia, Scebold, Fraenkel, Vasmer, UEW, SKES, SSA), without every time referring to them. The reconstructions are made in accordance with established phonetic laws (*Lautgesetze*) including, of course, the laryngeals on the Indo-European side. The Uralic/Finno-Ugric reconstructions are mostly based on the works of Janhunen (1981) and Sammallahti (1988; 1998). There are two exceptions: instead of *å* and the final stem vowel *-i* in Uralic/Finno-Ugric reconstructions, the more traditional *a* and *-e* are used. The Saami symbol "ˊ" denoting quantity III in certain cases (mostly in geminates) is not needed in the examples quoted in this article.

← PIE *skelH-/*skl̥H- > Lith. *skelėti*, *skeliù* (old *skelù*) 'to be guilty' / Goth. *skulan* 'to be guilty, shall, must', G *sollen* 'shall, (of hearsay) to be said to', etc.

Except in the earliest loanwords, the Proto-Indo-European laryngeal was often replaced by the Finno-Ugric "hushing" sibilant *š*; here, however, the substitute is FU *k*, simply, because a sequence **-lš-* did not exist (cf. Koivulehto 1991: 68-69).

4. Finn. **kulke-**, inf. **kulkea** 'to go, walk, wander', S *golga-* 'to run, to wander about', Hung. *halad-* 'to go, to walk, to proceed' < PFU ***kulke-** 'to go, wander'

← PIE ***k^{w}elH-e/o-** > OInd. *cára-ti* 'goes, walks, wanders (about)', etc.

FU *ku-* ← IE *k^{w}e-* is expected: cf. Finn. *kurkku* 'throat' ← Gmc. **kwerkō* (> **kwerku* > ON *kverk* 'throat, gullet').

As for the Finno-Ugric substitute *-lk-* see no. 3. (Koivulehto 1991: 68-69.)

Finn. **käve-**, inf. **käydä** 'to go, walk' < ***käve-** is an early Germanic loan: ← PGmc. ***skǣwje/a-** > Goth. *skewjan* 'to go, to wander', ON *skæva* 'to go, to hasten' (see Koivulehto 1999b: 223, fn. 56). See also fn. 6.

5. Finn. **myy-/myö-**, inf. **myydä/myödä** 'to sell', etc., Vogul 'to give', Proto-Samoyed 'to give, to sell' (Janhunen 1981: 245) < PU ***mexe-** 'to sell, give'

← PIE ***h$_2$mey-g^{w}-** > Gr. *ameíbō* 'I change, exchange'; OInd. *minā́ti* 'changes, deceives', *ní-máyate* 'exchanges' does not, according to Mayrhofer (EWAia II, p. 315), go back to a laryngeal stem **h$_2$mey-H-*, notwithstanding the form *minā́ti*, which seems to point to it, but to a shorter stem **h$_2$mey-*. However, the laryngeal root woud be the best source stem for the Uralic word (see Koivulehto 1991: 15, Anm. 6).

An established loan etymology (see Rédei 1986: 40; but the *-i-* posited by Rédei cannot be correct, in the light of the Saami form with *-ie-*, see also Sammallahti 1988: 538).

6. South-Est. **möske-**, Hung. *mos-*, Proto-Samoyed **måsə̑* 'to wash' < PU ***mośke-** 'to wash'

← PIE ***mozg-eh$_2$-ye/o-** > Lith. *mazgóti*, *mazgóju* 'to wash'; or ← PIE ***mozg-eye/o-** > Olnd. *majjáyati* 'submerges, drowns'. (Koivulehto 1991: 113; Rédei 1986: 40.)

An established loan etymology (Rédei 1986: 40).

7. Finn. **pura** 'borer, awl', Hung. *fúr-* 'to bore', Proto-Samoyed **pə̑rə̑* 'borer' < PU ***pura(-)** 'borer, to bore'

← PIE ***b^{h}r̥(H)-** > Gmc. **bur-ō-* 'to bore', OHG *bora*, OE *bor*, ON *borr* 'bore'. As to U *-u-*: cf. no. 2. (Cf. Koivulehto 1994b: 138.)

8. Finn. **salko** 'long thin pole', S *čuolggu* < **śalko-j* id., Mordvin *śalgo* 'stick; sting; staff, pole', Vogul 'slat, pole', Ostyak 'splint, slat; batten; board' < PFU ***śalka** (**śilka*: Sammallahti 1988: 549) 'long thin pole'

   ← PIE ***ǵʰalgʰo-/*ǵʰalgʰä** > Lith. *žalga-s / žalgà* 'long thin pole', Gmc. **galga-n-* > OHG *galgo* 'pole of a draw-well; gallows', etc. (Koivulehto 1983a: 142-143; Sammallahti 1999: 85).

9. Cheremis **uža** 'price', Votyak, Zyryan *vuz* 'merchandise; trade'; (verbal derivative **wos-ta-* > Finn. *osta-* 'to buy', S *oasti-* id.; Vogul *wɛta* 'trader', *wɛtal-* 'to trade' < **wos-ta-*) < PFU ***wosa** (**wiśa*) 'merchandise'

   ← PIE ***wosā** (> Proto-Gmc. **wazō* > **warō* > G *Ware* 'product, merchandise' (IE verbal root **wes-* 'to buy' > Hitt. *waš* 'to buy'; cf. OInd. *vas-ná-m* 'price, value').

   The Indo-European etymology for G *Ware*, etc. has been given by O. Szemerényi (see Seebold, p. 875). (Koivulehto 1991: 83, 146.)

10. Finn. **vesi**, stem *vete-* 'water', Proto-Samoyed **wit* id., etc. < PU ***wete** 'water'

   ← PIE ***wed-(er/en-)**: cf. the Swedish lake name *Vättern* (< PIE **wedōr*), Hitt. *watar*, gen. *wetenaš* 'water', Ann. *get* 'river'.

   It has been claimed that words like 'water' are not borrowed. There are, however, many examples of borrowed 'water' words. Stefan Georg (The Indo-European mailing list, 29 Jan. 2000) quotes several examples of this, the borrowing languages being Tamil (from Sanskrit), three Papuan languages (from Austronesian), several non-Semitic languages of Ethiopia (from Ethiosemitic). And "It is widely known that in the case of very intensive language contacts, practically anything can be borrowed, from words to affixes and structures" (Laakso 1999: 62). Rédei (1986: 43), too, considers the word an early borrowing.

11. Finn. **vetä-**, inf. **vetää** 'to draw', Mordvin (E) *ved'a-*, (M) *väd'a-* 'to lead, to guide', Cheremis *βiδe-, βüδe-* id., Hung. *vezet* id. < PFU ***wetä-** 'to lead, to draw'

   ← PIE ***wedʰ-e/o-** > Av. *vad-* 'to lead; to wed, to marry' > Lith. *vedù, vèsti* 'to lead, to marry', etc.

   An established etymology (Rédei 1986: 48).

2. INDO-EUROPEAN LOANWORDS IN WESTERLY FINNO-UGRIC

2.1. Contacts between North-West Indo-European and westerly Finno-Ugric

The Proto-Indo-European phonetic-phonological level is also reflected by loanwords which are attested in the westerly Uralic languages only: above all in Finnic (F) and/or in Saami, but also in a larger area encompassing branches of Volga-Finnic (Mordvin and Cheremis) and/or Permic (Votyak and Zyryan). Surprisingly enough, several loans are attested exclusively in Saami (see nos. 23-27).

Correspondingly, most of the Indo-European source words (originals) of these loans have a westerly distribution, too, being attested in Germanic (Gmc.) and/or Balto-Slavic (BSl.). Therefore, the contacting Indo-European speech form can be defined as "North-West Indo-European": i.e. approximately the protolanguage of the later Germanic, Baltic (= B) and Slavic (= Sl.) branches. This can be said because these contacts, with a high degree of probability, must have taken place in a rather westerly region which could be approximately equated with the Baltic Sea Region, the extent of which can be defined by facts of natural geography.

Most probably, in my opinion, these contacts should be dated back to the period of the Battle Axe or the Corded Ware culture, which is attested in Finland (according to calibrated datings) from 3200 to 2350 BC. Both archaeological and linguistic data match this dating. To propose a more distant period is inconsistent with the fact that several loans of this group imply the practice of a kind of primitive agriculture (the slash-and-burn method).

The contacting Finno-Ugric language stage is largely Pre-Finnic (PreF) or, alternatively, Pre-Saami (PreS). Pre-Finnic, also called Finno-Saamic protolanguage (Sammallahti 1998: 2) or Early Proto-Finnic, is the reconstructed common protolanguage of Finnic and Saami. Pre-Saami is phonologically the same as Pre-Finnic, but applies here to lexical items (loanwords) which are attested exclusively in Saami. Finnic (F) or Late Proto-Finnic (also, but less appropriately, called Baltic-Finnic), again, is a group of languages east of the Baltic Sea which are closely related to each other, i.e. Finn(ish), Ingrian, Karel(ian) proper, Olonets, Lude, Veps, Vote, Est(onian), Livonian. Vote and Livonian are almost extinct today.

The clearest Proto-Indo-European features which cau be reflected by Pre-Finnic loans are: (1) reflexes of Proto-Indo-European laryngeals, (2) reflexes of Proto-Indo-European palatal stops, (3) reflexes of Proto-Indo-European vocalic resonants (differing from the reflexes of the Gmc. vocalization with /u/), (4) reflexes of the retained IE /o/ as F /o/. The last feature alone cannot always prove an Indo-European stage, because even Gmc. /a/ is sometimes reflected as F /o/. There may be, however, in such cases internal Pre-Finnic criteria, i.e. Finno-Ugric phonology and/or distribution of the word, from which an early borrowing can be inferred (cf. no. 16 below). Of course, not every word has a structure that could be judged by phonological criteria. But there are, however, a sufficient number of features that allow the language stage to be established on both sides.

Some examples of loanwords in Finnic or/and Saami which fulfil the criteria are given below. The etymologies need somewhat more detailed commenting because of the great time-depth, and, additionally, because most of them are quite new. The substitutions for Proto-Indo-European laryngeals: FU *k-* in word-initial position, FU *š* in word-medial position are largely discussed in Koivulehto 1991: 72-99.

Note that "PIE" before an Indo-European reconstructed source word means the Proto-Indo-European phonological stage of the reconstruction. It does not imply that the word in question has necessarily existed in the ancient Proto-Indo-European language proper (in the Indo-European homeland).

Note, too, that the corresponding Finno-Ugric reconstructions, henceforth, do not have any language labelling (the only exception is "Pre-Saamic" = PreS in nos. 23-27, and, additionally, 28, 32). This means that these asterisked forms normally refer to the common protolanguage of the languages where the actual word is attested: (so, for no. 12 we could write "Early Proto-Finnic" or "Proto-Finno-Saamic **kale*", and for no. 16 "Proto-Finno-Permic **lonta*/**lomta*"). However, the reconstructions concerned can, in practice, be equated with the Proto-Finno-Ugric (PFU) phonological level.

12. Finn. **kalja** '(weak) beer' < ***kale** (+ suffix *-ja*) or ***kaleta** or ***kaleja** ← PIE ***$h_2$al-u-** (> B/Sl. **alu-* > OPr. *alu* 'mead', Lith. *alùs* 'beer', Sl. *olŭ* id.) or ← PIE ***$h_2$al-u-t-** (> Gmc. **aluþ-* > ON *ǫl*, etc. 'ale, beer') or ← PIE ***$h_2$al-ew-yo-** (> Proto-Sl. **alauja-* > ORuss. *oluj* 'beer').
The Finnic word was borrowed into Zyryan: *kal'ja* 'weak beer'. A new etymology by P. Kallio (1998). As to the ending in **kale* cf. no. 35.

13. Finn. **kasa** 'sharp point, edge', Karel. *kaža*, *kaʃdža*, SEst. *kadza*, S *geahči* 'end, point; outskirts' < ***kaća**

← PIE ***h$_2$alḱyä*** > Gmc. **agjō* > OHG *ekka* 'point, edge' > G *Ecke* 'corner'.

A later, Gmc. loan from the same Indo-European word is Finnic **akja* > Karel. *agja* jne. 'end, brim, edge'. (Koivulehto 1991: 23-25.)

14. Finn. **kaski** 'burnt-over clearing' (seed was thrown in the ashes) < ***kaske** (***kaśke**)

← PIE ***h$_2$azgV-*** > Gmc. **askōn-* > ON *aska*, OHG *aska*, etc. 'ashes'; PIE root **h$_2$as-* 'to burn; to dry';

Scand. *aska* denotes in many field-names ancient burnt-over clearings (KLNM XVII, p. 499). Cf. also Finn *palo* 'burnt-over clearing': a nominal derivative from Finn. *pala-* 'to burn', and see Finn. **huhta**, an Iranian loan (no. 55 below). (Koivulehto 1991: 28-32.)

15. Finn. **kyrsä** 'unleavened, thin bread; (pejorative) bread, not risen or which went wrong; crust; something small, insignificant', Olon. *kürzü*, Veps *kürz* 'pancake', Est. *kürss* 'first cut slice of bread, crust', Mordvin (E) *kše*, *kši*, (M) *kši* 'bread' < ***kürsä**

← PIE ***krusā́*** > Proto-Sl. **krŭchá* > Russ. *krochá* 'crumb', dim. *kroška* 'crumb (of bread), tiny bit, a little one', a zero grade derivative from PIE **krow-s-* 'to crush' = Gr. *kroúō* 'strike, smite'. (IEW, pp. 622-623; Vasmer I, pp. 669, 671; Buck, pp. 357-358.)

As to the semantics cf. the corresponding full-grade variant PIE **krowso-* > SCr. *krȕh* 'bread', Sloven. *krùh* id., Russ. *kruch* 'slice, piece, splinter' (Buck, pp. 357-358). Cf. also Modern Gr. *psomí* 'bread' < *psōmíon* 'morsel, bit, piece of bread'. Metathesis of a liquid and an obstruent in initial position is not rare in loanwords. As to the palatal vowel cf. e.g. the Baltic loans Finn. **tyhjä** 'empty', **tytär** 'daughter'; Baltic has *u*) and the alternation Finn. **tuhma** 'naughty, (dial.) stupid' ~ **tyhmä** 'stupid', **pursto** ~ **pyrstö** 'tail'. Old words with *-rs-* are normally loanwords (*-rs-* is not attested in Uralic). *kyrsä* is an older loan than the Gmc. loan Finn. **leipä** 'bread'. A new etymology (Koivulehto 1999a: 212).

16. Finn. **lansi** 'lowland; low' (< **lante* < **lon/mta*), Votyak, Zyryan *lud* 'field, meadow, pasture' < ***lonta/*lomta**

← PIE/PreGmc. ***lond^{h}o-/*lomd^{h}o-*** > Gmc. **landa-* > Goth., etc. *land* 'land'. – As to the phonetic development cf. ***komta** 'lid, cover' > Votyak, Zyryan *kud*; > Finnic *kante* > Finn. **kansi** id. (Koivulehto 1994b: 139.)

17. Finn. **lehti** 'leaf, blade', S *lasta* id. (also in Cheremis: id.) < ***lešte**

← PIE ***b^{h}l$_{e}$h$_{1}$-tó-*** > Gmc. **blaða-* > ON *blað*, OHG *blat* > G *Blatt* 'leaf' (or ← PIE ***b^{h}leh$_{1}$-tó-*** > Gmc. **blēða-* [> OE *blǣd* 'blossom,

sprout, fruit'] → S *lieđđi* 'blossom, flower; oar blade'). (Koivulehto 1995a: 122-125.)

18. Finn. **pohta-**, inf. **pohtaa** 'to winnow' < ***po(w)š-ta-** (*-ta-* is a normal verbal [causative] suffix)

←- PIE ***powH-eye/o-*** > Gmc. **fauja-* > OHG *fewen* (*fouwen*), MHG *vöuwen* 'to screen, to sift (corn), to clean', G (dial.) *fẅen* 'to screen; to sprinkle; to clean flour/meal by throwing it up in the air', OInd. *pavāyati* 'cleanses, purifies'.

As to *-wšt-* > *-št-* cf. Finn. *nouse-* 'to rise' (= **nowse-*) → *nos-ta-* 'to raise': the impossible cluster was simplified. (Koivulehto 1991: 91-93.)

19. Finn. **porsas** '(little) pig, piglet', Est. *põrsas* id., etc. (Mordvin *purtsos, purtsus, pursez, puŕt'śis*, etc. id.) < ***porćas**

←- PIE ***porḱos*** > Gmc. **farχaz* > OE *fearh* 'piglet' (> E *farrow* 'litter of pigs'), OHG *far(a)h* 'pig'; > Lith. *paršas* 'piglet; castrated boar'; SCr. (derivative) *prâse* 'piglet'.

The Mordvin reflexes of what is PIE *-ḱ-* are here entirely irregular: they match neither Finno-Ugric *-ć-* nor Finno-Ugric *-ś-* nor *-s-* (nor Finno-Ugric *-č-*, for that matter); so the Mordvin forms might be borrowed from Baltic Finnic. That they should be recent loans from some later Iranian language is improbable, because this would not explain the ending *-os* (< **as*), etc. The Baltic Finnic word could, fonnally, also be an early Indo-Iranian loan, but the ending *-as* does not seem to occur in this layer otherwise. On the contrary, it is usual in later, Proto-Iranian loans, but here the medial *-s-* does not match (see Section 4 below). So, we are led to the conclusion that the word was borrowed from early North-West Indo-European. Note, too, that the exact meaning of the Finnic word, 'young pig, piglet', is attested in North-West Indo-European languages only: in Germanic, Baltic, and Slavic.

Votyak *parś*, Zyryan *porś* 'swine, adult pig' cannot be equated with the Baltic Finnic word (we would expect ***purś* in both languages): it must be a separate, later borrowing.

20. Finn. **rohto** (dial. also *rohtu*) 'medicine, (medicinal) plant; weed; green herb; cattle feed', Est. *roht*, gen. *rohu* 'grass, herb, plant; spice, medicine') < ***rošto** '(green) grass, (medicinal) plant'

←- PIE/PreGmc. ***g^{h}róH-to-(n)-/*g^{h}róH-tu-*** > Gmc. **grōþa(n)-/ *grōþu-* > ON *gróð-r, gróði* 'herb, plant; growth' / Swed. *grodd* 'germ'; **g^{h}roH-tí-* > Gmc. **grōđi-* > MHG *gruot* 'green growth', etc. The words are nominal derivatives from the verbal root **g^{h}roH* > Gmc. **grō-(ja-)* 'to grow (esp. of green growth)' > Swed. *gro* 'to germinate, to grow (of plants)', E *grow*, etc. (Koivulehto 1999a: 213.)

21. Finn. **solki** 'fibula (thorn-pin to attach clothes with), buckle, brooch', etc., Mordvin *ś/ćulgamo* 'brooch', Cheremis *šolkama*, *šâlkama* 'clasp, fibula'; Votyak, Zyryan *śul* 'runner of a sleigh'; S *čulggon*, gen. *čulggoma* 'wedge-shaped patch in a skin mitten; side-piece of a Saami brogue made of shank-skin' < ***ćolke/a / *šolka**

← PIE ***ḱolh$_2$ó-*** > OInd. *śalá-* 'rod, stick' (derivative *śalyá-* 'arrowhead, thorn, prickle'), Hindi *säl* 'stake, thorn', Orijā *saḷa* 'pin, thorn', Bihari *sar* 'sticks used in setting up the warp'; derivative OInd. *śalā́kā-* 'thin stake or splinter', Pāli *salākā* 'twig, peg, thin bar, blade of grass, arrow'. Some more senses of this derivative in other Indo-Aryan languages: 'needle in shuttle; spindle', 'pin (of bamboo or wood or iron)', 'short stick, coarse needle'; = ON *hali* 'tail; spearhead'. The Proto-Indo-European verbal root: ***ḱel(h$_2$)-*** 'to prick, to stick'. Cf. ***ḱolh$_2$mo-*** > Gr. *kálamos* 'reed', Gmc. ***χalma-*** 'straw' > G *Halm* (in Gr. assimilation ***kólamos*** > *kalamos* or zero grade) (EWAia II, pp. 621-622; Monier-Williams, pp. 1058-1059; Turner, no. 715).

The essential thing in a fibula is the pointed needle, pin, "thorn" (G *Dorn* 'thorn', also 'tongue of a buckle'). – The phonetic relationship between the Finnic word and the rest of the forms is irregular (esp. Saami *u*: cf. no. 29), which in itself points to a borrowing. A new etymology (in brief presented in Koivulehto 1996: 427-428). – Note: Finno-Permic ***ćolka*** may also have been borrowed from an old representative of the derivative Oind. *śalā́kā-*, as the vowel of the middle syllable is liable to be syncopated, particularly in loanwords (for a parallel case see no. 48: ***soŋka*** 'old' ~ OInd. *sanaka-* id.). If this were the case – and I think it is rather plausible –, this loanword would belong to the early Indo-Iranian loans (see Section 3).

22. Finn. **tahdas**, gen. *tahta(h)an* 'dough, paste', Olon. *tahtaz* 'dough', Veps *tahtaz* id., SEst. *tahas*, gen. *tahta* id. < ***taštas**

← PIE ***tah$_2$i-s-to-***(s) > Celtic, OIrish *tōis*, *tāis* 'massa farinacea' = 'dough', Welsh *toes*, Breton *tōaz* 'dough', ChSl. *těsto*, Russ. *testo* 'dough', etc. To the same root belongs the Gmc. *m*-derivation OHG *deismo* 'sour dough' (= PIE ***tah$_2$-i-s-mo(n)-***) and OE *þän* 'moist' < Gmc. ***þaina-*** (= PIE ***tah$_2$-i-no-***). The Proto-Indo-European root is ***tah$_2$-y-*** 'to dissolve', nominal 'soft mass'.

In the F. word the *-i* was dropped in order to get a normal base stem of two syllables, cf. also: F ***rišma*** > Finn. *rihma* 'thread, snare' ~ Baltic ***rišima-*** 'binding', Finn. **vehma-ro** 'pole of a team of draught oxen' ~ Baltic ***vežima-*** 'drawing; waggon' (L. Posti). A new etymology (Koivulehto 1999a: 213-214).

Finn. **taikina** 'dough' is a later Gmc. loan from a different word (cf. G *Teig* 'dough').

Exclusively in Saami:

23. S **čuonji**, gen. *čuotnjágá-* 'goose' < PreS ***ćańak*** (theoretically also **ćońak*)

← PIE ***ǵʰan-/*ǵʰanad-/*ǵʰanud-*** > Gmc. **ganat-/*ganut-* > OHG *ganazzo, ganizo, ganezo, ganzo* 'gander (= male goose)', MLG *gante* id., etc. (Koivulehto 1983a: 143-144.)

Finn. **hanhi** 'goose' < ****šanše*** is a well-known Baltic loan (← Baltic ****žansi-***); the Permic word for the same fowl, Wotyak **d'ažeg** (auch *d'ažad'eg*; WW, p. 46), Zyryan **d'ʒod'ʒeg** (SW, p. 38) is obviously an Indo-European loan, too (← IE ****ǵʰans-*** or a corresponding Proto-Aryan form); *-eg* is a suffix. In all three cases the word medial consonant was assimilated with the initial one: in the Baltic loan the medial sibilant became "hushing", too; in the Saami and Permic words the medial consonant became palatal under the influence of the initial palatal consonant (Koivulehto 1999b: 244). So, the name of this important fowl was repeatedly borrowed into three Finno-Ugric languages.

24. S **čuorpmas**, gen. *čuorbmasa* 'hail (also collectively)' < PreS ****ćormeš*** (theoretically also **ćarmeš*)

← PIE ****ḱor-mo-/ḱor-mā*** (< ****ḱor-mah₂*** < ****ḱor-meh₂***) > Proto-Baltic **šarma-* > Lith. *šařmas / šarmà* 'white frost'.

As to the semantics cf. Modern Persian *zāla* 'hail, white frost' or Kashub. *žłodz* 'white frost' = Polab. *zlod* 'hail' (IEW, p. 453; Vasmer II, p. 257).

A later, Baltic loan is Finn. *härmä* 'white frost', (Koivulehto 1983b: 116-117.)

25. S **gožu** : (strong grade) *gohččo-* "soot, layer of soot, deposit of smoke or soot on things near a fireplace" (Nielsen II, p. 160) < PreS **kućo-j* < early PreS ****kuśo-j***

← PIE ****h₁usyo-*** or ****h₁usyā-*** > Gmc. **usjō(n)-* / **uzjō(n)-* > ON *ysja* 'fire'? (as a name for fire), Modern Isl. *ysja* 'quicksand; fine rain; loose fresh snow' / Gmc. **uzjôn-* > ON *-yrja*, attested in the compound Gmc. **aim(a)-uzjôn-* > ON *eimyrja* (f.) 'embers', OHG *eimuria*, MHG *eimere* id., E *ember(s)*. (Gmc. **aima-* > ON *eimr* 'smoke, steam'.) To the same word family belongs also Gmc. **us-ilan-* > anord. *usli* 'embers, sparks', Modern Norw. *usle* 'black smoke, coaldust, embers', MHG *usele, üsele* 'coaldust'; the Proto-Indo-European verbal root is **h₁ews-* approx. 'to burn' > Olnd. *óṣati* 'singes', Lat. *ūrō* 'to burn (trans.)'. FU palatal *ś* > Proto-Saami *ć* was substituted for PIE *-sy-* = *-s̬i-*, because there was no FU *-sj-*.

As to the semantics cf. also Finn. dial. *nuoha* 'soot; layer of dust; flying dust; snowstorm'. Also the other old Saami words for '(various kinds of) soot' are borrowings: **giehpa** 'soot' (a Baltic loan, Koivulehto 1992b: 300-

301), **ruohtti** 'coarse soot' (a Gmc. loan: cf. G *Ruß* 'soot' < Gmc. **hrōta-*), **suohtti** 'soot' (a Gmc. loan: cf. ON *sót* 'soot' < Gmc. **sōta-*). A new etymology (Koivulehto).

26. S **guolbba**, gen. *guolbana* 'heath, dry level plain with reindeer moss or heath plants, sandy plain without stones' < PreS ***kalpen** (theoretically also **kolpen*)

    ← PIE ***h$_2$alb^h-(en)-** > G dial. *Alben* 'chalky sand under the top soil', ON *alfr* "aur, möl" = 'gravel' (only in ONorw. place names, Magnússon, p. 11), Swed. (dial.) *alv* 'subsoil', to this Swed. dial. (e.g. Gotl.) *alvar* (f.) 'useless, barren, treeless, open field, bare montain field, level heath on a shore'. Substantivized form of PIE **h$_2$alb^h-o-* 'white' (> Gmc. **alba-*, Lat. *albus* 'white, pale'). A new etymology (Koivulehto 1995b).

    The standard connection with Hitt. *alpa-* 'cloud' is semantically unlikely: "the 'cloud' meaning would be unique, and the dominant Hitt. association of clouds with rain and thunder does not advocate "whiteness"" (Puhvel 1984: 38).

    Finn. **kalvas, kalpea** 'pale' is obviously a parallel borrowing (a new etymology, together with Petri Kallio). As to the semantics cf. Swed. *blek* 'pale' ~ (dial.) *bleke* (n.), *bleka* (f.) meaning the same as Gotl. *alvar*: "*Bleket* eller *Allvarmoen*, som det här kallas, var de mästa ställen brundt" (*mo* 'heath'; Linné, SAOB I B 3138; 917).

27. S **guovssu** : (strong grade) *gukso-* 'dawn' < PreS ***kawso-j** or ***kanso-j** (**kowso-j*, etc. not possible)

    ← PIE ***h$_2$aws-ōs-** > Proto-Gr. **au̯hōs* > Lesb. *auōs* (with a secondary long *ā* : Att. *héōs*) 'dawn', Iran. **aušah-* (attested in later Iran. languages) id., further derivatives in Lat. *aurōra* id., Lith. *aušrà* id., Gmc. **aus-ta-* *'dawn' > 'East'; zero grade in OInd. *uṣ-ā́s* id. Originally a Proto-Indo-European ablaut paradigm **h$_2$áws-ōs-* : **h$_2$us-s-* (EWAia I, p. 236), verbal stem **h$_2$ews-/*h$_2$wes-* 'to shine, to glow'. The suffix *-j* is attested in several ancient borrowings: cf. nos. 25 and S *čuolgu* 'long thin pole' (no. 8), further S *suolu* 'island' (a Baltic loan). The sequence **-ws-* was originally unknown in Uralic/Finno-Ugric. As to the consonant reflex in Saami cf. e.g. S *guksi* : *guvse-* 'scoop' (← Baltic **kauš-*). The unknown **-ws-* was also possibly replaced by the existing *-ŋs-*: cf. S *juoksa* : *juovsa* 'Bogen' = Finn. *jousi* id. < **joŋse*. A new etymology (Koivulehto 1997).

2.2. The Indo-European source words are not attested in North-West Indo-European

Also these westerly loans reflect the Proto-Indo-European phonological level. They probably represent the same chronological level as the North-West Indo-European loans proper discussed above, but they might come from a different – a more eastern? – language area than those.

28. S **arvi** 'rain' (in conservative dialects *-br-*) < PreS ***üprä** (or **iprä*)
    ← PIE ***m̥bʰ-ro-** > OInd. *abhrá-* 'cloud, rain cloud', Av. *aβra* 'rain, rain cloud', Lat. *imber* '(heavy) rain, shower'.
    The Pre-Saami loss of the nasal before *-pr-* is regular. The word-initial PreS **ü* (?**i*) was a necessary addition, in order to make the word phonotactically acceptable. Note that the IE syllabic **m̥* had a vocalic function. (Koivulehto 1990.)

29. S **gutna** 'ashes', Cheremis *kon* 'ash lye', Zyryan *kun* 'lye' < ***kone** 'ashes'
    ← PIE ***koni-** > Gr. *kónis, -ios* 'dust, ashes' (cf. Lat. *cinis* < **cenis* 'ashes').
    The Saami vowel does not match completely, which in itself points to a borrowing (cf. no. 21). A new etymology (Koivulehto 1999b: 7).

30. Mordvin **ponžavtoms** 'to winnow' < ***punše-kta-** (*-kta-* is a normal verbal [causative] suffix)
    ← PIE ***puneH-/*punH-** > OInd. *punā́ti / punánti* 'cleans, winnows / they clean, winnow'; **u* > *o* is regular in Mordvin. (Koivulehto 1991: 93.)

31. Votyak **puž́** 'sieve' (**pužnį-** 'to sieve'), Zyryan *pož́* 'sieve' (*požn-al* 'to sieve') < ***pe(w)šenV**
    ← PIE ***pewHeno-** > OInd. *pávana-* 'purification, winnowing of corn; sieve, strainer'.
    The *-n-* was regularly dropped in the Permic noun, being word-final, but preserved in the verb derived from it. (Koivulehto 1991: 87-91.)

32. S **suopman**, gen. *suopmana* 'human voice; dialect; voice quality' < PreS ***somenV** (theoretically also **samenV*)
    ← PIE ***stomen-** > Gr. *stóma* 'mouth (esp. the mouth as the organ of speech), speech, utterance', Av. *staman-* 'mouth (of a dog)'.
    IE *st-* → FU *s-* is a normal substitution. A new etymology by P. Sammallahti (1998: 126).
    Cf. phonetically S **vuopman** 'hunting fence with two long, converging arms ending in a pit or a pen' < PreS ***amenV** ← Gmc. ***hamen-** (*n*-stem,

masc.) > OHG *hamo* 'hunting net; fish weir net', MHG *ham(e)* 'sack-like hunting net', G *Hamen* 'landing net; a long, tapering hunting net'. The initial Gmc. **h-* had, as usual, no substitute in Saami, because there was no /h/ in Pre- and Proto-Saami. As to the semantics, cf. Finn. *siula* 'side net of a seine; side fence leading reindeers to an enclosure'. (Koivulehto: a new etymology; presented at the meeting of the Modern Language Society, Helsinki, January 29, 1998; Sammallahti 1998: 128). Cf. also S *siepman* 'seed' ← F **sēmen* (> Finn. *siemen*) ← B **sēmen-*.

3. EARLY CONTACTS WITH PRE-ARYAN AND EARLY PROTO-ARYAN

On the other hand, there were very old contacts with early Aryan (= Indo-Iranian, I-I) and even Pre-Aryan, too. There are, roughly speaking, two main very old groups: (1) loans with a wide distribution in Finno-Ugric languages and (2) loans which are attested in a westerly area only. Interestingly enough, several words of the westerly group reflect an archaic evolutionary stage. A clear indication of an old stage is the preserved PIE *e*. Among these early loanwords with a limited westerly distribution there are examples with a clear Iranian feature: an early depalatalization of the Common-Aryan palatal fricatives. The same depalatalization is also reflected by later, Proto-Iranian loans proper. These early and later Iranian loans are presented in Section 4.

3.1. Loans with a wide distribution in FU languages

33. Mordvin **azoro** 'lord', Votyak *uzyr*, Zyryan *ozyr*, Vogul *ātər* 'prince' = "Fürst" < ***asera**

    ← Early Proto-I-I ***asura-** (< PIE **ṇsu-*) > OInd. *ásuraḥ* 'god, lord; demon', Av. *ahura-* 'god, lord'. The IE *-u-* of the second syllable could not be replaced by the corresponding FU *-u-*, because labial vowels could not, originally, occur except in first syllables. An established etymology.

34. Finn. **mehi-läinen** 'bee', Mordvin *mekš*, Ungarian *méh* id. < ***mekše**

    ← Early Proto-I-I ***mekši-** > OInd. *mákṣi-kā* 'bee'. An established etymology. For the Aryan reconstruction **mekši* cf. Parpola 1999: 199-201.

35. Finn. **mesi**, stem *mete-* 'honey', Mordvin *med'*, Hung. *méz* id. < ***mete**

    ← Early Proto-I-I ***med^{h}u-** (< PIE **med^{h}u-*) > OInd. *mádhu-* 'honey'.

    Theoretically, this loan could even be a Proto-Indo-European one, but, because of its semantics, it is likely to have been borrowed at the same time

with **mekše* 'bee' from early Proto-Indo-Iranian, where the RUKI rule was already in operation. As for IE *-u-* → FU *-e* see no. 33. An established etymology.

36. Finn. **ora** 'thorn, prickle, awl', Mordvin *uro* 'awl', Hung. *árid.* < ***ora**
← Proto-I-I ***ārā** (= OInd. *ārā* 'awl, prickle' < (Late) PIE **ēlā* > Gmc. *ēlō* > OHG *āla* 'awl').
There are several examples of FU /o/ ← I-I /a/, /ā/: cf. PreS ***orja** > *oarji* 'South' ← I-I ***arya-** > Av. *airiia-*, OPers. *ariya-* 'Aryan' (variant OInd. *árya-* 'Aryan, belonging to the three highest castes'); PreS ***wojna-** > **ojna-* > S *oaidni-* 'to see' ← Proto-H ***vaina-** > Av. *vaēna'ti* 'sees', Old Persian *vaināmiy* 'I see', Middle Persian *vēn-* 'to see', OInd. *venati* 'looks, observes, sees'. Consequently, FU **ora* cannot be used as evidence of an alleged (Late) Proto-Indo-European ablaut form **ōlā* (as has been done earlier). In Finno-Ugric, the long Indo-Iranian vowel could only be replaced by a short one, because a long vowel could not occur in a FU *a*-stem.

37. Finn. **sata**, S *čuohti*; Mordvin *śado*, Cheremis *šüδə* Votyak *śu*, Zyryan *śo*; Vogul **śi̯tV*, Ostyak **saat*, Hungarian *száz* (P. Sammallahti 1988: 549:) < ***śata/*śi̯ta**
← Proto-I-I ***ćata-** (< PIE ***ḱm̥tó-m*) or Proto-IA **śatá* > OInd. *śatá-m* 'hundred'; PIE *m̥* > Proto-I-I *a* could have happened at a very early stage: the same development has also occurred in Greek.
The initial FU *ś* (instead of *č*) can be accounted for by an early lack of a palatal affricate phoneme (at least in this position): note that the reconstruction of the first syllable vowel (Sammallahti 1988: 549) is not quite clear and that the FU *i̯* is posited also in some other I-I loans for I-I /a/. An established etymology.

3.2. Loans attested in a western area only: Reflex of IE *e*

38. Votyak **burd**, Zyryan *bord* 'wing' < ***pertä**
← Pre-I-I/Early-Proto-I-I ***petro-** > OInd. *pát(t)ra-m* 'wing; feather'.
The metathesis IE *-tr-* → FU *-rt-* is expected and also occurs in Saami: *-tr-* did not occur in Finno-Ugric. (Koivulehto 1988: 43, 51.)

39. S **čearda** 'species, kind, sort; tribe' (the Saami stem vowel *-a* must be secondary) < ***ćertā/śertä**
← PIE, Pre-I-I / Early Proto-I-I ***ḱerd^{h}o(s)-/*ćerd^{h}o(s)-** > OInd. *śárdha-* 'power; company, troop', *śárdhas-* 'crowd, troop', Av. *sarəδa-* 'kind, sort'. A new etymology by P. Sammallahti (1998: 126).

40. S **earti** 'side, slope', Mordvin *irdes* 'rib', Cheremis *ördəš* 'side, flank', Votyak *urd-l̮i̮*, Zyryan *ord-l̮i̮* 'rib', literally 'side-bone' < ***ertä(s)**

← Early Proto-I-I/Iran. ***erd^{h}o-s** > Proto-I-I ***ard^{h}a-s*** > OInd. *árdha-ḥ* 'side, part, half'. The Saami fonn points to a geminated cluster *-rtt-*, but this phenomenon is attested also in several comparable cases (Koivulehto 1988). An established etymology.

41. S ***garta-** 'to tie, to bind fast' (= Inari S **korttad**) – Votyak *kerti̮-*, Zyryan *kęrt-* 'to tie' – < ***kert(t)e-**

← Pre-I-I ***kert-** > OInd. *cr̥tá-ti* 'ties' (fut. *cartsyati*; *c* shows the original full grade *e*: ***kert-** > ***cert-**).

The Permic (Votyak, Zyryan) vowels do not match perfectly, which in itself points to a borrowing (perhaps a parallel one). Instead of *-rt-*, *-rtt-* often appears in Saami (Koivulehto 1988, and see no. 40).

42. S **geavri** 'a circular thing': 'ski stick wheel, ring, shaman's drum, Saami drum' < ***kekrä**

← Pre-II ***kekro-** > Early Proto-II ***čekro-** > Proto-I-I ***čakra-** > OInd. *cakrá-* 'wheel; discus, circular missile weapon; circle; astronomical circle; cycle, cycle of years or of seasons' (IE ***k^{w}e-k^{w}-lo-** 'wheel, cycle').

On the other hand, S **geavli** 'a curved/circular thing; halo (around the moon or the sun)' < ***keklä** must be a Proto-Indo-European or a (Pre-) Gennanic loan from the same Indo-European origin. A new etymology.

Finn. **kekri** 'the old pagan new year feast' can be traced back to the same Prel-I source: as *'(the feast of) the yearly cycle': < ***kekrä-j**, a *j*-derivative from ***kekrä*** (for a detailed discussion of the Finnish and the Saami words see now Koivulehto 2000b: 241-250).

43. Finn. **herää-**, **herä(j)än**, inf. **herätä** 'to wake up (intr.)' < ***čerä-**

← Early Proto-I-I/Iran. ***džer-e/o-** (< ***ǵer-** < Pre-I-I ***ger-**) > OInd. *jára-se* 'you wake up', *jára-nte* 'they wake up' (perf. *jā-gā́ra* 'is awake' = Av. *jaγāra* id. < PIE ***h$_{1}$ge-h$_{1}$gor-e**). The Proto-Indo-European verbal stem is ***h$_{1}$ger-*** 'wake up, awaken' (EWAia I, p. 575): cf. Gr. *egeírō* < ***egerjō*** 'I awaken', (perf.) 'I am awake', (middle-pass.) 'I wake up'.

The etymology indicates that the result of the second palatalization was kept apart from the reflexes of the Proto-Indo-European palatal stops. A new etymology (Koivulehto 1999a: 221).

44. Finn. **kehrä**, **keträ**, Veps *kezr* 'wheel of the spindle', Liv. 'spindle'; S *gearsi* 'spindle; wheel of the spindle; snout of a pig', Mordvin (E) *št'eŕe*, (M) *kšt'iŕ* 'spindle' < ***kesträ** 'spindle'

← Pre-I-I/Pre-Iran. ***ket^{s}tro-/*kestro-** > Early Proto-I-I ***če-** > Proto-I-I ***ča-** > OInd. *cattra-*, *cāttra-* 'spindle', Proto-Iran. ***častra-** > Pashto *cāšai* 'spindle', etc.

There are just four words with (original) *-str-* in Finnic: all of them are loans. (Koivulehto 1979: 71-78.)

45. S **reašmi** 'net rope', Mordvin (E) *riśme*, (M)*riśmä* 'chain, rope' < ***reśmä**

<– Pre-I-I/Early-Proto-I-I ***rećmi-*** > OInd. *raśmí-ḥ* 'string, rope, cord'.

In view of the final open *-ä* in the loanword, the exact source word was probably a parellel form tenninating in IE *-mo-/-mā*, which has not been preserved, as far as I know. An established etymology.

46. Mordvin (E) sed', (M) *säd'* 'bridge; floor', Zyryan *sod* 'ladder, stairs', *sojd* 'bridge, footbridge' < ***se(j)te**

<– Pre-I-I/Early-Proto-H ***seitu-*** > Proto-H ***saitu-*** > OInd. *sétu-* 'binding; bond, fetter; dam, bridge', Av. *haētu-* 'dam'. An established etymology.

47. Finn. **vene**(h) 'boat', S *fanas*, *vanas*, Mordvin (E) *vemtš*, (M) *venəš* id. < ***veneš**

<– PIE/Pre-I-I/Early-Proto-I-I ***wen-(e/o-)*** > OInd. *ván-* (root noun) 'wood', *vána-* (n.) 'wood, tree; timber; wooden vessel' (Monier-Williams, p. 917; KEWA III, pp. 138-139).

Most ancient and new Finnic (non-derived) words for 'boat, canoe, vessel, ship' are loans, too: (from Gennanic:) Finn. **laiva** 'ship', **ruuhi** 'little boat, trough, (earlier:) a dug out stem, "Einbaum"; tub; groove', (obsolete., dial.) **karvas**, gen. **karpaan** 'a little boat' (= Veps *karbaz* "Einbaum"; cf. ON. *karfi* 'little ship', hardly from Baltic: cf. Lith. *kārbas* 'basket', cf. Fraenkel, p. 220), (from Old Swedish:) **paatti** 'boat', (from Russian:) **lotja** 'lighter', (from Modern Swedish:) **prooinu** 'lighter, barge', and, of course, all the names of more modern vessels. Old loans often show a suffixal *-eš*, without any clear counterpart in the source word (Koivulehto 1992a). ***veneš*** was apparently an "Einbaum": a dug-out stem used as a canoe/boat/vessel. There are many examples of words for 'vessels' which go back to 'a block of wood', cf. also Russ. *dub* 'oak; (dial.) "Einbaum". The Aryan original need not have meant 'boat', 'a wooden vessel' or something like that is enough: also the Gmc. original for Finn. *ruuhi* 'little boat, Einbaum' is not attested with this meaning, but only with the meaning 'a dug out stem/block of wood, tub, groove'.

That Finn. *vene* would be a derivative from Finno-Mordvinic ***vene-*** (Finn. *veny-*, Mordvin *venenems* 'to stretch (intr.)'): as *'a stretched, i.e. a long thing' (E. Itkonen: see SKES, p. 1695) is highly improbable. Firstly, the Finnic suffix *-eš* does not seem to form old deverbal derivates (while *-ek* does), as far as we know. Secondly, the alleged semantic parallel, Finn. **kaukalo** 'trough, basin', does not belong to Finn. *kauka-* 'distant; long', but is obviously a Baltic loan: cf. Lith. *kaukėlė* 'wooden bowl', *káukolė*

'skull' (= Gmc. **χauχa-* Swed. > *ho* 'trough') (Koivulehto 1994a: 232-233). That words for 'tub, vessel' are easily used for 'boat, ship' is a commonplace (Buck, pp. 726-729). Note, too, that **veneš* has been, so far, the only case on the strength of which an old deverbal suffix *-eš* has been posited: so, the alleged connection with Finn. *veny-* also smacks of circular reasoning.

There is no absolute language-internal certainty that the Aryan /a/ in the posited source word goes back to an earlier /e/ (because, as is well known, PIE /e/, /a/, /o/ merged in Common Aryan /a/, and the word seems to have no exact cognates in other Indo-European languages). However, in so far as the word is of Indo-European origin (PIE **wen[H]-*), the most probable vowel was /e/, especially if the word was, as it seems, originally a root noun (cf. EWAia II, p. 500).

I hope the readers of this volume had a good laugh at my expense while reading the fictional scene staged by Eugene Helimski in order to ridicule my etymology. Seriously speaking, however, there is no substance in Helimski's criticism. Anything can be borrowed, provided that the contacts are intensive enough (Laakso 1999: 62); and words for means of locomotion are especially likely to be borrowed, unless there is an acceptable autochthonous etymology, which is not the case here. The constant flow of lexical borrowings from Indo-European to Finno-Ugric accounts for the fact that no ancient common Uralic or Finno-Ugric term for 'boat' has been preserved (at least not in the westerly Finno-Ugric languages), although the object itself was, as an "Einbaum", well known in early Uralic times and for a long time before. – The method chosen by Helimski only shows that he has run out of serious arguments.

Since Helimski has also chosen to attack my etymological research in general and to reject my results wholesale, I am obliged to deal with his accusations in brief.

Charge no. 1: Lexical scope: My loan etymologies contain almost as many verbs and adjectives as nouns; and, more generally, my loan etymologies contain words for elementary objects and actions. – This charge is invalidated by the widely-known fact that "in the case of very intensive language contacts, practically anything can be borrowed, from words to affixes and structures." (Laakso 1999: 62). Unfortunately, this basic fact that has been controlled and verified by numerous cases from more recent languages, seems to be ignored by researchers working on Nostratic premises. Actually, this is quite understandable: early loans must be rejected because they threaten the Nostratic positions which presuppose that the words concerned are genetically related, Nostratic words. It would also be interesting to know which of the many adjectives claimed by Helimski really are covered in my paper published here. Among the 56 cases I can find only the following three: **serä* 'old, aged' (no. 48), **paksu* 'thick, fat, dense' (no. 52), **ačnas* 'greedy, voracious' (no. 53), all of them are Proto-Iranian loans (additionally there is Finn. *kalvas, kalpea* 'pale', which is only hinted at in connection with S *guolbba*: no. 26). I will return to this question at the end of this paper.

Charge no. 2: The Indo-European source words and their Finno-Ugric counterparts postulated by me, "often" differ semantically. – I think we can safely claim the opposite: most of my cases show a rather far-going semantic congruence, given the fact that there is a great time-depth. That there are sometimes minor semantic differences, is of course unavoidable: the same can be observed also in quite recent loans: cf. e.g. Finn. colloquial *snaijata* 'to understand, comprehend' from Russian *znat', znaet* 'to know'.

Charge no. 3: Stem structure: "quite often the presumed sources differ from the words which are actually attested in the Indo-European languages in the presence or absence of a suffix, in their *Ablautstufen*, etc.". – In my present paper, at least, where is the evidence of the

first claim? Of course, now and then we can observe that genuine Finno-Ugric or Proto-Finnic suffixes have been attached to the borrowed stems, but this is nothing peculiar. E.g. almost all later verb borrowings have verbalizing suffixes, and suffixation can occur in nouns, too (e.g. *-eš* is a frequent suffix, often without an exact counterpart in the source word: see Koivulehto 1992a, and now also 1999b: 309-328). The "omission" (Helimski: "absence") of a suffix in a source word is, as far as I know, very rare in my material and can easily be accounted for. In no. 10 (**vete*) the Indo-European counterpart is a heteroclitic *-er/-en-*stem, but it is obvious that this stem has been derived from a root noun **wed-* (cf. also Armenian *get* 'river'). And this is, of course, also postulated by the Nostraticists. As to the *Ablaut stufen*, the assertion is simply not true. In no case do I suggest an *Ablautstufe* which would not be attested in the source material, that is in the postulated source word.

Charge no. 4: Phonetics: Helimski reproaches me for having made new rules, which, however, are illustrated only with new etymologies which also stem from me. Helimski obviously refers to new substitution rules. – Helimski attacks here a standard scientific procedure. If I claim to have found a new substitution model, the proof of it can only be produced by showing that "it works", i.e. by showing that several other cases can also be found which show the same substitution, i.e. which are explained by the same substitution rule (cf. e.g. Section 4 in this paper). There is simply no other way. Reproaching this standard scientific method, Helimski openly takes a stand against development and innovation within science.

Charge no. 5: A combination of my alleged faults. After the above discussion further words would be superfluous.

4. A PROTO-IRANIAN FEATURE: REFLEX OF AN EARLY DEPALATALIZATION OF THE COMMON-ARYAN PALATAL AFFRICATES

It has often been assumed that Aryan (= Indo-Iranian) loans in Finno-Ugric languages are, in reality, of an early Iranian origin. This is hardly true of the most ancient loans – at least it cannot been demonstrated, quite simply because for those early times it is impossible to establish a linguistic boundary between Indo-Aryan and Iranian. Those loanwords must simply be defined as Aryan or Indo-Iranian and in some cases even Pre-Aryan (for Pre-Aryan = Pre-Indo-Iranian cf. e.g. nos. 41, 42, 44 in the preceding section: the palatalization of velars before front vowels had not yet taken place). But there is one criterion by which early Iranian loans can be distinguished from the common Aryan or Indo-Iranian ones: the reflexes of what were the early Proto-Aryan palatal affricates, which, in turn, go back to the Proto-Indo-European palatal stops *ḱ*, *ǵ*, *ǵʰ*. These affricates were early depalatalized in Iranian, i.e. they developed into non-palatalized dental affricates, which have been preserved as such in the Nuristan branch, but became later non-palatalized dental sibilants e.g. in Avesta. As the Proto-Indo-European aspiration correlation had disappeared even earlier, only two depalatalized affricates were left: (Early-)Proto-Iranian unvoiced *ts* and voiced *dz* (I use here the notation of M. Mayrhofer 1989 and R. Schmitt 1989).

Now it can be shown that these Iranian depalatalized affricates are reflected by several loanwords. While there are loans which show Finno-Ugric palatal substitutes for Pre-Aryan and Proto-Indo-Aryan palatal affricates (cf. nos. 37, 39 above), there are also loans which show non-palatal Finno-Ugric substitutes for Proto-Iranian depalatalized affricates *ts* and *dz*. Actually, two different substitution patterns can be found: they must represent two different layers of borrowings, which very probably also differ chronologically (Koivulehto 1999a: 214-231; 2000a: 35-40).

(1) In the earlier layer the substitute was FU *ks*, which in initial position was replaced by *s* – according to the general rule, which prohibits initial consonant clusters and means that in loans only the last consonant of a cluster of the source word is replaced. This substitution was due to the fact that Finno-Ugric did not possess a corresponding dental, non-palatalized ("sharp") affricate **c* [ts] and a two-phoneme-cluster *-ts-* was unknown, too. – Note that the present cluster Finn. *-ts-* (< Late Proto-Finnic *-tts-*) goes back to the Pre-Finnic geminated palatalized affricate *-ćć-*. – So the phonotactically impossible cluster *-ts-* was replaced by the existing cluster *-ks-*. Correspondingly, the Germanic cluster *-Tl-* (T = dental stop or fricative, with the exception of *s*) was replaced by the Proto-Finnic *-kl-*, as a **-tl-* did not (and still does not) exist (cf. Finn. *neula* 'needle', Karel. *niekla*, etc. < **nēkla* ← Gmc. **nēplō*). That the Finno-Ugric non-palatalized dorsal ("cacuminal") "hushing" affricate *č* (> Finnic *h* or *t*, see (2) below) was not felt to be an adequate substitute at first can be explained by the fact that this phoneme was, at the same time, used to replace the results of the Early Aryan palatalization of Proto-Indo-European velars/labiovelars before front vowels, i. e. Proto-Iranian *č* and *ǰ* (see Mayrhofer 1989: pp. 6, 11, and cf. no. 43 above). This indicates that the "results" of this palatalization were phonetically clearly distinct from the Iranian depalatalized affricates.

(2) Gradually, however, the Finno-Ugric non-palatal affricate *č* [tš] was getting to be used also as the appropriate substitute for the Iranian depalatalized affricates. In Baltic Finnic, this affricate became *h* (mostly in initial position) or *t* (often in medial position). Note that there was still no "sharp" dental affricate. Obviously, this phoneme, at the same time, continued to be substituted for Proto-Iranian *č* and *ǰ*. Examples of these two layers are given below.

4.1. (Early-)Proto-Iranian TS → FU VksV/#sV

4.1.1. Early Proto-Iranian loans (with preserved IE /e/)

48. Mordvin (E) **sire**, (M) *sirä*, *širä* 'old, aged' < ***serä**

← Early Proto-Iran. ***dzero-*** > Proto-Iran. **dzara-* > Modern Persian *zar* 'old man' (=Armenian *cer* 'old man' = PIE **ǵerh$_2$o-*); the Proto-Indo-European verbal root is **ǵerh$_2$-* 'to make old, to decay'. Cf. also OInd. *járant-* (Nom., Voc. *járan*) 'old, decayed' = Gr. *gérōn*, gen. *gérontos* 'old man' = Ossetic *zärond* id.

Words for 'old' tend to be borrowed. S **vuoras** 'old (of people, animals), an old man' is a Baltic loan (cf. Lith. *võras* 'old') and S **boaris** 'old, former' an Aryan one (cf. OInd. *para-ḥ* 'distant, remote; previous, former, ancient', etc. (Koivulehto 1992b: 302; 1999a: 229; Sammallahti 1998: 232; 1999: 82). The Finnic word for 'old', Finn. **vanha** (< ***vanša**) seems to be an old Gmc. borrowing (cf. Gmc. ***wanha-*** 'crooked, bent') which has been adopted also into Permic (Votyak *vuž*, Zyryan *važ* 'old'); the Zyryan vowel does not match, which in itself points to a borrowing from Finnic. Quite recent loans are (colloquial) **stara** 'old man' (cf. Russ. *staryj* 'old', *starik* 'an old man'), **gubbe** 'an old man' (vg. Swed. *gubbe* id.). A new etymology (Koivulehto 1999a: 221-222). – And finally, it seems plausible that FU **soŋka* 'old' (> Cheremis *šoŋgâ*, *šoŋgo* 'old; an old man', Hungarian *agg* id., UEW I 448) is also a borrowing: cf. Oind. *sanaká-* 'former, old, ancient' (~ Lat. *senex* 'old, an old man', Gall.-Lat. *Seneca*, etc.); the Finno-Ugric middle syllable is liable to be syncopated, especially in loanwords (cf. no. 21), and for the Proto-Aryan /a/ (<IE /e/) see no. 36.[2]

49. Finn. **synty-**, inf. **syntyä** 'to be born' (→ S *šadda-* 'to be born; to become; to grow'), noun *synty* 'birth, origin, genesis'; Zyryan *sod-*, *sud-* 'to increase' < **sen-tü-*

← Early Proto-Iran. ***dzen(h$_1$)-*** > Sogd. *zn-* 'to bring forth', Khot. *ysan-* 'to give birth' – cf. also Middle Persian, Modern Persian *zādan* 'to be born', Oss. *zajyn*, (Digor.) *zajun* 'to give birth; to be born, to grow' (Abaev IV, p. 284), Middle Persian *zādag*, Modern Persian *zāda* 'born, child' – < Early Proto-I-I **j'en(h$_1$)-* [d'źen-] > OInd. *ján-a-ti* 'to give birth, to generate', *jáyate* 'to be born, to grow': < PIE ****ǵenh$_1$-*** 'to beget, to generate, to give birth; (middle) to be born'. The Zyryan vocalism points to an original *e*, in Finnic. *e* > *ü* has taken place due to the influence of the medial suffix *-tü-* (see Itkonen 1954: 279-280).

[2] From the Finno-Ugric point of view (Hungarian, Cheremis), it is equally possible to posit a FU **šoŋka*, which would enable us to equate Finn. **honka** 'old, often dried up pine tree' (< **šoŋka*) to it. Also the Indo-Iranian word allow the positing of a FU initial **.šV-* for an early I-I **sV-*, since there was no initial I-I **š-*, originally.

A more recent loan from the same I-I word family is Zyryan **zon** 'son' (Rédei 1986: 82): cf. Av. ***zana-** (= OInd. *jána-* 'creature, man').

An early loan of the Proto-Indo-European stage from the same word family is Finn. **ihminen,** more ancient **inhi-mi-nen** 'man, human being' < ***inše-** ← PIE ***ǵn̥h$_1$(-e/o-)/*ǵn̥h$_1$-ye/o-** > OInd. *já-* 'born, offspring, descendant', Gmc. **kuna-* > ON. *kon-r* 'son, noble man' / Gmc. **kunja-* > ON *kyn* 'generation, lineage' (Koivulehto 1991: 79-82).

All (?) old Finno-Permic verbs denoting 'bearing, generating, increasing, growing' seem to be loanwords. Proto-Indo-European loans: Finn. **itä-** 'to genninate', **kasva-** 'to grow', Finn. **suku** 'generation, family, lineage (a nominal derivative from **suke-*: cf. *suke-utu-a* 'to be born, to develop, to grow': ←PIE **suH-* 'to beget, to bear', see Koivulehto 1991: 51, 32-36); Iranian loans: Finn. **hadas,** *hata* 'germ' (no. 54), Mordvin **tšatšo-** 'to be born; to grow (well)' (Koivulehto 1999a: 226), Votyak **vord-** 'to bring up, to feed; to give birth', Zyryan *verd-* 'to feed; to give birth' (Rédei 1986: 80). An old Slavic loan: Mordvin **raštams** 'to increase, to bear' (Stipa 1977: 158-160). – F *-tu- /-tü-* is a verbal suffix (medial-refl.), the corresponding transitive verb would be ***sen-tä-* ***'to give birth'. A new etymology (Koivulehto 1999a: 222-223).

50. Finn. **kahdeksan, yhdeksän** 'eight', 'nine' (<***kak-teksa-**, ***iik-teksä-**; 'two-ten', 'one-ten', more or less deformed forms also in Saami, Mordvin, Cheremis) < ***-teksä** 'ten'

←– Early Proto-Iran. ***detsa** 'ten' (> Proto-Iran. **datsa* > Av. *dasa*, OPers. *daθa*; Kati (Nuristan) *duc* [-ts]) = Proto-I-I **daća* > OInd. *daśa*. An old etymology revived on new grounds by A. Parpola: cf. also the semantic parallel from Dravidian: Proto-Dravidian, **om-patu* 'nine': 'one' + 'ten' (Parpola 1999: 198-199).

A traditional etymology, but the former explanations were phonetically not acceptable. (Koivulehto 1999a: 224-225; see also Parpola 1999: 198-199; Schindler's [1963: 204] "Pre-Aryan **dekśa-*" is, of course, impossible).

A more recent borrowing is Votyak, Zyryan *das* 'ten'.

4.1.2. Proto-Iranian loans (with IE /e/ > /a/)

51. Finn. **maksa-**, inf. *maksaa* 'to pay; to reward; to cost', Mordvin (E) *maksa-*, (M) *maksə-* 'to give' < ***maksa-**

←– Proto-Iran. ***ma(n)dza-** > Av. **mązə-* (cf. Av. *mązā.raii-* 'giving wealth') = Proto-I-I **manha-* > OInd. *máṃhate* 'gives, grants, bestows' < Pre-I-I **menj^{h}-e/o-* < PIE **meng^{h}-* (EWAia II, p. 286; IEW, p. 730).

The loss of the nasal before a consonant cluster like *-ks-* is regular. That the verb is a borrowing, is additionally proved by the fact that there was already a homonymous noun stem in the language: Finnic-Mordvin *maksa* 'liver' = Finn. *maksa* (< PU **mi̯ksa*). It is extremely unlikely that a

homonymous verb stem should have been created just "by chance", out of nothing. A new etymology (Koivulehto 1999a: 221).

52. Finn. **paksu** 'thick, fat, stout', Vepsian *paks* 'thick, dense', Votic *pahsu* 'thick', Est. *paks* 'thick, dense' < ***paksu**

← Proto-Iran. ***badzu-** > Baluči *baz* 'dense' = Proto-I-I **baj'^{h}u-* > OInd. *bahú-* 'much, large, thick' (= Gr. *pakhý-s* 'thick, dense, stout'), *bahur lá-* 'thick, dense' < Pre-I-I **b^hŋ̣j'^{h}ú-* < PIE **b^hŋ̣g^{h}ú-*; Proto-Indo-European root **b^heng^h-/*b^hŋ̣g^h-* 'thick, dense, fat'. A new etymology (Koivulehto 1999a: 221).

J. Schindler (1963: 203) has already connected these words, but his "Pre-Aryan" source word reconstruction **bhagźhu-* is impossible.

4.2. Proto-Iranian TS → FU č (non-palatal affricate)

53. Finn. **ahnas/ahne** 'greedy, voracious; avaricious' < ***ačnas/*ačneš**

← Proto-Iran. ***atsnas** (= Proto-I-I **aćnas* > OInd. *aśnaḥ* 'voracious'; a *-na-* derivatation from I-I. *aś-* 'eat' < PIE **$h_2$ak̑-* < **$h_2$ek̑-*). A new etymology (Koivulehto 1999a: 225-226).

54. Finn. **hadas**, gen. *hataan*: *juuri-hataat* 'roots of a germinating seed', *ohra on hataalla* 'the barley is springing up'; *hata, hatu* 'first new sprouting crop, shoot', *ohra, ruis, herne on hadulla* 'the barley, the rye is springing up', Karel. *hatahalla* 'in germ', *hatajas* 'the root of a germinating seed' < ***čata**(s)

← Proto-Iran. **dzāta-*(**s**), past part. of the verb **dzen-*: 'born, germinated, grown', etc. 'germ' = Proto-I-I ** j'āta-s* > Olnd. **jātá-ḥ* 'born, engendered, grown, appeared'. This participle is represented for instance by Oss. *zad* 'malt' < *'germinated corn': *zad xor* 'germinated corn' (Abaev IV, p. 283); the malt is produced by germination. A new etymology (Koivulehto 1999a: 226).

55. Finn. **huhta** 'burnt-over clearing', etc., Mordvin (E) *tšuvto*, (M) *šufta* 'wood (material)' < *'firewood' < ***čukta** 'burnt patch, burnt over clearing'

← Proto-Iran. ***tsukta-** > Av. *(upa-)suxta* 'burnt, set on fire', Modern Persian *sūxt, sūxta* id. = Ossetic *syḡd*, (digor) *suḡd* = Proto-I-I **ćukta-* (< PIE **ḱuk-to-*, zero grade part. perf. of the verb **ḱewk-e/o-* 'to burn, to glow, to shine').

The semantic background is illustrated by Ossetic *syḡd*, (digor) *suḡd* 'smoking; scorched, burnt'; (as a noun) 'burning, fire, burnt patch' (Abaev III, pp. 188-189, 165, 167-168), *syḡdon*, (Digor) *suḡdon* 'ashes; burnt patch'; to the same word family also belongs Ossetic *sūg* 'chopped

firewood, logs' < Iran. **sauka-* 'flame, fire' (Abaev III, pp. 165, 168) < Proto-Iran. **tsauka-*. The Mordvin sense 'tree, wood' is of course a secondary one, being an extension of *'firewood' (or, altematively, of *'trees growing on an old burnt patch': cf. Finn. *kaski*, 'bumt-over clearing', but dial. also 'a young birch'). As to the semantic relationship 'bumt patch' ~ 'ashes' cf. also Finn. **kaski** < ***kaske** ← PIE ***h$_2$azgV-** >> Swed. *aska* 'ashes': see etymology no. 14 above.

The irregular Mordvin *u* instead of the expected *o* points in itself to a borrowing. A new etymology (Koivulehto 1999a: 226; cf. also Koivulehto 1991: 32).

56. Votyak, Zyryan **už** 'stallion', Cheremis *ožo, ožə̑* id. < ***oč(w)a/*ëč(w)a** ← Proto-Iran. ***atsva-** > Av. *aspa-* 'horse' (= Proto-I-I **aćva-* > OInd. *aśva-* 'horse, stallion' < PIE **h$_1$ek̑wo-* > Lat. *equus* 'horse, stallion', etc.).

Permic *ž* is a normal reflex of FU *č* in word-medial position. The vowel correspondence between Permic and Cheremis is irregular, which in itself points to a borrowing; the same Permic vowel is attested also in other I-I loans which have I-I /a/. – A new etymology (Koivulehto 1999a: 227).

5. CONCLUSIONS

The very old contacts of the westem branch of Uralic with North-West Indo-European on the one hand (nos. 12-27), and with Pre-Aryan, Pre- and Early-Proto-Iranian on the other hand (nos. 33-56), suggest that the oldest Uralic homeland inferable from lexical contacts between Proto-Indo-European and Proto-Uralic (nos. 1-11) should be located not very far (south-)east of the ancient regions of Finnic and Saami, and the hypothesis of an Asian homeland should be rejected. In the present situation, the best altemative seems to be Central/Westem Russia; the westward spread of westemmost Uralic languages seems to have coincided with the westward spread of the (later) Combed Ware culture (4000-3600 BC).

There is a persistent view adhered to by some researchers, even today, according to which the apparently oldest lexical similarities like those presented above in Section 1 (nos. 1-11) should be interpreted as evidence of a genetic relationship between Proto-Indo-European and Proto-Uralic, in other words, as a lexical heritage of a common protolanguage, of an Indo-European-Uralic Proto-Language. However, as I have already claimed elsewhere (see e.g. Koivulehto 1993; 1994b: 141-145), the phonetic resemblance of the Proto-Indo-European words to their Proto-Uralic counterparts is far too strong to be explained by a common origin. The vowels are phonetically "the same" – i.e. as far

as that is possible –: PIE /e/ is rendered by U /e/, PIE /o/ is rendered by U /o/. The seeming exceptions (cf. nos. 2, 4, 7) are due to the fact that there was not always an exact phonetic counterpart in Uralic (there were no syllabic resonants and no labiovelar stops in Uralic). Furthermore, the consonantal counterparts are quite naturally explained by the same reason, as Uralic substitutions for such Proto-Indo-European consonants which had no exact Uralic counterparts. So the phonetic relationships of the examples in Section 1 are the same as in the examples in Section 2 (nos. 12-32), which by no means can be merely loans, quite simply, because the (P)IE counterparts are, with a few exceptions, perhaps, themselves derivatives from shorter Proto-Indo-European stems. Consequently, the oldest layer must be borrowed, too. If they were cognates, i.e. representatives of common "Indo-Uralic" words, the phonetic similarity would not be that strong. On the contrary, we would then observe divergent developments. And we should be able to detect regular sound laws (*Lautgesetze*), which, in turn, could account for these divergencies. In other words, we should be able to explain the alleged Indo-Uralic genetic relationship in the same way as we can explain that OInd. *ad (anam)* and G *ess(en)*, E *eat* are genetically the same verb, or that OInd. *cakrá* and E *wheel* are genetically the same noun. As long as this cannot be done with Indo-European and Uralic lexical items, a common origin cannot be shown, at least not by lexical material like that given in Section 1. This ought to be completely clear.

A still wider genetic frame is represented by the so-called Nostratic theory/hypothesis, the adherents of which are found today particularly among Indo-Europeanists and Uralists who have had their academic education and training either in what was the former Soviet Union or in the USA. It goes without saying that the more remote a relationship is assumed, the frailer the alleged lexical evidence of it is. Because no suitable lexical material can be found – so far –, which could qualify as evidence, especially with regard to such an immense time depth, the theory must remain – for the time being – just a belief or a hypothesis.[3] – A somewhat greater chance of saving the hypothesis may perhaps be found in some grammatical morphemes and similarities in some pronouns. But, once again, the lexical material, as presented e.g. in this paper, does not qualify as evidence.[4]

[3] This is also the view of Lyle Campbell (1998), who shows that even the best cases of Nostratic lexical comparisons involve inconsistencies in the alleged Nostratic sound correspondences and obvious mistakes in the alleged reconstructions of e.g. Uralic forms.

[4] Note that I am not opposed to the Nostratic hypothesis as such (cf. Koivulehto 1994b: 145). I only want to stress that the lexical material like that presented in Section 1 in this paper cannot be used as evidence to support it.

Unfortunately, this is not clear to the snpporters of the lndo-Uralic and the Nostratic hypothesis. Consequently, they can accept only borrowings from later branches of Indo-European, but not from a Proto-Indo-European stage itself. But there is no rational reason to think that there were no contacts on the proto-language level – and even on a pre-protolanguage level, for that matter. On the contrary, to make such a restriction is a circular way of reasoning, the only goal of which is to save the Nostratic hypothesis.[5]

That there are many elementary verbs among the most ancient borrowings, is simply explained (1) by the fact that anything can be borrowed, provided the contacts are intense enough, and (2) by the fact that verbs for elementary actions – no matter whether borrowed or genuine verbs – are the best preserved lexical entities, while nouns and especially adjectives are more liable to be replaced by innovations (by derivation processes, etc.) or, more usually, by new loans. A good case is the adjectives for 'old, aged' (see no. 48): besides the Proto-Iranian loan **serä*, there are several other loans: Finn. *vanha* (from Gennanic), Saami *boaris* (from Aryan), Saami *vuoras* (from Baltic). Recent loans are Finn. (colloquial) *stara* 'old, an old man' (from Russian), *gubbe* 'an old man' (from Swedish).

Finally, it may be added that there is, today, a far-reaching consensus on the dating and stratification of the ancient Indo-European and Indo-Iranian loans presented in this paper. I refer to Carpelan (1999; 2000), Häkkinen (1996), Kallio (1999; forthcoming), Parpola (1999; also Parpola & Carpelan in this volume), Sammallahti (1998; 1999). This statement does not exclude some

5 Just a few remarks to some alleged "lndo-Uralic"/"Nostratic" words, enumerated by Helimski in his paper (see now also Helimski 2000: 496, fn. 19 & 497, fn. 24): If IE **g^{h}es-* 'hand' were cognate with U **kāte* id. (how is IE -s- ~ U -t- accounted for?), then IE **wed* 'water' cannot be equalled with U **wete* because neither the consonant nor the vowel have identical correlation patterns. There is no reason why IE **men(H)-* 'to step upon' should be genetically cognate with U *mene-* 'to go': if the semantic difference can be accounted for (as it obviously can: there are several semantic parallels), nothing prevents us from assuming here a normal loan etymology; as for semantics: cf. the Baltic zero grade counterpart, Lith. *mìnti, mìna* 'to tread upon', but also 'to go' (Karaliūnas 1995: 87), Finn. *astua* 'to step, to go' etc. Furthermore, several other words for 'going' are loans, too (see no. 4 above). (Let it be said, too, even if it should be completely needless, that the Baltic zero grade does not, of course, match the U *e* in **mene-*. But this IE principal *e* grade of the verb root must have been there, originally, otherwise also the zero grade could not be possible!) The Finn. word for 'sinew' goes back to Proto-Finno-Permic **sõne* < PFU **sȳne* = PU **sixne* and the PIE form must be reconstructed as **sHinu-*. This being the case, it is obvious that the Uralic word was borrowed from (Proto-)Indo-European (for details, see Koivulehto 1995a: 126-128; 1999b: 351-353). Also the much discussed 'name' can be explained as an old Indo-European loan (Koivulehto 1995a: 128-132; 1999b: 353-357).

minor differences of interpretation in matching the linguistic evidence with that of archaeology.

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THE NEOLITHIC PERIOD OF NORTH-WESTERN SIBERIA: THE QUESTION OF SOUTHERN CONNECTIONS

L. L. Kosinskaya

The question of possible southern connections during the Neolithic period of north-westem Siberia is not a new one. It has been investigated ever since S. P. Tolstov (1948). V. N. Chemetsov (1953; 1968) discovered some similar features between the pottery of the early (Kozlovskaya) phase of the Vostochno-Uralskaya (Eastem-Urals) culture and the Kelteminar culture in the Aral Sea area. In his later works he not only elaborated the concept of the Urals-West Siberian ethnocultural province (UWS ECP) and its evolution, but he also argued in favour of its Uralic attribution, using ethnological, linguistic and anthropological evidence. His final version goes as follows:

The UWS ECP (the Proto-Uralic ethnocultural area) was formed in the Late Mesolithic as a result of a mixture of two components: indigenes, the descendants of the West-Siberian Upper Paleolithic population, and newcomers from the Aral region. In the Early Neolithic, the UWS ECP consisted of the Volga-Kama Pricked Ware culture in the Western Sub-Urals and the Eastern Ural culture in the Trans-Urals (including the all known Neolithic sites from the northern to the southern Trans-Urals). Their similarity with the Kelteminar culture included both pottery ornamentation and lithic artifacts such as blade flint tools and particularly the Kelteminar type of shouldered arrowheads. In the Middle and Late Neolithic, the UWS ECP extended as far as the Lower Ob and Yenisei, while the Proto-Uralic disintegration manifested itself in the formation of a number of cognate cultures: the Kama Comb Ware culture (Proto-Finno-Permic), the Eastern Urals culture (Proto-Ugric) and sites east of the Irtysh river (Proto-Samoyedic). The north-eastern part of the area was presumably the territory of the ancestors of the Yukaghirs (Chrnetsov 1969; 1973). The co-authors

of this view were O. N. Bader (1970; 1972), A. Kh. Khalikov (1969), A. P. Okladnikov (1957) and P. N. Tretyakov (1966). From the linguistic point of view, it was supported mainly by the studies of P. Haidú (1964), who located the original Uralic home in the taiga zone of the Urals and Western Siberia.

We should give due credit to these archaeologists who succeeded in elaborating this detailed and valid hypothesis though the available archaeological data were sporadic and meagre. However, some specialists disputed Chrnetsov's claim about the great role played by the Kelteminar culture in the Uralic ethnogenesis. While not refuting the southern connections of the UWS ECP that had been revealed, they assumed its base to have been a generally indigenous one, and they regarded similarities in pottery as an effect of cultural borrowing from the south (Tretyakov 1966; Formozov 1972 and others). I might also add here that the core of the Eastern Urals Neolithic community was located in sites in the Middle Trans-Urals (the southern woodland area), and V. N. Chrnetsov applied their particular characteristics to the northern and north-western areas of the UWS ECP, which had hardly been investigated at that time.

MODERN DATA

Field studies in the 1980s and 1990s have considerably increased the number of Neolithic sites, especially in the north of western Siberia (fig. 1). Thus, nowadays the picture of the Neolithic period that one gets is much more complicated, though it is not quite complete because there are still uninvestigated territories in the north. In the middle and southern taiga zone most Neolithic settlements have been investigated, but there are still isolated sites in the northern taiga that await exploration. No burial sites have been found, so the Neolithic anthropological type is still unknown. Recent data have revealed that the Early Neolithic culture in the Urals and western Siberia was not unique. The Eastern Urals culture, which was considered to be the Urals-West Siberia "standard" for a long time, occupied only the middle Trans-Urals. It has been suggested that the Neolithic of the area should be divided into two (but not three) stages: the Kozlovskaya culture representing the Early Neolithic (fig. 2) and the Poludenskaya culture representing the Late Neolithic. On the other hand, the Sosnovoostrovski cultural type (the Chestyiag phase, as Chernetsov called it) should be considered an Eneolithic one (Kovalëva & Chairkina 1991). Lastly, the Kelteminar type of shouldered arrowheads, which have never been found in stratified Neolithic layers, has been ascribed to the Eneolithic Shapkulskaya culture (Starkov 1976).

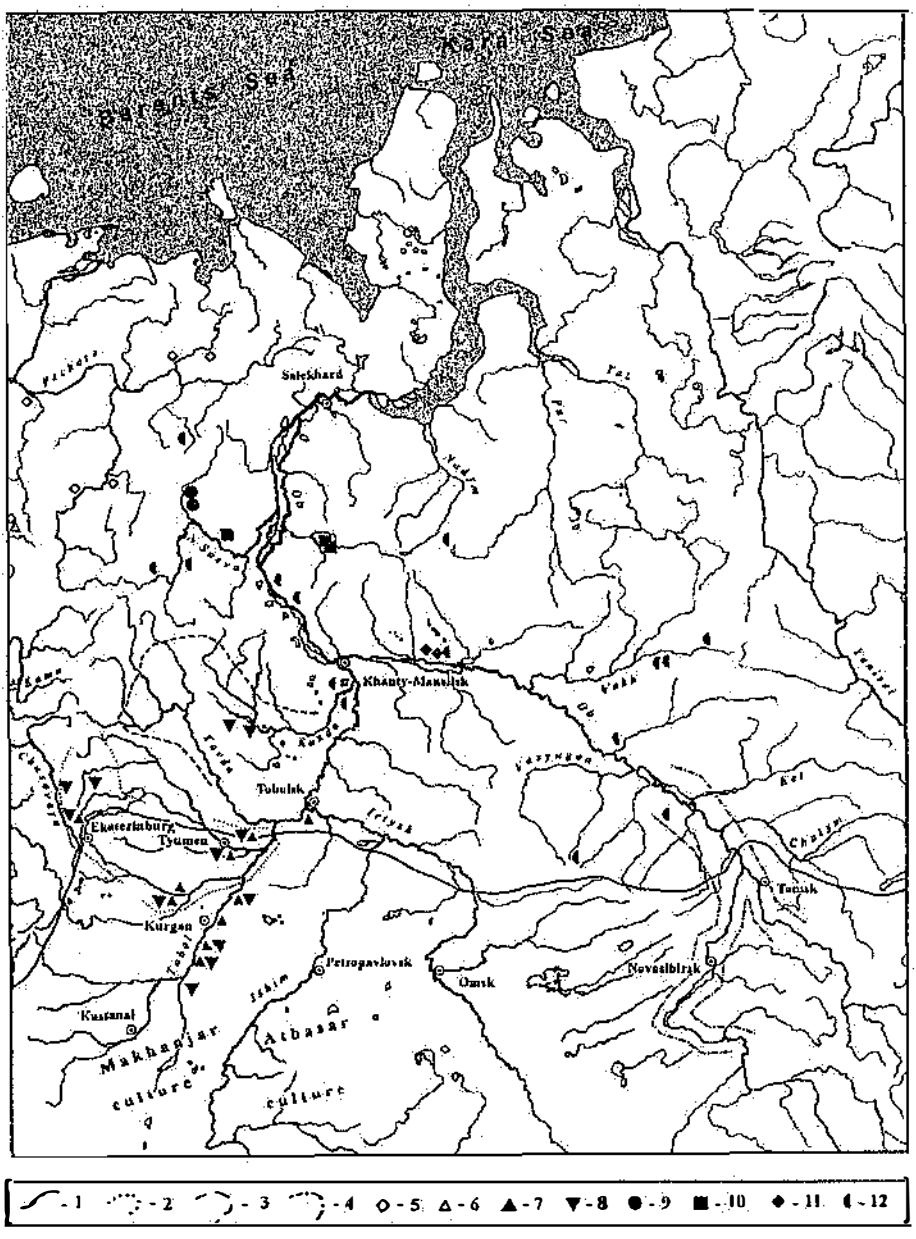

Fig. 1. Neolithic cultures and cultural types in the UWS taiga zone: (1) the southern limit of modern taiga zone – cultural areas: (2) Eastern Urals (Vostochnouralskaya), (3) Sumpanyinskaya, (4) Upper-Ob, (5) Sites of the Chernoborskaya culture, (6) Kama type, (7) Koshkino culture, (8) Boborykino culture, (9) Chestyiag type, (10) Amninski type, (11) Bystrinski type, (12) other Neolithic sites.

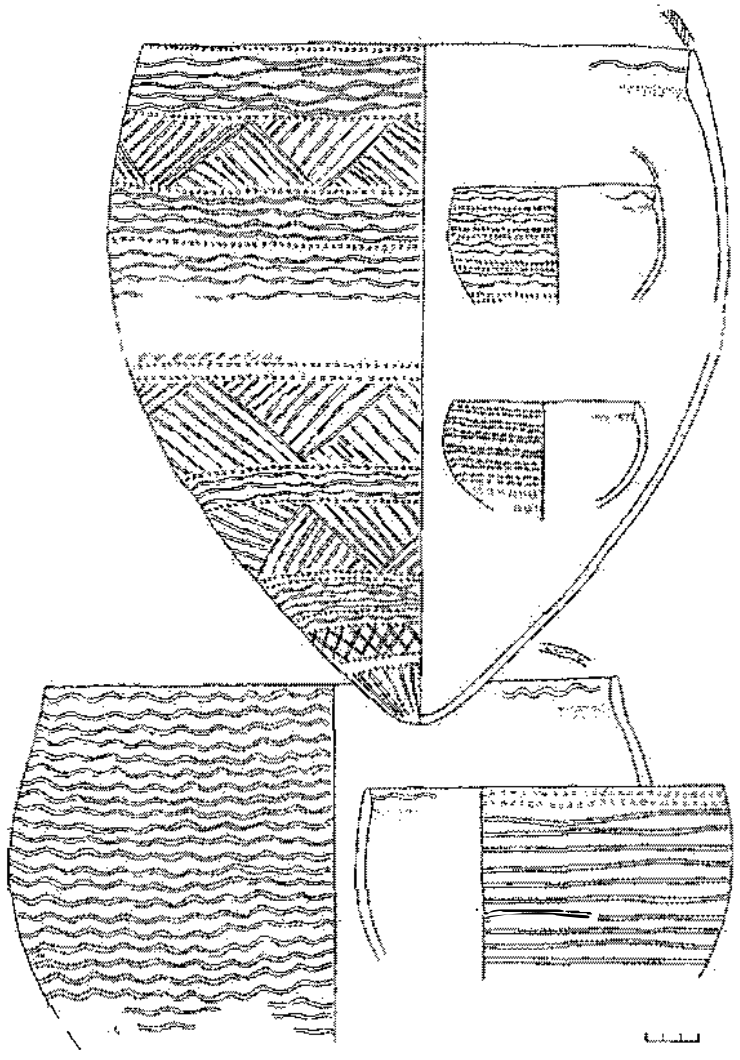

Fig. 2. Vessels of the Eastern-Urals' culture (early stage) from Iseiskoe Pravo-berezhnoe. (After Kemer 1991, fig. 2.)

A number of new cultures and cultural types have been distinguished in the Middle and Lower Ob area, some of them dating back to the Early Neolithic: the Sumpanyinskaya culture (Krizhevskaya & Gadjieva 1991) in the Konda basin (fig. 3), the northern Trans-Urals; the Chestyiag type of sites (Vasil'ev 1991) in the northern Sosva basin (fig. 7), the Northern Trans-Urals; the Bystrinski type of sites (figs. 8-10) in the Middle Ob area (Kosinskaya 1997a) and presumably,

the Amninski type of sites (figs. 4-6) (Morozov & Stefanov 1993) in the Lower Ob area (its archaeological and C^{14} datings are controversial). All of them are characterized by egg-shaped vessels with drawn-line and pricked wavy decoration together with a combed one. It has been found out that "natural" implements, i.e. bones, teeth and the jaws of small mammals such as beaver, hare, martin, etc. were used for both kinds of ornamentation in the whole Urals-West Siberian region (Kalinina & Gajieva 1993). Some vessels were partly decorated or undecorated. The main ornamental patterns are strait, wavy and zigzag lines, contained in horizontal or vertical zones. Sometimes there is a row of pits below the rim and small "ear-like" projections upon it. The latter are typical of the ceramics of the Eastern Urals and Middle-Irtysh cultures as well as some others. In addition, boat-shaped vessels have been found at the Chestyiag site and flat-bottomed pottery at the Amnya I and some other sites.

The lithic technologies of the taiga cultures have almost nothing to do with that of the Eastern Urals culture. Their characteristic features are flake-knapping hard-rock materials (quartz, quartzite, chalcedony) instead of a blade technique and rare retouching, so that individual morphological types can be distinguished. On the other hand, there is a variety of abrasive tools and polished implements (adzes, axes, chisels, knives, arrowheads) made of slate and other soft rocks. These peculiarities stem from the poorness of the taiga zone in raw materials and may be interpreted as a result of prolonged adaptation since the Late Mesolithic at least.

All the northern cultures have yielded examples of rectangular and square semi-pit dwellings differing in size (from 30-40 to 120-200 m²) and depth (0.5-1.5 m). Some sites are unique as architectural complexes. At the Amnya I promontory fort (the Amninski cultural type), three lines of ditches and palisades have been built in a reconstruction of the settlement (fig. 4). At the Bystryi Kulyogan 66 site (the Bystrinski cultural type) the earliest "fortified" dwelling has been discovered: two connected semi-pit dwellings surrounded by a ditch one metre wide and 1-1.3 m deep, presumably used for drainage (fig. 8). There are no known Neolithic sites corresponding to these either in northern Eurasia or in the steppe regions to the south. Radiocarbon datings of the above-mentioned cultures and sites point to 6900-5750 BP, i.e. the Middle Atlanticum, according to Khotinski (1977). Isolated earlier dates need to be confirmed by additional evidence.

The northern Early Neolithic cultures comprise the Urals-West-Siberian cultural province (UWS CP), together with cultures of the southern forest region

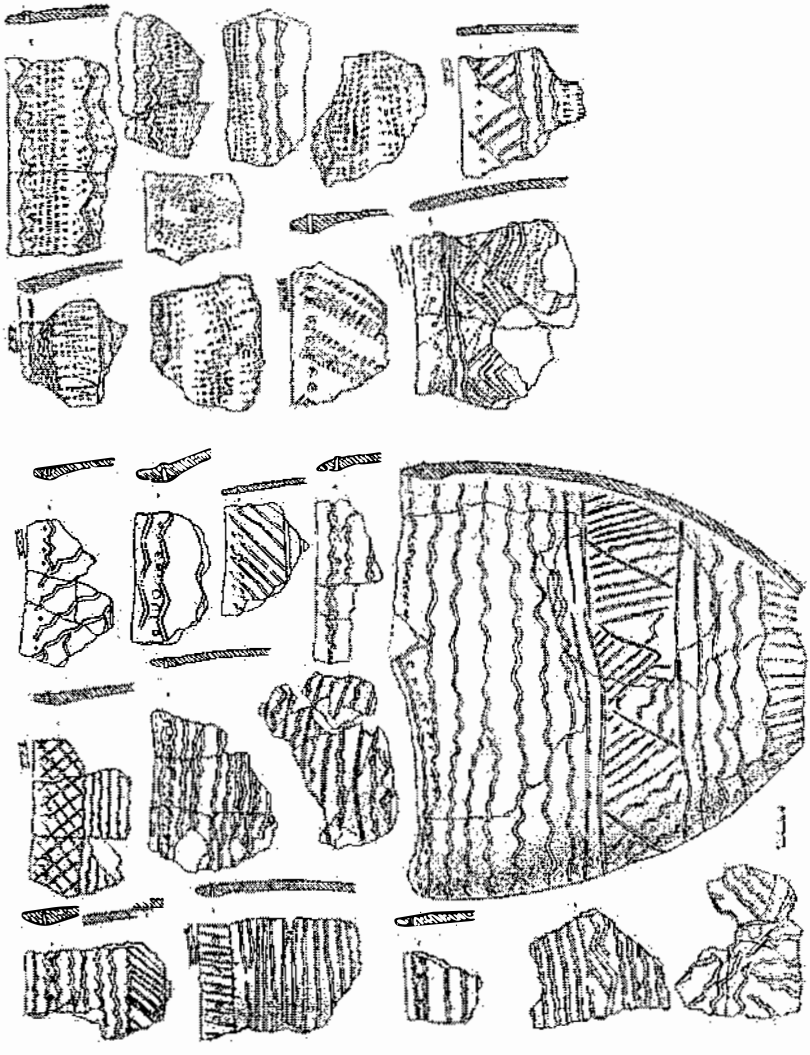

Fig. 3. Pottery of the Sumpanyinskaya culture from Sumpanya IV. (After Kovalëva, Ustinova & Khlobystin 1984, figs. 3, 4.)

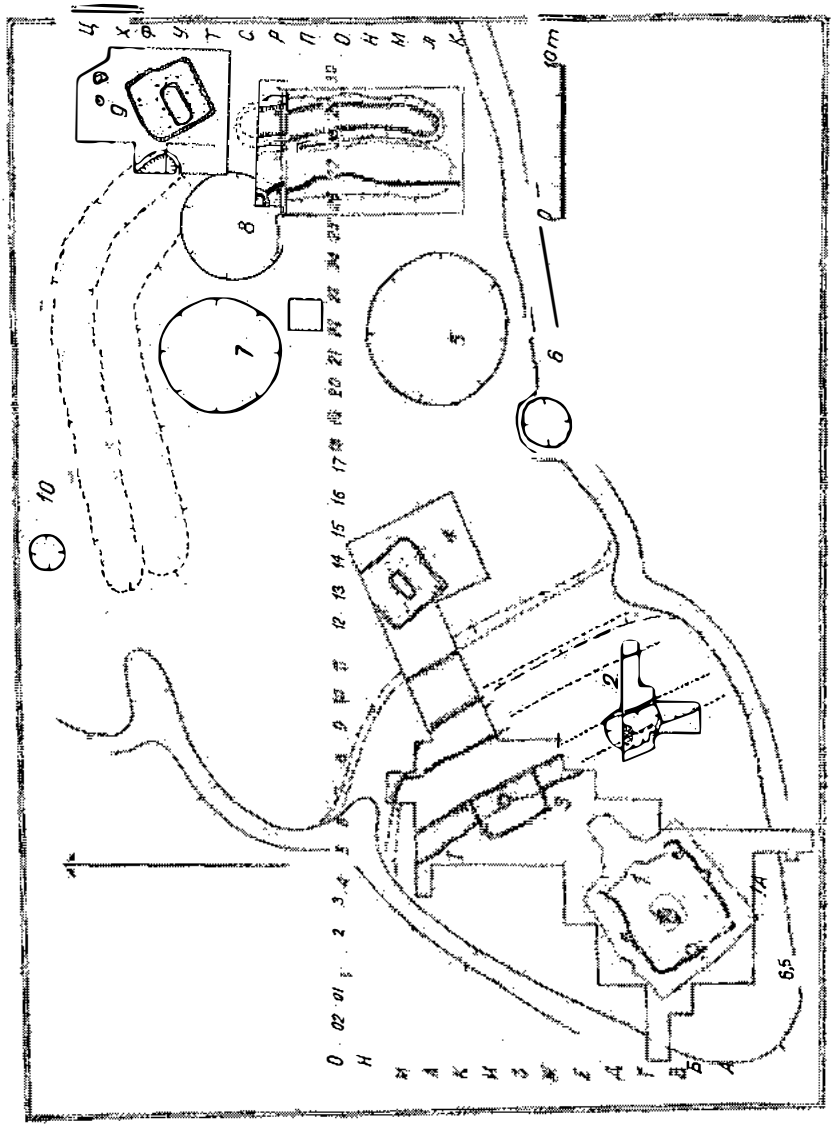

Fig. 4. Map of the Amnya I promontory fort showing excavated areas: (1-4, 9) excavated dwellings, (5-8, 10) dwelling hollows. (After V. A. Borzunov, V. M. Morozov, V. I. Stefanov.)

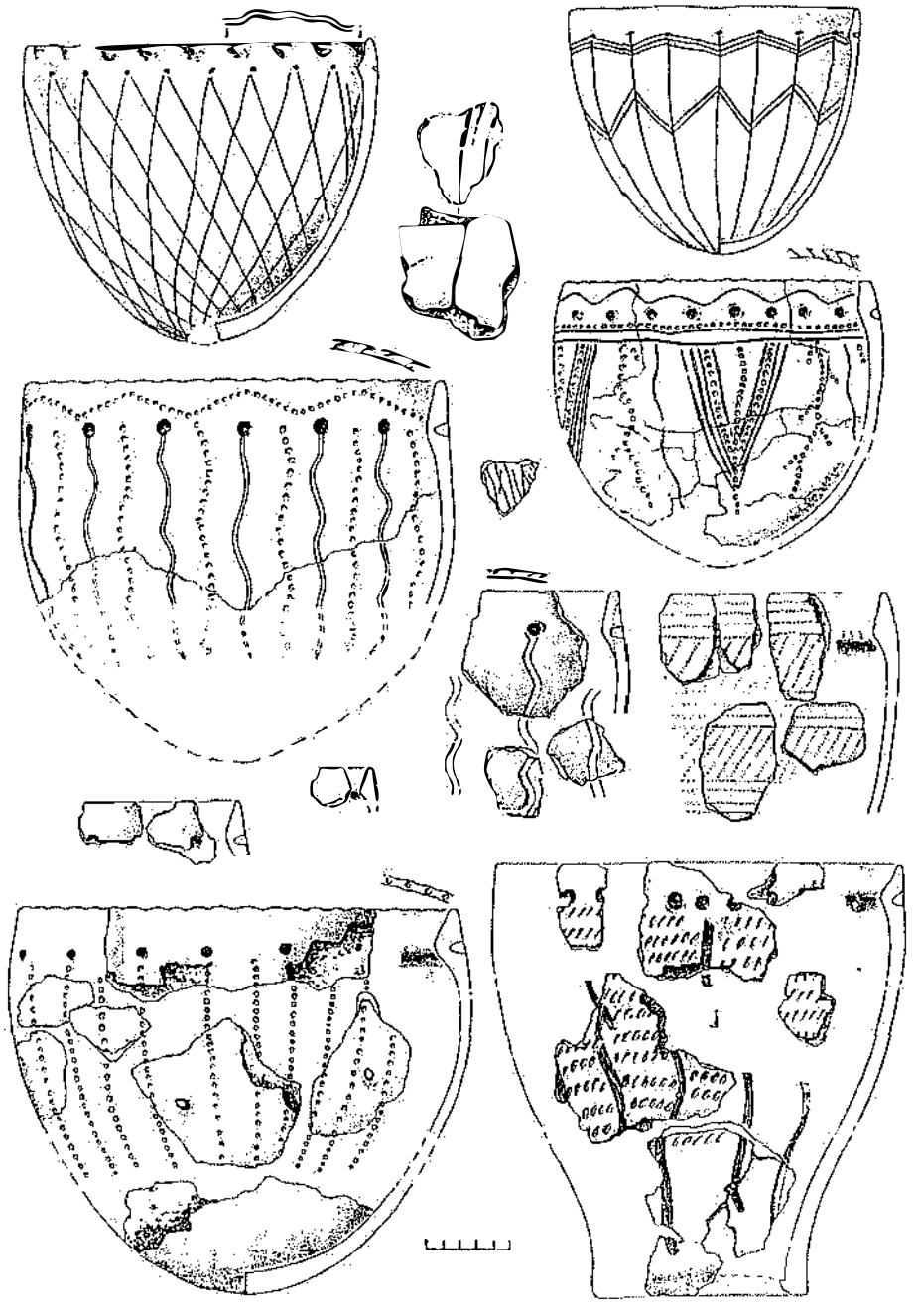

Fig. 5. Pottery of the Amninski type from Amnya I. (After V. A. Borzunov, V. M. Morozov, V. I. Stefanov.)

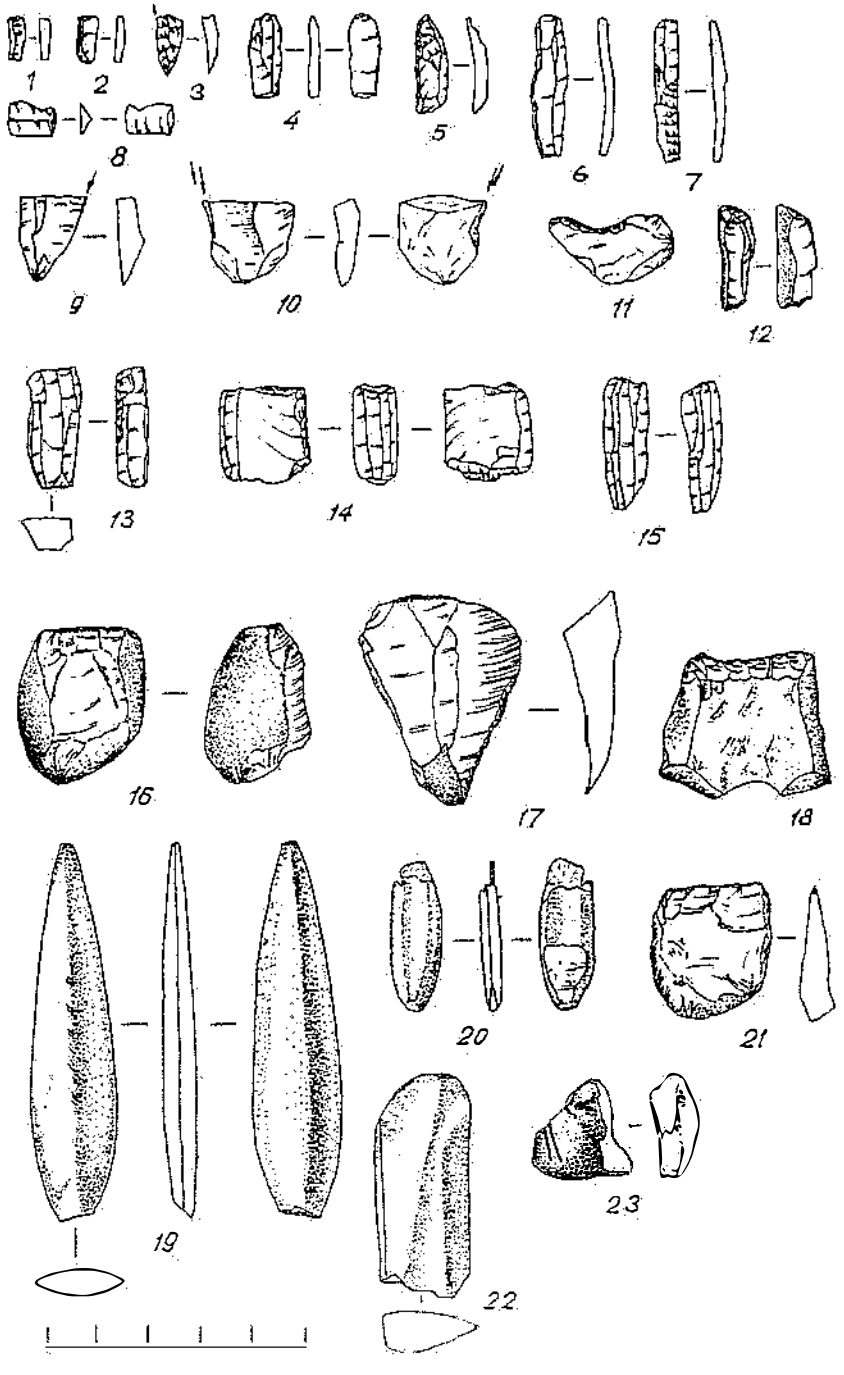

Fig. 6. Tools of flint (1-21) and slate (19-22), specimen of clay (23) from Amnya I: (1-8) blades, (9-10) burins, (11) retouched flake, (12-16) cores, (17, 22) knifes, (18, 21) scrapers, (19-20) arrowheads. (After V. A. Borzunov, V. M. Morozov, V. I. Stefanov.)

(the Eastern Urals and Early Kama, or Khutorskaya, cultures in that order) and those of the forest-steppe zones (the Middle Irtysh, Ekaterininskaya, Upper Ob, etc.). Unfortunately, the periodization and the chronological, and even cultural, attribution of forest-steppe sites is still rather uncertain as C^{14} datings are isolated, so that in this area the problem of distinguishing an Early Neolithic culture has not been finally solved.

It should be noted that sites of the Kama Comb Ware (Khutorskaya) culture have been found not only in the Kama region itself, but also in the southern Sub-Urals (Vybornov 1992) and in the Vyatka (Gusentsova 1981) and Vychegda basins (Kosinskaya 1997b). So, the western part of the UWS CP lies west of the Urals ridge, where it borders on the Pit-and-Comb Ware cultures. During the Late Neolithic, throughout this contact area syncretic cultures came into being to form a base for the Eneolithic Volosovo-Garino community (the Volosovo, Garino, Yurtik, Choinovty cultures).

Two related non-aboriginal cultures, the Koshkino and Boborykino cultures, have been found in the Middle Trans-Urals (Kovalëva & Chairkina 1991). They are characterized by round- and flat-bottomed vessels, including profiled (necked-shouldered) Boborykino specimens. As usual, they have line-drawn and pricked decoration on the throat and bottom. This pottery resembles that of the Early Neolithic Upper-Volga (Kostyleva 1994), Pricked Ware Volga-Kama (Vybornov 1992) and Chemoborskaya (Kosinskaya 1997b) cultures. The Boborykino and Koshkino flint assemblages contain many blades, including some geometric microliths, mainly trapezoid ones. The chronology and relationship of both cultures are still at issue. V. T. Kovalëva (1989) dates the Boborykino culture to the Late Neolithic and considers that it succeeded the Early Neolithic Koshkino culture. V. A. Zakh (1995) provides evidence for the earlier age of the Boborykino culture and presumes that the Koshkino was formed from a fusion of the Boborykino tradition with some indigenous one. Neither radiocarbon dates for the Koshkino (three dates, 6620-6380 BP) and Boborykino sites (four dates obtained at three sites, 7700-5490 BP) nor stratigraphy permit us to accept or reject either version. V. A. Zakh's reasoning seems to be more valid and makes it possible to solve the genesis of the Amninski and other northern cultural types with early flat-bottomed pottery by supposing that the Boborykino was one of their components.

Thus, the modern archaeological data both confirm the existence of the Early Neolithic UWS CP and allow us to ascertain its structure and its relationship to incoming and external cultures. The western border of the UWS CP can be distinctly seen in the Sub-Urals, the eastern one may be most likely located in

the area along the left bank of the Yenisei and in the Altai foothills, while the southern bounds are situated in the forest-steppe zone and look rather vague.

In the Late Neolithic, cultural peculiarities within the UWS CP became more distinct: combed pottery ornamentation predominated in north-western Siberia and the Trans-Urals, while in the Ob area pricked and line-drawn decoration was preserved to a considerable degree, and in the forest-steppe Irtysh area Comb-and-Pit pottery cultures were developing.

SOUTHERN CONNECTIONS AND THE QUESTION OF THE NEOLITHIC GENESIS IN THE TAIGA

When V. N. Chernetsov elaborated his concept of the UWS ECP, the Ural-Kazakhstan steppe region had hardly been surveyed. Since then it has been ascertained that the steppe Neolithic, namely the Djangar, Yelshanskaya (Vasil'ev & Vybornov 1988) in the Lower Volga area, and the Atbasar (Zajbert 1992) and Makhanjar (Logvin 1991) cultures in Northern Kazakhstan differed radically from the woodlands cultures in their lithic technology (blade-based microlithic industries with geometric microlithes) and housebuilding (surface dwellings). On the other hand, the pottery of both regions looks rather similar, though in the steppe area ceramics appeared much earlier than in the forest UWS zone, about 8000-7500 BP. The lithic technologies of these Ural-Kazakhstan cultures belong to the "microlithic" southern cultural zone involving the Neolithic of Middle Asia and adjacent areas of the Eurasian steppes and semi-deserts. The Ural-Kazakhstan Neolithic culture reveals close interrelations with those of the Azov, Aral and East-Caspian areas not only in lithic implements but in ceramics as well and therefore appears to be a kind of "transitional link" between the Aral-Caspian and UWS cultural regions. Therefore, the southern connections of the Neolithic UWS should be envisaged broadly within the framework of a relationship between the two above-mentioned northern and southern cultural worlds.

Detailed correspondences for each of the northern cultures point to the ceramic influence of different sources. For the Koshkino and Boborykino cultures such correspondences can be found in the Djangar, Seroglazovskaya and Bekbeke cultures in the northern and northeastern Caspian area, according to V. T. Kovalëva (1989), or the Kelteminar culture in the opinion of V. A. Zakh (1985); the pottery of the Chestyiag type of sites (fig. 7) would correspond to that of the Kelteminar cultural community (Vasil'ev 1991); the Bystrinski pottery type (fig. 9) resembles ceramics from the fifth chronological layer at the Tytkesken' 2 settlement in the Altai foothills.

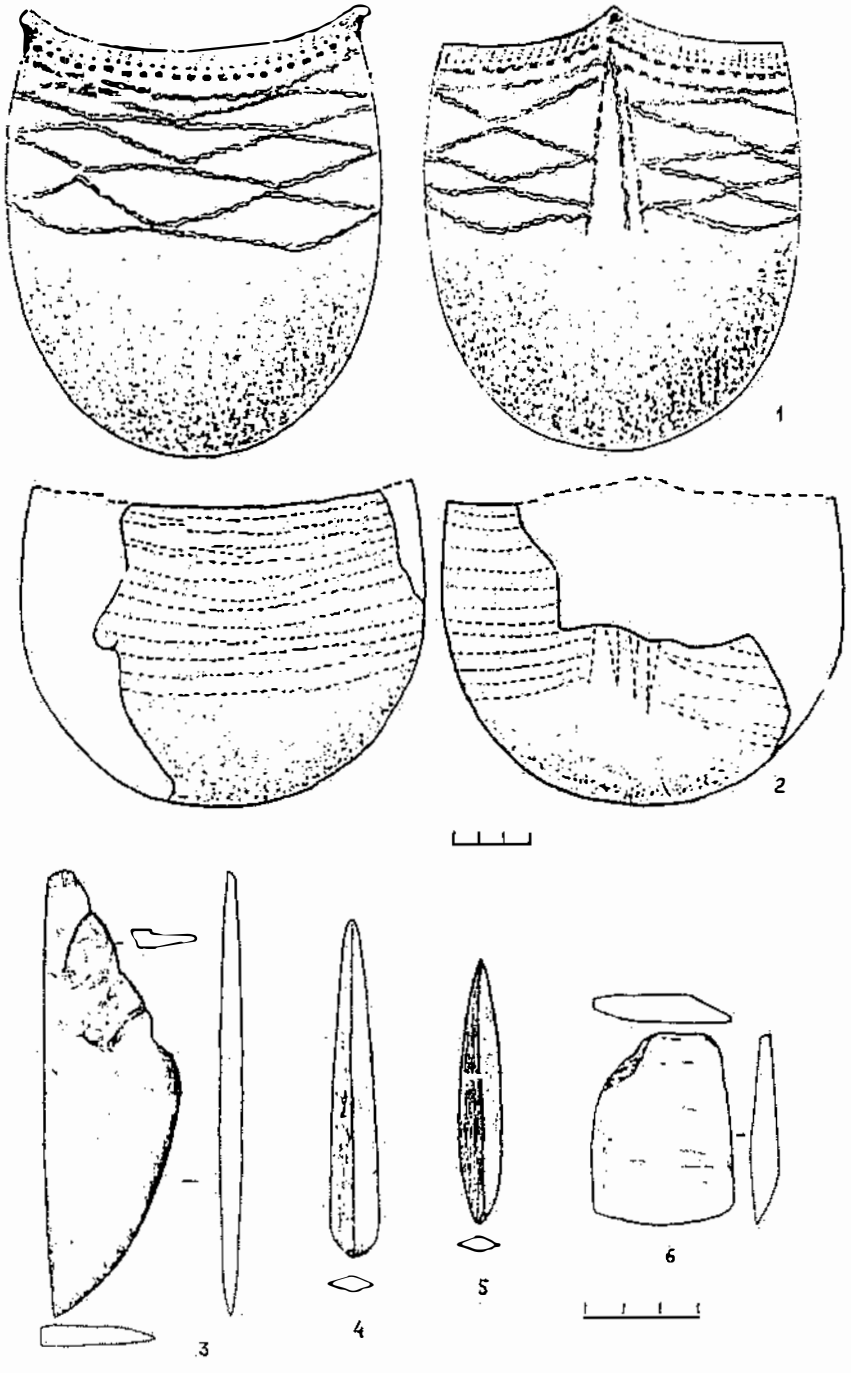

Fig. 7. Vessels (1,2) and lithic polished implements (3-6) from Chestyiag: (3) a knife, (4-5) arrowheads, (6) an adze. (After E. A. Vasil'ev.)

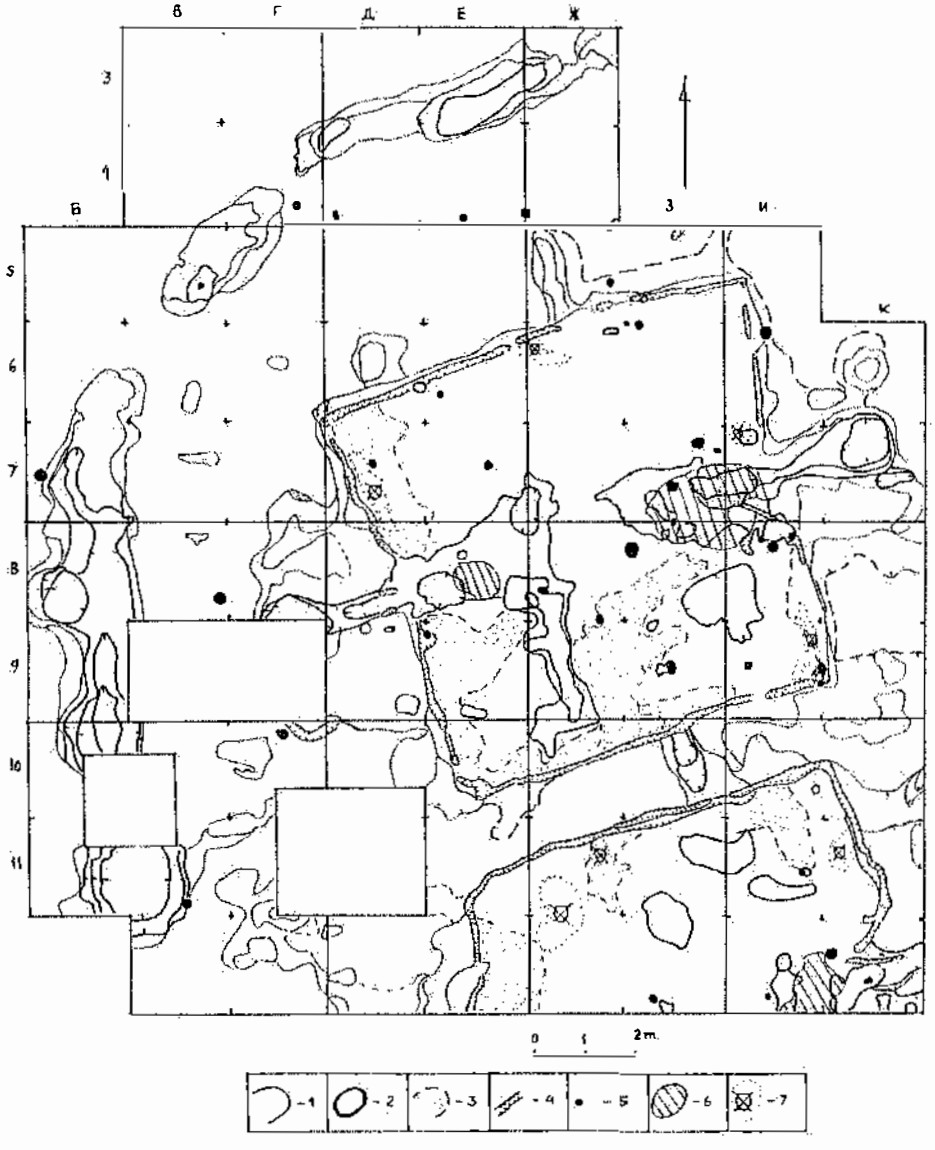

Fig. 8. The excavation plan of "fortified" dwellings 2.2a from Bystryi Kulyogan 66: (1) outlines in upper levels, (2) outlines in lower levels, (3) upper level of the floor, (4) a ditch in the floor, (5) a post-hole, (6) a hearth, (7) scatter shards. (After L. L. Kosinskaya.)

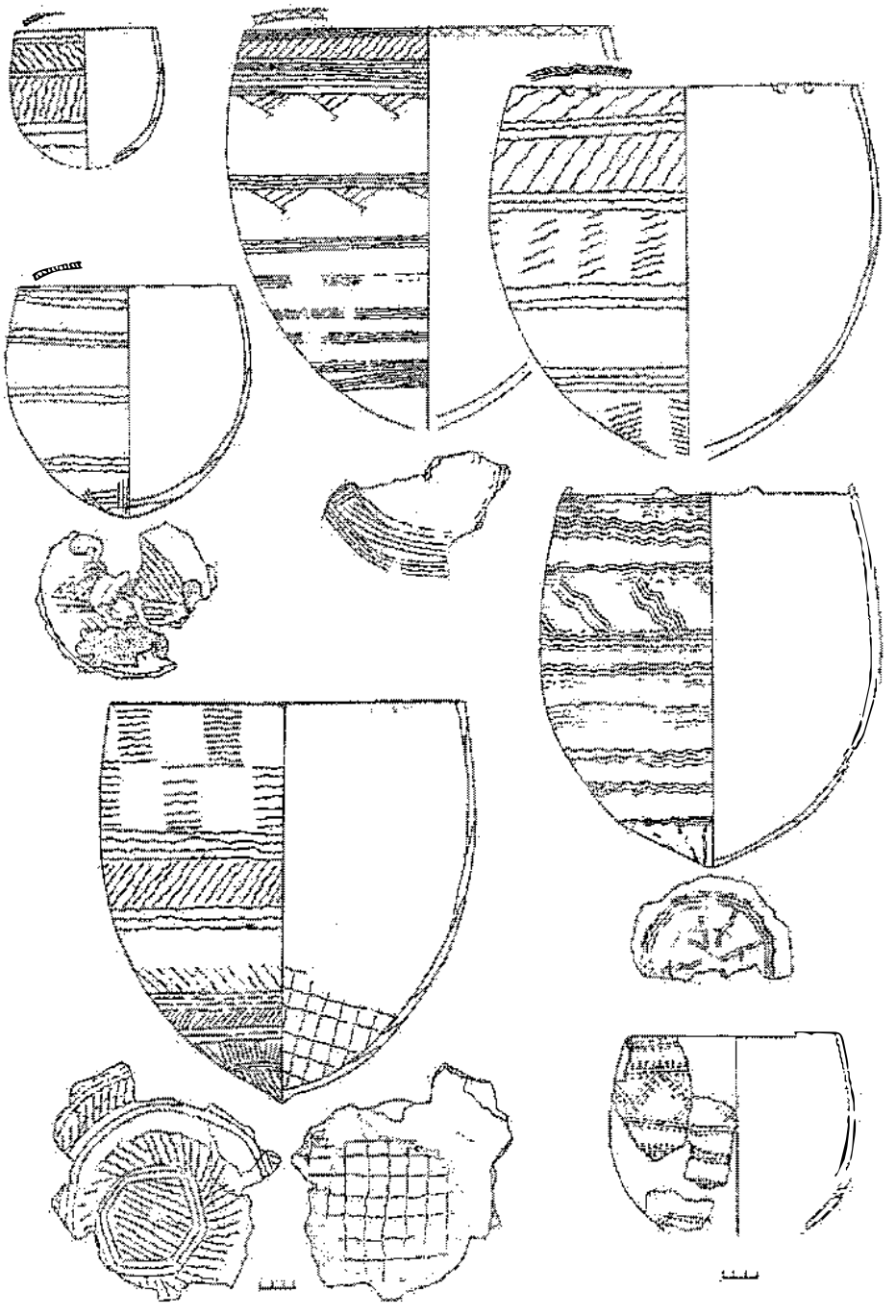

Fig. 9. Vessels of the Bystrinski type from Bystryi Kulyogan 66. (After L. L. Kosinskaya.)

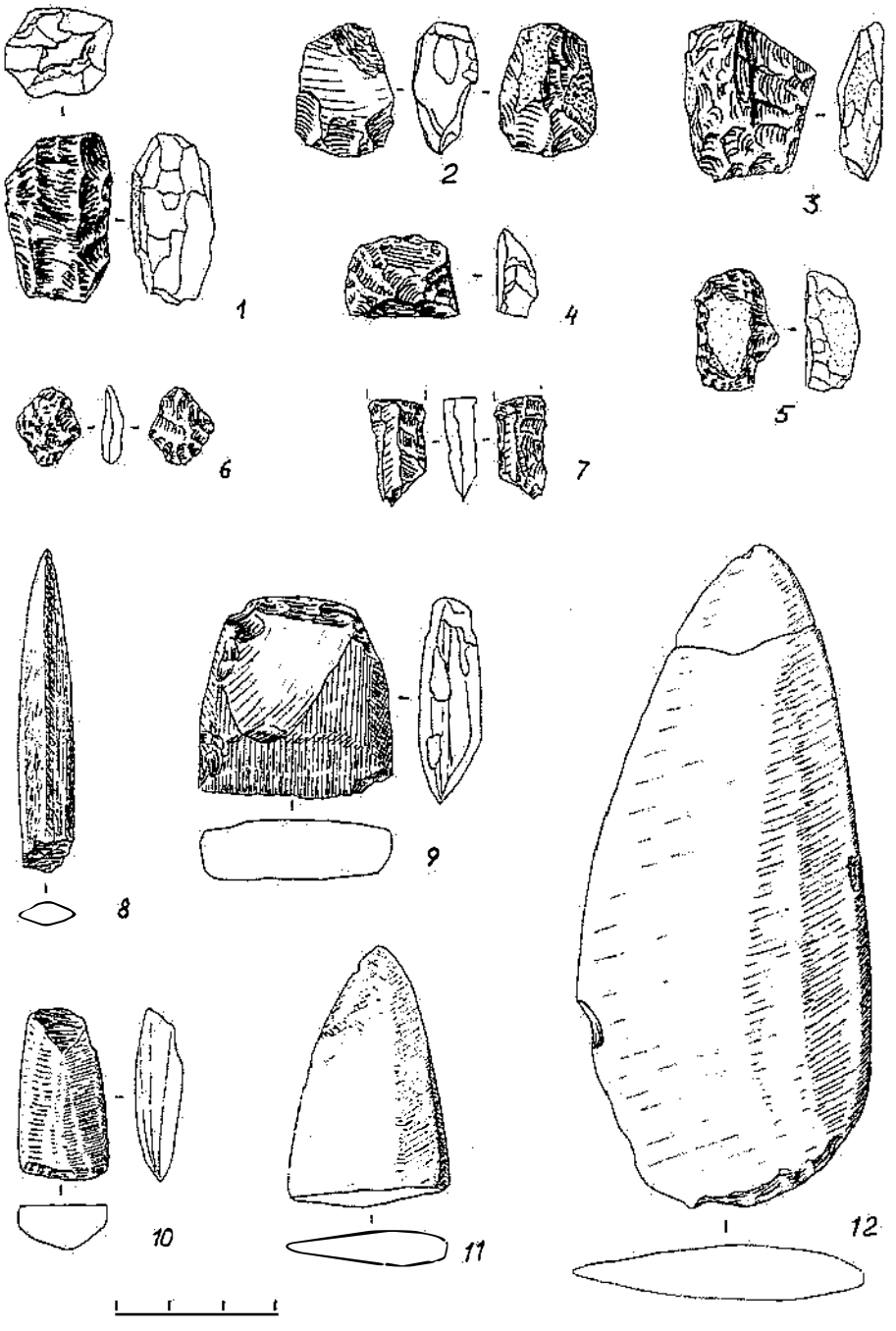

Fig. 10. Tools of quartz (1-7) and slate (8-12) from Bystryi Kulyogan 66: (1) a core, (2-3) chisels, (4-5) scrapers, (6-8) arrowheads, (9-10) adzes, (11-12) knives. (After L. L. Kosinskaya.)

Modern researchers usually derive taiga cultures like the Koshkino, Boborykino and Chestyiag, from some Aral-Caspian Neolithic groups which migrated into the heart of the forests as far as the northern Trans-Urals and Lower Ob and constituted the main component of the northern Neolithic community (Zakh 1995; Kovalëva 1989; Vasil'ev 1991), and they depict the mass colonization of the whole of Northern Siberia by the Neolithic steppe population (Derevyanko et al. 1994). In my view, such migratory hypotheses are not able to explain all the ascertained peculiarities of the taiga cultures and are therefore inadmissible. First, they usually deal only with ceramics and ignore lithic technologies and house-building. However, the UWS pottery is not a straight copy of the proposed original types and has many individual characteristics of its own. This means that southern pottery traditions must have reached the northern areas in a form already modified. This may be one of the reasons for the differences in the initial points of impetus for migratory movements proposed by scholars. Secondly, the southern cultures presumed to have been the sources of migration, e.g. the Djangar and Kelteminar, turn out to have been contemporaneous with the northern Neolithic. Thirdly, usually neither the types nor the scales of the migrations are discussed, while their causes (presumably environmental aggravation in the steppes) are controversial rather than proven. Lastly, rapid migration from the southern-steppe zone into the taiga area could have hardly been possible in the Neolithic since such an abrupt change of terrain would have required a prolonged and distressing period of adaptation for the newcomers, in both social-economic and mental-psychological respects.

I am convinced that the mechanism of cultural interaction between the north and the south was much more diversified and complicated. Only the Boborykino culture may be admitted as having been a migratory one. It has southern features both in its ceramics and its flint technology, it is rather protracted (presumably from about 7000 up to 5000 BP), its migrating route can be distinctly observed down the Tobol, Irtysh and Ob rivers together with its local variations. It is most likely that the Boborykino came from the steppe-forest part of the Irtysh area, since the Makhanjar and Atbasar cultures were located in its steppe zone. In other cases, it seems preferable to suggest that the advancement of pottery northwards was perhaps rather a result of cultural diffusion, i.e. the gradual borrowing of ceramic technology by more and more northern peoples within the UWS CP. Thus, the "neolithization" of the taiga cultures could be regarded as one of the last stages in the process which was started by the "Neolithic revolution" in the Near East. The transmission of this cultural innovation could have been

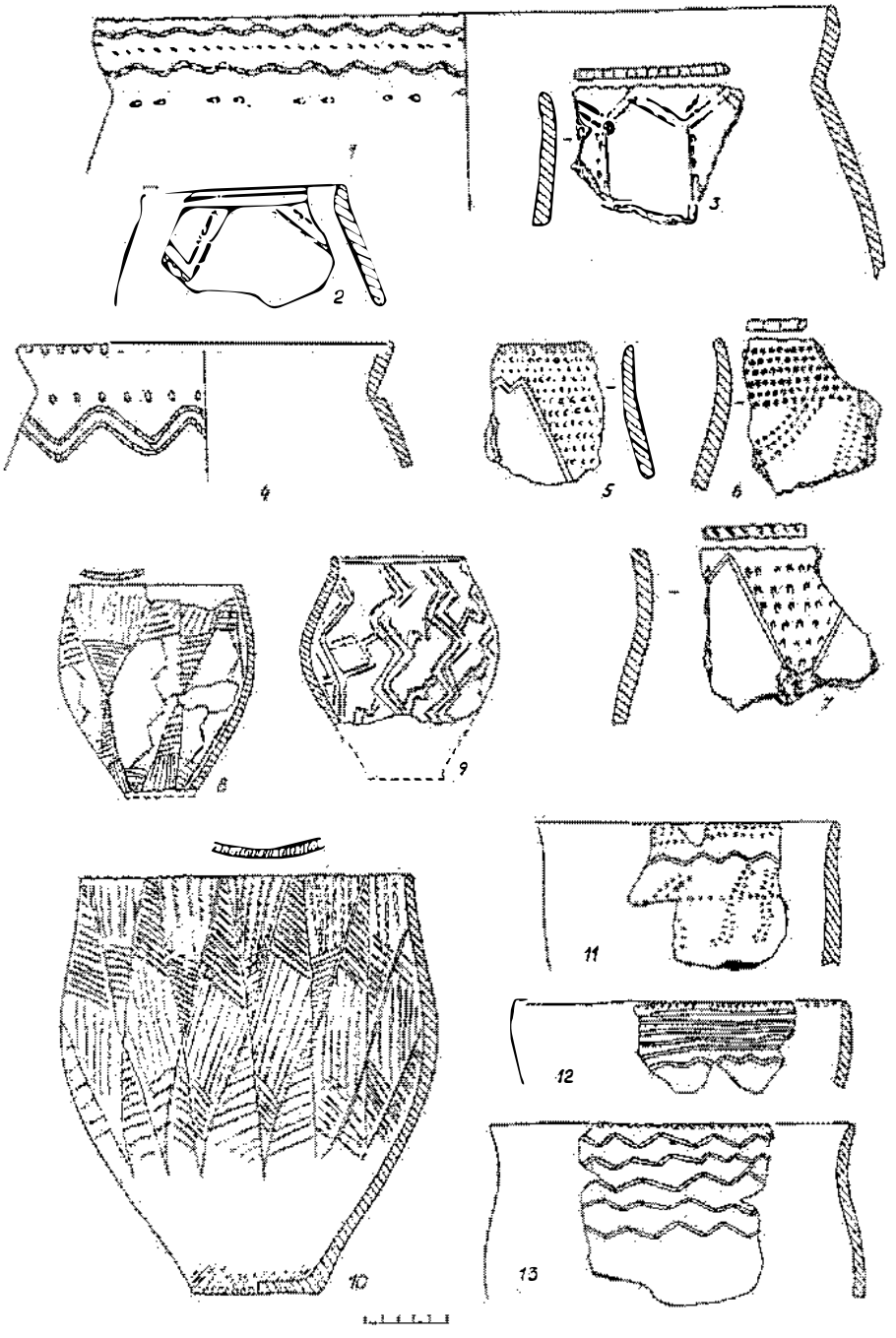

Fig. 11. Pottery of the Boborykino culture from Boborykino II (1-7), Verhnyaya Alabuga (8-10), Andrecvskoe ozero (11-13). (After Kovalëva & Potëmkina 1980, fig. 3, and Salnikov 1962, fig. 7.)

realized through the influence of the southern (foreststeppe) cultures of the UWS CP, all the more so since every investigator notes evidence of interaction between these and adjacent steppe cultures.

The proposed model allows us to take into account the fact that most of the taiga Neolithic sites are situated in regions which had been populated since the Late Mesolithic at least. Late Mesolithic settlements have been excavated in the area of the subsequent Sumpanyinskaya culture in the Konda basin (Besprozvanny 1997). Isolated sites have also been investigated along the Lower Ob up to Salekhard (Serikov & Starkov 1989; Pogodin 1997) and along the upper reaches of the Pyakupur river (Pogodin 1998). Traces of Mesolithic sites have been found in the Middle Ob area (near Surgut and in the Vasyugan basin) as well. These sites are characterized by a blade-based microlithic technology without geometric microlithes, so they should be included in the Late Mesolithic UWS CP together with the Mesolithic of the Middle Sub- and Trans-Urals, the Middle Irtysh area, the Altai foothills (Serikov & Starkov 1989) and the Middle-Vychegda culture in the Northern Sub-Urals (Volokitin 1997). It is remarkable that the area of the UWS CP in the Mesolithic was equal to that in the Early Neolithic. Excavated settlements in the Konda basin have yielded evidence of an abrasive lithic technique as well as semi-pit dwellings similar to Early Neolithic ones. Thus northern Mesolithic traditions in stone technology and house-building were either genetic for the indigenous taiga Early Neolithic population or substrative for Neolithic immigrants. The first alternative seems more acceptable because the lithic technology of the Early Neolithic cultures was perfectly adapted to local rock materials and had no traits of any innovations originating in the south, except for the Amninski cultural type, which was presumably related to the Boborykino.

Certainly, I would not completely reject the possibility of Neolithic migrations in western Siberia ,but I assume they took the form of a fairly slow advancement of the native forest and forest-steppe population as they conquered new hunting and fishing lands. I would also refer to V. N. Chernetsov (1973), L. Y. Krizhevskaya (1968), G. N. Matyushin (1976), who considered that the Middle Asian influences in the Mesolithic extended no further than the Southern Urals and could hardly be observed in the Middle Tran s-Urals.

ETHNO-LINGUISTIC IMPLICATIONS

Before we can address the ethno-linguistic identification of the Northern Neolithic culture, there are a number of contingent questions that need to be discussed. The first is whether the UWS CP was an ethno-cultural or an historic-cultural community. V. N. Chemetsov (1973) and O. N. Bader (1970) regarded it as an ethno-cultural one, i.e. one that consisted of genetically related cultures. However, in the light of modern evidence it seems reasonable to presume that the UWS CP might have been an historic-cultural community, in so far as the provenance of some forest-steppe cultures is not entirely clear and consequently they could have not been linked genetically to the rest of the UWS CP. In particular, the Boborykino traditions which influenced the Middle and Northern TransUrals Neolithic community to a high degree came from the steppes, regardless of where the Boborykino culture itself took shape.

This raises the problem of the ethno-linguistic affiliation of the whole community and the cultures within it, namely its relationship with the ethnogenesis of the Uralic peoples. No subsequent alternative to V. N. Chemetsov's proposal (the Uralic ethnocultural area) has been proposed. Some differences concern the attribution of certain parts of the community in the Middle and Late Neolithic. O. N. Bader (1972) and A. Kh. Khalikov (1969) shared Chemetsov's view of the cultures in the Sub-Urals as Proto-Finno-Permic and the West-Siberian cultures as Proto-Ugric and Samoyedic. M. F. Kosarev (1987) supposed the Comb-and-Pit cultures in the forest-steppe Middle Irtysh basin to have belonged to Proto-Samoyedic people and the eastemmost part of the region to have been the Proto-Ketic. Recently V. V. Napol'skikh (1991; 1997) has again demonstrated effective and complex reasoning in favour of the Uralic affiliation of UWS cultures since the Stone Age. New archaeological findings from the study area suggest that the outline of the interpretation is valid and no serious reconsideration is needed; only some reservations can be made: A Uralic (Proto-Finno-Ugric and Proto-Samoyedic) attribution could be most probably made only for those cultures of the UWS Neolithic community which had their basis in the aboriginal Mesolithic community. On the other hand, opponents of this view, who usually regard the Pit-and-Comb cultures in eastern Europe as Proto-Finno-Ugric, have not proposed any alternative hypothesis for the ethno-linguistic attribution of the UWS Stone age cultures. Moreover, this position makes it almost impossible to trace the origin of the Samoyedic peoples.

Thus, if the core of the UWS historic-cultural community is accepted as Uralic, it becomes necessary to discuss the possible linguistic attribution of the

above-mentioned steppe cultures which influenced the Northern Neolithic community.

Connections with the North-Caspian area

These connections are suggested by the Boborykino culture, whose direct influence was rather strong in the western part of the UWS CP. V. A. Zakh (1995) has assumed the Boborykino people to have been Indo-European speakers. However, it seems quite difficult to prove this. If the origin of this culture lay in the Lower Volga and North-Caspian Neolithic communities (Kovalëva 1989), then there is a link in the direction of the Mariupolskaya and Khvalynsk-Sredni Stog Eneolithic communities, inasmuch as their eastern part was based on the North-Caspian Neolithic (Vasil'ev & Vybornov 1988) community, and further on the Pit-grave (Yamnaya) community, which is commonly admitted to he Indo-European or Indo-Iranian. But it does not follow from this that the underlying indigenous North-Caspian Neolithic community was Indo-European as well, or that the Boborykino people were I-E speakers. Moreover, this interpretation is tenable only if the Indo-European affiliation of the "microlithic" cultural zone in the South-Caspian and Middle-Asian area both in the Mesolithic and Neolithic is accepted (Matyushin 1976; Renfrew 1987). In fact, this question is tied up with the problem of the IE original home and the routs of early I-E migrations. Exactly the same is true of the assumed connections between the Boborykino and the Kelteminar cultures (Zakh 1985). There is one more objection to this concept. The UWS Early Neolithic chronologically corresponds with the Proto-Indo-European and Proto-Uralic (or the beginning of the Proto-Finno-Ugric and Proto-Samoyedic) period. Taking into account the close interaction between the forest and steppe cultures all over the region, one might well expect to find some linguistic traces of this relationship. However, there is no indisputable evidence of such contacts in either of the protolanguages (Helimski 1990; Napol'skikh 1997).

Middle-Asian connections

As it has been shown above, the Kelteminar influence was most probably indirect. It could have been transmitted either through the Altai Neolithic or through the Northern Kazakhstan cultures. However, some Kelteminar traits in the Altai area are dated no earlier than the Late Neolithic, the fourth millennium

BC (Derevyanko et al. 1994). Once S. P. Tolstov (1948) supposed that the Kelteminar could have had relations with the Uralic UWS community and the Middle-Asian early agricultural Neolithic culture, which he deemed to have been Dravidian. Here, I would refer to a statement by V. V. Napol'skikh concerning some Uralic-Dravidian parallels revealed by Tyler (1968) which might indicate ancient contacts (Napol'skikh 1997: 167). It seems all the more interesting as among these lexical parallels there is the cultural word for "pot".

Connections with the Altai

The Bystrinski type of pottery could presumably be traced to one of the Altai Neolithic cultural types through the Upper Ob Neolithic culture in its Zavyalovo (early) stage. The Upper Ob culture was localized in the south-eastern part of the UWS CP. In this region archaeological and anthropological evidence of contacts between the Altai-Upper Ob and the Baikal Neolithic communities have been established (Derevyanko et al. 1994). Thence one may suppose this area to have been one of several possible channels for early Uralic-Altaic (Tungusic?) language connections.

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CONTACTS BETWEEN FINNO-UGRIC AND INDO-IRANIAN SPEAKERS IN THE LIGHT OF ARCHAEOLOGICAL, LINGUISTIC AND MYTHOLOGICAL DATA

E. E. Kuz'mina

The study of contacts between peoples belonging to different language families is important not only for reconstructing the cultural ties of antiquity but also for ascertaining the primary homelands of the ethnic groups in contact. The methodology requires a comparative analysis of three types of source: linguistics, archaeology and mythology.

HISTORY OF STUDY

The FinnoUgric languages comprise six branches: Baltic-Finnic (representing the earliest spread to the west); Volga-Finnic (Mari, Mordvin); Permic Finnic (Udmurt, Komi); Ugric (Khanty, Mansi, Hungarian); the now dead languages (Merya, Muroma, Meshchera); and Saami (Osnovy finno-ugorskogo). The hypothesis of a genetic relationship between the Hungarians and Ob-Ugrians as well as their primary homeland in Siberia was suggested as early as the 15th century by the Italian humanist Aeneas Silvius Piccolomini, who later became Pope Pius II. The great German scholar Gottfried Leibniz (1710) identified the Finno-Ugric linguistic unity and charted its borders; the Samoyedic languages, which constitute the other branch of the Uralic language family, are not studied in Leibniz's work. The split of the Finno-Ugric unity into a western (Finno-Permic) and an eastern (Ugric) branch is assumed to have taken place around the

turn of the third and second millennia BC (Fodor 1976; Hajdú 1985; Rédei 1986; 1997; Napol'skikh 1997).

N. Anderson (1879) first noticed that the Finno-Ugric languages may have genetic connections with the Indo-European languages; this was further explored by B. Collinder (1954) in particular. B. Munkácsi (1901) raised the question of borrowings from Indo-Iranian languages. The copious data relating to Indo-Iranian borrowings in Finno-Ugric languages were systematized by K. Rédei (1986; 1997), É. Korenchy (1972), A. J. Joki (1973), and augmented by A. Csillaghy (1974) and other scholars. Important contributions were made by T. Burrow (1976), V. I. Abaev (1972), J. Harmatta (1981), A. V. Lushnikova (1990) and E. A. Khelimskij (1996). They all suggested a chronological stratification of the linguistic material and proved that there were contacts not only with the Iranian but also with the Indo-Aryan branch, and that they go far back into antiquity; this was confirmed by A. Parpola (1988).

Another important source for the study of contacts between the Finno-Ugric, Ugric and Indo-Iranian speakers in particular consists of the mythological features that are common to these peoples. These have been investigated by Finnish scholars (Karjalainen 1921-27; Kannisto 1958), Hungarian scholars (Munkácsi 1901; Popular Beliefs; Ancient Cultures; Altaic Religious Beliefs) and Russian scholars (Ajkhenval'd, Petrukhin & Khelimskij 1982; Gertsenberg 1975; Steblin-Kamenskij 1995; Mirovozzrenie narodov; of particular interest are the following studies: Toporov 1975; 1981; Bongard-Levin & Grantovskij 1983).

LINGUISTICS AND ARCHAEOLOGY

The earliest layer of Indo-Iranian borrowings consists of common Indo-Iranian, Proto-Indo-Aryan and Proto-Iranian words related to three cultural spheres: economic production, social relations and religious beliefs. Economic terms comprise words for domestic animals (sheep, ram, Bactrian camel, stallion, colt, piglet, calf), pastoral processes and products (udder, skin, wool, cloth, spinner), farming (grain, awn, beer, sickle), tools (awl, whip, horn, hammer or mace), metal (ore) and, probably, ladder (or bridge). A large group of loanwords reflects social relations (man, sister, orphan, name) and includes such important Indo-Iranian terms like *dāsa* 'non-Aryan, alien, slave' and *asura* 'god, master, hero'. The word for 'price' and numerals show the establishment of barter relations. Finally, a considerable number of the borrowed words reflect religious beliefs and practices: heaven, below (the nether world), god/happiness, *vajra*

'Indra's weapon', dead/mortal, kidney (organ of the body used in the Aryan burial ceremony). There are also terms related to ecstatic drinks used by Indo-Iranian priests as well as by Finno-Ugric shamans: honey, hemp, and fly-agaric.

When and where could contacts between Indo-Iranian and Finno-Ugric speakers have taken place, leading the latter to adopt terms and skills referring to economic production, social stratification, and complex myths and rituals?

Decisive criteria for ascertaining the primary homeland of the Finno-Ugric-speaking peoples are provided by common terms for animals and plants. They locate the territory where the Finno-Ugric linguistic unity was formed and situated before its break-up in the forest zone of Eurasia, excluding the far north (Chernetsov 1953; 1963; Chernetsov, Moshinskaya & Talichkaya 1953; Veresh 1978; 1984-85). F. Köppen (1886), W. Radloff (1893) and P. Hajdú (1985) initially placed the Finno-Ugric homeland west of the Ural mountains on the basis of the shared words for 'elm', 'lime', 'ox', 'pine', 'bee' and 'honey'. Palynological analyses of pollen found on archaeological monuments of the second millennium BC in the forest and forest-steppe zones of the Urals and western Siberia have established the presence of elm, lime, birch, aspen and Siberian pine. (G. N. Lisitsina analyzed samples from the author's excavations in the southern Urals.) It is claimed that there were wild bees in the Urals and in southern Siberia, where bronze objects cast with lost wax method have been found. These data force us to accept the point of view expressed by the majority of scholars, that the primary homeland of the Finno-Ugric speakers was located in the Urals and in southern Siberia. The most detailed account of the palaeo-ecological arguments for the Uralic homeland has been given by V. V. Napol'skikh (1997). It is corroborated by common terms shared with Samoyedic languages and by borrowings from Palaeo-Siberian languages (Khelimskij 1988; Nikolaeva 1988).

In Siberia, the beginnings of economic production, an acquaintanceship with horse-breeding, and the development of advanced bronze metallurgy are associated with such aboriginal settlements and cemeteries as Rostovka, Preobrazhenka, Samus IV and Krokhalevka, dated to the 14th-13th centuries BC or earlier (Matyushchenko 1973a; 1973b; Matyushchenko & Sinitsyna 1988; Molodin 1985; Molodin & Glushkov 1989). These sites have yielded Andronovo ceramics of the Fedorovo type, as well as metal objects characteristic of the Andronovo-Fedorovo metallurgy of eastern Kazakhstan and Semirech'e and decorated with images of animals found in the mountain-steppe regions of the Tienshan and Altai regions. This gives sufficient grounds to suppose that it was particularly the Andronovo-Fedorovo tribes who influenced their northern

neighbours to start economic production, horse breeding and metallurgy in the southern taiga zone.

A more powerful southern influence coming from the Fedorovo representatives of the Andronovo cultural unity is seen in another group of monuments of the pre-taiga zones of the Urals and Siberia. These are Cherkaskul' (alias Zamaraevo) followed by Mezhovka, and Pakhomovka followed by Suzgun, Cherno-ozer'e and Elovka, all united under the common name of "Andronoid" (Gening & Eshchenko 1973; Matyushchenko 1973a; 1974; Kosarev 1974; 1981; Molodin 1985; Korochkova 1987; Obydennov 1986; 1997; Obydennov & Shorin 1995; Potemkina, Korochkova & Stefanov 1995; Shorin 1988; Gening & Stefanov 1993; Gening & Stefanova 1994). While preserving their own forest image, with fishing and hunting the main foundations of the economy, the Andronoid cultures nevertheless demonstrate an acquaintanceship with the beginnings of farming and cattle-breeding (bones of horses, cattle and sheep were found in the settlements).

According to all the ethnically defining features (house architecture, ceramic types, burial rites), the Andronoid cultures are quite specific and preserve traditions of the local aboriginal cultures of the preceding Eneolithic and Early Bronze Ages, but cattle raising and bronze metallurgy point to an influence of the Andronovo-Fedorovo culture. The pottery of the forest zone is ornamented, and the decoration represents an adaptation of Andronovo-Fedorovo ornamentation; this is the reason why these forest zone cultures were called Andronoid. Scholars unanimously accept the concept of an Andronoid cultural complex, but differ in their explanations of its origin and ethnic attribution.

V. I. Moshinskaya (1957: 134) and K. V. Sal'nikov (1964: 22) supposed that the close affinity between the ceramics of the Andronoid cultures of the forest zone and the Andronovo cultures of the steppe zone is due to their formation out of related Neolithic and Eneolithic cultures in the Urals and in western Siberia. V. N. Chernetsov (1948: 151-153, Table 6; 1951: 29; Chernetsov Moshinskaya & Talichkaya 1953: 61) suggested that there is a development line from the Bronze Age Fedorovo ornamentation to the decorations of the present-day peoples speaking Ob-Ugric languages, even though the modern Ugric-speaking people use the Andronoid ornaments not for decorating ceramics but in dress and birch-bark (Chernetsov 1948: 139; Ivanov 1963: 161, fig. 100). This argument is still accepted without criticism (Veresh 1978; Potëmkina 1983).

M. F. Kosarev (1974: 149-151) supposed that the Andronovo-Fedorovo and the Andronoid Suzgun and Cherkaskul' monuments of the Trans-Urals came into being from a single base, which "developed in the forested Trans-

Urals from the comb-geometric tradition". On the other hand, the appearance of the Molchanovka and Elovka Andronoid cultures in the region of the River Ob was explained by Kosarev as resulting from a migration of people belonging to the Andronovo tradition and the influence exerted by them upon the aboriginal peoples of Siberia. He came to the conclusion that the Andronovo-Fedorovo culture arose in the Urals, and that it exclusively belonged to Finno-Ugric-speaking peoples. He stressed, however, that "it is far from indisputable to assume that the Andronovo (Fedorovo) people and the Elovka people formed an ethnic unity" (Kosarev 1974: 157).

Looking at these hypotheses critically today, we must reject the proposal of V. N. Chernetsov. Fedorovo monuments have been discovered not only in the Urals but also far in the south, in Central Asia and in Afghanistan, where Ugric-speaking peoples never lived (Kuz'mina 1988; 1994b). The hypothesis of a Uralic origin of the Fedorovo monument type has in fact been disputed. The sources of the skilfully made Fedorovo pottery and its triangular ornamentation can be found in the Eneolithic cultures of central and eastern Kazakhstan.

On the basis of extensive ethnographic material, S. V. Ivanov (1963; 1964: 1-7) concluded that the Andronoid ornament complex has parallels not only in the art of the Ob-Ugric-speaking peoples but also in the art of peoples speaking languages belonging to other language families: Ketic, Yukaghir (two separate Palaeosibirian isolates), Evenki (Tungusic), Buryat (Mongolic), as well as Dolgan and Yakut (both Turkic). The ornament complex of Ugric-speaking peoples consists in the first place of very simple elements that arise convergently among different peoples in the world; in the second place, elements characteristic of some Eurasiatic cultures including the archaeological complexes of Andronovo and Timber Grave, and continued in the art of present-day peoples living in the Eurasiatic steppes; and thirdly, elements specificly characteristic of Ugric-speaking peoples (Ivanov 1963: 154-158). It follows that the survival of the Andronovo ornament tradition among peoples speaking Uralic languages (including Finno-Ugric and Samoyedic) in the Urals and Siberia does not prove that the people associated with the Andronovo-Fedorovo culture spoke the same language. It only points to an intensive and prolonged Andronovo influence on Uralic speakers and other Siberian peoples. This deduction is in agreement with the conclusion drawn by linguists, according to whom some terms connected with economic production in Uralic (as well as in Ketic and Turkic) languages have been borrowed from Indo-European languages, at first especially from Indo-Iranian, and later from Iranian (Joki 1973).

Linguists locate the original homeland of the Finno-Ugric speakers in the forest zone of Eurasia. Economic production started in this zone during the second half of the second millennium BC. As this is the very period in which the Andronoid ceramic complex spread in the forest zone, the Andronoid cultures probably reflect the reception of Indo-Iranian cultural influences by Uralic speakers and other native Siberian peoples. This suggests that the people associated with the Fedorovo culture were linguistically not Uralic but Indo-European and more specifically Indo-Iranian, related to the people associated with, but distinct from, the Alakul' culture (another member of the Andronovo complex). It must be mentioned that in the ornamental complex of the Andronoid cultures there are elements specific to Fedorovo, Alakul' and Kuzhumberdy cultures (Moshinskaya 1957: 124; Ivanov 1963: 161, fig. 100; Matyushchenko 1974, Table 12; Kosarev 1974, fig. 32; Kuz'mina 1994b). This points to influence not only from the Fedorovo culture, but also from other tribes belonging to the Andronovo complex.

From the point of view of ethnogenesis, it is important to note that ornamentation parallel to that of the Fedorovo culture is also found among the modern Tadzhiks, who speak an Iranian language (Bobrinskoj 1900). It is also found in India, where it has no precedents in the local Eneolithic cultures and can have spread there only with Indo-Aryan speakers arriving in South Asia in the Bronze Age. This supposition is backed up by the finds of handmade pottery in the isolated districts of northwestern South Asia and by textual references in the Vedas to such a technology being spread by the early speakers of Indo-Aryan.

If we admit that the Andronovo tribes spoke languages of the Indo-Iranian group, then we can see Uralic speakers as being represented by the Andronoid cultures. The boundary of the steppe and forest zones can be considered as the territory where contacts between them took place. Thus the correlation of the data relating to two ethnic groups belonging to two different language families strengthens the independent hypotheses concerning the habitats where these two ethnic groups settled.

Toponyms constitute an important argument in support of these hypotheses. *Ripa* is a name for the Ural mountains that can be traced both in ancient Iranian and in Uralic traditions. The idea of a sacred mountain Meru can be found in India as well as among the Finno-Ugric peoples. Mordvin *Rav(o)* 'the river Volga' corresponds to the early Indo-Iranian name of the river Volga in Scythian *Rhā*, Ṛgvedic (Old Indo-Aryan) *Rasä* and Avestan (Old Iranian) *Ranghā* (cf. Joki 1973: 307); the sources of the Volga are the Kama and the

Belaya rivers, which flow from the Urals. (Grantovskij 1960; 1998; Bongard-Levin & Grantovskij 1983; Abaev 1972; Dovatur, Kallistov & Shilova 1982; Chlënova 1983; 1989; Markwart 1938; Christensen 1943.)

MYTHOLOGY

Mythology constitutes the third source group which informs this hypothesis.

The early Finno-Ugric pantheon reflects the cult of three very early Indo-Iranian deities, who are attested in documents of the 14th century BC in the Near East relating to the Mitanni Aryans, in the Rgveda of the early Indo-Aryans as well as in the Avesta of the ancient Iranians. These three gods are Indra, Varuṇa and Mitra. That the early Finno-Ugric people were acquainted with Indra is proved by the fact that they borrowed the name of his weapon, *vajra*. Varuṇa has been compared many times to the supreme god of the Ugric people, Numi-Torum, who has similar functions and Varuṇa's attribute, the horse chariot. (Toporov 1981.) Another Uralic deity, Mir-Susne Hum, has obtained the functions of Mitra and his connection with a white horse. The sacrificial burial of the horse and plastic art images of this animal appear in the taiga zone on Andronovo-influenced monuments. This indicates that the Uralic people adopted horse-breeding together with mythical ideas and rituals comparable to the Indian *aśvamedha* (Moshinskaya 1979; Kuz'mina 1977a; 1990a; 1992a; 1992b). The formation of the image of Numi-Torum riding a chariot can safely be dated back to the second millennium BC, when the Andronovo people used chariots in the steppes (Gening 1977; Kuz'mina 1994a), for in the succeeding Scythian period the chariot was no longer used in warfare. Other shared pantheon figures, too, such as the "golden-rayed" hero Somipos and the first ancestor and King Yima, demonstrate that contacts existed between the Finno-Ugric and Aryan peoples (Steblin-Kamenskij 1995).

A comparison of the images of the Mother Goddess is especially interesting. In the Ugric tradition, she is conceived of as a she-beaver and depicted as flanked by a beaver on either side or as standing on a beaver (Skalon 1951; Kuz'mina 1988; 1990; 1992a; 1992b; Chlënova 1989). This association of the goddess with the beaver is based on the aphrodisiac force of the beaver's spurt, which was thought to yield fertility, and on the beaver's connection with the same two spheres of the universe with which Mother Earth is connected, that is, with the sphere of the earth and the underground/underwater sphere. It has been assumed that this association of the mother goddess with the beaver was borrowed from the Ugric peoples by the ancient Iranians. In the 5th Yasht of the

Avesta dedicated to the "stainless" goddess Ardvi Sura Anahita, she is dressed in a coat of beaver skin. Evidently such an attribute could appear only after the beaver had been conceived of first as the embodiment, and then as a companion, of the goddess, and only in a zone where the beaver lived. Osteological analysis of finds from the Andronovo settlements Kipel, Novo-Burino, Alekseevka, Shortandy-Bulak, Ust'-Narym and Malo-Krasnoyarka have shown that the beaver dwelt in the whole Andronovo area in the Bronze Age (Kuz'mina 1988: 56-57; Afanas'eva 1960; Kozhamkulova 1969), although this animal is no longer found in Kazakhstan.

The beaver's name in Indo-Iranian languages goes back to the Indo-European word for 'wave' and denotes 'water animal with a sparkling brown skin'; Finno-Ugric names for the beaver and the otter also refer to this characteristic (Gamkrelidze & Ivanov 1984: II, 529-531). Among the Iranians, the Mother Goddess is the protectress of waters. Thus many Iranian-speaking peoples associate her with rivers and water animals: in the Avesta, Ardvi Sura Anahita wears a beaver coat; the Scythians have as their pristine mother the daughter of the River Dnieper (Don Apris), a snakefooted nymph; in Greek art she is depicted with sea horses; among the Ossets she is the ancestral mother Dzerassy living in the watery deep, the daughter of Don Betyr the ruler of the waters, and depicted as a turtle (Kuz'mina 1977b; 1988).

According to Thomas Burrow (1976) and G. M. Bongard-Levin and È. A. Grantovskij (1983), the Indo-Iranians probably got from the Finno-Ugric peoples at the earliest date of contact the following mythical ideas: the world column and the Sampo mill connected with the Indo-Iranian wind god Vāta, the cult of the sacred Kara fish of the river Volga, and the fantastic elk called *śarabha*. The name and cult of the Bactrian camel were borrowed by the Finno-Ugric speakers from the Indo-Iranians in ancient times. (Kuz'mina 1963.) The practice of the shaman, too, has Indo-Iranian sources. The unfastened clothes of the Hanti that do not suit the ecology of their northern habitat is one of the borrowings from the Andronovo culture (Prytkova 1953; Moshinskaya 1978). The information about the northern lights found in the Indo-Iranian tradition and borrowed by the Greeks from the Scythians can be connected with the spread of Andronovo celts and utensils as far north as the arctic circle (cf. Chernykh & Kuz'minykh 1989).

All these data support the hypothesis that the original homeland of the Indo-Iranian speakers was located in the vicinity of Finno-Ugric speakers and that it is to be attributed to the Andronovo cultural complex.

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THE INDO-IRANIAN SUBSTRATUM

Alexander Lubotsky

1. Study of loanwords can be a powerful tool for determining prehistoric cultural contacts and migrations, but this instrument is used very differently in various disciplines. For instance, loanword studies are fully accepted in Uralic linguistics, whereas Indo-Europeanists are often reluctant to acknowledge a foreign origin for words attested in Indo-European languages. The reason is obvious: in Uralic, we know the source of borrowings (Indo-Iranian, Germanic, Baltic), but the source of possible Indo-European loans is usually unknown. Nevertheless, it is a matter of great importance to distinguish between inherited lexicon and borrowings, even if the donor language cannot be determined.

In recent years, the methodology of dealing with borrowings from an unknown source has been developed by Kuiper (1991; 1995), and applied by Beekes (1996) and Schrijver (1997). As these scholars have pointed out, an etymon is likely to be a loanword if it is characterized by some of the following features: 1) limited geographical distribution; 2) phonological or morphonological irregularity; 3) unusual phonology; 4) unusual word formation; 5) specific semantics, i.e. a word belongs to a semantic category which is particularly liable to borrowing.

2. In my paper, I shall apply this methodology to the Indo-Iranian lexicon in search of loanwords which have entered Proto-Indo-Iranian before its split into two branches. As a basis for my study I use the list, gleaned from Mayrhofer's EWAia, of all Sanskrit etyma which have Iranian correspondences, but lack clear cognates outside Indo-Iranian. The complete list of some 120 Indo-Iranian isolates is presented in the Appendix.

The words of this list are by default characterized by the first of the above-mentioned criteria, viz. limited geographical distribution, but this in itself is not very significant because the lack of an Indo-European etymology may be accidental: either all other branches have lost the etymon preserved in Indo-Iranian, or we have not yet found the correct etymology. Only if a word has other features of a borrowing must we seriously consider its being of foreign origin. The analysis of phonological, morphological and semantic peculiarities of our corpus will be presented in the following sections, but first I would like to make two remarks.

I use the term "substratum" for any donor language, without implying sociological differences in its status, so that "substratum" may refer to an adstratum or even superstratum. It is possible that Proto-Indo-Iranian borrowed words from more than one language and had thus more than one substratum.

Another point concerns dialect differentiation. In general, we can speak of language unity as long as the language is capable of carrying out common innovations, but this does not preclude profound differences among the dialects. In the case of Indo-Iranian, there may have been early differentiation between the Indo-Aryan and Iranian branches, especially if we assume that the Iranian loss of aspiration in voiced aspirated stops was a dialectal feature which Iranian shared with Balto-Slavic and Germanic (cf. Kortlandt 1978: 115). Nevertheless, Proto-Indo-Iranian for a long time remained a dialectal unity, possibly even up to the moment when the Indo-Aryans crossed the Hindukush mountain range and lost contact with the Iranians.

3. Let us now look at the peculiar features displayed by some of the words from the corpus.[1]

3.1. Irregular correspondences

In anlaut:

Skt. *s-* : PIr. **s-* (Skt. *síkatā* : OP *θikā-* 'sand'; Skt. *sūcī* : LAv. *sūkā-* 'needle');

Skt. *k-* : PIr. **g-* (Skt. *kéśa-* 'hair' : LAv. *gaēsa-* 'curly hair');

Skt. *ph-* : PIr. **sp-* (Skt. *phála-* : MoP *supār* 'ploughshare');

Skt. *ś-* : PIr. **xšu-* (Skt. *śépa-*, but Prākrit *cheppa-* : LAv. *xšuuaēpa-* 'tail').

[1] We should not be discouraged by the often "normal" looks of a word: the early date of borrowing may be responsible for the fact that the loanwords were adjusted to the phonemic system of that moment and went through the whole historical development of the Indo-Iranian languages. Note that I did not use the laryngeals in the reconstructions because for the time being we do not know at which stage and in which form the words were adjusted to the Indo-Iranian phonemic system.

In inlaut:

Skt. *-a-* : PIr. **-u-* (Skt. *jáhakā* : LAv. *dužuka-*, Bal. *ǰaǰuk*, *dužux*, MoP *žūža* 'hedgehog');

Skt. *-ā-* : PIr. **-a-* (Skt. *chāga-* : Oss. *sæǧlsæǧæ* 'billy-goat'; Skt. *āśā-* f. : LAv. *asah-* n. 'region, space');

Skt. *-v-* : PIr. **-b-* (Skt. *gandharvá-* : LAv. *gaṇdərəβa-* 'a mythical being');

Skt. *-dh-* : PIr. **-t-* (Skt. *gandhá-* 'smell' : LAv. *gaiṇti-* 'bad smell');

Skt. *-ar-* : PIr. **-ra-* (Skt. *átharvan-* : Av. *āθrauuan-/aθaurun-* 'priest');

Skt. *-ar-* : PIr. **-r̥-* (Skt. *gandharvá-* : LAv. *gaṇdərəβa-* 'a mythical being');

Skt. *-ūr-* : PIr. **-r̥-* (Skt. *dūrśá-* 'coarse garment' : Wakhi *ðərs* 'wool of a goat or a yak').

3.2. Impossible root structure for an Indo-European word

There is a well-known root structure constraint in Proto-Indo-European, which does not permit two unaspirated voiced stops within a root. This means that **gadā-* 'club' and **gr̥da-* 'penis' could not have been formed in the Indo-European proto-language.

3.3. Unusual structure (trisyllabic nouns with long middle syllable)

**pīi̯ūša-* 'biestings', **maḭūkʰa-* 'wooden peg', **i̯avīi̯ā-* 'canal', **u̯arāǰʲa-* 'wild boar', **kapauta-* 'pigeon', **kapāra-* 'vessel, dish'.

The structure of these words is such that it is very difficult to explain them on the basis of IE morphology. For instance, Mayrhofer (EWAia II, p. 138) writes about Skt. *pīyūṣa-* 'biestings': "Gewiß zu *PAY*$^{1/}$ ['to swell'], *páyas-* ['milk, fluid'] gehörig" with a reference to Wackernagel 1954: 500. Wackernagel assumes in this word a suffix *-ūṣa-*, which is further only found in the late Sanskrit words *gaṇḍūṣa-* 'water for rinsing the mouth' and *mañjūṣā-* 'box, chest' (to which we may add RV *āṅgūṣá-* 'hymn', Kuiper 1991: 19, 23), all of them being evident loanwords. Furthermore, even postulating a suffix *-ūṣa-* in *pīyūṣa-* does not solve all the problems, since we are still left with an unexplained long *ī*. The foreign origin of *pīyūṣa-* was already suggested by Kuiper (1968: 80; 1991: 46).

3.4. Phonetic peculiarities

Voiceless aspirates:

**(s)pʰāra-* 'ploughshare', **atʰaru̯an-* 'priest', **kapʰa-* 'mucus, phlegm', **kʰi̯ā-* 'well, source', **kʰara-* 'donkey', **maḭūkʰi̯a-* 'wooden peg'.

Extremely frequent palatal stops: **ańcu-* 'Soma plant', **āćā-/ać̣as-* 'region, space', **ćaru̯a-* name of a deity, **daćā-* 'hem, thread', **dṛća-/dr̥ća-* 'coarse garment', **j^{h}armi̯a-* 'firm structure', **kać̣apa-* 'tortoise', **kai̯ća-/gai̯ća-* 'head hair', **kućši-* 'side of the body, flank', **malj^{h}a-* (?) 'belly', **nai̯j(s)-* 'spit', **ućig-* 'sacrificing priest', **u̯arāj^{h}a-* 'wild boar', etc.

Frequent clusters with *-s-*: **kućši-* 'side of the body, flank', **u̯r̥ćša-* 'tree', **matsi̯a-* 'fish', **nai̯j(s)* 'spit', **kšīra-* 'milk', **pusća-* 'tail', **ścāga-/ścaga-* 'billy-goat'.

3.5. Peculiar word formation

"Suffix" *-ka-* (normally only denominal): **atka-* 'cloak', **stuka-* 'tuft of hair', **u̯r̥tka-* 'kidney', **j̆aj^{h}a/ukā̆* 'hedgehog';

"Suffix" *-sa-* (rare in the inherited lexicon): **pīi̯ūša-* 'biestings', **u̯r̥ćša-* 'tree';

"Suffix" *-pa-*: **kać̣apa-* 'tortoise', **pāpa-* 'bad', **stŭpa-* 'tuft of hair', **šu̯aipa-* 'tail';

Other unusual suffixation:

**stu-ka-* vs. **stŭpa-* 'tuft of hair', **nagna(j^{h}u)-* (Skt. *nagnáhu-* m. 'yeast', Iran. **nagna-* 'bread'), **karuš-* 'damaged (teeth)', **j^{h}arm(i)i̯a-* 'firm structure, permanent house', **matsi̯a-* 'fish', **nai̯j(s)-* 'spit', **ućig-* 'sacrificing priest', **b^{h}išaj̆* (Skt. *bhiṣáj-* m. 'physician'; LAv. *bišaziia-* 'to cure'), **pavastă̆* 'cloth'.

3.6. Semantic categories

We can suspect that some words have been borrowed because they belong to a specific semantic field, even if they display no phonological or morphological anomalies. For instance, I assume that the religious terms **ańcu-* 'Soma plant', **ćaru̯a-* name of a god, **magʰa-* 'gift, offering, sacrifice' are likely to be loanwords. These words belong to the cult of Soma-drinking Aryans and thus form a semantically closely related group. The other members of the group do show anomalies: **atʰaru̯an-* 'priest' and **g$^{(h)}$and^{h}aru̯/b$^{(h)}$a-* 'a mythical being' have irregular correspondences, **indra-* shows irregular vocalization, **r̥ši-* 'seer' has irregular accentuation in Sanskrit, while **ućig-* 'sacrificing priest' has an unusual morphological structure.

Also for semantic reasons, I assume foreign origin for words like **daćā-* f. 'hem, thread', **išt(i̯)a-* 'brick', **u̯āći-* f. 'axe, pointed knife', etc.

3.7. In general, we can state that although the foreign origin of some of the words is open to doubt, there is a small, but undisputable body of loanwords in Indo-Iranian[2]. Our next task is to scrutinize the structure of the Indo-Iranian substratum.

4.1. The phonological and morphological features of Indo-Iranian loanwords are strikingly similar to those which are characteristic of *Sanskrit* loanwords, i.e. words which are only attested in Sanskrit and which must have entered the language after the Indo-Aryans had crossed Hindukush. The structure of Sanskrit loanwords has been discussed by Kuiper (1991), so that a few examples will suffice.

The *maṭūkʰa*-type (trisyllabic words with long middle syllable) is abundantly attested in the foreign vocabulary of Sanskrit, cf. *urvārū́* f. 'cucumber', *úlūka-* m. 'owl', *uṣṇī́ṣa-* m.n. 'turban', *ṛbī́sa-* n. 'oven', *kapolá-* m. 'cheek', *kárīṣa-* n. 'dung', *kilā́sa-* adj. 'of variegated color', *kiśorá-* 'foal', *mayū́ra-* m. 'peacock', *masū́ra-* m. 'lentil', *śārdūlá-* m. 'tiger', *śṛgālá-* m. 'jackal', etc.[3]

Voiceless aspirates are represented e.g. in *ulū́khala-* n. 'mortar', *khilá-* m. 'uncultivated land', *khārī́* f. 'measure of grain', *kharvá-* adj. 'mutilated', *phála-* n. 'fruit', *múkha-* n. 'mouth, face', *śíkhā-* f. 'tuft of hair, crest'.

Palatal stops are very frequent. For instance, in Kuiper's list of 383 foreign words in the RV I counted more than 90 words containing palatal *ś*, *j*, *ch* and *h*.

Clusters with *-s-* are: *kṣauma-* adj. 'linen' (cf. also *úmā-* 'id.'), *chúbuka-* n. 'chin', *mukṣṭíjā-* '?' (V), *ikṣvākú-* NPr. (RV), *kútsa-* NPr. (RV), *kṣúmpa-* '?' (RV 1.84.8), etc.

For the "suffix" *-pa-* cf. *álpa-* adj. 'small', *turī́pa-* n. 'seminal fluid', *púṣpa-* n. 'flower', *śáṣpa-* n. 'young grass, moulted barley', *śílpá-* adj. 'variegated' (also *śílpa-* n. 'ornament'), *śū́rpa-* n. 'winnowing basket', etc.

For the "suffix" *-h-* cf. *malhá-* adj. 'with hanging belly/udder' (said of goats and ewes) vs. *bárjaha-* 'udder', *barjahyà-* 'nipple'.

For the "suffix" *-ig-* cf. *ṛtvíj-* 'priest', *vaṇíj-* 'merchant', *bhuríj-* '?'.

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2 During the discussion of my paper in Tvärminne, Professor E. Helimski stressed the point that the number of Indo-Iranian loanwords is relatively small, so that the homeland of the Indo-Iranians is likely to be not so far from the Urheimat of the Indo-Europeans.

3 Cf. also *ulū́khala-* n. 'mortar' with four syllables. In my opinion, also *karmā́ra-* m. 'blacksmith' is a loanword and is not derived from the root *kṛ-* 'to make', as is usually assumed. Also Skt. *piṭ́dāku-* 'panther; kind of snake' seems to be borrowed from the same language (the eventual origin of the word must be sought in the Near East, cf. the Iranian words Sogd. *pwrδnk-*, MiP *palang*, etc., Gr. πάρδαλις 'leopard').

For the sequence *-rṷ-* cf. *ṷrvārū́* f. 'cucumber', *kharvá-* adj. 'mutilated', *ṷrvášа-* NPr., *páṭharvan-* NPr. (RV 1.112.17), *phárvara-* '?' (RV 10.106.2), probably *śárvarī-* 'night'.

4.2. The phonological and morphological similarity of loanwords in Proto-Indo-Iranian and in Sanskrit has important consequences. First of all, it indicates that, to put it carefully, a substratum of Indo-Iranian and a substratum of Indo-Aryan represent the same language, or, at any rate, two dialects of the same language. In order to account for this fact, we are bound to assume that the language of the original population of the towns of Central Asia, where the Indo-Iranians must have arrived in the second millennium BCE, on the one hand, and the language spoken in Punjab, the homeland of the Indo-Aryans, on the other, were intimately related.[4] At the present stage, it is useless to speculate about the possible identity of these languages, but this does not affect the argument.

Another consequence is that the Indo-Iranians must still have formed a kind of unity during their stay in Central Asia, albeit perhaps dialectally diversified. Judging by the later spread of the Indo-Aryans – to the south-west in the case of the Mitanni kingdom and to the south-east during their move to Punjab –, they were situated to the south of the Iranians, forming the vanguard, so to speak, of the Indo-Iranian movement. Accordingly, the Indo-Aryans were presumably the first who came into contact with foreign tribes and sometimes "passed on" loanwords to the Iranians. In this way, we may account for the difference between Skt. *śíkatā-* and Iranian **sikatā-* 'sand, gravel' or Skt. *sūcī́-* and Iranian **sūčī-* 'needle', which cannot reflect a single proto-form. At the stage when words with Skt. *s-* arrived in the Iranian territory, PIIr. **s* had already become Iranian **h*, and PIIr. **ć* had turned into PIr. **s*, so that these words entered Iranian with PIr. **s-*. This direction of borrowing (rather than from Iranian to Sanskrit, as is usually assumed) also explains the irregular correspondences within Iranian. For instance, the word for 'sand, gravel' has no less than four different formations in Iranian, viz. **sikă-* (OP *θikā-*, Bel. *six*, Pashto *šəga*), **sikaia-* (Median *Sikayauvati-* 'made of gravel', the name of a fortress, Munji *səgya*, Išk. *sëγio, sigioh*), **sikatā-* (Pahlavi *sygd* = *sikat*, Sogd. *šykth*, Khot. *siyatā*), **sikitā-* (Kurdish *sigit* 'earth', Oss. *syǵyt/sigit* 'id.', etc.); the word for needle has two forms, viz. **sūkā-* (LAv. *sūkā-*) and **saucaṇia-* (MiP *sozan*, Khot. *saujsaña-*, Oss. *sūʒın/soʒīnæ*, etc.) (Abaev 1958-95, III: 164-165, 187-188).

[4] The links between the culture of Central Asia and that of the Indus Valley are also repeatedly reported by archaeologists (cf. Parpola 1988: 204; Hiebert 1995 with ref.).

5.1. We can now turn to the culture with which the Indo-Iranians came into contact. Let us look at the semantic categories which are represented among the Indo-Iranian substratum words. I have arranged them in accordance with their frequency. One of the largest categories is "body parts, hair" (9 items: **kapʰa-* 'mucus, phlegm', **kaića-/gaića-* 'head hair', **kućši-* 'side of the body, flank', **gṛda-* 'penis', **maljʰa-* 'belly', **puśća-* 'tail', **stuka-* 'tuft of hair', **šuaipa-* 'tail', **uṛtka-* 'kidney'), but this category, as well as "pejorative adjectives" (**aka-* 'bad', **karuš* 'damaged (teeth)', **pāpa-* 'bad'), is not particularly telling for the identification of the culture.

"Religion, cult" (8) has been shortly discussed above.

"Wild animals" (8): **(H)uštra-* 'camel', **kʰara-* 'donkey', **kaćiapa-* 'tortoise', **kapauta-* 'pigeon', **jaǰʰa/ukă* 'hedgehog', **matsia-* 'fish', **mṛga-* 'game', **uarāǰʰa-* 'wild boar'.

"Clothing" (5): **atka-* 'cloak', **daćā-* 'hem, thread', **dṛća-/dṝća-* 'coarse garment', **pauastă* 'cloth', *sūčī-/ćūčī-* 'needle'.

"Building technology" (4): **išt(i)a-* 'brick', **ǰʰarmia-* 'firm structure, permanent house', **maiūkʰa-* 'wooden peg', **sikatā/ćikatā-* 'sand, gravel'.

"Artifacts" (3): **kapāra-* 'dish, bowl', **naiǰ(s)-* 'spit', **uāćī-* 'axe, pointed knife'.

"Water economy and irrigation" (3): **kʰā* 'well, source', **čāt* 'pit, well', **iavīiā* 'canal'.

"Cattle breeding" (3): **kšira-* 'milk', **pīiūša-* 'biestings', **śćāga-/śćaga-* 'billy-goat'.

"Agriculture" (2): **nagna-* 'yeast, bread', **(s)pʰāra-* 'ploughshare'.

5.2. Starting with the assumption that loanwords reflect changes in environment and way of life, we get the following picture about the new country of the Indo-Iranians. The landscape must have been quite similar to that of their original homeland, as there are no new terms for plants or landscape. The new animals like camel, donkey, and tortoise show that the new land was situated more to the South. There was irrigation (canals and dug wells) and more elaborate architecture (permanent houses with walls of brick and gravel). Agriculture still did not play an important role in the life of Indo-Iranians: presumably, they did not change their life style and only used the products ('bread'!) of the farmers, hardly tilling the land themselves. The paucity of terms for military technology (only **gadā-* f. 'club') can be seen as an indication of Aryan military

supremacy. It seems further obvious to me that the Soma cult was borrowed by the Indo-Iranians.

This picture, which is drawn on exclusively linguistic arguments, is a strong confirmation of the traditional theory that the Indo-Iranians come from the north. Most probably, the Indo-Iranians moved from the Eurasian steppes in the third millennium BCE (Pit-Grave culture, 3500-2500 BCE) in the eastern direction, first to the region of the lower Volga (Potapovo, etc., 2500-1900 BCE) and then to Central Asia (Andronovo culture, from 2200 BCE onwards).

As we have seen above, there are reasons to believe that the Indo-Aryans formed the vanguard of the Indo-Iranian movement and were the first to come into contact with the original inhabitants of the Central Asian towns. Then, presumably under pressure from the Iranians, who were pushing from behind, the Indo-Aryans moved further to the south-east and south-west, whereas the Iranians remained in Central Asia and later spread over the Iranian plateau. The urban civilization of Central Asia has enriched the Indo-Iranian lexicon with building and irrigation terminology, with terms for clothing and hair-do, and for some artifacts. It is tempting to suggest that the word **gadā-* 'club, mace' refers to the characteristic mace-heads of stone and bronze abundantly found in the towns of the so-called "Bactria-Margiana Archaeological Complex". Also **u̯āćī-* 'axe, pointed knife' may be identified with shaft-hole axes and axe-adzes of this culture.

6. Finally, I would like to shortly discuss the implications for the contacts between Indo-Iranian and Uralian speakers, which is the actual theme of this conference. As is well known, Uralic has borrowed heavily from Indo-Iranian, but I agree with those scholars who believe that many of the apparent early borrowings rather reflect an etymological relationship between Uralic and Indo-European, and I doubt that there are Proto-Uralic borrowings from Indo-European. At any rate, borrowings from Indo-Iranian start with the Finno-Ugric period. It is remarkable that the oldest layer of borrowings often concerns words which are only attested in Sanskrit and not in Iranian (e.g. FU **ora-* 'awl' : Skt. *ā́rā-* 'awl'; FV **reśmä* 'rope' : Skt. *raśmí-* m. 'rein', *raśmán-* m. 'id.'; FV **onke* 'hook' : Skt. *aṅká-* 'hook'; FP **antɜ* 'young grass' : Skt. *ándhas-* 'grass', etc.). This fact can be explained by the vanguard position of the Indo-Aryans, who were the first to come into contact with the Uralic population on their move to the east. The Iranians, who came slightly later, lived in the neighbourhood of the Uralians for a very long time and continuously contributed to the enrichment of the Uralian vocabulary.

Another problem is how to account for Indo-Iranian isolates which have been borrowed into Uralic. It is hard to believe that the new vocabulary, which most probably was acquired by the Indo-Iranians in Central Asia, could reach the Uralians in time, so that we only have two options: either the Indo-Iranian isolates are of Indo-European origin, or the Uralians borrowed these words from an Iranian source at a later stage. To the first group may belong PIIr. **raćm-* 'rope, rein' : FV **reśinā* 'rope' (the *-m-* is only attested in Sanskrit); PIIr. **makš* 'fly, bee' : FU **mekše* 'bee' (the fact that the word can be reconstructed for FU precludes a late date for borrowing); PIIr. **surā-* 'alcohol' : PP **sur* 'beer' (the PP word cannot be a late borrowing from Iranian because of its **s-*) and PIIr. **dasiu-* 'foreigner' : Vog. *tas* 'stranger' (the Uralic word cannot be due to late borrowing from Iranian because of the preserved **s*). On the other hand, I assume that FV **oraśe* '(castrated) boar' was borrowed from Iranian (PIIr. **uarāj^{h}a-* 'wild boar' can hardly be an IE word). The same probably holds for FP **śuka* 'chaff, awn' because this form is only found in Iranian (LAv. *sūkā-* 'needle') and further for PP *vörk* 'kidney' (PIIr. **urtka-*), FP/FV **śaka* 'goat' (PIIr. **śćāga-/śćaga-*), PP **ńań* 'bread' (PIIr. **nagna-*), PP **majāk/majāg* 'stake' (PIIr. **maiūk^{h}a-*).

APPENDIX:
A list of Indo-Iranian isolates

The list presented below is based on Mayrhofer's EWAia. I have collected those Sanskrit etyma which have Iranian correspondences, but lack other IE cognates. In general, I follow the etymological analysis of Mayrhofer, and whenever I disagree with his judgement, this is expressly mentioned. Since it is often difficult to decide whether a particular word is a borrowing or not (the most important criteria have been discussed in the main body of the article), I have decided to present the evidence in full.

The list is divided into the following sections: A. Loanwords; B. Inherited words; C. Verbs; D. *Wanderwörter*; E. Words with uncertain Ilr. etymology. The verbs are given separately, as at this stage it appears impossible to distinguish between inherited verbs and borrowings. The section "Wanderwörter" contains words which are attested both in Sanskrit and Iranian, but whose ProtoIndoIranian age cannot be ascertained.

Every lemma begins with a Proto-Indo-Iranian reconstruction, followed by grammatical information (in the case of agreement between Sanskrit and Iranian) and the meaning. In square brackets I have added words from other language families (mostly, Uralic) which are borrowed from Indo-Iranian or from which an Indo-Iranian word might have been borrowed.

A. Loanwords

**aka-* adj. 'bad': Skt. *áka-* n. 'pain', *ákam* adv. 'in a bad way'; Av. *aka-* 'bad, evil'.

**ancú-* m. 'Soma plant' (probably ephedra): Skt. *aṃśú-* 'Soma plant'; Av. *ąsu-* 'Haoma plant'.

**atka-* m. 'cloak': Skt. *átka-*; LAv. *aδka-*, *aṯka-*.

**aθaryan-* m. 'priest': Skt. *átharvan-*; Av. *āθrauuan-/aθaurun-*.

**āćā-/aćas-* 'region, space': Skt. *āśā-* f.; LAv. *asah-* n.

**bʰiš-* 'medicine, medicinal herb': Skt. *bhiṣáj-* m. 'physician'; Av. *°bīš-* 'medicine', LAv. *bīšaziia-* 'to cure'.

**ćarua-* m. name of a deity: Skt. *śarvá-* name of a god; LAv. *sauruua-* name of a daēva.

**čāt-* 'pit, well': Skt. *cā́tvāla-* (Br.+) m.n. 'pit (dug in order to get ground for the northern altar)'; LAv. *cāt-* f. '(dug) well', Buddh. Sogd. *č't*, Bactrian σαδο 'well'.

**daćā-* f. 'hem, thread': Skt. *daśā-* 'hem'; Khot. *dasa*, Bal. *dasag* 'thread'.

**dṛća-/dṛčа-* (?) 'coarse garment': Skt. *dūrśá-* n. 'coarse garment'; Wakhi *δirs* (Grunberg & Steblin-Kamenskij 1976, *dərs*) 'wool of a goat or a yak', Shughni *δoxc* 'id.; body hair; coarse cloth' (cf. Karamshoev 1991 s.v.).

**gadā-* f. 'club': Skt. (Sū+) *gadā-*; LAv. *gaδā-*, MiP *gad*.

**gand^{h}/t-* 'smell': Skt. *gandhá-* m. 'smell'; LAv. *gainti-* 'bad smell'.

**g$^{(h)}$and^{l}(a)ru/b$^{(h)}$a-* m. 'a mythical being': Skt. *gandharvá-*; LAv. *gaṇdərəβa-*.

**gṛda-* 'penis': Skt. *gṛdá-* m.; LAv. *gərəδō.kərəta-* adj. 'cutting off the genitals'.

**indra-* m. name of a deity: Skt. *índra-* name of a god; LAv. *iṇdra-* name of a daēva. Mayrhofer (EWAia s.v.) offers several etymologies, none of which is convincing however. From a semantic point of view, the most plausible etymology is Slavic **jędrъ* 'strong, fresh', but the primary meaning in Slavic is clearly 'pit, kernel'. Note the "wrong" vocalization, if this were an IE formation (from **(H)indro-* we expect IIr. ***iadra-*).

**išt(i)a-* 'brick': Skt. *iṣṭakā-* f. (VS+); LAv. *išti̯a-* n., OP *išti-* f., MiP *xišt* (cf. on this word Witzel 1995: 103).

**iavīā-* f. 'canal': Skt. *yavyā́- /yavīyā́/* 'stream, canal'; OP *yauviyā-* 'canal'.

**j^{h}armi̯a-* 'firm structure, permanent house': Skt. *harm^{l}yá-* n. 'firm structure', later 'palace' (for the meaning see Elizarenkova 1995: 28-29); LAv. *zairimiiāuuaṇt-* adj. 'with a permanent house' (said of the moon), *zairimiiaŋura-* m. 'tortoise' = 'with toes in a house'.

**jaj^{h}a/uka-* 'hedgehog': Skt. (YV+) *jáhakā-* f.; LAv. *dužaka-*, Bal. *jaǰuk*, *dužux*, MoP *žūža*. [Brahui *ǰaǰak*, Santali *ǰhik* are most probably late borrowings from Indo-Iranian languages]

**kaći̯apa-* m. 'tortoise': Skt. *kaśyápa-*; LAv. *kasiiapa-*.

**kadru-* 'reddish-brown': Skt. (TS+) *kádru-* 'reddish-brown', Av. *kadruua.aspa-* name of a mountain, MoP. *kahar* 'light brown'.

**kaića-/gaića-* m. 'head hair': Skt. *kéśa-*; LAv. *gaēsa-* 'curly hair', *gaēsu-* 'with curly hair'. Connection with Skt. *késara-* n. (YV+) 'mane' and Lat. *caesariēs* 'head hair' is uncertain.

**kapauta-* m. 'pigeon': Skt. *kapóta-* 'pigeon'; OP *kapautaka-* adj. 'blue', MiP *kabōd* 'grey-blue, pigeon'.

**kapāra-* 'dish, bowl': Skt. *kapā́la-* n.; MiP *kabārag*, MoP *kabāra*.

**kap^{l}a-* m. 'mucus, phlegm': Skt. *kapha-* (Up.+) 'phlegm'; LAv. *kafa-* 'foam, mucus'.

**karuš-* adj. 'damaged (teeth)': Skt. *kárūḍatin-* 'with bad teeth'; Sogd. *krw δnt'k* 'id.'.

**kućši̯* m. 'side of the body, flank': Skt. *kukṣí-*; Sogd. *ɣwšy-*. The often proposed connection with Skt. *kóśa-* m. 'coop, cask' is unconvincing.

**kšīra-* 'milk': Skt. *kṣīrá-* n.; MiP *šīr*, Yidgha-Munji *xšīra*.

**k^{h}ara-* m. 'donkey': Skt. *khara-* (AVP+); LAv. *xara-*. [Akkadian (Mari) *ḫârum, ajarum* 'donkey'; Tam. *kaṟutai* 'id.' ?]

**k^{l}ā-* f. 'well, source': Skt. *khā́-*; LAv. *xā-*.

**mag^{l}a-* n. 'gift, offering, sacrifice': Skt. *maghá-*; OAv. *maga-*. A connection with Gothic *mag* 'can, may' and its family is uncertain.

**maiūk^{l}a-* m. 'wooden peg': Skt. *mayūkha-* 'peg for stretching the woof'; OP *<myux>* = *mayūxa-* 'doorknob', Sogd. *myyk* 'peg', MiP and MoP *mēx* 'peg, nail', Oss. *mīx/mex* 'stake'. The current etymology derives the word from the root *mi-* 'to build, erect', which explains neither its morphology (suffix **-ūk^{l}a-*?) nor its semantics (the verbal root only means 'to fix in the ground'). The meaning 'stake' is only attested in Ossetic and is clearly secondary. [In view of its meaning, PP **majäk/majāg* 'stake' (Rédei 1986: 72) is probably borrowed from Pre-Ossetic]

**malǰʰa-* (?) 'belly': Skt. *malhá-* adj. 'with hanging belly/udder' (said of goats and ewes)[5]; LAv. *mərəzāna-* n. 'belly', *maršuiiā̊* gen.sg. (the stem *maršuuī̆-*?) 'paunch'. Probably, also Skt. *bárjaha-* 'udder', *barjahyá-* 'nipple' belong here. The current IE etymology, connecting Lith. *milžtis*, Latvian *mìlzt* 'to swell up', is phonetically impossible, since the Baltic acute points to IE **ǵ* (Winter's Law).

**matsia-* m. 'fish': Skt. *mátsya-*; LAv. *masiia-*. The current IE etymology, which connects Germanic words like Gothic *mats* 'food' < *PGm. *mati-*, explains neither the meaning nor the morphology of the Ilr. word.

**mṛga-* m. 'game': Skt. *mṛgá-* 'forest animal, bird'; LAv. *mərəγa-* 'bird'.

**nagna-* 'yeast, bread': Skt. *nagnáhu-* (AVP+) m. 'yeast, ferment'; Plr. **nagna-* 'bread' (Sogd. *nγny*, Pashto *nayan*, MiP *nān* with an irregular development, etc.). The old theory, according to which the Skt. word was borrowed from Iranian **nagnax'ād-* 'bread seasoning', seems improbable to me. [→ PP **ńań* 'bread' from Iranian, Rédei 1986: 73]

**naiǰ(s)-* 'spit': Skt. *nikṣ-* 'to pierce', *níkṣaṇa-*, *nékṣaṇa-* n. 'spit, fork'; LAv. *naēza-* n. 'sharp point (of the needle)', MiP *nēzag* 'lance', MoP *nēš* 'sharp point', *nēštar* 'lancet'. The Sanskrit verbal forms (present *níkṣati* with its accented zero-grade) do not look old.

**paṷastă* 'cloth': Skt. *pavásta-* n. 'cover, garment'; OP *pavastá-* f. 'thin clay envelope used to protect clay tablets'.

**pāpa-* adj. 'bad': Skt. *pāpá-*; LAv. *pāpa°*.

**pīṷīša-* 'bicstings': Skt. *pīyūṣa-* m.n.; Wakhi *pyix*, Munji *fəyū*.

**pusća-* 'tail': Skt. *púccha-* m.n.; LAv. *pusa-* m.

**rāći-* 'heap': Skt. *rāśí* m. 'heap, mass'; Pashto *ryāša* 'heap (of grain)' < **rāsiṷā̆*. A connection with **raćm-* 'rope' cannot be excluded, however.

**ṛši-* m. 'seer': Skt. *ṛ́ṣi-*; OAv. *ərəši-*. The initial accentuation in Sanskrit is aberrant (Lubotsky 1988: 29, 54).

**śćaga-/śćaga-* 'billy-goat': Skt. *chā́ga-* m.; Oss. *sæǧ/sæǧæ* 'goat', Wakhi *čəγ* 'kid'. [→ FP, FV **śaka/śawa* 'goat', Rédei 1986: 59]

**sikatā̆/ćikatā̆-* 'sand, gravel': Skt. *síkatā-* f. 'sand, gravel'; OP *θikā̆* f. 'gravel', Khot. *siyatā-* 'sand', Buddh. Sogd. *šykth* 'gravel'. [Kannada *usiku*, *usigu* 'sand' ?]

**(s)pʰāra-* 'ploughshare': Skt. *phāla-* m.; MoP *supār*, Išk. *uspir*, Wakhi *spūndr* (Grjunberg & Steblin-Kamenskij 1976, *spundr* 'plough'). It cannot be excluded that this is a migratory term and belongs to category D (Wanderwörter).

**stuka-* 'tuft of hair': Skt. *stúkā-* f. 'tuft of hair (esp. of a bull) or wool'; Oss. *styg/stug* 'lock, tuft of hair'. Cf. also Skt. *stū́pa-*, *stupá-* m. 'tuft of hair'.

**sūčī̆/ćūčī̆* 'needle': Skt. *sūcī́*; LAv. *sūkā-*, MiP *sozan*, Oss. *sūzīn/soǯīnæ*. [→ FP **śuka* 'chaff awn', Rédei 1986: 59; probably, from Iranian, cf. § 6]

**šuaipa-* (?) 'tail': Skt. *śépa-* m. (with irregular anlaut), Prākrit *cheppā-* f.; LAv. *xšuuaēpā-* f. (for the etymology see Lubotsky 2000: 260, fn. 20).

**ućig-* m. 'sacrificing priest': Skt. *uśíj-*; Av. *usig-*.

**uarāǰʰa-* m. 'wild boar': Skt. *varāhá-*; LAv. *varāza-*. [→ FV **oraśe* '(castrated) boar', Rédei 1986: 54; probably, borrowed from Iranian, cf. § 6]

**uāćī̆* f 'axe, pointed knife': Skt. *vā́śī* f 'axe, adze, chisel'; LAv. (Yasna 42.4) *vāsī* 'pointed knife (?)', Oss. *wæs* (better *was* ?)[6] 'axe, wood-chopper'.

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[5] The word always refers to a female, usually pregnant, animal, cf. TS 1.8.19.1 *ādityā́ṃ malhā́ṃ garbhiṇī́m á labhate* 'he offers a *malha* pregnant female animal, dedicated to Āditya' (similarly, MS 4.4.9; KS 13.1; TB 1.8.3.2), so that the meaning 'dewlap', given in the dictionaries, is improbable.

**u̯ŕćša-* m. 'tree': Skt. *vṛkṣá-*; LAv. *varəša-*.

**u̯ŕtka-* m. du. 'kidney': Skt. *vṛkká-* (TS+ *vŕkyau*); LAv. *vərəδ̊ka-*. The usual etymology derives this word from the root *vṛt-* 'to turn', which can hardly be correct because the suffix *-ka-* is only denominal in Indo-Iranian. [→ PP *vȯrk* 'kidney', Rédei 1986: 79]

**(H)uštra-* m. 'camel': Skt. *úṣṭra-*; Av. *uštra-*, OP *uša-bāri-* adj. 'camel-borne' (the laryngeal may be responsible for *-ð-* in *zaraθuštra-*).

B. Inherited words

**(H)agra-* 'top': Skt. *ágra-* n. 'tip, summit'; LAv. *aγra-* adj. 'first, topmost'. The word has a clear IE appearance, although there are no plausible cognates. Note that the connection with Latvian *agrs* 'early' (EWAia s.v.) is impossible because of Winter's Law.

**(H)ainas-* n. 'crime, mistake': Skt. *énas-*; Av. *aēnah-*.

**(H)and^{h}a-* adj. 'blind': Skt. *andhá-*; LAv. *anda-*. IE if Gallo-Latin *andabata* 'gladiator fighting in a helmet without openings' (*'blind-fighter') belongs here.

**(H)aruna-* 'red-brown': Skt. *aruṇá-*; Av. *auruna-*.

**(H)aruša-* 'reddish': Skt. *aruṣá-* 'reddish'; Av. *auruša-* 'white'.

**(H)asra-* adj. 'painful': Skt. *asrá-*; OAv. *aŋra-*, LAv. *aŋra-* 'evil'.

**(H)atHtHi-* (?) m. 'guest': Skt. *átithi-*; Av. *asti-*. The laryngeal in the Proto-Indo-Iranian form makes a non-IE origin improbable.

**(H)aud^{h}r/n-* 'cold': Skt. *údhani*, OAv. *aodərəš-čā*.

**(H)au̯asa-* n. 'provision': Skt. *avasá-* (cf. also denom. *ávayati* 'eats'); LAv. *auuaŋha-*.

**ćarad-* f. 'autumn, year': Skt. *śarád-* 'autumn, year'; LAv. *sarəd-*, OP <ϑrd-> 'year' (cf. Toch. A *śārme* 'autumn' < **kerdmēn-*?, Pinault 1998: 362).

**dási̯u-* m. 'foreigner', **dasi̯ú-* f. 'country (of the foreigners)': Skt. *dásyu-* m. 'enemy'; Av. *daxiiu-* f. 'country'. [→ Vog. *tas* 'stranger'] See the next word.

**dāsa-* '(hostile) people': Skt. *dāsá-*, *dā́sa-* m.; LAv. *dāhī-* 'belonging to the Dāha-people'. There are several suggestions for an IE etymology, but they are all doubtful (Gr. δοῦλος 'slave'; Gr. δῆμος 'people', for the latter see Lubotsky 1995: 231, fn. 18).

**drapsa-* m. 'streak, banner': Skt. *drapsá-*, LAv. *drafša-* (for the connection with Gr. τρέφω, Gennan *Treber*, etc. see Oberlies 1990: 153ff).

**i̯aćas-* 'fame': Skt. *yáśas-* n. 'fame'; OAv. *yasō.xšiiən* 'to attain fame', LAv. *yasō.bərəta-* 'brought with dignity'.

**i̯aćti-* f. 'stick, branch': Skt. *yaṣṭí-* (RVKh, ŚB+) f. 'staff, pole'; LAv. *°yaxšti-* 'branch'.

**i̯aj^{h}u-* 'youthful': Skt. *yahú-* 'youthful'; OAv. *yazu-* 'young'.

**i̯ātu-* '(black) magic': Skt. *yātú-* m.; LAv. *yātu-* f. (m. 'sorcerer'). In spite of its IE appearance, no convincing etymology for this word has been suggested.

**ɟraias-* n. 'wide expanse, sea': Skt. *jráyas-* n. 'wide expanse'; Av. *zraiiah-* n., OP *drayah-* n. 'sea'. Cf. also Skt. *úpajrayati* 'extends'. [→ PP **sariʒ* < **ɟaris* < **ɟarjəs* 'sea' from Iranian, Rédei 1986: 81]

**karna-* m. 'ear': Skt. *kárṇa-*; LAv. *karəna-*.

**d^{h}ārā-* f. 'blade of the sword': Skt. *dhā́rā-*; LAv. *dārā-*. IE if identical with Skt. *dhā́rā-* 'stream, pouring' (→ 'casting').

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6 As Johnny Cheung points out to me, this word is undocumented in Ossetic. Both Abaev (1958-95) and Miller & Frejman (1927-34) s.v. *wæs* refer to Miller 1903: 10, but there this word is spelled as *vas*, i.e. was.

**dʰrigu-* adj. 'poor, needy': Skt. *ádhrigu-* 'exalted'; OAv. *drigu-* 'needy', LAv. superlative *draējištō.təma-*.

**makš* f. 'fly, bee': Skt. *máks(ā)-* 'fly, bee'; LAv. *maxšī-* f. 'fly'. [→ FU **mekše* 'bee', Rédei 1986:45]

**māiiā-* f. 'magic power': Skt. *māyā́-*; OAv. *māiiā-*, LAv. *maiiā-*. There are various etymological proposals, but they are all rather improbable. The word looks fairly IE though, and its IE origin is conceivable.

mušti-* 'fist': Skt. *muṣṭí-* m.f.; LAv. *mušti°*. A connection with the word for 'mouse' (e.g. EWAia s.v.) is impossible, because the latter contains a laryngeal (muHs-*). The best chance for an IE etymology is the connection with Lith. *mùšti* 'to beat', Toch B *maśce* 'fist'.

**naima-* adj.: Skt. *néma-* 'some, half'; LAv. *naēma-* 'half'.

**paćšman-* 'eyelash': Skt. *pákṣman-* (YV+) n. 'eyelash'; LAv. *pašna-* n. 'eyelash or eyelid', MiP and MoP *pašm*, Khot. *pe'ma-*, Oss. *fæsm/fans* 'wool'. If the original meaning is 'fluff', then a connection with Gr. πέκτειν 'to comb' is plausible.

**pāman-* 'itch, scabies': Skt. *pāmán-* m.; LAv. *pāman-* m. Probably connected with Gr. πῆμα n. 'evil, harm'.

**pṛt-* f. 'battle': Skt. *pṛ́t-*; Av. *pərət-*.

**rać-m-* 'rope, rein': Skt. *raśanā́* f. 'rope', *raśmí* m. 'rein', *raśmán-* m. 'id.'; MiP, MoP *rasan* 'rope'. (Skt. *raśanā-*, MiP *rasan* < **raćmna-*?) [→ FV **reśmā* 'rope', Rédei 1986: 57]

**rūćša-* adj. 'raw': Skt. *rūkṣá-* (YV+) 'raw, dry'; OAv. *uruša-* 'needy, poor'. The connection with OHG *rūh*, etc. < PGm. **rūhwa-* is possible.

**sainā-* f. 'army': Skt. *sénā-*; LAv. *haēnā-*, OP *hainā-*.

**sṛakti-* f. 'comer': Skt. *sraktí-* 'comer'; LAv. *sraxti*, *θraxti-* 'comer, side'. Here probably also *sṛká-* 'sharp point'. The variants like *sṛkāyín-* (Kāṭh+) : *sṛgāyín-* (MS+) : *sṛkāvín-* (TS), etc. 'spear-bearer' (see Kuiper 1991: 35) may point to a foreign origin, though.

**striH-* f. 'woman, wife': Skt. *strī́-*; LAv. *strī-*.

**surā-* 'alcohol': Skt. *súrā* f.; LAv. *hurā-* f. Probably, connected with the root **su-* 'to press'. [→ PP **sur* 'beer', Rédei 1986: 77]

**taukman-* n. 'germ, germed seed': Skt. *tókman-*; Av. *tauxman-*. Cf. also the root noun Skt. *túc-* f. 'posterity, children'.

**uanča-* 'roof beam': Skt. *vaṃśá-* m.; Wakhi *was*, Shughnī *wīs*. Most probably, related to Mlr. *féice* 'ridge-pole, top' < **u̯(e)nkio-*.

**u̯rata-* n. 'rule, command': Skt. *vratá-* 'commandment'; OAv. *uruuata-* 'rule'.

C. Verbs

**bʰaru̯-* 'to chew': Skt. *bharv-*; LAv. *aš baouruua-* 'place where there is much to eat', *baoiriia-* 'to be chewed'.

**ćan-* 'to ascend': Skt. *śánaiḥ* 'gradually, quietly'; LAv. *san-*, Khot. *san-/sata-* 'to rise'.

**ćiā* 'to coagulate, congeal': Skt. *śyā-*; Oss. *syjyn/sujun*.

**dʰu̯aǰ* 'to flutter': Skt. *dhvajá-* m. 'banner', *kṛtá-dhvaj* 'with streaming flags'; LAv. *duuaž-* 'to flutter'.

**gʰas-* 'to devour': Skt. *ghas-*; LAv. *gah-*.

**gʰas-* 'to laugh': Skt. *has-*; LAv. *jahī*, *jahikā-* f. 'prostitute'.

*g^iauš 'to make sound, hear': Skt. *ghoṣ-*, Av. *gaoš-*.
*(H)at- 'to wander': Skt. *at-* 'to wander'; Av. *x^vāϑra-* n. 'well-being'.
*Huiad^h- 'to wound, hurt': Skt. *vyadh-*; LAv. *°vīδ-* 'wounding'.
*j^hi- 'to incite': Skt. *hi-*; LAv. *frāzaiiaiiāmi* 'ich lasse hindringen'.
*kuč- 'to crook, bend': Skt. *kuc-*; MiP *n-gwc-*.
*nard-: Skt. *nṛd* 'to hum, growl'; Buddh. Sogd. *nrδ-* 'to complain'.
*raij^h-: Skt. *rah-* 'to be abandoned'; MiP *rāz* 'mystery'.
*sag^h- 'to be able to bear': Skt. *sagh-*; LAv. *azgatō* 'unbearable'.
*srans- 'to fall apart': Skt. *sraṃs-*; LAv. *rāŋhaiiən* 'they make fall away'.
*suag- 'to embrace': Skt. *svaj-*; LAv. *pairiš.x^vaxta-* 'surrounded'.
*uand(H)- 'to praise': Skt. *vand-*; LAv. *vaṇd-*.
*uap- 'to scatter': Skt. *vap-*; OAv. *vīuuāpaṯ* 'scatters, robs, devastates'.
*uap- 'to shave': Skt. *vap-*; Khot. *patāvutta-* 'shaven'.
*uik- 'to separate, sift': Skt. *vic-*; LAv. *vic-*, MiP *wēxtan/wēz-*.
*uiak- 'to encompass': Skt. *vyac-*; MoP *gunǰidan*.
*uiatH- 'to be unsteady': Skt. *vyath-*; LAv. *aiuiϑura-* (< **aṯiϑura-*) 'unshakable'.
*uriH- 'to oppress, collapse': Skt. *vlī-*; LAv. *uruuīnaitīš* (acc.pl.f.) 'pressing together'.

D. Wanderwörter

Skt. *úmā-* f. 'flax'; Yidgha *imoγō*, *ümoγō*, Munji *yimaγâ* 'linseed' (cf. also Skt. lex. *kṣumā* 'id.').

Skt. *máṣa-* m. 'bean'; MiP *māš* 'legume', Shughni *max̌* 'bean'.

Skt. *muṣká-* m. 'testicle'; MiP *mušk* 'musk' (probably, a loanword from Indo-Aryan).

Skt. *sarṣapa-* m. 'mustard seed'; Khot. *śśaśvāna-* 'mustard', Sogd. *šywšp-δn*, MiP *span-dān* 'mustard seed' (cf. also Gr. σίναπι n. 'mustard').

E. Words with uncertain IIr. etymology

Skt. *avánì-* f. 'river bed, stream'; LAv. *aoniia-* n. 'Heizvorrichtung'.

Skt. *aś-* 'to eat'; Iranian cognates, mentioned by Mayrhofer, are uncertain. LAv. *āsitō* (Yasna 10.14) rather means 'lying', cf. Humbach 1960: 27,28; Oberlies 1990: 159 and 166, fn. 55. At any rate, this form cannot be derived from PIIr. **aćHta-* because laryngeal disappears in this position in Iranian. The explanation of LAv. *kahrkāsa-* m. 'vulture' as 'chicken-eater' has a strong flavour of folk etymology and is almost certainly false. Sogd. *črks*, Oss. *cærgæs* 'eagle' show initial **č-* and short *-a-* in the second syllable, which are incompatible with the Avestan word. I suspect that this is a borrowing, which may have been interpreted in some of the Iranian languages as containing the word for 'chicken'. The best candidates for Iranian cognates to Skt. *aś-* are MoP *āš* 'food, soup' < PIr. **āsia-*, Oss. *has/basæ* 'soup' < **upa-āsia-*, etc.

Skt. *prasalaví* 'to the right'; OP *frhrvm* /*fraharavam*?/ 'all round'.

Skt. *hirā-* f. 'vein'; LAv. *zira-žan-* (Aogəmadaēcā 57) 'striking the veins' (?, cf. Humbach 1983: 120). The meaning of the Avestan compound remains hypothetical.

Skt. *valká-* m.n. 'bark', LAv. *varəka-* (Frahang-i-ōīm 8 = Kling. 395) m./n. 'leaf'.

ABBREVIATIONS

Av.	Avestan (i.e. both OAv. and LAv.)
AVP	Atharva-Veda Paippalāda
Bal.	Baluchi
Br.	Brāhmaṇas
FP	Finno-Permian
FU	Finno-Ugric
FV	Finno-Volgaic
Gr.	Greek
IE	Indo-European
Išk.	Iškašimi
Khot.	Khotanese
KS	Kāṭhaka-Saṃhitā
LAv.	Late Avestan
Lith.	Lithuanian
MiP	Middle Persian
MoP	Modern Persian
MS	Maitrāyaṇī-Saṃhitā
OAv.	Old Avestan
OHG	Old High German
OP	Old Persian
Oss.	Ossetic
PGm.	Proto-Germanic
PIIr.	Proto-Indo-Iranian
PIr.	Proto-Iranian
PP	Proto-Permian
RV	Ṛgveda
RVKh	Ṛgveda-Khilāni
ŚB	Śatapatha-Brāhmaṇa
SCr.	Serbo-Croatian
Skt.	Sanskrit
Sogd.	Sogdian
Sū	Sūtras
Toch.	Tocharian
TB	Taittirīya-Brāhmaṇa
TS	Taittirīya-Saṃhitā
Up.	Upanishads
Vog.	Vogulian
VS	Vajasaneyī-Saṃhitā
YV	Yajurveda

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THE EARLIEST PROTO-INDO-EUROPEAN–PROTO-URALIC CONTACTS: AN UPPER PALAEOLITHIC MODEL

János Makkay

In a period of exponentially growing overproduction in scientific quarters, and especially one in which such a surplus is aggravated by the burden of sweeping paradigm change, I will briefly present in this paper an overview of the meagre prehistoric information available on the topic of this symposium, the question of contacts between Indo-Europeans and Uralians with particular relevance to the original (or secondary) homelands of their speakers. With sufficient naïveté, one might suppose that this and similar questions have attracted the attention of generations of scholars. However, that is not the case, and I partly agree with the opinion of P. W. Schmid that much yet remains to be done:

> Wichtig nun aber ist der Umstand, daß in dem Raum nördlich des Schwarzen Meeres in der indoiranischen Zeit und der alteuropäischen Hydronymie keinerlei Kontakt mit finnisch-ugrischen Stämmen nachzuweisen ist. Diese tauchen erst später auf, am Ende der älteren iranischen Periode und müssen im mittleren Wolgagebiet gesucht werden. Dies mag für die Vorstellung der finno-ugrischen Kollegen erschreckend sein, denn die Konsequenzen für ihre Modelle sind beträchtlich. (Schmid 1978: 22.)

Although our archaeological sources (and their interpretations by linguists and historians) are woefully inadequate, and their analyses raise many more questions than they can answer, they probably do allow us to draw some conclusions which considerably differ from those drawn by Schmid. Even more so because the area mentioned by him, that to the north of the Black Sea, was the territory of the archaeologically identified Yamna culture, one of the candidates for the earliest or secondary homeland of the speakers of the Indo-European parent language.

By the end of the 1980s the relevance of linguistic and archaeological interests for each other has come to be better appreciated. This can clearly be demonstrated with a short survey of the relevant literature (Klima 1998a; Rédei 1998: 19; Napol'skikh 1995: 22-23, 27-30). Linguists have made concessions to the intellectual gulf between their work and that of archaeologists, which derive partly from the different methods of study employed by them and partly from the contrasting dating evidence, with archaeological chronologies relying extensively on ceramics and other industries. The fundamental problem of linguists using the data of archaeology is that they must take account of various chronological systems as well as make educated guesses (balanced judgements). They are naturally free to use any of the different available dating methods (i.e. traditional dating systems, C_{14} dating with or without calibration, dendrochronologically re-calibrated C_{14}), but they should always mention which they are employing.

To begin with, most experts are familiar with the well-known fact that the number of the earliest borrowings between the two protofamilies (or their commonly inherited words from a hypothetical linguistic superfamily) is very low; the Uralic handbook of Péter Hajdú only contains nine occurrences, which are, surprisingly, mostly verbs (Hajdú & Domokos 1987: 300; Hajdú 1976: 29; 1977: 158):

	***Indo-European/ Indo-Iranian**	***Uralic/Finno-Ugric (Finnish)**	**Hungarian equivalent**	**English**
1.	**wedh-*	**wetä-*	*vezet*	leads
2.	**wegh-*	**wiγge-*	*visz*	carries
3.	**doγw- < *dō- *toγe-*	**toke-* (Finnish *tuo*)	*hoz*	brings
4.	**mozge-*	**mośke-, *muśke-*	*mos*	washes
5.	**dhɜk-*	**teke-*	*tesz*	makes
6.	**nōmn̥-*	**nime*	*név*	name
7.	**wed-*	**wite, *wete*	*víz*	water
8.	**kot-*	**kota*	*ház*	house
9.	**sniew-, *sen-, *son-*	**sōne, *sine, *senę*	*ín*	sinew

To this list should be added concordances between pronouns and similarities of some grammatical elements (as for example the **-i* marker of the plural). Károly Rédei agrees with numbers 3, 4, 6, 7 and 9 in his inconsistent work and supplements the list with two more correlations (Rédei 1986: 40-43):[1]

1 Rédei in his new book (Rédei 1998) strongly criticized my reference to his comparisons between PIE and PU roots when I (in his opinion mistakenly) wrote (Makkay 1991: 255) that he had only accepted nos. 3-4, 6-7 and 9 from the list of P. Hajdú. On re-reading Rédei's 1986 book, I see that my reference was absolutely correct, because he

10.	**mei-*	**mĭγe-* (Finnish *myy*)	*ad*	to give
11.	Tokh. **was*, **wäs* (originally 'gold')	**waśka*	*vas* originally *véz*	iron, copper

Number 11 surely belongs to a later period because the use and knowledge neither of iron nor of gold and copper can be postulated for the assumed period of the protolanguages. Very recently, T. K. Nilsson (1997: 301-307) has brought evidence of two more correspondences:

12.	**g*ol-* 'absterben'	Uralic **kola* 'sterben'	*halni*	to decease
13.	**kōruä* 'Horn, Gehörn'	Finnish *korva* 'ear'	*szarv*	horn

Participants in this symposium have also complemented this list or commented on this question. E. Helimski pointed out that neither direct nor lateral kinship between languages is traceable on the basis of the scanty stock of suggested PIE-PU cognates, and that the third possibility, the much-discussed contact kinship or areal affinity (i. e. the Sprachbund theory) is a mere chimera.[2]

mentioned these correspondences in his first group (Erste Gruppe) while his second group (Rédei 1986: 43-49) is comprised of eighteen Indo-Iranian/Proto-Iranian correspondences, and as such they cannot have any traceable connection with the matters under consideration. E. Helimski also refers to seven words as PIE loans into PU when he emphasises that K. Rédei restricts the evidence to a group of seven words (his paper in this volume). I only hope that Rédei is able to account for the weighty differences between Indo-European and Indo-Iranian/Proto-Iranian. His correlation no. 6 (here no. 11 above) between Tokharian **was* and a very hypothetical Proto-Uralic *metal, *copper (which probably never existed) is absurd and needs no further comment here. See also Makkay 1998b: 83-84. According to K. Häkkinen (in this volume), Tokh. **was* (i.e. Finnish *vaski*) causes a semantic problem because it would indicate a very early use of metal amongst the Finno-Ugrians. I do not want to engage in argumentation with Rédei about the fact that there is no trace of the use of copper (or any other metal) in the suggested (or in the latest possible) time of the Uralic protolanguage. Also, the time depth surmised by Häkkinen (it has been established that copper ore was some times cold-forged even in the Stone Age – cf. her abstract for this Symposium, 12) is a very broad one to operate with.

2 See Helimski's paper in this volume. Recently Hungarian linguists in particular have attached much importance to the Sprachbund (language alliance, language league, areal contacts, etc.) theory in their efforts to solve questions concerning the origins of protolanguages (including the emergence of PU/PFU). It is difficult to identify their precursor since it is clear that they have never read a line of the more detailed papers of N. S. Trubetskoy (the founder of the Sprachbund theory). Péter Hajdú was the first amongst Hungarian scholars to give a general outline of the formation of the PU language family as a result of the integration of small, tribal language groups of otherwise totally unknown character (Hajdú 1977; also Hajdú 1995: 129-140). For his followers see, for example, Rédei 1998: 17, 23, 26; Klima 1998a: 65; Pusztay 1997: 11-12; etc. See my thorough description of the Trubetskoy theory including his obvious psychological problems (Makkay 1997a: 40-46).

J. Koivulehto suggested a few more PIE loanwords in Proto-Uralic (under the strict rule that they should cover the whole area of the Uralic languages, including the Samoyed branch):[3]

14. **h₂mey-gʷ-*	Uralic **mexe-*	?	to sell
15. **pelh₁-*	Uralic **pele-*	*fél-*	to fear
16. **pnH-e/o-*	Uralic **puna-*	*fon-*	to spin[4]
17. **bʰr(H)-*	Uralic **pura-*	*fúr-*	to bore

On the other hand, I do not know of any occurrences of assumed borrowings from the Uralic protolanguage into the Indo-European one. After the long period in the 19th century during which the method of linguistic palaeontology was in use (and in Uralistics has been up to the present day especially in connection with arboreal and also faunal terms; see Napol'skikh 1997: 125-142; Rédei 1998: 20-21), it is patently obvious to me that these seventeen or so occurrences offer scant evidence on which to build relationships. Moreover, a recent analysis by K. Häkkinen[5] shows that the oldest lexical inventory of the Uralic languages (roots/stems which are found today in all branches of the family, i.e. a category of 100% etymological certainty) contains only eigbteen items.[6] Only two of them also occur among the words of the above list, and the only cultural term (which can have an archaeological equivalent) is the word *arrow*. P. Hajdú once considered this word as reflecting a Neolithic way of life (Hajdú 1976: 33), but this technology can also be characteristic of Upper Palaeolithic and Mesolithic times as well. Therefore, the listed and other (grammatical) agreements cannot be regarded as solid proof of linguistic contact, and thus a phylogenetic relationship between IE and the Uralic language family cannot be elaborated into a plausible hypothesis either.

3 See Koivulehto's paper in this volume: cases where the phonetic shape of the Uralic (i.e. Samoyed) counterpart does not show the kind of irregularities that would point to loans from one secondary Uralic dialect/language to another.

4 See Koivulehto's paperin this volume. The presently known time of the knowledge of real spinning (i.e. preparing textile threads) in Europe (i.e. the Early Neolithic of the Balkans and the Carpathian Basin) is inconsistent with the probable early dating of PIE-PU contacts before the Neolithic.

5 See Häkkinen's paper in this volume.

6 The equivalents in Finnish are *ala-* 'under', *kadota* 'to disappear', *ku(ka)* 'who', *maksa* 'liver', *me* 'we', *mi(kä)* 'which', *minä* 'I', *niellä* 'to swallow', *nimi* 'name', *nuoli* 'arrow', *nuolla* 'to lick', *pesä* 'nest', *punoa* 'to weave', *silmä* 'eye', *suoni* 'vein', *sydän* 'heart', *tuo* 'that' and *uida* 'to swim'.

It is a commonplace that a reliable location of the Uralic homeland (and its chronology) largely depends on the reconstructed seat of the speakers of the Proto-Indo-European protolanguage. Not without reason: the historic seats of the Uralic peoples are remote from cultural areas with an early historical chronology (like Mesopotamia, Anatolia or the eastern Aegean). At the same time, the historical – and modern – distributions of the Uralic/Finno-Ugric branch – with the exception of the Hungarian – lie to the north of the long west-east belt of Indo-European dialects, suggesting to us that the more northern belt of Uralic peoples (from the Lapps in the west to the Samoyed peoples in the far east) had always extended along the whole area of the early Indo-Europeans. This situation itself clearly shows that the more ancient, *pre*-historic Uralic homeland is to be located *north* of the Proto-Indo-Europeans, because it would be hard to believe that early Uralic speakers had migrated to the north from the south across territories already occupied by Indo-Europeans. At the same time, however, the early Uralic homeland surely lay close to the Proto-Indo-Europeans (especially during the later Proto-Iranian and Old Iranian periods), but – as we have seen from the very limited number of early correspondences – without getting into, or maintaining, direct contacts with them. This is an *a priori* hypothesis which I cannot – and do not want to attempt to – justify.

If one concludes, therefore, that one very early seat of the Proto-Indo-Europeans was in the steppe zone northeast of the Caspian Sea (as, for example, the Vienna School of Ethnography thought in the thirties, or one variant of the Kurgan theory still does today), a west Siberian homeland of the Uralic tribes would seem to be realistic. Although modern scholarship has ceased to be interested in postulating romantic primary homelands – as was generally done in the early days of research, which located the Uralic homeland in the Altai mountains, or in the territory of the Central Asian oasis cultures in Khorezm or even further to the east (see fig. 1; Klima 1998b: 26) – a West Siberian Uralic homeland on the eastern side of the Ural Mountains has remained a strong candidate. In the sixties, for example, V. N. Chemetsov located the settlement territory of the Uralic language family in the Uralic region, on the eastern side of the mountain range, and following him in the sixties Péter Hajdú placed it on both sides of the range. Both theories proposed areal extensions below average in magnitude, i.e. small homeland areas consisting of the distribution territory of one archaeological culture in most cases (for example, the identification of the territory of the Anan'ino culture with a secondary/transitional homeland of the Finno-Ugrians).

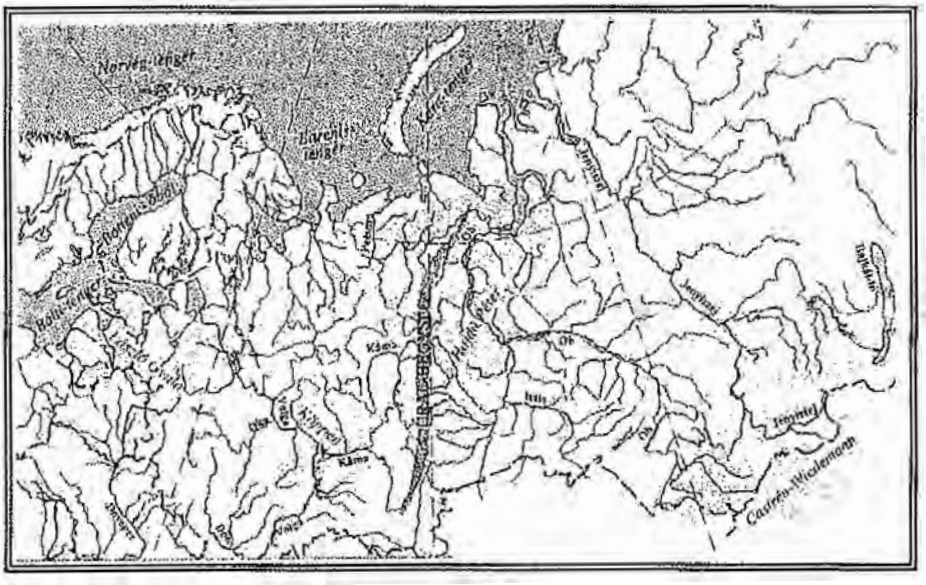

Fig. 1. Several locations of the Uralian homeland according to Castrén-Wiedemann, Hajdú, Köppen and László. (After Klima 1986b: 26.)

Speculations about small, confined homelands were the predominant theory of the 19th century, and they have survived till now.[7] Archaeological research of the pre-Great-War period supported such ideas because it seemed that there were huge archaeologically empty geographical areas between small centres of activity. Such small centres were the Kama river area (a candidate for the Uralic homeland) and Saxony (a candidate for the PIE protohabitat). However, very few if any experts have considered one important question: if these two confined areas were the homelands of two linguistic protofamilies, what other peoples (not belonging to the protolanguages in question) then lived in the vast territories extending from the Kama river to the Saale, an enormous area over which, as a result of intensive archaeological work, local museums today are chockablock with prehistoric finds.

Of course, the existence of such vast territories between proposed homelands might offer some support for the Sprachbund theory, if one supposed that a number of tribal groups speaking independent (or only partly related) tribal

7 The idea that the ancestral Uralic homeland was a relatively confined area has recently been seriously challenged, especially by linguists and archaeologists working in Finland (see Fodor 1998: 29).

tongues of unknown language types, lineages and stages lived in these territories. However, there is a general consideration that should be accounted for when we come to consider the specific aspects. Supporters of the Sprachbund theory usually assign the period of large-scale *integration* of tribal or even so-called group languages into larger (protolanguage) units to PreNeolithic (i.e. Mesolithic) times. On the other hand, the (continental and northern) European Mesolithic is associated with a gradual adaptation to local resources and conditions in response to post-glacial environmental changes.[8] This adaptation finally led to the diversification of the Mesolithic material and spiritual culture, and as a result the Mesolithic assemblages show great variation from region to region, especially in the area of the Baltic states and the North European Plain.[9] This means that parallel with the assumed language *integration* there would be a cultural *disintegration* and *differentiation*. Moreover, correlating with the assumed language integration processes – the Sprachbund theory continues – there developed true language families, among others the IE and U/FU parent languages. But the supporters of the Sprachbund theory never indicate the causes and reasons for the apparently unwarranted and sudden change in the course of developments that then took place: after the postulated emergence of parent languages by a way of ethnocultural integration why did the process abruptly change direction without any apparent reason, and the final differentiation of common languages begin? Nor is it possible to deny that these diverging processes took place (i.e. the final separation of IE or U/FU languages) since the differentiation of the speech communities of the parent languages into separate daughter tongues has continued ever since the Neolithic, and it can be clearly documented from as far back as the first occurrence of IE linguistic written (Hittite) sources from the early second millennium BC.[10]

8 I.e. deforestation, a rise in temperature, the development of dense woodlands, the dying out of large herd animals and the disappearance of a specialized herd-animal (the mammoth and the reindeer) hunting economy, the disappearance of cave art and naturalistic art, etc.

9 To mention only a few, we read about the Svaerdborg, Oldesloe, Kobrow, Ahlbeck, Ellerbek, Duvensee, Komornica, Chojnice-Pieriki, Maglemose and Janisławice cultures or groups, the Rügen-Lietzow group, anonymous Late Mesolithic groups, the Kashubian Mesolithic, the Pyrzyce complex, the Tanowo type and others. See *Harvesting the Sea*, pp. 114, 118, 122–123, 137.

10 The writer of this paper does not consider the Sprachbund theory (which denies the existence of language families in the conventional sense; see Pusztay 1997: 18) a scientific approach, therefore this paper does not take the suggestions of this ignorant (and fantastic) theory into consideration.

In spite of these (and other) facts,[11] a west Siberian homeland of the Uralic protolanguage has remained a strong and popular favourite. V. Napol'skikh's recent summary and excellent book on the subject show that the general trend of theories has been shifting eastwards towards western Siberia and away from the frequently mentioned identification of Proto-Uralic with the Pit-and-Comb marked culture of northeastern Europe (Napol'skikh 1995: passim; Napol'skikh 1997: 125-142, 167-183, especially p. 174; cf. also Fodor 1998: 28-29).

Some linguists think that the main flaw in these homeland theories is that they fail to offer an adequate explanation for early Uralic and Proto-Indo-European contacts (Fodor 1998: 29), although these early contacts, as we have seen, have left only very sporadic traces. One prominent expert of the Budapest linguistic school, L. Klima, in his paper published last year[12] believes that he can adduce some evidence against the northwestern European homeland theory[13] when he wrote that this new theory cannot solve the problems of the origin of the Siberian Proto-Ugrians and especially that of the Samoyeds, since there is no way of proving that they moved to their historical seats from areas west of the Uralic Range. (Of course, there is no possibility either to prove that the Samoyeds did *not* move to their historical seats.) This new approach, he wrote, has developed under the influence of studies on Finnish prehistory and simply ignores the eastern dialects of the Uralic peoples, i. e. the Permians, the Ob-Ugrians and the Samoyeds.[14]

Klima's opinion does not take into consideration some important facts, such as the following: the modified version of the extensive homeland and the European Forest Zone theories (EFZ) was not built on new directions in the Finnish school of Uralic prehistory, even if it cannot be denied that prominent Finnish scholars have expressed such or similar thoughts since the days of K. B. Wiklund and J. Ailio at the beginning of the 20th century (Makkay 1992:

11 As, for example, Klima (1998a: 62) pointed out, if contacts between Finno-Ugric and Indo-European are studied within the context of the generally accepted homeland of the Uralians in western Siberia, they (i.e. the language contacts) cannot be reconciled with this ancestral homeland location.

12 Klima 1998b: 31. See also Klima 1996: 34-37, mentioning the theories of Chernetsov, who derives the peoples of the Uralic language community from the region of Lake Aral. Klima also discusses here theories about the Kama river area as a Uralic or Finno-Ugric homeland. His two papers from 1998 differ from each other in some important details since the shorter Hungarian variant does not deal with the earliest PIE-PU contacts.

13 Also known as the European Forest Zone (EFZ) theory.

14 Klima 1998b: 31. I think Klima did not read my 1990 paper (he has certainly not seen Makkay 1992) carefully, and his remark simply reflects the opinion of Napol'skikh (1997: 148, note 20).

17; 1997a: 30; 1997b: 66-71). On the contrary, this view was the result of considerable evidence and recent data offered by prehistoric archaeology, old and new, but mostly from the last three decades, when particularly the datings and distributional patterns of archaeology have become more reliable. My reconstruction, i.e. the EFZ theory, has been formulated independently of the emergence, distribution, chronology and ethnolinguistic interpretation of the peoples of the Pit-and-Comb decorated pottery by Finnish or other scholars. In fact, however, I agree with most of the Finnish experts in regard to their present reconstruction of events. This contradicts the current consensus of believers of the West Siberian homeland theory, which makes the following claim: the beginnings of the expansion of Proto-Finnic speakers (including the ancestors of the Proto-Lapps) into the northeastern Baltic area and Finland took place around or before 4000 BC (calibrated C_{14} dating, I suspect). This view says that the core area for this expansion may be found in territories *somewhere* [my emphasis] south and southeast of the occupied territories, i.e. in the Dnieper-Volga-Kama area or, with lesser probability, east of the Uralic range.

As a matter of fact, historical linguists (in my country as well) do not always confront the findings of archaeology seriously. To mention just one example, I refer to the case of the famous Mesolithic skeleton found and excavated in Janisławice (the Skiemiewice[15] district), from a Mesolithic *Tardenoisian* grave now dated to the Janisławice culture.[16] This is a large archaeological area of the North European Plain between the Oder and Dnieper rivers dating from the second half of the local Mesolithic, but its territorial distribution never arrived at the shores of the Baltic Sea (fig. 2). It was represented by societies with a Late Mesolithic stone industry, but it also shows evidence of contacts with early Central European Linear Pottery (*Harvesting the Sea*, pp. 37, 73-74, 131). There is no mention of this important discovery in a recently published book on early Saami–Germanic contacts,[17] in the otherwise rich literature on the physical anthropology of Lapps and Finno-Ugrians,[18] or in a recent comprehensive volume on the Mesolithic of the North European Plain.[19] The skeleton of

15 Middle Poland, halfway between Łodź and Warsaw, west of the Vistula river. Cf. Filip 1966: *s.v.* with further literature.

16 For the final publication of the grave excavated in 1936 see Chmielewska 1954, and the anthropological investigation on pp. 49-66. See also Thoma 1965: 37, note 1.

17 *Möten i Gränsland: Samer och Germaner i Mellanskandinavien.* Stockholm, 1997.

18 The excellent book of Karin Mark did not mention the Janisławice man amongst the graves and skeletons of the Mesolithic and the Saamis (Mark 1970: 16, 79-88). I. Potekhina also fails to mention it in her short summary of the anthropological data of the Mesolithic-Neolithic transition (*Harvesting the Sea*, pp. 65-69).

the 30-year-old man definitely belongs to the Lappid type. A. Thoma, an excellent anthropologist, emphasized the fact that *the* [modern] *Lapps are an exception to the general rule, since 93% of them can be identified on the basis of their three body characters* (Thoma 1965: 37). The skeletal characteristics of the Janisławice man are in full accord with data of modern Lapp bone material. According to A. Thoma, this Tardenoisian population may be identified, at least partially, with the Proto-Lapps. In the territory of Poland, the areas of Tardenoisian and Swiderian cultures overlap, and consequently the people of the Swiderian culture may have given the Lapps their [Uralic] language.[20] One fact must be borne in mind: the Janislawice site lies on the periphery of the earliest Central European Linear Pottery area, and at the same time far away from the huge distribution territory of the Pit-and-Comb decorated Neolithic pottery (including tbe Narva culture).

Such important and frequently neglected archaeological facts led me to a reformulation of the EFZ theory, independently from, but in full accord with, the old and new conclusions of Finnish scholars. It can be taken for granted here that, during the period of the Janislawice man (i. e. during the local Late Mesolithic), the genetic ancestors of Proto-Lappic populations lived southwest of the Vistula river. On the otherhand, *there is absolutely no archaeological evidence to prove the presence of a Proto-Lappic population in western Siberia in the Palaeolithic, Mesolithic, Neolithic or any other later periods.*

Advocates of the west Siberian theory seem to be wrongly informed about suggested solutions conceming the original territories inhabited by the earliest Proto-Ugric and Proto-Samoyedic tribes which were already separated or were

19 *Harvesting the Sea*, pp. 37, 73-74, 131, 137. E. Niesiołowska-Sreniowska, however, mentions the rich bone inventory of this famous grave as consisting of only wild animals (*Harvesting the Sea*, p. 138).

20 The short English summary of Thoma 1965: 41 and his other remarks can be interpreted here as follows: The first settlers of the North European Plain (the long zone lying north of the later territorial distribution of the Linear Pottery between the rivers Weser and Daugava) were non-Indo-Europeans before the emergence of the TRB culture. There are different possibilities for their ethnic/linguistic identification. The main candidates which can meet certain minimum requirements are the subarctic population of J. Pokorny and/or Pre-Neolithic groups of Proto-Saamis speaking a language or dialects of Uralic or non-Uralic descent. Saami groups survived in the territory of Estonia until the Middle Ages (Makkay 1992, note 52). The original language of the group of the Janisławice man also depends, of course, on other factors, such as whether the historically Uralic character of the Saami dialects was the result of an early language shift, or whether they have preserved their original Uralic tongue ever since the Mesolithic. This is a question for linguists to decide. See also Makkay 1992: 20, notes 79-84a with further references, and also Makkay 1990: 63, 67, 71, 73.

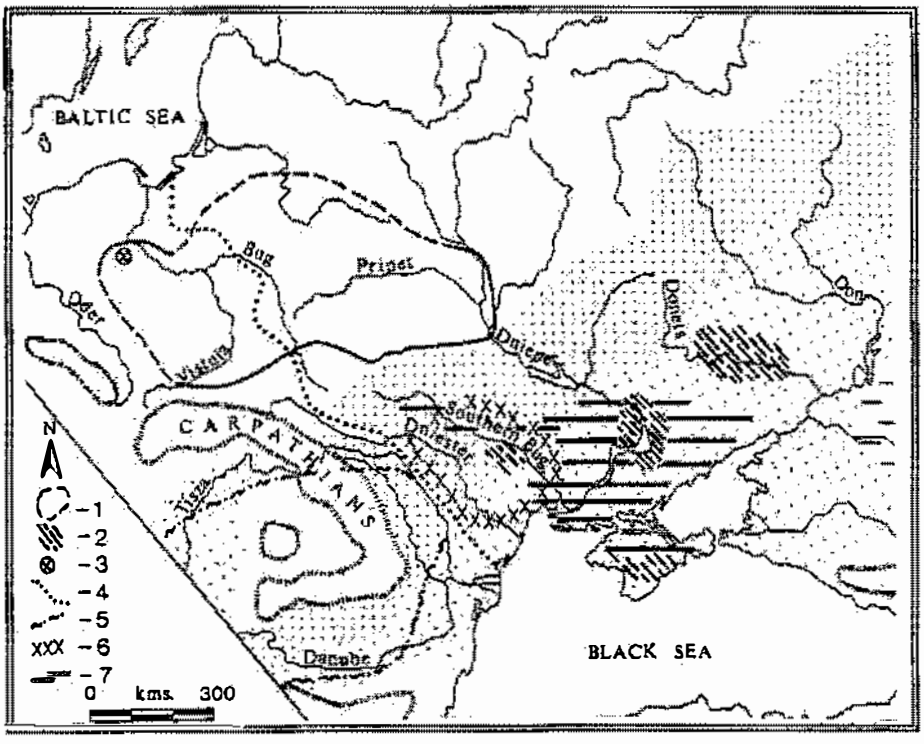

Fig. 2. Distribution map of the Janislawice culture in its relation to other, Mesolithic and Early Neolithic, cultures. (After *Harvesting the Sea*, fig. 15.2.) 1. The Janislawice culture. 2. The distribution of the Janislawice points in the steppe region. 3. The Dęby site. 4. The Bug-Dniester 'limes'. 5. The Starčevo-Körös culture. 6. The Bug-Dniester culture. 7. The Kukrek culture.

diverging, i.e. those that spoke protodialects. In my paper read at the 1990 Debrecen Congress, I discussed this question when I wrote that the separation of PU into PFU and Proto-Samoyed dialect continuums can be dated to before the Neolithic (Makkay 1990: 74 and its enlarged Hungarian version, Makkay: 1992, 20-21, note 88). Twice I made a reference to the well-known paper of J. Harmatta (1967: 215-216)[21], who assumed that the separation of Proto-Uralic into Proto-Finno-Ugric and incipient Proto-Samoyed dialect continuums occurred along the Ural river, and can be dated to before the local Neolithic in the third millennium BC, or even the Mesolithic (Makkay 1990: 74, with further references). It must be mentioned here that Péter Hajdú in his very first paper on

21 The paper is an abbreviated version of J. Harmatta's comments on the manuscript of the famous book of László (1961).

the prehistory of the Samoyeds written in 1949 wrote to the effect that the Samoyedic branch left the Uralic homeland around the third or second millennium BC, and its migration can be considered as the end of the existence of the common Uralic protolanguage (Hajdú 1949: 1). A dating to the third millennium BC made in the forties corresponds exactly to a recent dating to the Early Neolithic or before. Such a hypothesis clearly also corresponds with the well-known fact that the Upper Palaeolithic and Mesolithic tool industries of west Siberian-Central Asian territories basically differ from the contemporary or later industries of easternmost Europe. Migrations from western Siberia and Central Asia *played no role* in the initial colonization of northeastern Europe or the Baltic.[22] Concerning the early ancestors of the Proto-Ugrians, mediaeval history offers supporting evidence for the view that they were driven out from their old habitats west of the Urals by Russian expansion from the 10th to the 14th centuries AD onwards (Makkay 1990: 68, note 40; 1992: 30, note 55. See also Kurlaev 1997: 102-107, and the map onp. 112).

The west Siberian school does not bother itself with small matters like the natural features of the suggested territory. The area that is generally assumed to have been the confined Proto-Uralic homeland, i.e. the vast territory between the Irtysh, Tobol and Isim rivers in western Siberia (west of the lower course of the Irtysh river: Makkay 1990: 72-73; 1997a: 24-25), was a huge inland sea and marshland during the Epipalaeolithic and afterwards: the Zapadnaya Sibirskaya Ravnina or Zapadno-Sibirskaya Nizmennost. This huge territory extends from the Altai Mountains in the south-east to the Urals in the west, is bordered in the north by the Arctic Ocean and in the south by the Kazakhstan steppes, and it covers approximately two million square kilometres. This enormous old depression came into being as a result of tectonic movements during Palaeozoic times and was an unbroken sea throughout the geological periods from the Middle Mesozoic (Jurassic) times till the Middle Tertiary. The sea did not dry up but continued to exist over most of the depression throughout in the last third of the Tertiary and into the Quatemary (BSE, XXXVIII, pp. 648-650). During these long periods it was filled with layers of depositions pouring out from rivers flowing from the southeast (the Ob and the Irtysh) and the west, i.e. from the Urals (the Tobol, Pisma, Isset, Tura, Tavda, Konda and Sosva). As a result it became a sparsely populated marshland for long millennia afterwards, and Chinese sources refer to it as the Northern Sea in the 8th century AD (Senga

[22] Compare the curious theory of L. Domańska, according to which the Caucasian and Black Sea territories played a role in the pre pottery neolithization of the Kuyavian territory (i.e. the Janislawicc culture). Recent and well informed researches refute this theory as unsubstantiated (S. K. Kozłowski in *Harvesting the Sea*, pp. 141-148).

Toru 1996: 38). This, together with other factors, argues against the possibility that this water-covered territory could have been densely populated in the Mesolithic and Early Neolithic and could thus have constituted the area of emergence (original homeland) of one protolanguage, whether this was the result of *separation* from an ancestral and genetically related – Nostratic – language or of the *integration* of small and linguistically unrelated tribal/group languages. If adherents of the west Siberian homeland theory also believe the Sprachbund theory, they must inevitably accept the fact that important linguistic processes (integrations, separations or differentiations) took place in the area of a huge sea and its neighbouring marshlands around the end of the Upper Palaeolithic. However, I cannot accept this sea or marshy area as the true Proto-Uralic homeland.

Commenting on this question during the symposium, V. Napol'skikh flatly declared that my short remark was not true, and put forward his idea that the territory of the Ravnina was only depopulated during the seventh to the second millennia BC (the Mesolithic and Neolithic), i.e. in the generally suggested time of the existence of the PU homeland. As a matter of fact, however, recent local literature clearly shows that the land between the Ural and the Ob and Irtysh valleys was populated – albeit sparsely – during the whole span of the Mesolithic and Neolithic periods (Bezprozvannij & Pogodin 1998; Burov 1993; Kosinskaya 1997; 1998, especially chapters 1 and 2; Kovalëva 1993; Kovalëva & Tsanko 1998; Matyushchenko et al. 1993; Morozov & Stefanov 1993; Panina 1997; Potëmkina et al. 1995; Serikov 1993; Sorin 1993; Chairkina 1997; 1998; Viktorova & Kemer 1998: strong connections with Middle Asia and Kazakhstan).[23] So much for that question!

The Catalogue of the Hungarian National Museum, commemorating the Hungarian Conquest in 896 AD, considers this marshy area the original homeland of the forebears of the ancient Hungarians, who had not diverged from the rest of the Proto-Ugric subfamily in the Bronze and Iron Ages. The appended colour map does not indicate the true geography of the area[24]: there are very few signs on the map to mark marshes. One can easily check this case by comparing this false map (fig. 4) with any other accurate map of the area.

I. Fodor summarized the separation of the independent Proto-Hungarian tribes from their Proto-Ob-Ugric brethren as follows. The Proto-Ugric community settled *somewhere* in the forest steppe zone of western Siberia and at *some point* during the second millennium BC. During the Bronze Age, these

23 Studies in V. I. Matyushchenko et al. 1993 mostly contain papers dealing with Bronze and Iron Age matters. See also Potëmkina et al. 1995.

24 *The Ancient Hungarians*, the map on the back of the front cover.

hunters, fishers and gatherers [somehow] became farmers, stockbreeders and an equestrian people. The Proto-Hungarians split off from the Ugric community *sometime* in the Late Bronze Age or Early Iron Age (around 500 BC). These Proto-Hungarians settled the forested steppe zone of the Irtysh-Isim-Tobol region. This southernmost Ugric group adopted the new mode of subsistence (pastoralist stockbreeding or equestrian nomadism), and after *some time* (my italics) this mobile economy led them farther away – also in the territorial sense – from their Ugric cognates (Fodor 1996: 13). This short statement is not only full of hypothetical suggestions (the repeated use of "some time", "some point", "somewhere"), but is not well supported by the available evidence, either.

Recent archaeological finds and literature clearly show that there must be serious doubts about any kind of *migrations of forest and forest steppe inhabitants to the south*. On the other hand, intense steppe and forest steppe influences can be seen in the Bronze and Iron Age materials of the Ob-Irtysh-Tobol area.[25] As V. F. Gening and N. K. Stefanova have pointed out, in the second half of the second millennium BC strong assimilation-integration processes had taken place between the original inhabitants and southern newcomers in the forest steppe zone of western Siberia, and their archaeological traces clearly show the influences of the Andronovo culture. The Chernoozero (i.e. Black Lake) type of the Andronovo culture developed there as a result of these ethnocultural processes (Gening & Stepanova 1994: 4).

While the Andronovo culture has been interpreted by some experts (for example I. Fodor or E. E. Kuz'mina; for more details see Makkay 1998a: 311, note 572) as part of the archaeological heritage of ancient Finno-Ugric (Proto-Ugric) groups, after the discovery of the sacral circular fortresses in the northern territories of the same culture in the area of the southern Urals, the Iranian character of the Andronovo populations has become evident and cannot be denied (Makkay 2001: passim for more details). The Gaevo cemetery of the Sargat culture in the valley of the Iset river shows a clear Iranian character around the middle of the first millennium BC, and as such it belongs to the world of mixed Ugric and Iranian cultures of the forest steppe zone in the Transural area and western Siberia, while the [territorially] enormous Ugric and Samoyedic world developed in the forest zone of western Siberia (Koryakova & Daire 1997: 156). The fortified settlements and kurgan burials of the Sargat culture must therefore not be considered as belonging to groups of Finno-Ugrians. The territorial

[25] Cf. for example the early Scythian metal types of the local Bronze and Early Iron Age sites in Kosinskaya 1998, figs. 23-25.

Fig. 3. Distribution map of the Sargat cultural area southwest of the Ob river (after Koryakova & Daire 1997: 9).

distribution of the greater Sargat community (fig. 3), which was of clear Iranian character, perfectly coincides with the territory suggested for the ancient Hungarians when they broke away (fig. 4). The earlier finds and burial customs of the Middle Bronze Age Kamennie Ambar-5 cemetery in the area of Chelyabinsk (metal weapons, horse harnesses, etc.) are also Iranian in character (Kostyukov et al. 1995: 156-207).

The origin of this curious location of the Proto Uralic homeland, in other words, the birth of the west Siberian homeland theory, has become clear. The first indication of the ancient (hypothetical) homeland of the Hungarians (and also of the Huns!) in the area of the Ural mountains was made by a chronicler in the 11th century AD. The Abbot Ursio from Hautmont (now in Belgium, south of Brussels) wrote in his *Miracula Sancti Marcelli* (compiled between 1054 and 1079) that the *Rhipei* [i.e. Uralic] *montes... emiserunt Hungrorum et Hunorum tempestates et fulmina* (Kellner 1997: 58). An Austrian diplomat, Siegmund Herberstein (1486-1566) visited Russia five centuries later in the years 1516-18 and again in 1526. His book (*Rerum Moscovitarum commentarii*, Vienna, 1549) is an excellent source for the geography and history of tsarist Russia. He

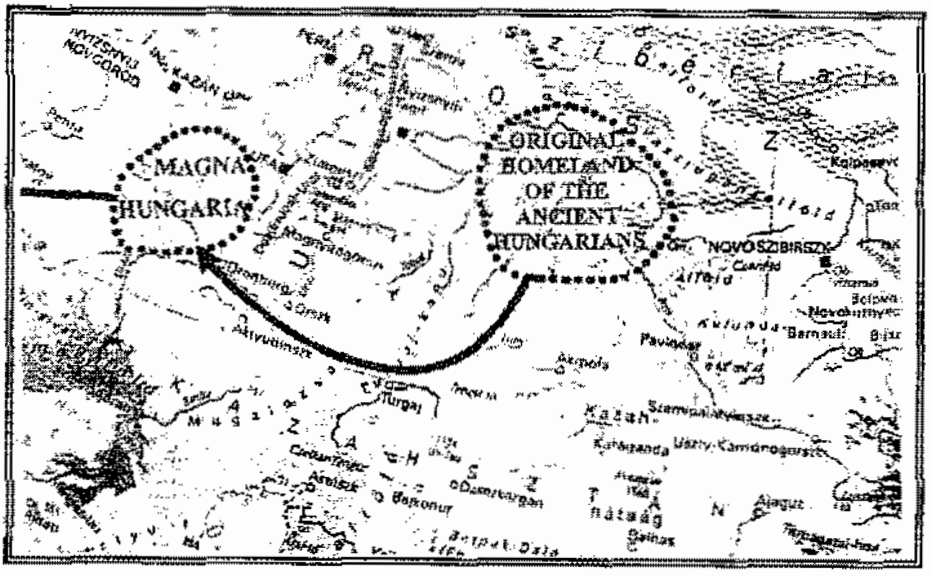

Fig. 4. The location of the original homeland of the Hungarians between c. 1500 and 500 BC. (After *The Ancient Hungarians*, cover.)

Fig. 5. The *Vngarorvm origo* on the map of S. Herberstein from 1556 AD. (After Kurlaev 1997: 113.)

also drew up a map representing western Siberia, and he located the original homeland of the Hungarians in the Ob valley (north of the Irtysh-Isim marshes): *IVHRA, inde Vngarorvm origo* (fig. 5; Kurlaev 1997: 113). He had as much reason and data for this location as modern historians have for setting our common Uralic homeland in this particular marshy place.

Authors working in the field of Uralistics are occasionally insufficiently informed about matters of prehistoric archaeology and uncritically accept the hypotheses of their fellows from other disciplines. One of the biggest problems is, of course, the different and contradicting opinions about the suggested location of the PIE homeland, which is, as we have seen, a determining factor in locating the PU homeland. Leaving aside the sometimes unscholarly suggestions for an Anatolian homeland (and also the suggested origins of the Yamna cultural group from Tripolye-Cucuteni assemblages by C. Renfrew and his followers), I shall briefly refer to the Kurgan theory. I do so because it was in the broad northernmost zone of the Yamna-Kurgan-Ochre Grave cultural group and its descendants that IE-Finno-Ugric contacts took place.

The European (south Russian and Ukrainian) steppe has always been one of the chief candidates for the PIE homeland, or at least for the already separated Indo-Iranian dialectal continuum area. The Yamna, Kurgan or Ochre grave culture has been – and still is – proposed as the archaeological equivalent of this initial – or secondary – Indo-European homeland. The Kurgan theory is generally attributed to M. Gimbutas, but it had in fact been proposed considerably earlier, for example by Schrader, Childe, Sulimirski and others (Makkay 1988: 121). According to Gimbutas, the Proto- or Early Indo-Europeans, whom she labelled Kurgan People in 1956, arrived from the east, from southern Russia, on horseback and in wagons around the middle of the fifth millennium BC and distributed early IE dialects everywhere over the territory of her so-called Old Europe: the Balkans (including Greece), Anatolia and the Levant (Bab ed Dhra).[26] Although Gimbutas emphasized that she did not change her theories radically in the last four decades of her life, and that they were continually strengthened by new archaeological data (Gimbutas 1997: xviii), it can be accepted that the (presently known) archaeological facts do not square with her theories. I mention here only a few points:

1. The area of the undivided PIE language did not extend, not even on the steppe, to Asia between the Urals and the Caspian Sea. The first Indo-European tribes to penetrate areas east of the southern Urals belonged to the latest Yamna, Early Catacomb and Andronovo culture groups from around 2000 BC and as

26 See Gimbutas's partly revised papers in her posthumous book 1997.

such they represented Indo-Iranian dialects that had already separated. They were the idioms of those Indo-Aryans and Proto- and Old Iranians who had not remained in their original (European) homeland-territories but left on their long journeys to their historical seats for mostly unknown reasons. Since the discovery of the curious cult centres of Sintashta and Arkaim, this suggestion no longer requires further confirmation (Makkay 2001: passim).

2. The distribution of the Yamna culture over the whole territory of the so-called Old European Neolithic (an artificial creation of Gimbutas) contradicts the accumulated evidence of European Neolithic researches and ought to be considered a mere archaeological phantasm.

3. One of the most remarkable peculiarities of the Yamna or Pit-grave area between the Dniester in the west and the Ural and Emba rivers in the east was the apparent cultural continuity going back to the emergence of the Yamna culture. This over three-millennia-long autochthonous local development can easily be followed down to Sarmatian times, including the expansions of its cultures to the west, southwest, north and east. One of the few certain points in European prehistory is that the peoples of the Yamna complex spoke various dialects of Indo-Iranian from the beginning, and that its later groups between the Volga and Dnieper/Dniester rivers spoke Proto- and Old Iranian. It follows from this that the Yamna/Kurgan culture could not have disseminated any dialects either in Europe or in Asia that were not derived from Indo-Iranian.

4. Curiously enough, expanding groups of the Yamna culture and its descendants, i.e. Late Indo-Iranian/Old Iranian speakers had never imposed their dialects on the temporarily occupied territories of their Indo-European brethren in Europe nor in the Anatolian-Near Eastern cultural province during Mitanni times. It is calculated that there were three independent waves of migrations during Yamna times and afterwards from the east downwards to the Scythians in the Carpathian Basin: the penetration of the eastern half of the Basin by the Yamna culture; the arrival of Pre-Scythian groups in the earliest part of the first millennium BC; and the coming of the Scythians around the turn of seventh and sixth centuries. Their populations were assimilated by the local non-Indo-Iranian peoples after brief periods and left no trace of their undoubtedly Iranian language.[27]

This is an important conclusion which is alone sufficient to discredit the archaeologically ignorant theories of Gimbutas. There is no need here to go into

27 With the exception of very sporadic and hence hypothetical substrat words in hydronymy. Cf. Makkay 1994a: 153-154, with further literature. See also Makkay 1988: 121-124; 1996: 121-124.

details concerning her ideas, and here only follows a short summary. Experts are familiar with one of her last books, *The Language of the Goddess* published in 1989. When historical and other interpretations are evaluated, the main question is whether the data that are used are correct and valid. Gimbutas's sources were mostly based on published data. I investigated finds from the early Neolithic that she mentioned as connected with, or coming from, my country and found that most of her references to Hungarian finds (altogether 20) are absolutely wrong. To mention only one example, her reference to the famous clay figure of the Tisza culture from Szegvár-Tűzköves in the Hungarian Plain was incorrect: she confused it with the anthropomorphic vessel of the Baden culture from Transdanubia (Makkay 1994b: 419-425). Russian scholars (for example, Igor Diakonoff and E. E. Kuz'mina) have also come to the conclusion that the data listed by Gimbutas are not always correct, judging her works to be compilations and to be based on a preconception (Makkay 1994b: 421 with furtber references). I will only repeat here the closing words of my review of her book: misunderstandings, mistakes, arbitrary datings and similar distortions were discovered almost without exception whenever her data concerning Hungarian finds were checked. Considering this fact, and other circumstances, I am convinced that the time has come to replace the unfounded Kurgan theory of M. Gimbutas or its modified versions with a better model.

* * *

The alternative solution may be the Palaeolithic model presented by the late Miklós Gábori at the Nice Congress in 1976 (Gábori 1976).[28] An expert in Palaeolithic matters, Gábori extensively studied the primary (Acheuléen) and the second (Middle Palaeolithic) colonization of Europe by early man from the Near East and Africa. He showed in his neglected paper that the second colonization was the result of the dispersal of the modern human species, the archaic or early *Homo sapiens fossilis* from Africa and South East Asia in the developed phase of the Middle Palaeolithic (in the Riss-Würm interglacial), and that it replaced earlier hominids in Eastern Europe. These men arrived between 45 and 35 thousand years ago. The western wave led to the formation of West European Moustierian and later Aurignacian cultures and was – for many thousand years – isolated from the central branch. Archaic insular languages like Basks, Sicans and the tongues of the Canarians may be the survivors of the tongues of this ancient Western *Homo sapiens fossilis*.

28 For Gábori's other books and papers see Makkay 2000 with full bibliography.

The central (Balkanic) wave played a role in the emergence of the Molodova facies of the eastern Levalloisien and its assemblages were distributed as far as the Dniester river. Between this river and the Dnieper a cultural vacuum approximately 500 kilometres wide developed entirely devoid of any contemporary assemblages. The third wave was diffused east of the Dnieper river and was represented by eastern Micoquien assemblages. Parallel with this rapid dispersal, a population explosion had taken place. This is attributable to two factors: the arrival of relatively populous groups and the favourable climate.

Around the end of the development of the eastern (Caucasian) group, the Micoquien, there appeared stone assemblages which represent transitional types leading to the next cultural phase of the Upper Palaeolithic: the East Gravettien, or as Gábori calls it, *the* Gravettien. This widely distributed Gravettien began to expand to the west around 20,000 BC, and its expansion affected territories already covered by loess in Central Europe and in the Danube valley area. The whole settlement area of this late Gravettien dispersal on the loessic plains largely corresponds to the territorial distribution of the much later Linear Pottery, while many thousand years later the Yamna culture developed on Late Mesolithic Bases on the original – eastern – territory of *the* Gravettien. The linguistic equivalent of this cultural pattern can be seen in Gábori's diagram (for more details see Makkay 2000):

Linguistic map of postglacial Europe around 8000-7000 BC

Europe →	*West*		*East*	
↓				
North	Proto-Lapps		Proto-Finno-Ugrians	
Middle	Indo-Europeans	Indo-Europeans	Indo-Europeans	
South	Iberians-Basks	Sicans	Indo-Europeans	Caucasians

1 2 3

Proto-Hattians Proto-Urartuans

Proto-Elamites[29]

After the end of the Ice Age around 13,000 BC, the latest Palaeolithic-Epipalaeolithic tribes of the Gravettien heritage began their northward migrations, primarily through the wide valleys of the Dnieper and Volga rivers. This slow process led to the initial colonisation of a huge hitherto unoccupied territory[30] by an incoming human population with its own language or languages,

29 The linguistic map of Gábori 1976, unnumbered map.

30 *Unoccupied* is, of course, used here in the sense that any trace of former human settlements from earlier Interstadials and Interglacials were repeatedly annihilated during frozen periods. The exceptional case of the Susi rock shelter in Finland does not change this fact. I am indebted to C. Carpelan for this information.

and ethnically it can be ascribed back to a Gravettien base. Migrations from western Siberia and Central Asia played no role in it, and the western influences of the Magdalénian world (including groups of Hamburgian, Federmesser, Ahrensburg, etc. technologies) arrived only in the southern half of the Baltic.

If we accept (as I, for example, strongly believe) that the forest and subarctic areas were initially populated from the south, and that this first population can be considered to be the Proto-Finno-Ugrians,[31] we are faced with a serious problem, for this would imply that PU/PFU-speaking peoples had migrated from an area where speakers of PIE groups had lived already in the Early Mesolithic, and these PIE speakers were successors of Upper Palaeolithic groups termed as Gravettien. Since the Indo-Uralic hypothesis cannot be verified, the only possible solution is to assume that the Late Palaeolithic ancestors of the still unseparated PU/PFU tribes populated the periglacial zone north of the whole continental distribution belt of the Gravettien (and probably also the Magdalénien). Miklós Gábori did not explicitly come to this conclusion, but he postulated the existence of such an extensive periglacial economic zone of this kind between the ice cover and the more southern area of both (eastern and Central European) groups of the Gravettien.

This model resembles the somewhat similar suggestion of M. G. Núñez from 1987, but it was fonnulated more than one decade before it. Recent suggestions by M. Otte can also be associated with Gábori's conclusions (Otte 1995).

This model only makes sense if Proto-Lappic is considered an originally Proto-Uralic dialect. If it is not, the aboriginal population of the periglacial economic belt above the Eastern Gravettien (east of the Vistula) should basically have been different from that which had lived north of the Magdalénien belt and the so-called secondary Gravettien of Central Europe (a hypothetical Proto-Lappic speaking group whose tongue which might either have belonged to, or been different from, the PU protolanguage). The geographical position of the Janislawice grave supports the first version of this latter possibility, i.e. that the population of the Janisławice culture belonged to the PU parent stock. If one agrees with this conclusion, one should also conclude that Proto-Lapps and their successors have been continuously driven away from their original protohabitats to the north by southern newcomers/immigrants/invaders since time immemorial.

A linguistic frontier already began to appear between eastern and western groups of the Gravettien in the Upper Palaeolithic, and the not always clear

[31] In his recentpaper C. Carpelan came to a basically similar conclusion (Carpelan 1998: 31–38). See also Carpelan's paper in this volume.

division between them can be seen as the first sign of the emergence of the Proto-Indo-Iranian of the later Yamna area on the eastern loess (*the* Gravettien in the east), and the formation of the dialect continuum of the Western Indo-Europeans on the western loess (the secondary Gravettien in Central Europe including the Carpathian Basin). According to this model, the separation of Indo-Iranian from the parental stock began already during Upper Palaeolithic times. Proto-Uralic-Proto-Indo-European contacts were therefore mostly restricted to the stage of language development after this first separation and later. I think this model that I have briefly outlined here can eventually replace the rather fashionable Kurgan theory, including its mistakenly applied conclusions about Finno-Ugric prehistory.[32]

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32 For a more detailed discussion of the question, see Makkay 1997b: 100-114; 2000.

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URALICS AND INDO-EUROPEANS: PROBLEMS OF TIME AND SPACE

J. P. Mallory

There has been a general consensus that identification of the Uralic homeland has been on a firmer footing than the host of competing solutions that still dog the issue of Indo-European (IE) origins and dispersals (e.g., Décsy 1969: 307; Mallory 1989: 148; Napol'skikh 1995: 30). The presumption that we are much closer to defining the Uralic homeland rests on a number of factors:

1. The more confined distribution of the Uralic languages compared with that of the IE languages offers a smaller region in which to "lose" a potential homeland.
2. The environmentally more uniform geographical area of the Uralic languages presupposes a similar homeland territory for its speakers while the IE languages are distributed, even from an early date, everywhere from forests across steppelands and even deserts that reveal a marked complexity in subsistence strategies. Quite divergent IE homeland territories and subsistence bases are, consequently, proposed to account for these differences.
3. The cladistic relationship between the different Uralic languages is comparatively simpler (5 Finno-Ugric and 2 Samoyedic) than IE with its 11 major groups.
4. The different Uralic groups (no matter how defined; see Salminen in this volume) are in terms of dialect geography much more transparent than those of the Indo-Europeans, i.e., there is a chain relationship running from Baltic Finnic on the west across the Ugric languages and on to the Samoyed languages (with Yukaghir in the far east if necessary to one's argument). Chains are much more difficult to claim for IE and even when we do have them, e.g., Germanic-Baltic-Slavic, Iranian-Indic, it is not transparent

how they articulate geographically with either isolated language groups, e.g., Tocharian, or other potential chains, e.g., Greek-Armenian.

5. The smaller number of Uralicists militates against the proliferation of competing theories that one finds in the much larger world of IE scholars (and the not-so-scholarly), i.e., diversity of opinion is proportional to the density (no pun intended) of the scholars involved in studying a problem.

What I intend to do here is to examine Uralic homeland solutions from the viewpoint of an archaeologist who has been struggling with the problem of Indo-European origins for the past 25 years. As I cannot utilize sources in Finnish nor Hungarian, I lack both the competence and confidence to pronounce on any of the specifically empirical evidence concerning the Uralic homeland (especially the specifics of a linguistic-palaeontological approach where the names of trees [e.g., Hajdú 1969 and *contra* Sinor 1969] or fish [de Rohan-Csermak 1969; Napol'skikh 1994] are employed to delineate the homeland territory). Rather, I intend to direct my attention entirely to the logic of the arguments employed by Uralicists in light of what I perceive to be the experience of IE research. In attempting this, I may well make what appear to be a number of glaring empirical mistakes in handling the Uralic data and I am well aware that the sight of an Indo-Europeanist thrashing around in the world of Uralic studies may be much like watching a bull in a China shop: it can't help but make a mess of things but, on the other hand, the blundering of a clumsy outsider is one sure way to test its foundations. I structure my comments broadly on a recent survey of the structure of IE homeland theories (Mallory 1997).

ASSESSMENT PRINCIPLES

In 1997 I outlined five principles which are required of any solution to the IE homeland problem for it to be at least regarded plausible (tests for the validity are still even more difficult). These were the following:

1. Temporal-spatial plausibility
2. Exclusion principle
3. Relationship principle
4. Total distribution principle
5. Archaeological plausibility

Of these I wish to comment on numbers 1, 4 and 5. The exclusion principle (no. 2) maintains that it is unlikely (not impossible) that the IE homeland lay in a

territory known to have been occupied in antiquity by a non-IE language. This has far less force in Uralic studies. We can ascribe certain territories of the greater IE world, at least since the Bronze Age, to other language families, e.g., Hurrians in east Anatolia, Elamites in southern Iran, or we can make a good circumstantial case for the prior occupation of some regions by non-Indo-Europeans, e.g., Basques. On the other hand, our historical sources do not take us nearly so far back in antiquity either with regard to the existence of Uralic languages or the various putative Uralic homelands.

The relationship principle (no. 3) requires that a homeland solution accommodate the inter-group relationships of the constituent languages of a family. As observed above, this is far more easily done in Uralic than in Indo-European where the former shows a broad correlation between dialectal position and geographical position (e.g., Napol'skikh 1997: 114-117). It is to the remaining three aspects that I turn as the focus of my discussion.

TEMPORAL PLAUSIBILITY

Time and place in homeland research are dependent variables, i.e., there is no meaningful concept of one without the other (Mallory 1996). This can be appreciated if we consider a hypothetical example. Let us say that I identify the homeland of the Latin language as the area around Rome. Geographically, this makes perfect spatial sense but the statement, in terms of discussing the formation of the Latin language and the dispersal of the Italic languages, can only have meaning if I introduce the factor of time. If I were to argue, for example, that the Latin language formed in the area around Rome c. 35,000 years ago, then I am clearly wrong about the language spoken in the region (whatever it was, it did not remotely resemble Latin); similarly, if I attributed the Latin homeland to c. 1500 AD I might have the area right but again the language would have been wrong, at least if we mean the Latin vernacular. In both these cases, I may be talking about the same geographical region but I am clearly not talking about the same language.

A survey of solutions to the Uralic homeland problem reveals that most of them can be placed in one of two broadly defined models:

1. Deep time depth with broad territory. Here the homeland is generally set to an early period, often associated with the earliest post-Pleistocene colonisation of Subarctic Eurasia, c. 9500-7500 BC. Here, one might typically propose a homeland stretching from the Baltic to the Urals or across the

northern periglacial zone (e.g., Nunez 1987; Larsson 1990; Makkay, this volume). Although infrequent, Palaeolithic models of IE origins are also occasionally suggested (e.g., Otte 1997).

2. Shallow time depth with confined territory. These homelands adhere to the type most commonly found in IE homeland research in that the homeland is placed temporally c. 4500-2500 BC and is situated in a smaller territory, usually constituting 30% or less of the historical extent of the Uralic languages. Here we would find homelands proposed occupying regions such as that between the Kama and Urals (e.g., Décsy 1965).

One of the obvious problems with homeland size is that any increase in logical accuracy generally leads to a decrease in locational precision and, ultimately, a collapse of plausibility. Consider for the moment the general range of Uralic homeland solutions. They tend to run from Denmark to the Yenisei. Now we could easily solve the problem of Uralic origins if we drew a circle around all these (competing homeland) territories and declared the whole region from Denmark to the Minusinsk Basin was the Uralic homeland; some Indo-Europeanists, in desperate attempts to square circles and retain both a homeland for Europeans in the Baltic region and one for Indo-Iranians in the steppelands, tend to envisage homelands stretching from the Baltic to the Caspian (Mallory 1997: 106-109). If we say that the homeland falls *somewhere* within the enormous area proposed, we have gained little in actually locating it geographically as we have sacrificed precision (where) for accuracy (somewhere). A critical question here is how confined must the Uralic homeland have been?

Lars-Gunnar Larsson (1990: 235-237) has suggested that a good comparison can be made between the distribution of the Uralic languages and those of the Cree of Canada and this seems a good starting point to investigate the issue of territory and time-depth. First, we need to set out a comparison between the linear extent of Uralic territory and the two major Subarctic language families of North America, i.e., Northern Athapaskan and Algonquian (fig. 1).

Uralic = c. 3500 km (Estonian to Selkup). Confined shallow depth homelands fall c. 500-1500 km, i.e., c. 15 to 30% while deep depth maximum extent homelands (Baltic-Ural) extend c. 1500 km or 40% or more of the historical distribution of the Uralic languages.

Algonquian = c. 4500 km with homelands on the order of c. 500-1000 km, i.e., c. 13-25% of the linear extent of the language phylum.

Northern Athapaskan = c. 3500 km with homelands on the order of c. 500-1000 km, i.e., 15 to 30% of the linear territory.

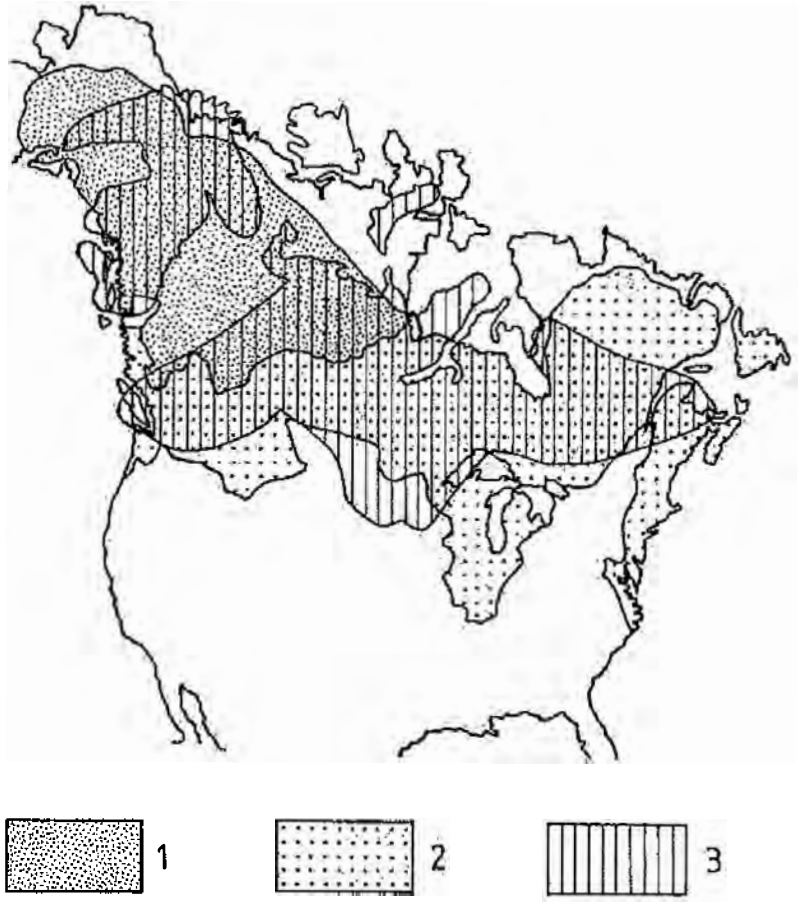

Fig. 1. Generalized distribution of the Northern Athapaskan (1) and Algonquian (2) languages in the Subarctic zone. The approximate areal distribution of the Uralic languages (3) is superimposed for comparative purposes.

In order to bring the North American data into sharper focus, we will make a closer comparison between it and the Uralic evidence.

1. Language families such as Athapaskan and Algonquian occupy Subarctic conditions similar to what we both find and generally propose for Uralic.
2. The North American languages exhibit broadly similar cultural ecologies whose linear extent is approximate to that of the Uralic languages. Their cultures often reflect subsistence strategies and social organisation (Rogers & Smith 1981) that are probably not too far removed from that reconstructed for Proto-Uralic.

a. Hunting (caribou, lesser extent elk, etc.) and fishing.
b. Seasonal settlement along inland waterways.
c. Regional groups of 50 to 4500 who recognised a common linguistic and ethnic identity.
d. Subgroups of 200-400 that might assemble for any activity.
e. Bands of two families as basic residential structure.
f. Egalitarian social structure.

3. The Subarctic Shield, the territory in which we find Northern Athapaskan and Algonquian, has been occupied since the Palaeo-Indian period, i.e., c. 7000 BC. The Uralic territory has similarly seen Post-Pleistocene occupation since c. 8000 BC.
4. The resultant North American linguistic landscape consists of but two major language families found in chains of closely related languages (Northern Athapaskan and Algonquian; Eskimo-Aleut is an obvious later intruder). The resultant North European–Northwest Asian linguistic landscape consists of but one major historically attested language family (Uralic).

Larsson argues that the North American territorial model accommodates Nunez's archaeological model that would admit of a homeland extending from the Baltic to the Urals c. 8000 BC (Nunez 1987: 14). The attractiveness of applying the North American model to the Uralic situation is obvious but there is one very major discrepancy between the two models. As I suggested above, in homeland problems space has no meaning without time and the dates proposed for the North American language chains are markedly shallower than those accepted by Larsson and Nunez for Uralic. Proto-Algonquian, admittedly conjecturally, is provided with a date of c. 4000-3000 BC (Haas 1958), 1500-1200 BC (Rhodes & Todd 1981: 60; Siebert 1967) or more recent (c. 700 BC on the presumption that its expansion is associated with the spread of the bow and arrow, Fiedel 1991) while Proto-Athapaskan has been provided similarly recent dates, e.g., 1500-500 BC (Krauss & Golla 1980: 68) because of the high degree of similarity between the different Northern Athapaskan languages.

Since the crucial problem here is the correlation between area and time depth (see also Leskinen 1989), let us first consider the implications for North America and then for Uralic studies.

As the commonly proposed dates for the protolanguages of Athapaskan and Algonquian fall generally since the second millennium BC or more recently, then:

either a) Algonquian must have spread over a vast territory of non-Algonquian (and non-Athapaskan) languages in North America during the 2nd or first millennium BC, i.e., linguistic history seems to begin with Proto-Algonquian and we must presume that there were some or many earlier languages (or phyla) that have all become extinct and that Algonquian and Athapaskan spread through processes of migration and language shift;

or b) some form of Amerindian (à la Greenberg) persisted in the Subarctic region until it evolved into Algonquian.

If one wishes to maintain the American parallels then the options left to us from the Uralic evidence would appear to be:

either a) Proto-Uralic was spoken across the Baltic-Ural region since c. 8000 BC and the American estimates of time depth are simply much too recent and should have no bearing on what is otherwise interpreted as a comparable Uralic situation,

or b) Uralic spread over a vast territory of non-Uralic languages in North Eurasia at a much later date than that suggested in Nunez's and Larsson's model and it too, presumably, swallowed up territory earlier occupied by speakers of other (non-Uralic) language groups.

It should be clear now that we may have a better idea of the spatial constraints on Uralic once we have ascertained its temporal position. It would seem to me that the critical first question then is *when* was Proto-Uralic? The Indo-European experience suggests three purely linguistic techniques for determining the date of a protolanguage: glottochronology, estimation, and external contact dating.

GLOTTOCHRONOLOGY

Although lexicostatistics has been applied, employing Swadesh's basic word list of both 100 and 200 words (Raun 1956), it is more likely to be utilized in exploring the inter-group relationships (Khelimskij 1982: 11) than in determining the time depth of the protolanguage. I am unaware of its application to the Uralic languages for specifically dating purposes, or at least, its use in providing absolute dates for Proto-Uralic other than references by Nunez (1989: 93) to a split between Finno-Ugric and Samoyedic estimated at c. 8500-7500 years ago. Generally, Uralicists seem to be about as unimpressed with glottochronology for dating purposes as linguists in the IE world (Napol'skikh 1997: 120).

ESTIMATION

Consensus estimation (= "educated guess") of the time-depth required to explain the earliest differentiation among the IE languages tends to fall generally somewhere on the order of c. 5000-2500 BC (Mallory 1996). In this, Indo-Europeanists are somewhat privileged in possessing evidence from languages several thousand years ago, a situation that does not obtain for Uralicists. Here it seems to me that Uralicists employ two types of dates: conceptual and pennitted. The conceptual are driven, one would suppose, by the time required to explain the degree of separation found among the various Uralic languages (the existence of archaeological and palaeo-botanical factors, however, can hardly be ignored). One can note a similar order of magnitude for many linguists for the period of Uralic-Yukaghir, e.g. 7000-6000 BC (Napol'skikh 1991: 25), Proto-Uralic, e.g., c. 6000-4000 BC (Hajdú 1975: 42), c. 5000-4000 BC (Napol'skikh 1991: 22; sixth to end of fifth millennium in Napol'skikh 1997: 125), c. 4000 BC (Décsy 1965: 154; Bomhard 1996: 32; Vuorela 1964: 3), and the period of Finno-Ugric, e.g., c. 3000-2500 BC (Vuorela 1964: 4), 4000-2000 BC (Hajdú 1975: 42), c. 2500-2000 (Napol'skikh 1997: 125).

The second school of thought does not so much seem to estimate but rather "pennit" much earlier dates, generally on the order of c. 8000 BC, e.g., Wiik 1994; Larsson 1990. Here the dates seem to be "pennitted" in order to entertain homeland models that comprise a broad region with greater time-depth; such models are probably more explicitly driven by archaeological (Nunez 1987; 1989) than linguistic factors.

EXTERNAL CONTACT DATING

Although the estimation of the date of a prehistoric language by cross-correlation with another language family has seen hardly any application in Indo-European, it is the most frequently employed technique in Uralic. Other than a few rather speculative attempts to anchor Proto-Indo-European temporally by some loan from Semitic or Sumerian, there are really few serious attempts to situate Proto-Indo-European in time by loanwords (Mallory 1996: 3). On the other hand, Uralic and subsequent stages of its development have been cross-dated with respect to loanwords from Indo-European on the presumption that we have a clearer idea of the dates of IE development than Uralicists do of their

own language family. In short, there is a tradition of calibrating Uralic dates against the chronology of Indo-European.

The somewhat better precision of IE dates is probably valid in that IE languages are attested much earlier than Uralic and, consequently, we can ascribe the existence of at least some of the historically attested IE languages to the Bronze Age and feel at least some confidence in triangulating some of the earlier stages of IE development. But we should also admit that there are still wide variations in the estimates of potential language group beginnings in IE. Generally, Proto-Indo-European is placed within the temporal range between c. 5000 and 2500 BC on the basis of all the means that may be employed in dating it (Mallory 1996). There is, however, a peculiar discrepancy between the estimated dates of the major subgroups. Anatolian, Greek and Indo-Iranian are all granted a Bronze Age existence, i.e., presumed dates for Proto-Greek or Proto-Indo-Iranian, all fall somewhere between c. 2500 and 1500 BC, probably at the earlier end of the range. On the other hand, many of the estimated dates for most European languages tend to run after 1500 BC and there is an unexplicit image of some form of vaguely undifferentiated *Late Indo-European* in Europe contemporary with the emergence of the historically attested (Aegean and Asiatic) IE languages of the Bronze Age (Mallory 1996). This obviously has some impact on dating Uralic as the chronology of potential loans must be congruent with a model of IE evolution that sees the creation of Indo-Iranian earlier than, say, Baltic or Germanic. (We will ignore for the present that the dating of the later developments of IE does present a slightly disturbing correlation: where historical evidence in the east requires us to set an early date for linguistic separation, we must accept it; where we have no early written evidence and are not compelled to accept such an early date in the west, we tend to regard the separations as more recent).

Now this discrepancy in the putative dates of western IE has a quite definite impact on some of the conclusions which Uralicists might choose to draw from the evidence of loanwords. Uralicists have long discussed and debated the presence of what would appear to be PIE words in Uralic (or some subset of it, particularly the western segments of the chain) and, therefore, this presupposes that western Uralic was in contact with undifferentiated IE (= PIE) somewhere in or near the Baltic region. But if the major changes that define the individual subgroups of Balto-Slavic or Germanic did not come into being until well into the second millennium BC, this does not necessarily speak for an early presence of western Uralic in the Baltic. We have to be aware of unstable anchors that fix neither the temporal nor spatial dimensions of Uralic but merely let it float in

some form of ill-defined relationship with IE. Some specific examples should make it clear how serious this issue is.

Both Jorma Koivulehto (this volume) and Pekka Sammallahti (this volume) make a good case for setting the westernmost Uralic languages in a contact relationship with undifferentiated IE, i.e., a language state which is to all intents equivalent with PIE. This defines a period of loans before more recent Balto-Slavic and then Germanic or individual Baltic and Slavic loans. As the Corded Ware culture of northern Europe is widely regarded as the archaeological equivalent of late northern IE, i.e., a linguistic ancestor to what would later emerge as Meillet's Northwest IE dialects (Germanic, Baltic, Slavic), then it might be argued that this indicates that the chain of Uralic languages extended to the Baltic by this time if not somewhat earlier. The place of contact then should be the east Baltic region.

The problem with this is twofold. As we have seen, Late IE may have extended (must if one believes most estimates) to 1500 BC or later in which case the contact between undifferentiated IE and western Uralic in the Baltic region need not have been anywhere so early as imagined, i.e. a loanword from Late (western European) Indo-European in the second millennium BC could pass for Proto-Indo-European. Alternatively, Uralicists must not ignore the fact that the Fat'yanovo culture (fig. 2) extended eastwards throughout the entire upper Volga region. As part of the greater Corded Ware phenomenon, it may have been responsible for undifferentiated IE loans entering western Uralic in the third millennium BC. In this way Uralic or later Finno-Ugric could have taken up loanwords from undifferentiated IE near the Urals and then Balto-Slavic and Germanic loans appeared progressively, over space as well as time, as it spread westwards towards the Baltic.

In short, the use of external contact dating depends on temporal and spatial relationships that have often been assumed to provide better anchors than they necessarily do.

LINGUISTIC-CULTURAL DATE OF URALIC

I have argued that the most informative means of dating PIE is applying archaeological dates to the reconstructed cultural vocabulary of the Indo-Europeans (Mallory 1996). Here the vocabulary consistently indicates a mixed agricultural economy with a full range of domestic plants and animals, ceramics, plough, and even some evidence for metals and wheeled vehicles. I have also emphasised the

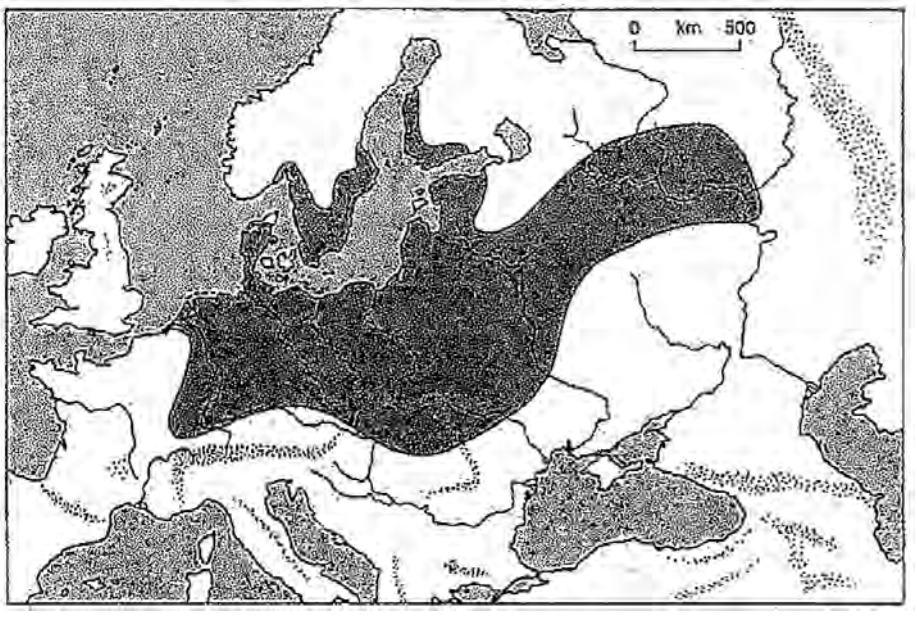

Fig. 2. Distribution of the Corded Ware culture(s), including the Fat'yanovo extension into the Volga region.

limitations of such an approach to dating a protolanguage. The principle one (assuming that the semantics of the reconstructed form are clear) is that the reconstructed vocabulary is merely that which linguists cannot ascribe to loanwords between already differentiated languages. Such words could have moved through a linguistic continuum at various periods of its expansion, some moving farther than others without detection, depending on the stability of their phonetic shape.

The Uralic languages pose a much more problematic area of inquiry than IndoEuropean in that the economy and technology attested is fundamentally hunter-gathererfisher rather than agricultural, i.e., Uralic lacks the many economic and technological terms that cumulatively provide a temporal horizon for Proto-Indo European. The exceptions to this are few and I realize that I am risking correction from Uralicists when I mention the few examples, uncertain of their current linguistic status (drawn here largely from Collinder 1954). The series that includes Finnish *pata*, Mari *pat*, Voghul *poot*, Ostyak *put*, etc. (Collinder 1954: 65; see also Napol'skikh 1997: 124) would seem to suggest the reconstruction of a vessel, either earthenware or (less likely) metallic (and not obviously a "basket" as indicated by other cognate sets), among the speakers

of Finno-Ugric, Uralic if one wishes to accept the more questionable proposed Samoyed cognates. Obviously, the word indicating some type of metal, seen in Finnish *vaski* 'copper, bronze', etc. (Collinder 1954: 83; Napol'skikh 1997: 123) also suggests that a knowledge of some metal and its name spread among Finno-Ugric speakers before significant linguistic divisions had emerged. To these we can add the words of IE origin pertaining to domestic pigs, seen in Finnish *porsas* and *oras* (Rédei 1988: 660), and the word for grain seen in Finnish *jyvä* (Rédei 1988: 659), etc., all generally derived from Indo-European or Indo-Iranian in its widest sense. These range from Finno-Permic to Finno-Ugric in distribution and presumably antiquity.

It seems to me that archaeological evidence accommodates the spread of pottery anywhere proximate to the Uralic world from c. 5500 BC (van Berg 1997) or more recently with agricultural dates obtaining no earlier than the fourth millennium BC. Now here I want to be quite explicit what this means.

As we have seen above the history of research into Uralic origins indicates that there is one school of thought that envisages a homeland stretching from the Baltic to the Urals at a date of c. 8500 BC. In practical terms it seems that this school must then suggest one of two things:

a) Proto-Uralic was spoken in the east Baltic region at 8500 BC and it later evolved into our historically attested West Finnic languages.
b) Proto-Uralic was spoken in the east Baltic region at 8500 BC but it left no modern traces; the West Finnic languages must be explained by later intrusions. This second line of argument is methodologically awkward at best and generally requires Proto-Uralic to be spoken somewhere in accordance with a proxy model, e.g., archaeological distribution, despite the fact that it is not required by any later historical evidence. We then have a language posited in a geographical region for absolutely no linguistic reason and its existence cannot explain any subsequent development. It is meaningless. Hence, I think the first option is the only serious logical option that our methodology permits us.

If this is the case, then we must explain how Proto-West Finnic could have existed in the Baltic region when it lacked elements of the Proto-West Finnic vocabulary/material culture? The obvious solution is that the word for ceramic vessel spread to this region sometime after the Proto-Finns were in place. On the current basis of proposed deep chronology, this should have happened about 3000 years after the initial occupation of the region by Uralic speakers. The presumption then is that

either a) there was no significant language divisions across the Baltic-Ural region for at least 3000 years or more so as to permit the word that emerges as Finnish *pata*, etc., to be interpreted in any way differently from other words reconstructed to Proto-Finno-Ugric;

or b) that there had been linguistic divisions between the Uralic languages but that the phonetic shape of the loanwords in question (here **pata*) was so stable in all the languages that its borrowing could not be detected.

Similar arguments would be extended to the terms for grain and domestic animals that should have appeared (theoretically) even more recently. For these reasons, I believe that it is up to those who propose deep time-depths and widespread homeland solutions to satisfy linguists how such models can accommodate the more recent cultural elements of the reconstructed vocabulary.

TOTAL DISTRIBUTION PRINCIPLE

One of the most frequently violated principles of IE research is what I call the total distribution principle, i.e., a solution to a homeland problem must explain all of its constituent languages. Defining how large this constituency is may be problematic in Uralic (can one concentrate entirely on Uralic origins or does one have to resolve a Uralic-Yukaghir homeland problem or a Uralic-Altaic relationship?). However Uralicists define their task, the important thing is that any solution to the Uralic homeland problem requires that all the pieces of the puzzle fit together with no exceptions. While this may appear obvious, it is violated so often in IE studies that we must recognize it as a problem almost generic to homeland research. The total distribution principle is generally breached when one argues that it is possible to fix the location of a segment of the proto-language (and by extension the entire homeland territory) if one can anchor a segment of a language family in a given area.

The greatest stimulus to violating this principle is what I call the "continuity card", an archaeological gambit that secures the homeland to a particular region on the basis of regional archaeological "continuity". In a thought-provoking paper, Milton Nunez provides us with an excellent example of how this card is played. He writes:

> Finnish archaeological material radiates a clear message of settlement continuity. This has a bearing on the controversial question of the origins of the Finns (Nunez 1987: 11).

> It seems logical to assume that major migrations should be reflected in the archaeological material. But there is no evidence for a major migration that could have brought a Finnic language to Finland other than that connected with the Mesolithic colonization of the country (Nunez 1987: 12).

What happens when we accept such statements, i.e., we conclude that there is no major change in the archaeological record of Finland, since its earliest Post-Pleistocene colonization, that might be ascribed to a major population influx capable of altering the language trajectory set by Finland's initial occupants. We are then left to conclude that the language spoken in Finland in the ninth or eighth millennium BC was essentially Proto-Uralic and on a direct evolutionary line to Finnish. If this is the case, then it follows that

either a) The Uralic homeland is in Finland,
or b) The Uralic homeland was larger but should have included Finland within its territory.

We then extrapolate the homeland eastwards a bit in order to have a Proto-Ugric homeland immediately to the east of Finland and, possibly, the ancient ancestors of the Samoyeds must be immediately east of them. The important thing is that as we have securely anchored part of the homeland (in Finland) the rest will follow easily enough.

Now as an Indo-Europeanist I can assure you that there is probably not a territory in Eurasia in which this argument has not also been employed in the search for the IE homeland. It matters not whether we speak of Ireland, northern Europe, Greece or the Indus, there are archaeologists to declare that there has been no major break in the archaeological record that could explain the intrusion of a new language. These arguments for cultural continuity or, as they are put negatively (there is no evidence in the archaeological record that indicates a population influx that caused substantial linguistic change), can't all be right and the majority must clearly be wrong. Archaeological competence is not at issue; the problem here is the nature of the archaeological record and the presumption that when archaeologists talk of archaeological continuity, this is good proxy evidence for linguistic continuity. I believe that the experience of IE scholarship demonstrates that the archaeological record cannot be so clearly read and that statements concerning the linguistic stability of a region, based on the evidence of apparently related archaeological sequences, are simply misleading – no linguist should ever trust an archaeologist who makes such sweeping statements. What then can archaeologists hope to contribute?

ARCHAEOLOGICAL PLAUSIBILITY

Throughout this discussion we have been working with two types of models of Uralic origins: a deep model which would associate the distribution of the Uralic languages with the spread of human populations northwards after the Pleistocene and models which require a later expansion of Uralic over an area formerly occupied by non-Uralic speakers. Now a solution to the Uralic homeland problem need not correlate with an archaeological culture but there should be some evidence for population or social trajectories to explain the dispersal of a language family. If one prefers the deep time-depth model (and I hope I have raised serious reasons why this is less likely than one that envisages a later expansion of the Uralic languages) then the archaeological evidence can be rather clear cut as we require only the earliest evidence for post-Pleistocene activity in our target area. On the other hand, if we agree that Uralic must have spread across earlier populations then we require some population movement and language shift and we should at least look to the archaeological record to find the possible social vehicles for such a shift. While archaeology as a discipline may still be far from erecting the type of middle-range theory that a marriage of linguistics and archaeology requires, I think with persistent nudging, we may find a path and it is in this light that I explore the issue of archaeological plausibility and Uralic dispersals.

I have suggested that an archaeologist investigating language shift should start with first principles and by these I mean socio-linguistic principles (Mallory 1992). Language shift generally seems to require societal bilingualism (I am unaware of any serious model suggesting major population replacement for the spread of Uralic although some population replacement may have been the case). From a social perspective then we should expect that Uralic spread through the various socio-linguistic domains of the pre-Uralic inhabitants of Subarctic Eurasia. If we assign the social models provided by the North American Subarctic cultures to the earliest Uralic culture(s), then we might expect a rough hierarchy of the following social domains:

1. Nuclear family
2. Household unit (c. 2 extended families)
3. Band/annual assembly
4. Regional unit/annual concentration/exchange units.

Of these, we might expect that Uralic language(s) would initially spread through the larger social domains such as exchange units or the seasonal social

gatherings. The specific reasons for its spread may be difficult to establish but I think it is worth looking at an ethnographic example that might suggest some of the social mechanisms involved in language shift.

Ronald Atkinson (1989) provides an insightful study of the Acholi of Uganda where a minority language (Luo) became the exclusive language of a territory. As Atkinson argues, the spread of Luo in Uganda cannot be attributed to primacy of settlement, economic advantage, nor numerical superiority but rather political pre-eminence. Prior to the expansion of Luo, northern Uganda was occupied by lineages of various language groups who lived in villages and were governed by autonomous chiefs. In the period between 1625 and 1725, the Paluo, who had developed a higher order of social organization under the influence of the neighbouring Banyoro, immigrated in small numbers into northern Uganda where they established themselves primarily in two clusters organized into 13 chiefdoms, none of which consisted of more than 5 villages under a common leader. The new social organization (chiefdom) was spread through marriage alliances with potential lineages, the use of tribute to impress local lineages, the offer of military assistance in times of difficulty, and outright military pressure on lineages to join one of the chiefdoms. The local lineage heads willingly joined the new chiefdoms as the social structure posed no threat to their own role within the village, it enhanced the importance of the local village leader as a representative within a larger social unit, and in some cases local leaders were recipients of central tribute. Exchange systems for basic commodities such as iron were also centred on the Luo speakers. The local population first adopted the new social system and in so doing gradually adopted the language associated with it. The vehicle for language shift here was then a shift in social organization and Atkinson emphasized that the social shift preceded language shift.

In a recent article (Mallory 1998) I attempted to emphasize the importance of social organization when I suggested a black-box model for the spread of Indo-Iranian languages on the basis of one of the current theories for their dispersal south of Bactria-Margiana. Archaeologists have faced a conundrum in that we have Bronze Age cultures occupying the steppelands of western Asia that would in both a cultural and a geographical sense apparently accommodate some form of Indo-Iranian identity, one that is subsequently confirmed for the region in the Iron Age (Kuz'mina 1994; Parpola, this volume). However, the historical seats of many of the Indo-Iranian languages lies south of the Bronze Age oasis citadels, i.e., in Iran and northwest India. These are territories in

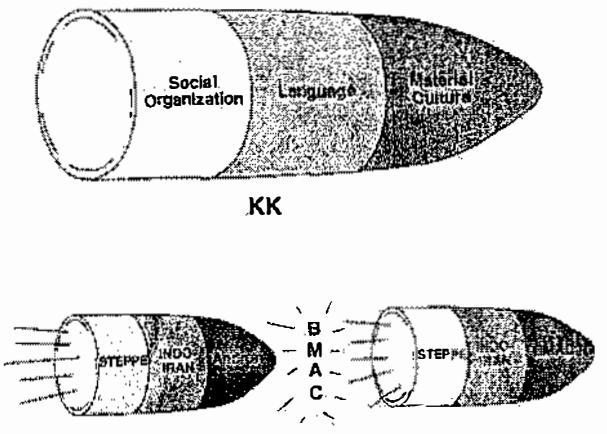

Fig. 3a. The model of the *Kulturkugel*. *3b.* The dynamics of the *Kulturkugel* are illustrated here where the material culture of the Indo-Iranian Andronovo culture is shed on impact with the BMAC although the language trajectory continues.

which there is no archaeological evidence that the steppe (Andronovo) cultures penetrated although there is strong evidence that they were in regular and profound contact with the Central Asian citadels of the Bactria-Margiana Archaeological Complex (BMAC). Burials typical of the BMAC are found on the major routes southwards into the historical seats of the Indo-Aryans and so the only way I could imagine this being expressed archaeologically was by positing what I termed a *Kulturkugel* (fig. 3a) (*recte "Geschoss"* but that hardly alliterates). This is a model in which we imagine a "cultural bullet" powered by social organization, carrying a language, but possessing a soft malleable nose of material culture. When fired from the steppe through the BMAC (fig. 3b), the bullet shed its steppe (Andronovo) nose for a BMAC nose, but its motion was not arrested as it carried Indo-Iranian languages southwards.

The concept of a Uralic *Kulturkugel* could be explored in a variety of ways and I merely wish to propose two different types of models that archaeologists, far more familiar with the region in question than myself, might wish to explore.

The first presumes that the *Kulturkugel* offers a model for Uralic expansions on the presumption that the social organization of early Uralic speakers provided the required vehicle for its expansion. Obviously, the later we propose Uralic expansions, the easier it is to sustain such an argument. One might, as one has, suggest that the spread of the Uralic languages was tied to the later

spread of stockbreeding and limited agriculture in the first millennium BC in which we might posit such a marked difference between Uralic populations and local hunter-gatherers that familiar models of language shift might be proposed (Renfrew 1987). Putative Uralic expansions that might be seen in the spread of the Textile-Pottery culture or Mälar-type axes (Kuz'minych 1996) are well rehearsed in Uralic Urheimat literature.

But rather than dwelling on the more obvious models, I would like to conclude my comments with a more speculative model, a variation on the *Kulturkugel* adapted for hunter-fisher societies where we might not expect marked degrees of social differentiation. Although we may have to be cautious about dates and linguistic stages, it is clear that there were contact relationships, possibly at various periods, between Uralic speakers (at various stages) and Indo-Europeans, primarily Indo-Iranian (at various stages). The cultural vocabulary borrowed into Uralic concerns livestock, agriculture, metals, and a series of broader conceptual terms concerned with exchange (including the higher numerals) or the supernatural.

OInd *argha-* 'price, value' : Fi *arvo* 'value'
OInd *asura-* 'god, demon' : Mord *azoro* 'lord'
OInd *aṃśa-* 'part, share' : Fi *osa* 'part, share'
OInd *bhaga-* 'share' : Mord *paz* 'god, happiness'
OInd *śatám* 'hundred' : Fi *sata* 'hundred'
OInd *sáhasram* 'thousand' : Vot *śurs* 'thousand'
OInd *vasnám* 'price, value' : Fi *osta-* 'buy'

The importance of exchange systems among essentially hunter-gatherers can be seen in the North American Subarctic cultures as well. For example, we find that among the northern Ojibwa:

> Each band was led by a senior male of the core family. Frequently, if not always, these individuals acted as the "trade-chiefs". The position of leader appears to have been based on his ability to secure for his followers abundant trade goods, to excel as a hunter, and to command superior religious knowledge. (Rogers & Taylor 1981: 233.)

What I am suggesting here is that there may be a relationship between Indo-Iranian social organization and Uralic linguistic dispersals. Where hunter-gathering populations of the southern forest zone came into contact with steppe populations (or Fat'yanovo stockbreeders), they most likely came into the orbit of societies with more complex social organizations. Such an interface could result in subtle changes in the social organization of the Uralic populations (cf. changes in the social organization among hunter-gatherers who were in contact relations with farmers in Neolithic Europe, Zvelebil 1995). Such changes

could have been stimulated by internal evolution within Uralic society which developed its own variant of trading chiefs under the influence of Indo-Iranian contacts. We should also not ignore the tendency among societies of lower social complexity that when they must interact with one of greater complexity they may remodel themselves so that the two can maintain a corresponding social interface. Either way, the resulting situation would see Uralic populations not only as middlemen in exchange systems but also as possessing a set of social values, concepts and presumably organizational capacities that one might not expect among more remote hunter-gatherers in Subarctic Eurasia. The (here) hypothetical interface then (see Table) would see a chain of languages running north (Proto-European) through Finno-Ugric territory to the south (Indo-Iranian). The interface between Finno-Ugric and Indo-Iranian would invariably leave the Finno-Ugric-speaking populations at a social (in terms of prestige) advantage with respect to residual Proto-European (non-Uralic and non-IE) populations.

Proto-European		**Finno-Ugric**		**Indo-Iranian**
Subarctic		Subarctic		Forest-steppe/Steppe
Hunt-Fish	< >	Hunt-Fish*	<	Stockkeeping
egalitarian		egalitarian*	<	ranked
exchange	< >	exchange*	< >	exchange
lowest		middle*		prestige

Table. The interfaces between the indigenous Proto-European language(s), Finno-Ugric and Indo-Iranian. The asterisks indicate elements added from the interchange, e.g., exchange goods. The last row suggests status of each language in a contact situation.

The model proposed here is purely speculative although it could be fleshed out with archaeological data. The important point here is that it suggests a different type of *Kulturkugel* from that employed to explain Indo-Iranian dispersals. Here, social organization was insufficient to see a major spread of Indo-Iranian across the Subarctic zone; the environment may have rendered a northward expansion of Indo-Iranian with a mixed agricultural-stockbreeding basis, too difficult. Nevertheless, contacts with Indo-Iranian social organization may have provided the impulse behind Finno-Ugric expansions. We can recall here that in the case of Luo expansions in Uganda, the source population and language came from the periphery of the largely Bantu-speaking Banyoro state. The

archaeological trail of linguistic dispersals may not be found primarily in the remains of material culture (and its putative continuity or discontinuity) and their presumed ethnic correspondences so much as in the residue of their social systems.

CONCLUSIONS

Uralicists appear to be wrestling with many of the same problems faced by Indo-Europeanists in the search for their respective homelands. There seems to be one major difference, however, which, even if it does not secure a widely accepted homeland solution, at least renders the quest for the Uralic homeland potentially more rewarding. As Nunez (1987), Larsson (1990) and others have indicated, the parallels between the dispersal of the Uralic languages and the language phyla of the North American Subarctic are well worth investigating further. Both offer opportunities to study widely dispersed language families in broadly similar ecological and subsistence systems. Closer scrutiny of both regions may reveal subtle yet crucial differences that render the comparisons made so far less appropriate but even this would provide a greater recognition of what is truly critical to understanding the linguistic origins and expansions of hunter-fishers in a Subarctic environment. Moreover, it is possible that North American studies may reveal the types of small technological innovations that could have provided selective advantages to linguistic groups and facilitated widespread language shift. We have already mentioned in passing attempts to associate the possession of the bow and arrow with Algonquian expansions. A recent article by Evans and McConvell (1998) on the enormous expansion of Pama-Nyungan over much of Australia is credited by them to the spread of microliths, the appearance of large ceremonial gatherings made possible by the exploitation of new plant foods, and by increased exchange. The driving force behind much of this is a series of smaller technological or subsistence innovations that stimulate the creation of more open and prestigious social systems that become the vehicles for language dispersal. That elusive middle-range theory and method required to render the archaeological record a reasonable proxy of the linguistic record may lie in comparative Uralic studies.

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TOCHARISCH-URALISCHE BERÜHRUNGEN: SPRACHE UND ARCHÄOLOGIE

Vladimir Napol'skikh

Die folgenden Wörter uralischer Sprachen können als Entlehnungen aus einer dem Urtocharischen sehr nahe stehenden indogermanischen Sprache betrachtet werden. Ich benutze für diese Sprache die Benennung *Paratocharisch*, was eine Sprache bezeichnet, die derselben indogermanischen Gruppe wie die tocharische Sprachen (= dem "Frühurtocharischen") angehörte, aber keine unmittelbare Muttersprache des Tocharischen A und B (= Urtocharisch) war und keinen dokumentierten Nachfolger hinterließ.

1. Syrj. *gęgiľ*, (Wym) *gogiľ* 'Rad, Kreis, rundes Ding'; *gęgľ'avnį* 'sich drehen' < (?) vorperm. **kökɜlʲ* 'Rad, rund'. Die Entwicklung **k* > *g-* im Anlaut ist im Permischen trivial, das inlautende **-k* konnte durch Assimilation an das anlautende *g* stimmhaft werden, was durch die volksetymologische Verbindung des Wortes mit syrj. *gęgęr* 'Kreis; Umgebung; rund' < (?) *gęg* 'Nabel' (< U **küŋkɜ*; Napol'skikh 1995a) erleichtert werden konnte

   ← paratoch. **kuəkų(ə̂)lə̂* 'Wagen': toch. A *kukäl*, B *kokale* 'Wagen' < urtoch. **kuəkulə̂* < idg. **kʷekʷl-os* < **kʷel-* 'Rad' (mit Reduplikation) (Windekens 1976: 239-240; Hilmarsson 1996: 163-164). Für die para- und urtocharischen Rekonstruktionen benutze ich die standardisierten finnisch-ugrischen Transkriptionszeichnen: *ə̂* für reduzierten Hintervokal (=Hilmarssons *œ*) und *ə* für reduzierten Vordervokal (= Hilmarssons *ä*);

   // ← vorperm. **koŋkɜlʲ* – eine "Standardrekonstruktion" des vorpermischen Prototyps (**-ŋk* > perm. **-g-*). In diesem Fall gäbe es zwei Möglichkeiten: 1) < vorperm. **kòŋkɜ* 'Nabel; (?) Kreis' (> syrj. *gęg* usw., s.o.), was aber den semantischen übergang und dazu noch die Fixierung des urpermischen Nominalsuffixes **-lʲ* erfordert – beide Bedingungen sind nicht problemlos; 2) ← tü. **kaŋ(ly)* 'Rad' (vorgeschlagen von Prof. Klaus Röhrborn, Göttingen). Der Stamm des türkischen Wortes ist aber **kaŋ* (Räsänen

1969: 232). Die Entwicklung *ŋ > *g ist im Permischen nicht möglich (vgl. z.B. bulg. *ŋ → syrj. *n* (/ *m*), wotj. *-m*, *-n-* / (dial.) *-ŋ*, *-ŋ-*; Wichmann 1903: 2 0-24; Rédei & Róna-Tas 1972: 290), außerdem sind die Schwierigkeiten im Vokalismus (tü. *a* ~ perm. **o*) unüberwindbar. Dieses toch. Wort wurde wahrscheinlich auch ins Altchinesische entlehnt: achin. **kok* 'Nabe' (Lubotsky 1998: 383, dort auch andere mögliche toch. Entlehnungen ins Altchinesische aus dem Bereich der Wagenterminologie). Die Bedeutung des altchinesichen Wortes zeigt auch, daß die ursprüngliche Semantik des Tocharischen dem 'Rad' nahestand.

2. Syrj. *jort* 'Kamerad, Genosse; Gatte', *jorta-jort* 'einander'; *jortaś-* (Wym) 'befreundet sein', (OWy.) 'für sich einen Partner, einen Genosse finden' (SSKZD, S. 120-121) ~ wotj. *jurt(t)-* 'helfen' (< perm. **jort* 'Kamerad, Genosse, Helfer') ~ nenz. *jūŕu* 'Kamerad, Genosse (über die Leute nicht-nenzischer Nationalit(ten)' (NRSl, S. 816) ~ enz. *júru* 'Freund' ~ ngan. *ńiruŋ* id. < (?) U **jərtə* 'Freund, Kamerad'. Die Rekonstruktion der uralischen Urform ist nicht sicher: die samojedischen Wörter weisen auf ursprünglich velaren Vokalismus, die permischen aber auf palatalen (UEW, S. 108)

   ← paratoch. **jortu* (mit u-Umlaut) < **jərtu:* toch. A *ort* 'Freund', *ortune* 'Freundschaft' < urtoch. **ə̂rtu* 'Freund' < *'verbunden, vereinigt; Verbündete' < idg. **r̥tu-* 'Ordnung, Gesetz' (> gr. (Hes.) ἀρτύ- 'eng, zusammengefügt', lat. *artus* 'zusammengefügt, eng in Raum und Zeit') (Hilmarsson 1984). Das Auftreten von **j-* vor anlautendem Vokal ist im Tocharischen möglich, zumindest ist eine solche Präjotierung vor den anlautenden idg. **i* und **e* gut bekannt, obwohl es hierfür keine überzeugende Erklärung gibt, vgl. z.B.: toch. A *yuk*, B *yakwe* 'Pferd' < idg. **ek̂ᵘos*, AB *yok* 'trinken' < idg. **ēkᵘ* 'Wasser' (Adams 1988: 15-16) (s. auch nächstes Wort).

3. Tscher. *jeŋ* 'Mann, Mensch' (ohne Entsprechung in den anderen uralischen Sprachen)

   ← paratoch. **jənkə̂* : toch. A *oṅk*, B *eṅkwe* 'Mensch, Mann' < urtoch. **ə̂nkə̂* < idg. **n̥kᵘ-os* 'Sterblicher' (Windekens 1976: 337). In diesem Fall, ebenso wie bei syrj. *jort* 'Kamerad' (s. oben), entstand der Anlautvokal im Tocharischen aus einem idg. Sonanten (**n̥* oder **r̥*). Da in beiden Füllen für die Quellensprache (*Paratocharisch*) die Präjotierung zu rekonstruieren ist und da in den tocharischen Sprachen (im *Urtocharischen*) **j-* vor anlautenden *Vorder*vokalen entstand, nehme ich für das Paratocharische ebenfalls den Vordervokal an, also: idg. ** n̥-* > paratoch. **ən-* > **jən-*, idg. **r̥* > paratoch **ər-* > **jər-*;

   // ← tü. : tschuw. *śĭn* 'Mensch' < tü. **jon* 'Leute' (ESCh II, S. 153). Obwohl die Annahme einer türkischen Herkunft eines isolierten tscheremissischen Wortes vom historischen Standpunkt her sehr wahrscheinlich

ist, stößt sie auf wesentliche phonetische Schwerigkeiten. Die Entlehnung des tscheremissischen Wortes aus dem Tschuwassischen ist unmöglich: tschuw. *ś* (< tü. **j-*) → tscher. *s* (/ *ś*) (Räsänen 1920: 30-31). Ältere türkische Lehnwörter nichttschuwassischen Typus sind bislang im Tscheremissischen nicht ermittelt worden. Diese Möglichkeit kann man natürlich nicht ausschließen, aber die Entsprechung im Vokalismus (tü. *a* ~ tscher. *e*), wie auch der übergang tü. **n* → tscher. *ŋ* bleiben in diesem Fall überaus problematisch.

4. (?) Sam. **kejmä* / **kijmä* 'Weibchen' (Janhunen 1977: 66)

   ←- paratocb. **kəna* 'Frau, Weib': A *śäṁ*, B *śana* 'Ehefrau' < urtoch. **kəna* < idg. **gᵘenā* (Windekens 1976: 476-477). Für paratocb. **ə* → sam. ** äj* (außer im Anlaut) s. auch sam. **sej(k)twə̂*, nord-sam. **menūjə̂*. Sam. **m* ~ urtoch. **n* bleibt aber unklar, was diese Etymologie sehr zweifelhaft macht.

5. (?) FP **kärtɜ* 'Eisen' (> mord. (E, M) *kšńi* ~ tscber. (KB) *kərtńi*, (U., B.) *kürtńö* ~ wotj. *kort* ~ syrj. *kȩrt* 'Eisen') ~ (?) wog. (T.) *kĕr*, (N) *kēr* 'Eisen' ~ (?) ostj. (Ni.) *kĭr-*: *kĭr-ńŏtəp-ĭmə* 'Zauberin, Hexe' ('Frau mit *kĭr-* (*'eisemer') Nase') (UEW, S. 653) // tscher. *kerδe* 'Säbel, Schwert'. Es ist fraglich, ob alle diese Wörter gemeinsamen Ursprungs sind. Ostj. (Ni.) *kartə*, (Kaz.) *kartĭ* 'Eisen' wurde aus den permischen Sprachen entlehnt.

   ←-iran. **kart* (/ ? **kärt*- nicht belegt): aw. *karəta-* 'Messer', pehl. *kārd* 'Messer', osset. *kard* 'Messer, Säbel, Schwert' usw. (Joki 1973: 273; Rédei 1986: 71). Die Vokale der ersten Silbe in den FP Sprachen deuten auf einen Vordervokal in der Quellensprache, in allen mittel und neuiranischen Sprachen findet sicb aber *a* / *ā*, was durch einen Hintervokal wiedergegeben werden sollte (vgl. z.B. osset. *kard* → ung. *kard* 'Schwert'; Joki 1973: 267). Dieses Problem kann durch Annahme einer sehr alten ariscben Quelle (wie z.B. ai. *kr̥tí-* 'Dolch, Messer': FU **er* ist eine normale Entsprechung des arischen **r̥* zumindest im Anlaut; Lushnikova 1990) oder nicbt-arischer Quellen gelöst werden;

   // ←- paratoch. **kə̂r(ə)tə̂* 'Schwert': toch. B *kert(t)e* 'Schwert' < urtoch. **kə̂rət(t)ə̂*, Wenn das toch. Wort selbst keine iranische Entlehnung ist, muß es auf den Verbalstamm **kə̂rt-* < idg. **(s)ko/er-* 'schneiden' zurückgeführt werden (Hilmarsson 1996: 134-135). Dieser Stamm liegt offensichtlich in toch. B *kärst-* 'schneiden' vor (Hilmarsson 1996: 93-94; IEW, S. 938) und ist möglicherweise ins Türkische entlehnt werden: tü. **kert-* 'schneiden' (Róna-Tas 1986: 73). Die Möglichkeit toch. B *kertte* → tscher. *kerδe* wurde von (Joki 1973: 269) abgelehnt, weil das toch. Wort "wohl zu weit entfemt" ist. Im Lichte der hier entwickelten Hypothese ist dies aber kein Argument.

6. lp. **kəśkə-* 'träufeln' (Lehtiranta 1989: 58-59) ~ tscher. (M.) *kiške-*, (B.) *kəške-* 'werfen, begießen' ~ perm. **kišt-* '(aus)gießen (auch Metall)', **kišk-* '(be)gießen, streuen' (<FP **kiśkɜ-* 'gießen, streuen'; UEW, S. 667; KESK, S. 124). Der Vokalismus der in UEW rekonstruierten FP Urform ist problematisch. Der Stamm des Permischen kann als **kiś-* (> **kiś-k-* und **kiś-t-* mit verschiedenen Suffixen) bzw. **kišk-* (> **kišk-t-* > **kišt-*) rekonstruiert werden. **-k-* kann als altes Suffix gleichfalls im Lappischen wie auch im Tscheremissischen betrachtet werden. Der Archetyp ist also **kVś(-k)-*

   ← paratoch. **kâS-* 'gießen' : A *käs-* 'begießen, bewässern', *käs* 'Bewässerung, Irrigation' < urtoch. **kâs-* < idg. **ghus-* '(be)gießen' (Hilmarsson 1996: 101-103). Für FU **ś* ~ paratoch. **S* vgl. auch f. *salama* 'Blitz', FW **waśke* 'Messing, Kupfer, Bronze'; für FP Vordervokal ~ paratoch. **â* – FP **kertɜ* 'Eisen'.

7. Syrj. (LuLe., OSy., MSy., Petsch.) *kẹin*, (OWy., UWy., Skt., Wym, Ud.) *kẹjin* 'Wolf' ~ prmj. *kẹin* ~ jaz. *kòin* ~ wotj. *kion*, (U., MU., M.) *kijon*, (G.) *kĭjon* id. < perm. **kö(j)ɜn / *kü(j)ɜn* 'Wolf'. Das seit Y. Wichmann hinzugezogene lp. N *gaidne* 'Wolf' (Wichmann 1912: 131; KESK, S. 139) ist problematisch, da das Wort mit der Bedeutung 'Wolf' nur in Leems Wörterbuch vorkommt (Leem 1768: 313). K. Rédei hat aber unrecht, wenn er schreibt, daß das Wort überhaupt nur in Leems Wörterbuch vorkommt (Rédei 1971: 421): vgl. *gaidne* 'Teufel' ("diabolus, Fanden"); *mana gaidnai!* 'geh zum Teufel!' (Friis 1887: 189). Die Bedeutung dieses veralterten lappischen Wortes ist also nicht sicher. Wenn das lp. Wort trotzdem mit den permischen Wörtern zu vergleichen ist, gibt es ausserdem beachtliche kulturhistorische Gründe zu bezweifeln, ob ein ur-FU Wort für 'Wolf' überhaupt bis in die heutigen Sprachen überleben konnte (Rédei 1971: 421; Napol'skikh 1997). Die Etymologie Rédeis: **kö(j)ɜn / *kü(j)ɜn* 'Wolf' < perm. **kü(j)an* 'fangende(s Tier)' < **küj-* 'fangen' (> syrj. *kij-* id.) (Rédei 1971: 421) ist nicht akzeptabel, weil das perm. Suffix **-an* nicht für die Bildung der *nomina agentis*, sondern nur für die *nomina actionis* oder *nomina abstracta* verwendet wurde, d.h., daß perm. **küjan* nicht 'fangend', sondern 'Fang' oder 'gefangen; was zu fangen ist' oder (mit sehr seltenen Beispielen in den permischen Sprachen) 'irgendein Instrument zum Fangen' bedeutet hätte. Die Bedeutungsentwicklung *Fang / *gefangen > *Wolf ist keinesfalls plausibel, ganz zu schweigen von den abnormalen phonetischen Formen der etymologisch (nach Rédei) klaren permischen Wörter. Außerdem kann nach V. I. Lytkin hier kaum perm. **kùjan*, sondern nur **kòjan* rekonstruiert werden (Lytkin & Gulyaev 1975: 26-27). Wichtiger als die fragwürdigen Nuancen des urpermischen Vokalismus ist aber, daß die Rekonstruktion des **j* in diesem Wort sehr zweifelhaft ist, weil normalerweise in den LuLe., Petsch., MSy. Dialekten das alte **VjV* beibehalten ist: **majɜg* 'Stange, Pfahl' (← iran. *majūxa*; Rédei 1986: 72) > LuLe., MSy. *majęg*, **śojan* 'Essen' (← **śoj-* 'essen') > LuLe., Petsch., MSy. *śojan*

(SSKZD, S. 216, 334) usw. Die epenthetische Entstehung des **j* in intervokalischer Position in einigen syrj. und wotj. Dialekten ist andererseits ganz natürlich. Der Archetyp ist also aller Wahrscheinlichkeit nach **kөзn* oder ** kuзn*

← paratoch. **k(u)u̯ə̂n* 'Hund': AB *ku* (Obl. Sing. A *kon*, B *kwen*) 'Hund' < urtoch. **kuu̯ə̂(n-)* < idg. ** ḱu̯ō n / *ḱu̯on-* (Hilmarsson 1986: 213; 1996: 187). Zur Semantik vgl. est. *hund* 'Wolf' ← germ. Urtoch. **kuu̯ə̂n-* 'Hund' wurde möglicherweise ins Altchinesische (und von da in viele tibeto-burmanische Sprachen) entlehnt: achin. **khwen* 'Hund' (Pulleyblank 1966: 11). In diesem Fall gibt es aber auch eine konkurierende urtibeto-burmanische Rekonstruktion **kwij* (Benedict 1972: 44).

8. Perm. **komз* 'Mensch; (?) Verwandte' (> (?) syrj. *komi* 'Komi, Syrjänen oder Permjaken', wotj. *vi̯ži̯-kumi̯* 'Verwandten', wo *vi̯ži̯* 'Wurzel'; KESK, S. 132) ~ ugr: wog. **kom* 'Mann', ung. *hím* 'Männchen' ~ selk. *kum* 'Mann, Mensch' (< U **komз*; UEW, S. 168). Die ururalische Entstehung dieses Wortes aus **koj(e)-mз* < **koje* 'Mann' (UEW, S. 167, 168) ist phonetisch schwer zu akzeptieren, und außerdem unbeweisbar

← paratoch **ki̯/u̯ou̯mə̂* : toch. A *śom* 'junger Mann, Knabe', B *śaumo* 'Mensch' < urtoch. **ḱou̯mə̂* < idg. **gʷi̯ōu̯-mo-s* 'lebend' (Windekens 1976: 486).

9. Ugr. **luw* 'Pferd'

← paratoch. **lə̂u̯a* 'Vieh': toch. A *lu*, B *luwo* '(wildes) Tier' < urtoch. **lə̂u̯a* < idg. **lHu̯ā* 'Beute, Raub; Wild' (Windekens 1976: 267-268). Urtoch. **lə̂u̯a* wurde wahrscheinlich ins Türkische und (über das Türkische) ins Mongolische entlehnt: atü., mo. *ula-γ-* 'to relay a horse', wenn die tü. und mo. Wörter überhaupt als Entlehnungen betrachtet werden können (s. Sinor 1967: 313-315; 1988: 737). Dieses Wort wurde ausführlich in Napol'skikh 1996 besprochen.

10. Nord-sam. **måŋkə̂* 'Armut, Not, Elend' (> nenz. *maŋg* 'Elend, Armut', enz. *maggǫ* 'arm' usw.)

← paratoch. **mə̂ŋk-* 'in Not sein': toch. A, B *märk* 'bitten, benötigen, brauchen', B *menki* 'minder' < urtoch. **mə̂ŋk-* < idg. **mn̥-k-* 'ein wenig, Mangel' < **men-* 'klein, verkleinem' (Windekens 1976: 289). Paratoch. **ə̂* > nord-sam. **å* nach **m*. Diese Etymologie wurde in Helimski 1985: 293 vorgeschlagen.

11. Nord-sam. **menüjə̂* 'Vollmond' (> nenz. *meńuj*, enz. *menio*) (Helimski 1978: 126)

← paratoch. **menə* : toch. A *mañ*, B *meñe* 'Mond' < urtoch. **meńə* id. < idg. **mēn-es* 'Mond' (Windekens 1976: 280). Für paratoch. **ə* (außer dem Anlaut) → sam. ** äj* s. auch sam. **sej(k)twə̂*, sam. **kejmä*. Diese

Etymologie wurde mir persönlich von Dr. Václav Blažek (Příbram – Brno) vorgeschlagen.

12. (?) FU **met(e)* 'Honig'

← arisch: ai. *mádhu-* 'süßer Trank, Met, Honig', aw. *maδu-* 'Wein, Honig' usw. (Rédei 1986: 45; Joki 1973: 283-285). Obwohl diese Etymologie allgemein akzeptiert ist und mit den historisch-kulturellen Umständen übereinstimmt, ist es merkwürdig, daß Semantik und Vokalismus problematisch sind. Deshalb ist die Suche nach Alternativen berechtigt;

// ← paratoch. **məṭ(u)* : toch. B *mit* 'Honig' < urtoch. **məṭ(u)* < idg. **medhu-* (Windekens 1976: 298). Das tocharische Wort paßt hier besser als das arische, sowohl semantisch ('Honig' gegen 'Met, Wein') als auch phonetisch (Vordervokal gegen **a*). Urtoch. **məṭ* 'Honig' wurde wahrscheinlich ins Altchinesische entlehnt: achin. **mjit* 'Honig' (Pulleyblank 1966: 11);

// ← urbalto-slawisch: aksl. *medŭ* 'Honig, Met', lit. *medùs* id. Diese Annahme würde keinen Schwierigkeiten begegnen (außer auslautendem **u*, das ja einfach ausfallen konnte), wenn die Entlehnung Urbalto-slawisch → Urfinno-ugrisch oder (separat) Urugrisch historisch als möglich angesehen werden könnte. Meines Erachtens ist diese Möglichkeit nicht ausgeschlossen, benötigt aber noch weitere Untersuchungen.

Sam. **pârå-* 'brennen', **pur(-)* 'Rauch' (> nenz. *pur?* 'Rauch gegen die Mücken (auch Sonderfeuer, das für Rauch angemacht ist' usw.) (Janhunen 1977: 131)

← paratoch. **pəu̯or* / **pur* : toch. A *por*, B *pūwar* 'Feuer' < urtoch. **puu̯ār* / **pāu̯âr* < idg. **peu̯ōr* / **pūr* 'Feuer' (Hilmarsson 1986: 207).

13. f. *salama* 'Blitz' ~ ugr. **săl-* 'blitzen; Blitz' (> wog. N *sāl-*, T. *sę̄l-*, P. *sę̄l-* 'blitzen', ostj. W. *săl-*, Ni. *sŏt-* 'zucken, blitzen', D. *săt: pàjsăt* 'Blitz') < FU **śala(ma)* 'Blitz; blitzen' (UEW, S. 459) ~ sam. **sålâ-* 'blinken' (> mat. *salamarga* 'Blitz'; Janhunen 1977: 135; Helimski 1997: 334)

(?) ↔ paratoch. **Su̯əlom* 'Flamme; Blitz': toch A *slam*, B *sleme* < urtoch. **su̯əlemâ* 'Feuer, Flamme' < idg. **su̯el-om-* < **su̯el-* 'schwelen, brennen' (Windekens 1976: 430; IEW, S. 1045). FU **ś* ~ paratoch. **S* vgl. auch FP **kiśkə* 'gießen, streuen', FW **waśke* 'Messing, Kupfer, Bronze'. Die idg. Etymologie des tocharischen Wortes ist aber sehr unwahrscheinlich: idg. **su̯e-* sollte im Tocharischen **ṣ* (< **śś*) ergeben. Deshalb ist zu erwägen, ob das tocharische Wort nicht selbst eine Entlehnung aus einer ugrischen oder samojedischen Sprache ist. In diesem Fall würde es wohl das einzige uralische Lehnwort im Tocharischen sein, da alle bisher unternommenen Versuche dieser Art (Naert 1964-68; Windekens 1962; 1963a; 1963b; 1964a; 1964b) nicht haltbar sind.

14. Ugr. **śă̆pt* 'sieben', wo **S* = entweder **ϑ*, phonetisch eher **ʌ* (< **s* / **š*): ostj. **ʌă̆pət*), oder **s* (< **s̄*): wog. **sät*, oder, obwohl nicht so wahrscheinlich, **χ*: ung. *hét*

← paratoch. **Səptə̂*: toch. A *ṣpät*, B *ṣukt* 'sieben' < urtoch. **ṣəptə̂* < idg. **septm̥-*. Für die verschiedenartigen ugr. Widerspiegelungen des toch. **S* s. auch unter FW **waśke* 'Messing, Kupfer, Bronze'. Urtoch. **ṣəptə̂* wurde wahrscheinlich ins Altchinesische, achin. **s jɛt* 'sieben', und ins Türkische, tü. **jetti* (< **jepti*) 'sieben', entlehnt. Darüber ausführlich in (Napol'skikh 1995b);

// ← arisch : ai. *saptá-* 'sieben' usw. (Joki 1973: 313). Diese Etymologie ist aber phonetisch kaum möglich (Napol'skikh 1995b).

15. Ursamojedisch **sej(k)twə̂* (? < **sejtwə̂* < **sejptə̂*) 'sieben' (Janhunen 1977: 139-140)

← paratoch. **Səptə̂* : toch. A *ṣpät*, B *ṣukt* 'sieben' (s. oben). In Napol'skikh 1995b verband ich sam. **sej(k)twə̂* mit der wahrscheinlichen Protoform von toch. B *ṣukt* < ur(B)toch. **ṣeu̯kᵘtə̂* < urtoch. **ṣəptə̂*. Da nach J. Janhunen der ursamojedische Archetyp als **sejptə̂* rekonstruiert werden kann (Janhunen 1994: 259) und die Entwicklung paratoch. **ə* → sam. **ëj* von einigen anderen Beispielen bestätigt wird (s. nord-sam. **menüjə̂* 'Vollmond', sam. **kejmä*), ist es möglich, das sam. Wort auf dieselbe paratoch. Quelle zurückführen wie ugr. **Să̆pt*. Der tocharische Ursprung des samojedischen Wortes wurde in (Janhunen 1983: 119) vorgeschlagen.

16. (?) f. *suola* 'Salz', est. *sool* ~ mord. *sal* ~ syrj. *sol*, wotj. *s̈ilal* 'id.' < FP **salɜ* (UEW, S. 750) / **sōlɜ* 'Salz' (Keresztes 1986: 129). Die Rekonstruktion eines **o* bzw. **ō* begegnet keinen Schwierigkeiten, für **a* sind verschiedene (nicht so überzeugende) Erklärungen anzufügen

← arisch: ai. *salilá-* 'See' (? **'salzig'* – Adj.) < (?) idg. **sal-* 'Salz'. Das ist aber der einzige, noch dazu fragwürdige Vertreter des idg. Stammes in den arischen Sprachen. Dieses Problem veranlasste auch die Verfasser der klassischen Werke über die idg. Lehnwörter in den uralischen Sprachen zur Annahme einer tocharischen Herkunft des FP Wortes (Joki 1973: 316; Rédei 1986: 58);

// ← paratoch. **salə̂* : toch. A *sāle*, B *salyiye* 'Salz' < urtoch. **salə̂* < idg. **sal-* 'Salz' (Windekens 1976: 417). Obwohl die tocharische Quelle zweifellos besser als die arische aussieht, verbleibt das Problem des Vokalismus: paratoch. **a* ~ FP **ō* / **o* hat keine Erklärung;

// ← urslawisch **solĭ* (aksl. *solĭ* usw.) < idg. **sal-* 'Salz' (nur im Slaw. **a* > **o*; IEW, S. 878-879). Dies begegnet keinen phonetischen Schwierigkeiten. Da es historische Gründe für die Hypothese ältester Berührungen zwischen Urfinno-Permiern und einer Gruppe von Indogermanen gibt, deren Sprache zu demselben idg. Areal wie das Ur(balto)slawische gehörte,

halte ich die vorurslawische Herkunft dieses FP Wortes für am wahrscheinlichsten.

17. FW **varćɜ* 'Krähe' (f. *varis* 'Krähe' ~ lp. **võrȩć*, **võrććē* ~ mord. (E) *varšej*, *varćej*, (M) *varši*, *varći*) ~) ugr. **wărŋɜ* 'Krähe' (wog. (N) *ūrin*, (MLoz.) *urin* ~ ostj. (Wach) *urŋi*, (D.) *wărŋäj*, (O.) *wărŋa* ~ ung. *varjú*) ~ sam. **wər(ŋä)-* 'Krähe' (nenz. (T.) *bărŋe*, (W.) *barŋəə̆*, selk. (Ta.) *kuere*, (Ty.) *kȩrä*, kam. *barį*, mat. *berē*) < U **warɜ* 'Krähe' "Onomat." (UEW, S. 559; Janhunen 1977: 170; Lehtiranta 1989: 154) oder ugrisch-samojedische **warŋɜ*. Die ugrischen und samojedischen Wörter stehen einander sehr nahe, das FW hat aber ein anderes Suffix. Ein onomatopoetischer Ursprung dieser Wörter ist unbeweisbar: in keiner uralischen Sprache schreit die Krähe *"war"*

← paratoch. **u̯ə̂rna* 'Krähe': toch. B *wrauña* 'Rabe' (auch Personenname *Wrauške* '(?) kleiner Rabe') < urtoch. **u̯ə̂rnau(ńi̯a)* 'Rabe' < idg. **u̯r̥n-os* (masc.) 'Rabe' (auch **u̯r̥n-ā* (fem.) 'Krähe') < **u̯r̥n-* 'schwarz' (*'verbrannt') < **u̯er-* 'brennen' (Windekens 1976: 583; IEW, S. 1166);

// ← balt. oder slaw. **u̯arnă* (fem.) 'Krähe' / **u̯arnos* (masc.) 'Rabe': lit. *varna*, aksl. *vrana* 'Krähe, lit. *vařnas*, aksl. *vranŭ* 'Rabe' < idg. **u̯r̥n-*. Die Entlehnung Urbaltisch oder Urslawisch → Ursamojedisch ist aber historisch kaum möglich;

// ← (?) iran.: pashto *vrēγ* 'Rabe', ormuri *kaṇª-wraγa* 'Rabe', pehl. *varāγ*, *varāk*, balochi *gurāγ* 'Krähe' < **varāka* (Morgenstierne 1927) (andere idg. Erweiterung). Die Suffigierung **-ka* kann sich aber nur in mord. E *varaka* 'Krähe' widerspiegeln.

18. FW **waśke* / **wäśke* 'Messing, Kupfer, Bronze' (f. *waski* ~ est. *vask* ~ lp. **vēškē* ~ mord. E *uśke*, *viśkä*, M *uśkä* 'Draht') ~ perm. **weś* 'Schmuck (aus Metall)' (> wotj. *veś* 'Glasperlen': *aźveś* 'Brustschmuck aus Münzen', wo *aź* 'vor., Vorderteil', *ćirtįveś* 'Halskette (aus Münzen)', wo *ćirtį* 'Hals' ~ syrj. *vęśę* '(mein) lieber' < *'teuer') ~ penn. und urwogulisch **äs-weś* 'Zinn, Blei' (wotj. *uzveś* ~ syrj. *ozįś* ~ wog. N *ātwəs*, P. *oâtwəš*, K. *oâtkhwəs*, T. *äütküš*) ~ ugr. **waS* 'Metall, Eisen', wo **S* = **č* (ung. *vas*) / **χ* (ostj. **wäχ*) (vgl. ugr. **Säpt* 'sieben') ~ sam. **wesə̆* 'Metall, Eisen; Schmuck' (UEW, S. 560-561; Janhunen 1977: 175; Lehtiranta 1989: 146-147). Wegen der phonetischen Schwierigkeiten (FW, Ungarisch und Ostjakisch zeigen einen ursprünglichen Hintervokal, Samojedisch und Permisch eher einen Vordervokal) ist schwerlich U **waśke* anzunehmen. Außer dem Vokalismus ist auch das vollständige Fehlen von Spuren des **-k* am Wurzelende in den permischen Sprachen merkwürdig: normalerweise sollte es in den obliquen Formen erscheinen, im Udmurtischen wäre also also **uzveśkanį* statt *uzveśanį* 'verzinnen' und **aźveśkį* statt *aźveśe* 'mein Brustschmuck' zu erwarten. Udm. *azveś* ~ syrj. *ezįś* 'Silber' ist, wie ung. *ezüst*, eine urossetische Entlehnung (← osset. *æwzīst* 'Silber' < **zvestæ*)

(IESO I, S. 213). Auf diese Weise so werden die abnormalen syrjänischen (mit *-jś*) und die rätselhaften ungarischen Formen ohne größere Schwierigkeiten (wie in Joki 1962: 157-158) erklärt, was auch mit den historischen Tatsachen (Ausbreitung des Silbers aus dem Süden ins Wolga-Ural-Gebiet) in Einklang steht

← urtoch. **wəSə* 'Gold' (A *wäs*, B *yasa* 'gold') < idg. **Hues(k)-* (lit. *áuksis*, apr. *ausis*, arm. *oski*, lat. *aurum* (< **ausom*); für die weitere Geschichte des idg. Wortes vgl. sum. *ḫuškin* 'Gold', (buchstäblich 'rote Erde') (Aalto 1959: 36; Menges 1965: 132-136). Die tocharischen und uralischen Wörter wurde schon früher zusammengestellt (Aalto 1959; Joki 1976: 339; Rédei 1986: 42-43). Eine Entlehnung in umgekehrter Richtung (U → idg.), wie es von den oben genannten Forschern vermutet wurde, ist phonetisch unmöglich, ganz zu schweigen von der hypotetischen vorderorientalischen Herkunft des indogermanischen Wortes. Ein uralisches Wort für 'Metall' kann auch aus historischen Gründen kaum rekonstruiert werden, was mit den lautlichen Schwierigkeiten einhergeht (s. schon in Napol'skikh 1989). Unter allen idg. Sprachen gab es nur im Tocharischen Formen, die als Quelle für die uralischen dienen konnten, was auch auf eine verhältnismäßig späte Entlehnung hindeutet. J. Janhunen hat bestimmt recht, wenn er schreibt, daß (zumindest) das samojedische Wort als gesonderte Entlehnung aus dem Tocharischen betrachtet werden muß (Janhunen 1983: 120). Zu FU *ś* ~ urtoch. *s* vgl. auch finnopermisch **kiśkə* 'gießen, streuen', f. *salama*. Toch. B *yasa* wurde wahrscheinlich auch ins Türkische entlehnt: tü. **jäz* 'Messing, Bronze' (Róna-Tas 1986: 74); die Bedenken J. Reinharts (1994: 80) sind unberechtigt, da das B-tocharische Wort zwar als *yasa* geschrieben, aber etwa wie (*jəsa*) (obliquer Stamm *ysā-*) ausgesprochen wurde.

Obwohl einige dieser Lehnwörter in den uralischen Sprachen sehr weit verbreitet sind (s. syrj. *jort*, perm. **komə*, FU **met(e)*, f. salama, FW **varćə*, FW **waśke*), zeigen ihre phonetischen Formen fast immer Unterschiede, die sich am besten als Ergebnis einer unabhängigen Entlehnung in die bereits getrennten uralischen Ursprachen erklären lassen. Die folgenden uralischen Ursprachen waren wohl zur Zeit der Kontakte *noch nicht* weiter zerfallen: Urpermisch (bis Anfang des 2. Jts. u.Z.), Ursamojedisch (bis in die ersten Jahrhunderte u.Z.), Urugrisch (? – mit Ausnahme von **waśke* – kaum später als bis zur Mitte des 1. Jts. vor u.Z., wahrscheinlich früher), die sogenannte "Finno-wolgaische" (nur eine wissenschaftliche Konstruktion, besser wäre von einer ostseefinnisch-lappisch-mordwinischen Spracheinheit zu sprechen, die ungefähr bis zum Ende des 2. Jts. – Anfang des 1. Jts. vor u.Z. existierte). Die finno-permische Spracheinheit muß aber zur Zeit der Kontakte *schon* zerfallen gewesen sein (etwa gegen Ende des 3. – erste Hälfte des 2. Jts. vor u.Z.). Zusammenfassend kann

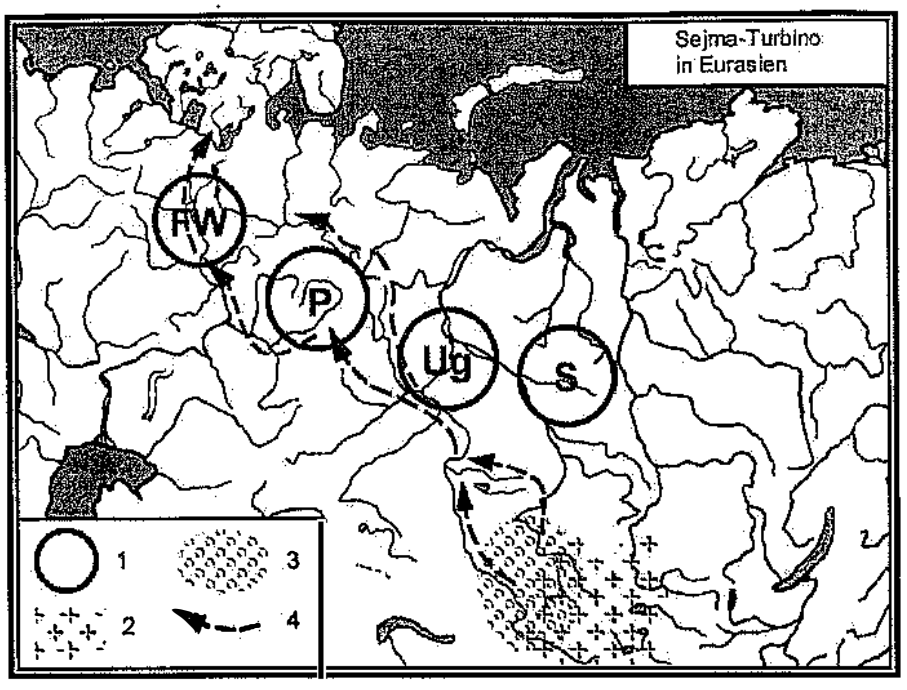
man folgern, daß der Kontakt kaum später als zu Beginn des 1. Jts. und kaum früher als am Ende des 3. Jts. vor u.Z. stattfand.

Da einige der vorgelegten Etymologien dem Bereich der (Bronze-) Metallurgie, Pferdezucht und Radverkehr angehören – Kulturphänomenen, die in der eurasiatischen Waldzone seit Ende des 3. bis ins 2. Jt. vor u.Z. verbreitet sind, kann man folgern, daß die Datierung der paratocharisch-uralischen Berührungen im großen und ganzen auf das 2. Jts. vor u.Z. das Richtige trifft.

Die paratocharischen Quellenformen passen ebenfalls dazu. Sie sehen nicht zu archaisch aus; einige weisen auf Formen vor der Palatalisierung von **k*. Vom sprachwissenschaftlichen Standpunkt her muß die eigenständige Entwicklung der einzelnen tocharischen (A und B) Sprachen mindestens fünf bis zehn Jahrhunderte vor dem Auftreten der ersten schriftlichen tocharischen Quellen und den ersten Übersetzungen buddhistischer Literatur begonnen haben (Lane 1966: 221, 232). Da aber die kutschanische – am wahrscheinlisten Westtocharisch sprechende – Bo-Dynastie schon im 1. Jh. u.Z. in Kutscha herrschte und der Buddhismus schon in den letzten Jhn. vor u.Z. in Kutscha bekannt war (Liu 1969: 11-15, 20-22), muß diese Datierung noch um mindestens 500-600 Jahre tiefer angesetzt werden. Das bedeutet, daß die angenommenen paratocharischen Formen am wahrscheinlichsten vor dem Beginn des 1. Jts. vor u.Z. existiert haben müssen.

Wenn man über den Ort und die Art der Berührungen sprechen will, muß man in Betracht ziehen, daß *alle* obenerwähnten uralischen Ursprachen für den Kontakt herangezogen wurden (s. Karte). Parallele Entlehnungen ins Türkische und Altchinesische zeigen, daß derselbe (ur)tocharische Einfluß auch für die kulturhistorische Entwicklung der Völker Zentral- und Ostasiens sehr wichtig war. Es handelt sich also um eine kulturhistorische Erscheinung, die einerseits zwischen der Wende des 3. und 2. und der erste Hälfte des 1. Jts. vor u.Z. auftrat und die weiten Gebiete zwischen der Wasserscheide von Ob und Jenissei und der Oberen Wolga umfaßte und die andererseits mit dem zentralasiatischen Kulturgebiet, sowie dem Ursprung der historischen Tocharier, irgendwie verbunden gewesen sein muß. Für die Entwicklung der Metallurgie, des Radwagenverkehrs, der Pferdezucht usw. in Zentral- und Nordeurasien muß der Einfluß dieses Phänomens bedeutungsvoll gewesen sein.

Im Norden gibt es nur eine einzige diesen Bedingungen entsprechende archäologisch nachweisbare urgeschichtliche Erscheinung – das sogenannte Sejma-Turbino-transkulturelle Phänomen (s. Chemykh & Kuz'minykh 1989), das in zahlreichen Kenotaph-Gräbern aus der Zeit zwischen dem 17. und 15 Jh.



Sejma-Turbino in Eurasien. (1) Die wahrscheinliche Lokalisation der uralischen Ursprachen zur Zeit der Berührungen mit den Para-Tocharen: S – Ursamojedisch, Ug – Urugrisch, P – Urpermisch, FW – finno-wolgaische (finno-mordwinische) Einheit. (2) Die Afanasevo-Kultur in der zweite Hälfte des 3. – Anfang des 2. Jts. vor u.Z. (3) Das Kerngebiet der Entstehung der metallurgischen Tradition und Kultur des Sejma-Turbino Phänomens. (4) die Hauptrichtungen der Wanderungen der Sejma-Turbino-Gruppen von Südsibirien nach Osteuropa.

vor u.Z. in den Gebieten vom Oberen Ob bis zur Oberen Wolga faßbar ist. Einige Erzeugnisse aus der Sejma-Turbino-Produktion wurden auch an der Ostsee und in Moldawien (der sog. Borodino-Schatz) gefunden (s. Karte, s. auch die Karten in Chernykh & Kuz'minykh 1989: 15-16). Diese Funde sind reich an ausgefallenen, kunstvoll gearbeiteten Bronzewaffen. Sie stammen von Gruppen von Metallurgen, Kriegern, Pferdezüchtern und Händlern, die sich entlang der großen Flüsse bewegten, mit der lokalen Bevölkerung in Berührung kamen und so in der Waldzone Westsibiriens und Osteuropas ihre hochentwickelte Bronzemetallurgie verbreiteten. Als Folge des Sejma-Turbino-Phänomens begann hier eine neue Entwicklungsstufe der Bronzezeit, während im Gebiet vom Ural bis zum Baltikum das östliche, uralische metallurgische Zentrum dominierte

(Chernykh & Kuz'minykh 1989: 267-277; s. auch Kuz'minych 1996; Chernykh & Kuz'minykh 1994). Obwohl dieses Phänomen nicht sehr langlebig war, müssen die Sejma-Turbino-Gruppen starken Einfluß auf die Kultur der Waldstämme vom Jenissej bis zum Baltikum ausgeübt haben, was sich auch in der Sprache wiederspiegeln mußte.

Wie aus den archäologischen Materialen und aus der chemischen Analyse des Metalls folgt, zogen die Sejma-Turbino-Gruppen aus dem Süden Westsibiriens zum Uralgebirge und weiter nach Westen durch die Wälder Osteuropas. Der Kern der Träger dieses Kulturkomplexes stammte von der Bevölkerung der südsibirischen Waldsteppen und dem Vorland des Altai-Gebirges ab, die ihrerseits den östlichsten Teil des großen Areals der ältesten Viehzüchter der eurasiatischen Steppen darstellte (Chernykh & Kuz'minykh 1989: 251-253). Die Zugehörigkeit der Sprachen dieser nordeuropäoiden Bevölkerung zur indogermanischen Sprachfamilie gilt im allgemeinen als sehr wahrscheinlich. Die früheste Gruppe dieser Bevölkerung in Südsibirien waren die Träger der Afanas'evo-Kultur, die von der ersten Hälfte des 3. Jts. vor. u.Z. bis zum 18. Jh. vor u.Z. am oberen Ob, Irtysch, Jenissej und teilweise auch in der nordwestlichen Mongolei verbreitet waren (Vadetskaja 1986). Die Afanas'evo-Kultur und das Sejma-Turbino-Phänomen sind nicht unmittelbar miteinander verbunden, anzumerken sind aber die drei folgenden Umstände: erstens war der Beitrag der Afanas'evo-Kultur an der Entwicklung der Bronzemetallurgie und der Entstehung der Viehzucht Südwestsibiriens sehr beträchtlich. Zweitens stimmt das Verbreitungsgebiet der Afanas'evo-Kultur mit dem Entstehungsgebiet des Sejma-Turbino-Phänomens überein (s. Karte): die Zeitspanne zwischen den beiden beträgt nicht mehr als einhundert Jahre. Schließlich wurde die Afanas'evo-Kultur von der Okunëvo-Kultur, deren ursprüngliche Träger aus dem Osten stammten, abgelöst. Obwohl die Träger der Okunëvo-Kultur zu einem anderen Rassentypus gehörten, wurden sie die kulturellen Nachfolger der Afanas'evo-Kultur und sicherlich gingen Teile der Träger der Afanas'evo-Kultur in ihr auf. Mit der Okunëvo-Tradition hat die Sejma-Turbino-Metallurgie und -Kunst vieles gemeinsam.

Obwohl die Denkmäler der Afanas'evo-Kultur deutlich auf Viehzucht hinweisen, muß es sich um ein früheres ökonomisches System handeln, das nicht mit der offenen Steppenzone verbunden war, sondern von jahrzeitlichen Wanderungen in die Waldsteppe oder in den Berggürtel abhängig gewesen sein muß. Damit vereinfachte sich die Verbreitung dieser Bevölkerung in die Vorgebirge Zentralasiens einerseits und in die sibirische Taiga andererseits. In die letzte Richtung bewegten sich die Sejma-Turbino-Gruppen, mit der ersten

könnte das Eindringen der Urtocharier in Xinjiang verbunden sein. Zwar sind die Regionen im Süden des Sajan-Altai-Gebirges sehr schlecht erforscht, ein solches Eindringen ist aber nichtsdestoweniger archäologisch dokumentiert. Besonders die chinesische (Gansu) Qijia-Kultur (Ende des 3. – Anfang des 2. Jts. vor u.Z.) zeigt einige Züge, die als Reminiszenzen des nördlichen Einflusses der Afanas'evo- und Okunëvo-Kulturen und als Spuren kultureller Verbindungen mit der Sejma-Turbino-Tradition betrachtet werden können (Semënov 1993: 28; Huber 1995: 34-51).

Die Hypothese über die Abstammung der Urtocharier von Trägern der Afanas'evo-Kultur ist nicht neu und scheint, nach der Entdeckung der kaukasoiden Mumien aus dem 3. –2. Jts. vor u.Z. in Xinjiang, für die Erklärung des frühen Auftretens der Tocharier im Osten die beste zu sein (Mallory 1995: 379-382). Sie bekommt noch eine zusätzliche Stütze im Licht der hier dargestellten Materialen und der Möglichkeit, die uralisch-paratocharischen Berührungen mit der Entwicklung des Sejma-Turbino-Phänomens zu verbinden.

ABKÜRZUNGEN

achin. – altchinesisch
ai. – altindisch
aksl. – altkirchenslawisch
apr. – altpreussisch
arm. – armenisch
atü. – alttürkisch
aw. – awestisch
balt. – (ur)baltisch
bulg. – wolga-bulgarisch (türkisch)
enz. – enzisch
est. – estnisch
f. – finnisch
FP – urfinno-permisch
FU – urfinno-ugrisch
FW – finno-wolgaisch
genn. – germanisch
gr. – altgriechisch
idg. – urindogermanisch
iran. – (ur)iranisch
kam. – kamassisch
lat. – lateinisch
lit. – litauisch
lp. – lappisch
  N – Norwegisch-lappisch
mat. – matorisch
mo. – mongolisch
mord. – mordwinisch
  E – erzänisch
  M – mokschanisch
nenz. – nenzisch
  T. – Tundrajurakisch
  W. – Waldjurakisch
ngan. – nganasanisch
nord-sam. – (ur)nord-samojedisch
osset. – ossetisch
ostj. – ostjakisch
  D. – Demjanka-Dialekt
  Kaz. – Kazym-Dialekt
  Ni. – Nizjam-Dialekt
  O. – Obdorsk-Dialekt
  Wach – Wach-Dialekt
paratoch. – paratocharisch
pehl. – pehlewi (mittelpersisch)
penn. – urpermisch
sam. – ursamojedisch
sum. – sumerisch

selk. – selkupisch
  Ta. – Tas-Dialekt
  Ty. – Tym-Dialekt
slaw. – (ur)slawisch
syrj. – syrjänisch
  LuLe. – Luza und Letka-Dialekt
  MSy. – Mittel-Sysola-Dialekt
  OSy. – Ober-Sysola-Dialekt
  OWy. – Ober-Wytschegda-Dialekt
  Petsch. – Petschora-Dialekt
  Skt. – Syktyvkar-Dialekt
  Ud. – Udora-Dialekt
  UWy. – Unter-Wytschegda-Dialekt)
  Wym – Wym-Dialekt
toch. – tocharisch
tscher. – tscheremissisch
  B. – Birsk-Dialekt
  KB – Kosmodemjansk oder Bergtscheremissisch
  M. – Malmyž-Dialekt
  U. – Ufa-Dialekt
tschuw. – tschuwassisch
tü. – (ur)türkisch
U – uralisch
ugr. – (ur)ugrisch
ung. – ungarisch
urtoch. – urtocharisch
vorpenn. – vorurpermisch
wog. – wogulisch
  K. – Konda-Dialekt
  MLoz. – Mittel-Lozwa-Dialekt
  N – Nordwogulisch (Soswa)
  P. – Pelym-Dialekt
  T. – Tawda-Dialekt
wotj. – wotjakisch
  G. – Glasow-Dialekt
  M. – Malmyž-Dialekt
  MU. – Malmyž-Uržum-Dialekt
  U. – Ufa-Dialekt

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THE RISE OF THE FINNO-UGRIC LANGUAGE FAMILY

Tapani Salminen

There exist a good number of often radically different scenarios about the early history of the Finno-Ugric (Uralic) language family. The crucial questions can be formulated as follows. Firstly, how are the Finno-Ugric languages related to each other, or more specifically, how are they properly classified? Secondly, where was the oldest centre of expansion of the Finno-Ugric family? Thirdly, when did the first contacts between Finno-Ugric and Indo-European take place? Fourthly, what are the prospects for a distant genetic relationship between Finno-Ugric and Indo-European? It may be said that to all these questions there is one standard answer but in each case both the standard and the competing views require critical evaluation. This essay attempts to give a general overview of some of the problems that scholars need to tackle in the future, without going into details of various controversial issues or referring to all important publications in the field.

DEFINING FEATURES

If we try, as we should, keep the concepts 'protolanguage' and 'reconstruction level' apart, it is self-evident that protolanguages have been natural languages, and typical features of a natural language are variation and change, which are connected with both internal contacts promoting unity of the language area and external contacts leading to differentiation. A natural protolanguage, so to speak, must have been a dynamic dialect continuum. Changes frequently result in the increase of dialectal differences, which is a necessary but not a sufficient condition for an actual break-up of the protolanguage into a number of daughter

languages. Rather, new languages are created so that the transitional dialects between the main dialects of the protolanguage disappear through assimilation to the main dialects or other languages, which yields clear-cut units that can no longer profoundly influence each other but continue to change independently. Paradoxically, then, the extinction of transitional dialects changes the status of dialects to languages.

The outcome of the recurrent divisions within a language family can well be captured in the classical tree model, although it is important to keep in mind that the tree model is not a theory of genetic relationship but a means of illustrating it. There is also no need to assume that the structure of the tree model must always be binary, with every node divided into two branches, but a tree with several equal branches is natural and even expected in the case of a language family whose subsequent diversity appears to be the result of a rapid expansion from the original language area to different directions. Finno-Ugric and Indo-European are prime examples of such highly expansive language families, but there is a difference in the traditions of classification. The Finno-Ugric family, which is the name that is provocatively used here instead of Uralic, is almost always classified according to a binary tree model, which is based on the status of the Finnish language as the focal point of the classificatory scheme.

In other words, it is a grave error to assume that a single innovation equals a break-up of the protolanguage, and that an established isogloss within the family corresponds to an early language boundary. Such an approach is typical of scholars who insist on a binary classification, but do not recognise that the starting-point of any changes must have been a protolanguage which was already characterized by variation. Furthermore, the choice of decisive innovations in a binary classification is generally quite random, because true language boundaries must have become established much later than the oldest isoglosses dividing the language area.

Finno-Ugric languages, in the widest sense of the word, share a few core vocabulary items, though when critically examined, the number of satisfactory etymologies appears smaller than was thought earlier (Janhunen 1981; Sammallahti 1988). Whether or not there were borrowings from Indo-European that spread to all branches of Finno-Ugric including Samoyed, is still being argued but the case for such borrowings seems quite strong (Koivulehto 1991; Rédei 1986; 1988). While scholars agree on many details of the Proto-Finno-Ugric sound system, there are also different views about several crucial questions. The basic morphological structure is, hopefully, better understood, and three types of suffixal markers can be quite reliably reconstructed in Proto-Finno-Ugric,

namely a set of case endings and two sets of personal suffixes (Janhunen 1982). The personal suffixes, in particular, can be regarded as defining features of the Finno-Ugric language family, because on the one hand, they are transparent enough to be recognized as products of agglutination processes of personal pronouns, and on the other hand, certain morphophonological alternations can be reconstructed in the system of possessive suffixes at least (Janhunen 1982), so they had already had time to lose some of their original agglutinative character before any major disintegration of the protolanguage. Curiously, Indo-European is characterized by a set of personal suffixes with a similar background, and it might prove interesting to study the possible connections.

CLASSIFICATION

In the traditional binary classification of the Finno-Ugric (Uralic) family (for an illustration, see Häkkinen 1983: 83; 1984: 8), there are two kinds of proto-language. Nine of them (Proto-Saami, Proto-Finnic, Proto-Mordvin, Proto-Mari, Proto-Permian, Proto-Hungarian, Proto-Mansi, Proto-Khanty, and Proto-Samoyed), often given as the lowest nodes in a tree graph, clearly stand apart from each other and from their common predecessor (Proto-Uralic), with a large number of characteristic innovations. The other alleged protolanguages (Proto-Finno-Ugric, Proto-Finno-Permian, Proto-Finno-Volgaic, Proto-Finno-Saami, Proto-Ugric, Proto-Ob-Ugrian, and Proto-Volgaic) are supergroups of the nine well-founded branches, and little substantiation has ever been presented for them. Häkkinen (1984) presents a detailed critique of the larger groupings (Finno-Ugric, Finno-Permian, and Finno-Volgaic) as they are still based on obsolete criteria formulated in the 19th century, and Salminen (forthcoming) evaluates the controversies over the narrower subgroups. Helimski (1982), while critical of such intermediate protolanguages as Finno-Permian and Finno-Volgaic, calling them areal genetic units instead, tacitly assumes the primary division between Finno-Ugric and Samoyed, but it is difficult to see how Finno-Ugric should earn a different treatment and why, for instance, Ugro-Samoyed (including Hungarian, Mansi, Khanty, and Samoyed) would not be an areal genetic unit exactly like Finno-Permian and Finno-Volgaic.

As to the factual basis of the suggested primary division, no sound changes were assigned to the intermediate Finno-Ugric level (and the same was largely true about the other binary nodes as well) until the recent studies by Janhunen (1981) and Sammallahti (1988) who have actually presented a couple of tentative sound changes characteristic of the intermediate levels. A good summary is

provided by Sammallahti (1998: 119-122) in his presentation of the historical background of the Saami languages: according to him, there are two Finno-Ugric, two Finno-Permian, one Finno-Volgaic, and three Finno-Saami sound changes; the actual number is, however, lower, because some of them represent different phases or effects of the same process. It is very difficult to see these results as conclusive: in some cases it may be a question of an illusion created by reconstruction techniques; in other cases there are too few etymologies to establish the actual distribution of the innovation; and with regard to the Finno-Saami sound changes (1) and (2) as posited by Sammallahti (1998: 122), there are no grounds for arguing that they covered Finnic (cf. Sammallahti 1998: 190). All of the few sound changes involve the history of vowels, and while it is true that Janhunen and Sammallahti have made notable progress in this field, no systematic patterns of innovations have been established as yet, and scholars like Abondolo (1996) have pursued an entirely new picture of the development of vowels.

The established basis for the primary division is, however, not sound changes but the number of shared vocabulary: it is an undeniable fact that with regard to their lexicon, the Samoyed languages form an aberrant branch within the family. However, shared vocabulary is not a criterion for classification since only innovations count, and it is straightforward to assume that a wave of lexical innovations met Proto-Samoyed in the eastern periphery of the area. The other logical option would be that Samoyed had retained the bulk of the original Uralic lexicon which would make Finno-Ugric the innovative branch, but a situation with massive changes in vocabulary but with no or very few changes in grammar, phonology included, can hardly be expected.

There are two special groups of lexical items used as supporting evidence for the primary division, namely the numerals and the Indo-European loanwords, supposed to be exclusively Finno-Ugric. By now it should be clear that Samoyed shares two numerals with the rest of the family, 'two' and 'five' (cf. Rédei 1986-91), the cognate of the latter meaning 'ten' in Samoyed, which appears to be a semantic innovation, especially since the Samoyed word for 'five', being four syllables long, looks very much like an innovation. However, the numerals for 'three', 'four' and 'six', if we assume that they were not simply replaced by other words in Proto-Samoyed which seems the likeliest possibility, speak undeniably for the unity of the traditional Finno-Ugric branch. Whether the distribution of these numerals constitutes a sufficient basis for establishing a protolanguage remains an open question.

The argument concerning the Indo-European loanwords, on the other hand, has become largely obsolete because there are a number of words with cognates in Samoyed that are now recognized as being of Indo-European origin, cf. Koivulehto (1991) and Rédei (1986; 1988). There are vocal critics of this idea (cf. Helimski 1995; Napol'skikh 1997), but their assessments seem to derive from somewhat outdated views about Finno-Ugric and Indo-European historical phonology (cf. Anttila 1993).

Whatever the value of the proposed innovations is, the crucial thing is that they are very few; so few that even their cumulative effect is not sufficient to make a lowest-level intermediate protolanguage (e.g., Proto-Finno-Saami) different from the highest-level one (i.e., Proto-Uralic). In other words, by comparing Saami and Finnic alone we reach phonological and morphological reconstructions that are supposed to be distinctly Finno-Saami (also known as "early Proto-Finnic" which is an unfortunate misnomer) but turn out to be virtually identical with Proto-Uralic reconstructions. This state of affairs is, incidentally, evident from the tables including reconstructions on each intermediate level in Sammallahti (1998: 189, 198-202). It must be concluded that in comparison with the well-established protolanguages, the intermediate protolanguages represent a different kind of theoretical construct and, consequently, another taxonomic category. Calling them 'areal genetic units' in the Helimskian sense seems an appropriate terminological choice.

There is no need to claim that the intermediate protolanguages in each case lack foundation altogether, but that the evidence for them is scanty, and that in fact, it is possible to draw competing binary trees with as much substance to the alternative intermediate nodes as to the nodes in the traditional binary tree. Creating conflicting binary trees is not difficult, and one serious proposal has been made by Viitso (1997: 921; cf. also Viitso 1995). Furthermore, if a tree following similar standards but from a Samoyed point of view was drawn, it would probably include branches such as Khanty-Samoyed and Ugro-Samoyed, contradicting both the traditional and Viitso's alternative scheme.

Consequently, it would be a wise move to disqualify the ill-founded intermediate protolanguages in the basic taxonomic description of the Finno-Ugric (Uralic) language family, and be content with a flat family tree consisting of the nine basic branches (for an illustration, see Häkkinen 1983: 384). This is not to say that higher groups would not require extensive study, quite the contrary, but it would actually be a more fruitful approach from every point of view to treat them as results of areal inter-branch connections rather than properly defined protolanguages. Binary classification as such is a valid possibility, so its appa-

rent invalidity when applied to Finno-Ugric is simply due to the lack of substantial evidence. The actual historical and linguistic developments that led to the establishment of the nine uncontested branches must have been a highly complex process rather than a neat nine-fold division of the language area, but sticking to a single untenable hypothesis to explain this process does not help but hampers serious study in the field.

The multi-level hierarchy typical of a binary tree also obscures the obvious chain-like structure of the Finno-Ugric language family, or the network-like structure of Indo-European, for that matter. The problem is that while binary trees look interesting, their non-binary alternative is flat both literally and figuratively, but has one obvious and unquestionable merit, though, namely that it only includes well-founded units representing valid, historically significant proto-languages. In technical terms, non-binary trees need not be called anything else but trees, although sometimes 'bushes' and other makeshift terms are used to refer to them.

The lack of hierarchy in a non-binary tree means a lack of predictive power. Nevertheless, since the predictions based on any of the possible higher-level intermediate protolanguages in a binary tree are few, controversial and conflicting, it can be maintained that a non-binary tree is the only version of the tree model that properly and realistically reflects the relations between the well-established branches. Of course, there are other possible models to describe the structure of a language family, most notably the wave model. One model that could be called a circle model is a kind of a compromise between the tree and wave models in that it superficially looks like the wave model and the arrangement of the circles has a similar function, but fundamentally it is a graphic variant of the tree model because it recognizes a number of intermediate proto-languages which have developed from a single parent language and would be further divided into a number of daughter languages (for an illustration, see Salminen 1999: 20). It is richer than a tree only because it can include information about areal connections between branches, and the empty space between circles can be interpreted iconically as representing the transitional dialects whose extinction created the primary language boundaries. It would also be possible to give distances between circles an indicative value, and one place for greater distance might well be between Khanty and Samoyed.

Both the tree and circle models resemble a map, which in the case of the non-binary tree model is, however, not dictated by any principal factors but the geographically based order of the nodes is simply a mnemonic device. The circle model, by contrast, is designed to reflect both genetic and areal connections and

it is therefore expected that in most (but not necessarily in all) cases it does form a map-like pattern.

URHEIMAT

The chain-like distribution of the Finno-Ugric branches suggests that the original dialect continuum has been created through a rather rapid expansion along a particular ecological zone (expansion in this context only refers to a linguistic phenomenon which can occur with or without large-scale migrations). It is difficult to think that the centre of the expansion could have been very close to either periphery so the safest assumption is still that the homeland was located near to the present nucleus of the language family, that is the area where Mordvin, Mari and Udmurt are spoken, in other words between the Volga and the Urals. The alternatives are a Siberian homeland supported by Napol'skikh (1997), and a homeland extending far to the west as described by Sammallahti (1995). Sammallahti finds it possible to connect archaeological and linguistic evidence to support the idea that Proto-Uralic was spoken among the first settlers of the Baltic region, but this seems truly hubristic because early cultural boundaries need not have corresponded to linguistic boundaries any more than they do in historical times, for instance in Siberia, and because a language can spread through diffusion as well as migration.

Some indications about the *Urheimat* can presumably be found in the oldest and most widely known common lexicon, though there is a great risk of jumping to conclusions in this context. Whatever paleolinguistic evidence is presented in the discussion about *Urheimat*, one thing is certain: the etymological material must be reliable and well-established. Luckily, Janhunen (1981) and Sammallahti (1988) have critically examined the stock of proposed Uralic etymologies and at least as far as Samoyed material is involved, their etymological word-lists must be regarded as highly conclusive.

To see what happens if the rule of the reliability of etymological material is not respected, we may take a brief look at an etymology concerning a fish-name playing a crucial role in Napol'skikh's famous article (Napol'skikh 1993: 49-50). The fish in question is known as 'round-nosed whitefish', and Napol'skikh himself calls his main point "the round-nosed whitefish argument". It is not the only fish-name he discusses but, as he readily admits himself, it is the only one pointing to a specifically Siberian homeland, the hypothesis Napol'skikh strives to prove. The fish-names in question appear, firstly, locally in Saami with the meaning 'a little whitefish', secondly, very scantily attested in Finnish with the

meaning 'a salmon with a hooked nose', thirdly, in two old records of Northern Khanty in compounds whose meaning is given as 'round-nosed whitefish', and, finally, in a single ancient attestation of a compound in Tundra Nenets with the same meaning. Starting from the compounds, the Khanty word may he understood transparently as "a stone fish". While this is acknowledged by Napol'skikh, it can be added that the Tundra Nenets record may well be seen as a temporary formation referring either to "a whirlpool fish" or "a nearby fish". Itkonen (1956), in his critique of Collinder (1955), regards the comparison of the Finnish and Nenets words as questionable (60), and refers to the Finnish word as a possible Saami loan (63), a conclusion, it may be added, strongly suggested by its phonotactics. Häkkinen (1996: 70) points out that while being critical of earlier treatments of the topic, Napol'skikh has failed to take account of the latest results of etymological research. Notably, this etymology is absent from the Uralic etymological dictionary (Rédei 1986-91) as well as both of the Finnish etymological dictionaries (cf. Joki 1973: 197). Furthermore, while Napol'skikh (1993: 49-50) talks about five or six Proto-Uralic fish-names, there are no fish-names at all in the Uralic word-lists by Janhunen (1981) and Sammallahti (1988) and in Sammallahti's Finno-Ugric list there are only 'ide' and 'tench', two fish that occur in a wide territory in northern Eurasia.

On the other hand, Napol'skikh (1993: 41-44) may well be right in his claim that the Baltic origin of two important fish-names in Finnic, those for 'eel' and 'salmon', indicates that the Finno-Ugric language spread to the Baltic area in a relatively late period. We can simultaneously assume that Proto-Finno-Ugric, while a natural language with internal variation, was still relatively uniform at the time of its expansion, because these and other distinctly Baltic loans have gone through all Finnic sound changes. After the expansion, Proto-Finno-Ugric began to disintegrate quickly under the pressure of contact languages.

Viitso (1997) is highly critical of the use of names of animals and plants in defining the *Urheimat*, and he wisely keeps quiet about details. What we can safely say on the basis of widely attested and etymologically sound material is that the *Urheimat* was quite far from the sea, and in deep forests rather than tundra or steppe environment, but such reasoning does not narrow down the possibilities very much.

INDO-EUROPEAN CONTACTS

From the point of view of the earliest contacts between Finno-Ugric and Indo-European it does not matter too much if the primeval Finno-Ugric and Indo-

European centres of expansion are thought to have been located next to each other or not, because even at the time of a relatively late first contact the dialects within the protolanguage continuums had not differentiated much. Some Indo-European loanwords have been used as evidence either in classifying Finno-Ugric languages and locating their *Urheimat* or for the Indo-Uralic hypothesis. Three cases may be briefly dealt with here, namely the words for 'bee' and 'honey', the word for 'copper', and the word for 'water'.

Words for 'bee' and 'honey' of Indo-European origin occur in most Finno-Ugric languages (e.g. Hungarian *méh* and *méz*), but not in Samoyed, which is seen as evidence for a secondary Finno-Ugric protolanguage after Samoyed had split off. The altemative hypotheses, namely that these Indo-European words were once known in the entire protolanguage area but were subsequently lost in Samoyed, or, more likely, that the words have spread from one branch to another within an already disintegrated Finno-Ugric language chain are often rejected without proper consideration. More interestingly, perhaps, the words for 'bee' and 'honey' have been used for postulating a Proto-Finno-Ugric homeland subsequent to the primeval Proto-Uralic one. Napol'skikh (1997: 137-138) sees as the only possibility that the insect itself was unknown to the speakers of Proto-Uralic and it was therefore borrowed when Proto-Uralic, in the form of Proto-Finno-Ugric, began to be spoken in the Volga region. Against this view it can be argued that even in an exclusively Siberian *Urheimat* bees or closely related insects would not have been unknown, and even if the protolanguage speakers had encountered bees for the first time after expansion to the Volga region, the natural source of borrowing would have been the alleged aboriginal language of the Volga region rather than Proto-Indo-European which according to everyone was spoken further away. The most probable explanation is therefore that the words for 'bee' and 'honey' were borrowed because they represented a cultural innovation.

Interestingly, while there appear to be no common Finno-Ugric words related to agriculture, there is a word which refers to a metal, in some languages meaning 'copper' (e.g. Finnish *vaskī*) and in some others 'iron' (e.g. Forest Nenets *wyesya*), and which can be regularly reconstructed to the earliest protolanguage on the basis of cognates from the westernmost and eastern-most branches as **wäśkä* (Sammallahti 1988: 541); for a competing view, see Napol'skikh (1997: 123, 154-155). It is tempting to regard the early use and trade of copper as the defining cultural innovation behind the expansion of the Finno-Ugric language area.

The so-called Uralic word for 'water' (e.g. Hungarian *víz*), with well-known reflexes in all branches except Saami and Khanty, is one of the most widely-used pieces of evidence either for ancient contacts or *Urverwandtschaft* between Indo-European and Finno-Ugric (Joki 1973). It would be difficult to think that the resemblance between the Indo-European and Finno-Ugric roots could be a plain coincidence, and indeed, the absence of this root in Saami and Khanty clearly points to a secondary nature of the Finno-Ugric root. The common Saami word for 'water' (e.g. North Saami *čáhci*) has namely a cognate in nowhere else but Khanty, where the meaning is 'tide, flood'. The most plausible scenario involves a semantic shift from 'water' to 'tide, flood' in Khanty, which is consistent with the fact that the common Khanty word for 'water' is based on the root meaning 'ice'. The Saami word and its Khanty cognate can therefore be regarded as reflexes of the original Uralic word **śäčä* 'water' (cf. Sammallahti 1988: 549; Rédei 1986-91: 469), retained in the northern periphery of the Finno-Ugric language area but replaced by an Indo-European borrowing elsewhere. The assumption, based on the application of the traditional binary model, that cognates of Hungarian *víz* etc. must have existed in pre-Saami or pre-Khanty is axiomatic and only leads to circular argumentation.

Most similarities between Indo-European and Finno-Ugric can be easily explained on the basis of language contacts. The only notable exception are the basic pronominal stems, widespread in northern Eurasia and beyond. The striking thing about the common nominal and verbal roots is that their independently reconstructed Indo-European and Finno-Ugric forms are so similar to each other, a situation which must be seen as an indicator of contacts rather than *Urverwandtschaft*. In most of these cases it is also semantically plausible to explain them as borrowings, because they often belong to the field of trade relations, and in the few instances without semantic motivation, like 'water' discussed above, other arguments in favour of a contact explanation can be presented.

If scholars want to pursue the search of evidence for genetic affinity between Indo-European and Finno-Ugric, it must be kept in mind that the relationship between these language families must be much more remote than that amongst their branches. To illustrate this quantitative difference, it may be estimated that any speaker of a Finno-Ugric language shares 50 to 100 common lexical items with a speaker of any Finno-Ugric language of another branch, while even if we take a most positive stand to the genetic affinity hypothesis, we can count that any speaker of a Finno-Ugric language shares no more than 5 to 10 common lexical items, pronouns included, with a speaker of

any Indo-European language. It seems reasonable to interpret such a major quantitative gap qualitatively as well, which means the rejection of the so-called Indo-Uralic hypothesis. The one thing that seems certain about Neolithic communities is that they were characterized by wide-spread multilingualism, and in such conditions language contacts were at least as extensive as they are known to have been more recently. There is no need to assume that the primary Finno-Ugric and Indo-European homelands were adjacent to each other but secondary expansions must have brought them into contact relatively early, spreading the knowledge of Indo-European among Finno-Ugric speakers.

In the study of ancient prehistoric developments, a high level of source criticism is required, and intuitive or authoritative methods must be avoided. If, for instance, evidence suggesting ancient contacts between Finno-Ugric and Indo-European is disregarded without proper consideration because of an underlying hypothesis of a Siberian *Urheimat* for Finno-Ugric, or vice versa, the results are bound to be biased and circular. While comparing archaeological and linguistic data in general, it should be remembered that the correlation between language and culture has always been weak at best, as can be seen from historically attested cases, for example, the complex linguistic and cultural patterns found in Siberia. To sum up the basic, perhaps rather discouraging message of this paper, the development of the field depends, more than anything else, on getting away from preconceived notions, which means that scholars must welcome rather than deny or ignore information that seriously challenges their preconceptions.

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THE INDO-EUROPEAN LOANWORDS IN SAAMI

Pekka Sammallahti

In this paper I shall give an overview of the oldest Indo-European loanwords in Saami and examine the implications of their IE (= Indo-European) sources and distributions. There seems to have been a constant flow of loanwords from the Germanic division of Indo-European, from Pre-Germanic Proto-Indo-European up to the present Scandinavian languages. The flow of loanwords from the Balto-Slavic division of IE into Saami stopped after Proto-Baltic; from a phonological point of view, the earliest loanwords from this part of IE represent the Proto-IE horizon, as do those acquired from the Germanic part of the IE languages. Some of the early Baltic and Germanic loanwords in Saami and Finnic have counterparts in the Volgaic languages but not beyond. The distribution of the PIE (= Proto-Indo-European) loanwords in Saami speak for an early contact area around the northernmost part of the Gulf of Bothnia and indicate that the Pre-Saami linguistic area extended to the east as well as to the west of the area of the PIE-Pre-Saami contacts. It is further shown that proto-languages may have had areal differences even if the structural development of the different areas proceeded in step. On the basis of the distributional differences in the PIE loanwords, it is concluded that at the time of the PIE-Uralic/Finno-Ugric contacts the Uralic idioms which later evolved into Saami were spoken in the same areas around the Gulf of Bothnia where their descendants are now used.

* * *

The concept of separate old IE loanwords in Saami is fairly new. In the 60's there were scholars who doubted even the existence of Proto-Scandinavian loanwords in Saami (cf. Sköld 1961), but so much evidence has accumulated since

then (cf. the various publications by Jorma Koivulehto and the new etymologies below) that the existence of separate old Indo-European loanwords in Saami is indisputable. Loanwords not known in other Uralic idioms have entered Saami – or those parts of the protolanguages leading to Saami – from PIE, PG (= Proto-Germanic), PBS (= Proto-Balto-Slavic), and PA (= Proto-Aryan). In addition, Saami shares many PB (= Proto-Baltic), PG and PA loanwords with Finnic but no PBS (= Proto-Balto-Slavic) ones, although both language groups have adopted some loanwords from it.

The following new IE etymologies for Saami words have not yet been published in English, and some of them are completely new (sS = Southern Saami, sU = Ume Saami, sP = Pite Saami, sL = Lule Saami, sN = North Saami, sI = Inari Saami, sSk = Skolt Saami, sA = Akkala Saami, sK = Kildin Saami, sT = Ter Saami; PFS = Proto-Finno-Saamic, PFV = Proto-Finno-Volgaic):

1. sN *buorggos* 'forbidden' (KN *buorgŏs*; *-os* is a derivational suffix, basic stem **buorgi-/*buorga-*), *burgot* 'to refuse' (KN *bur'gut*; also in sL) < PS adj. **puorgŏs* < PrePS **pa/ōrkos* < IE *bhorg^{u}o-s* (IEW, p. 163) 'barsch, unfreundlich' or more likely from PBS/PB **barga-s*; the word is also found in Annenian (*bark* 'heftig, zornig etc.'), Celtic (Old Irish *borb* 'töricht'), Baltic (Latv. *barģs* 'streng, hart') and Swedish (dial. *bark* 'eigensinniger, unfreundlicher Mensch').

2. sN *deatnu* 'big river' (KN *dædno*; confined to sN) < PrePS **teno* < **täno* < IE **dānu* 'Fluß' (IEW, p. 175); IE **ā/a* has (especially in palatal contexts) been replaced by a front vowel, apparently for the reason that it was a mid vowel whereas there was an opposition between **a* vs. **ä* in Uralic; the vowel substitution in this case can be compared with the following Baltic loanwords: Finnish *hanhi* 'goose' (<**šanši* < PFS **šanša* ~ **šänšä*; cf. Finnish *talvi* 'winter' < **tälvä*) ~ Mordvinian *šenše* 'duck' (< Pre-Proto-Mordvinian **šänšä* < PB **žans-*). Instead of the expected PrePS (= PFS) **täno*, the word was taken over as **teno* for the obvious reason that there were no primitive PFS words with the vowel sequence **ä-o* whereas **e-o* was possible (cf. **kejno* 'way'). Pokorny's reconstruction contains the problematic IE **ā/a*, which (according to Beekes 1995: 138) was not found in (Mid-)PIE. The IE word has been attested in a number of languages (such as Old Indic, Avestan, Russian, Celtic, Germanic) so that it does not seem to be a loanword in IE either. If, however, the original vowel was Mid.PIE **ē(h$_2$)* instead of Late PIE **ā/a*, the PrePS vowel would need no special explanation.

3. sN. *dordnu* 'door' (KN *dor'dno*; also in sI, sSk, sT) < PrePS **turno* < PG **durunz* (acc.pl., IEW, p. 279; commonly a *plurale tantum* word) < IE zero

grade stem **dhur-* 'door' (IEW, p. 278); Qvigstad (1893: 134) regards it as a Scandinavian loanword (Old Norse *dyrn-*; here *-n* seems to be the definite article, suffixed fairly late), but the vowels in Saami point to a PG origin.

4. sa. *guoržžu* 'cursed thing or being' (KN *guorǯo*; also sI ? < sN) < PS **kuorǯōj* < PrePS **karśoj/*karćoj* (? ~ Finnish *karsea* 'hideous') < IE **garəǵ-* 'grauenvoll, Grauen', **garĝo-s* 'grausig, wild' (IEW, p. 353); IE meanings of the word include 'frightening, threatening, cf. Greek *Γοργώ* 'Schreckgespenst', Latvian *gręzuôt* 'drohen'; for the substitution G **rj* > PrePS **rś* cf. nS *skálžu* 'clam' < G **skaljō* id.

5. sN *čearda* 'tribe' (KN *čærʹdâ*; also in sL) < PS **čearÞe̜* < PrePS **śa/ertз* ~ **ća/ertз* < IE **k̑erdho-*, **k̑erdhā* 'Reihe, Herde' (IEW, p. 579) or PA **śardha-*; from the Baltic reflex of the same IE stem (with IE **k̑-* > PB **k-*) also Finnish *kerta* (~ nS *geardi* id., *nuorrageardi* 'youth, young generation'). The IE meanings of the word include 'group, flock', 'tribe' and 'species', cf. Old Indic *śárdha-* 'Herde, Schar', Old Persian *ϑard-* 'Art, Gattung'. The Saami word shows the awkward vowel sequence *ea-a* which is typical of recent loans, but it is sometimes found in connection with palatal consonants in old loans such as sN *geahčča-* 'to look' (~ Finnish *katso-*) < PFS **kaćći-* < G **gātja-*.

6. sN *gatna* 'flaky substance: dandruff, stone lichen, etc.' (KN *gâdnâ*; also in sS, sL, sI, sSk) < PrePS **keni* (from the point of view of Saami, also FS **kini* and **küni* would be possible) < IE **keni-*, **kenə-* 'Asche' (IEW, p. 559); the IE meanings of this word include 'dust' and the like, cf. Greek *κόνις* 'Staub, Asche'. According to Jorma Koivulehto, nS *gutna* 'ashes' (< PrePS **kūni*; found throughout the Saami area) derives ultimately from the same IE source.

7. sN *gárži* 'narrow, cramped' (KN *garʹǯe*; also in sS, sL, sI, sSk) < PrePS **kärśä* ~ **karśa* ~ **kärćä* ~ **karća* < IE **kerk̑-*, **kark̑-* 'einschrumpfen, magern' (IEW, p. 581); the etymology is not quite flawless from a semantic point of view: the IE meanings center around 'small in size or growth' whereas the Saami words means 'small in space or room'.

8. sN *čuoris* 'mottled brownish grey' (KN *čuores*; also in sS, sP, sL; sI < ? sN) < PS **čuorēs* < PrePS **śaras* < PA **śārá-* 'bunt, scheckig' < IE **k̑ē-ro-* Farbbezeichnung (IEW, p. 582); the IE word is also found in Greek.

9. sa. *čáris* 'coarse (of wool)' (KN *čāres*; also in sS, sL, partly with **-rr-*) < PS **čārēs* < PrePS **śäräs* ~ **śaras* < PA **śala-* in the word *kapucchala-* 'Haar am Hinterhaupt' < IE **k̑er(s)-* 'Borste, steifes Haar' (IEW, p. 583); the IE word is also found in Celtic, Germanic and Balto-Slavic.

10. sN *šūvon* (KN *šūvun*; also sL *sjuovun*, sU *sjoovenje* [sI *šuuvon* < sN], sS *sjåavonje* 'hyvä koira' < PS **šuovunję* [sN-sL-sU] ~ **šuovōnjē* [sS] < Mid-PS **šōvōnję* < Early PS **śōvonji* [~hypothetically also **śavonji*]) is connected with IE **ḱu̯on-*, **ḱun-* 'Hund' (IEW, p. 632; the IE root gives also Greek *κύων* 'Hund' and many words meaning 'dog' in Germanic such as Swedish *hund*; according to Koivulehto, Finnish *susi* 'wolf' derives from the *n*-expansion **ḱu̯ntó* of the same IE root). The PS sibilant **ś-* reflects a satemized IE **ḱ-* which has retained its palatalization, and the time of borrowing is after PFS **ś-* > PrePS **ć-*. As the IE **ḱ-* like its Aryan reflexes have all become PS **ć-* (< FS **ś-* and **ć-*; cf. the etymologies 5, 8, 9 and 14), the only possible source is Proto-Balto-Slavic where according to Kortlandt (1989: 46) PIE **ḱ* developed into **ś*, cf. Lithuanian *šuõ*, gen.sg. *šuñs* 'dog' < PBS **śo̯u̯on(i)-*; cf also Lith. *i*-stem variant *šunis*, Old Prussian *sunis* id., which seem to account for the cluster **-nj-* in Saami). The earliest Saami changes **ś* > **ć* (prevocalically; other instances of **ś* remained unaltered, which means that Pre-Proto-Saami had the phonemes **s*, **ś*, **š*, **č* and **ć*), **š* > **s*, **č* > **c* and **sj/šj* > **šš* and the earliest Finnic change **ti* > **ći* (> **śi* > *si*) mark the split of PFS into Saamic and Finnic. Of the Saami changes, **śV* > **ćV* is the earliest, and all the Aryan loanwords have undergone this change but not the Proto-Balto-Slavic ones (10 and 11), which have retained the palatalized sibilant of the Balto-Slavic satemized original. Thus, the first Saamic change **śV* > **ćV* had already taken place and the Finno-Saamic protolanguage had already begun to disintegrate at the time the Proto-Balto-Slavic loanwords were adopted. The PBS palatalized dental sibilant **ś* later developed into alveolar **š* in PB and this sound, in turn, is reflected as *h* in Finnic and *s* in Saami (PB **šalnà* > PrePS/Pre-Proto-Finnic **šalna* > 1. PS**suolnē* > sN *suoldni* 'night frost; dew', 2. PF **halla* > Finnish *halla* 'night frost'). However, Finnish **š* > *h* must be later than Saami **š* > **s* because such old Finnic loans as sS *sïjle* 'charcoal' (also in sU, sP, sL < PS **šilę* < PrePF **šīle* > su. *hiili*) and sN *buošši* 'bad-tempered' (< PrePF **paša* > su. *paha*) show Proto-Saami **š* (< PrePS **š*) and not **s*, which would be the case if the Saami change were later than the Finnic one. These Finnic loanwords have entered Saami *after* the Saami change **š* > **s* and *before* the Finnic change **š* > *h* when MidPS had the phonemic opposition **s* vs. **ś* and MidPF the opposition **s* vs. **š*. As to the chronology of the Finnic change **ti* > **ći* > **śi* > *si*, the Finnic loanword *buolža* 'ridge' in North Saami (cf. Finnish *palsi*, gen.sg. *pallen* 'slope etc.' < PrePF **palti* [< Genn.]) only indicates that the Finnic change had begun but had not reached its final stage with the nonpalatalized sibilant *s* at the time of the borrowing. The Saami word further shows the change **a* > **õ* (> *uo*), which happened after the adoption of the PB loanwords (cf PB**šalnà* > PrePS **šalna* > PS**suolnē* > sN *suoldni* above). It can be concluded that the Finnic change **ti* >> *si* had reached at least the stage **ći* before the Saami change **a* > **õ* which, in turn, happened after the adoption

of the PB loanwords. PrePF **palti* was also borrowed into (Pre-) South-Pite-Lule Saami but with a different cluster (sL *buollda* 'slope'). This shows that the Proto-Saami language area was geographically divided by the time of the adoption of the PB loanwords: the structural changes such as **a* > **ō* swept the whole Saami at a time when there were already lexical differences between its divisions. Thus, *there may be geographical divisions in protolanguages, and these divisions may show lexical differences even if their structural developments run parallel.* I think this is a very important conclusion for the theme of the symposium. Such differences in vocabulary reflect different local identities which have persisted up to modem times, in this case at least from 500 BC.

11. sN *šearrat* 'bright' (KN *šǣrrâd*; also in sSk and sI) < PS (derived adjective) **šeaȓeɒē* < PrePS stem **śerä-(?/*śera-)* < PBS **źer-* < IE **ĝher-* 'strahlen, glänzen, schimmem' (IEW, p. 441); the word is found in Gennanic, Baltic and Slavic, cf. Lith. *žeriù*, *žerěti* 'im Glanze strahlen'. Gennanic only has reflexes of the zero grade, cf. Old Icelandic *grár* (< IE **ĝhrē̆u̯os*) 'grau', so that the PBS fonn **źer-* is the most probable source for the Saami word in that respect as well.

12. sa. *sággi* 'pin' (KN *sag'ge*; attested in all principal Saami idioms) < PS **sāŋɢẹ̄* < PrePS **säŋkä/*saŋka* < PG **stagga-* ~ **stanga-*, cf. PIE **stengh-* (~ **stegh-*) 'stechen; Stange etc.' (IEW, p. 1014); the same substitution (established by Jorma Koivulehto) IE/G **st-* > FS **s-* as in the word Finnish *sija* 'place, room' ~ sN *sadji* id. < PG **stījā* id.; the nasalized stem (from PIE **stengh-*) is found in Gennanic (cf. Old Icelandic *stinga* 'stecken'), whereas Balto-Slavic seems to show mainly non-nasal stems (cf. Lith. *stegis* 'Stechel') and is therefore not a likely source for the Saami word.

13. sa. *suopman* 'dialect; (human) voice' (KN *suobmân*; confined to sN) < PS **suoȓhẹnẹ* < PrePS **somin(ʒ)* (~ **sōmin(ʒ)* ~ **samin(ʒ)*) < IE **stomen-* 'Mund' (IEW, p. 1035); the same substitution **st-* > **s-* as in the previous word (*sággi*). The Greek reflexes of the PIE word have meanings that center around 'mouth' and 'speaking', cf. *στωμύλος* 'mundfertig, geschwätzig; artig plaudemd'. The IE word has been attested in Old Indic, Old Persian, Greek and Celtic, but Gennanic seems to lack it. This is the first example of the substitution IE **st-* > FS **s-* in PIE loanwords. In Saamic the non-altemating strong grade *an*-stems are generally loanwords (cf. sN *márkan* 'church village' < Finnish *markkina* 'market; church village' < Scand., *suohkan* 'municipality' < Scand., *omman* 'oven' < Scand., *állan* 'ell' < Scand., *árran* 'hearth' < Finnish, etc.). The North Saami word is not derivable from any shorter stem; Lule and Skolt Saami have similar words which come semantically close to the North Saami one but seem to be late

developments, cf. sL *suom'mit* (instead of regular **suobbmit*) 'undeutlich sprechen', sSk *suõmm* 'tone; singing voice' (the latter may be a bisyllabic back-formation from PS trisyllabic **suomeŋe*).

14. sN *čearru* '(roundish) fell top' (KN *čærro*; also in sL, sSk, sKld, sT, in the last two with the meaning 'tundra') < PS **ćeaṛō* < PrePS **śero/*ćero*, vrt. IE **ker-*, **kereu-* 'Kopf' etc. (IEW, p. 574), cf. Greek *κορυφή* 'top'; the word may also be a loan from Aryan (Proto-Iranian **śaraś-*). The PFU **śorwa* 'horn' (> sN *čoarvi*, Finnish *sarvi* id.) derives ultimately from the same IE root but as a Proto-Aryan *o*-loan (Koivulehto 1991)

15. sN *soamis* 'some' (KN *soames*, also in sS, sU, sL, sI; sI < ? sN) < PS **soamēs* < PrePS **somas* < Aryan **samas* 'some', cf. Indo-Aryan *samáḥ* id. < IE **s$_e$mo-* (~ **s$_o$mos*) id. (IEW, p. 903); also attested in Latin, Greek, Gennanic etc. (PG-PScand **sums*), cf. English *some*, Swedish *somlig* id. The Saami word is the same kind of Aryan *"o"*-loan as sN *boaris* (KN *boares*) 'old' (Koivulehto 1991) < Aryan **paras* (from which Finnic *paras* 'best' as an "a"-loan). K. B. Wiklund suggested a Proto-Scandinavian origin for the word and reconstructed PScand **somaz* as the source fonn. There is, however, no evidence for such a form: the reflex of PIE **s$_e$mo-* (~ **s$_o$mos*) had **-u-* in Proto-Scandinavian (Vries 1962: 561, s.v. *sumr* 2), and this would have produced *-o-* (or maybe *-u-*) in Saamic. It seems impossible to consider it later than (early) Proto-Scandinavian (i.e. adopted after the change PScand **-u-* > Swed. *-o-*, which sometimes gives Saami *-oa-*) because of its phonological shape (second syllable nS *-i-* < PrePS **-a-* and final *-s*).

16. sN *soabbi* 'stick, cane' (KN *soab'be*, attested in all major Saami idioms; Finnish *sompa* with the stricter meaning 'ski stick ring' seems to be borrowed from this Saami word, as are many other skiing terms according to Terho Itkonen [1957]) < PrePS **sompa* < IE **stomb(h)o-s* 'Pfosten, Pfeiler, Stamm, Baumstumpf' (IEW, p. 1011). The nasal stem has a wide distribution in the IE languages, and therefore it is difficult to give a definite IE source for the Saami word. In addition to PIE origin, the word could be also a Germanic (Jorma Koivulehto, oral communication), Aryan or Baltic *"o"*-loan, cf. Old Indic *stambha* 'Pfosten, Säule' (< IE **stombho-*), *stambá-* 'Busch, Büschel' (< IE **stombo-*), Lith. *stámbas* 'Kohlstrunk', Old High German *stampf* 'Werkzeug zum Stoßen' (< PG **stampa-* < IE **stombo-*). A reflex of the same IE root was adopted separately from Aryan (**stambha-s*) as Finnic *sammas* (gen.sg. *sampaan*) 'pole etc.', but – according to Koivulehto's terminology – as an *"a"*-loan (cf. the Finnic *"a"*-loan *paras* 'best' and the Saami *"o"*-loan *boaris* 'old' from the same Aryan source as in the previous etymology).

17. sN *buohta* 'opposite to' (KN *buottâ*; attested in sS – sK) < PS **puohtɐk* < PrePS **pɔlattik* < IE (cf. **po-ti*, 'gegenüber, entgegegen, gegen', IEW, p. 842). The IE word is found in Iranian (Av. *paiti* 'gegen', etc.) and Greek (*ποτί* 'gegen', etc.), and the possible sources are PIE/Pre-Aryan **poti* and Proto-Aryan **pati*.

18. sN *guoš'ši* 'birch bark basket' (KN **guoš'še*, also in sI, sSk, sK, sT) < PS **kuoš̮š̮ē* < PrePS **kasja* < PIE **kʷas-i̯o-* 'Flechtwerk, geflochtener Korb' (IEW, p. 635). The root **kʷas-* has been attested in Latin (dem. *quasillus* 'Körbchen', etc.), and the Slavic languages have the derivative with ** i̯o-* (cf. Russian *koš* 'Korb, Fischreuse; Hürde'). Borrowing from Russian is excluded (it would have given sN **goaš'ša*). The Saami word has been borrowed into the northern dialects of Finnish (*kosio*) and into Karelian (Northern *kosja*, Olonetz *koiza*); borrowing into the opposite direction from Karelian would have given sN **goaš'ši* whereas borrowing from Finnish would have given **goaš'šu*. The Votic *košša* 'basket' which is often cited in connection with these words (cf. SKES, p. 222) is a late borrowing from Russian or a hypochoristic back-formation from the Russian loanword *košel* 'basket'). Proto-Saami **sj* > **š̮š̮* is a regular change (cf. FS **pošjo-* > Early PS **posjo* > PS **poaš̮š̮ō* > sN *boaš'šu* 'rear'). A borrowing from Proto-Balto-Slavic is probably not excluded, but the PrePS second syllable broad vowel **a* suggests a very early (Pre-FS) borrowing.

The following old IE loanwords are not known outside Saami (PS = reconstructed Proto-Saami form, S = South Saami, U = Ume Saami, P = Pite Saami, L = Lule Saami, N = North Saami, I = Inari Saami, Sk = Skolt Saami, K = Kildin Saami, T = Ter Saami, PreG = Pre-Gennanic, PreBS = Pre-Balto-Slavic, PBS = Proto-Balto-Slavic, PreA = Pre-Aryan, PreB = Pre-Baltic, PSL = Proto-Slavic, A = Aryan, G = Gennanic). The infonnation on their distribution has been gathered from various sources (Lehtiranta 1989; T. I. Itkonen 1958; E. Itkonen 1986-87; Nielsen 1932-62; Lagercrantz 1939; Grundström 1946-54; Schlachter 1958; Bergsland & Magga 1993). The index on the right is the number of the main Saami idioms (except for the poorly documented Akkala) where the word has been attested. About two fifths of these loanwords have been borrowed from IE idioms with Proto-IndoEuropean phonetic traits:

Table 1
The PIE loanwords in Saami

PS	gloss	IE source	S	U	P	L	N	I	Sk	K	T	Index
*kuoksōj	'dawn'	PIE	+	+	+	+	+	+	+	+	+	9
*ćęnę-	'to tie'	PIE	-	+	+	+	+	+	+	-	-	6
*kārǯē	'cramped'	PIE	+	+	-	+	+	+	+	-	-	6
*ćearō	'top'	PIE	-	-	-	+	+	-	+	+	+	5
*kęnę	'dandruff'	PIE	+	-	-	+	+	+	+	-	-	5
*puorgē-	'to refuse'	PIE	-	-	-	+	+	-	-	-	-	2
*teaňō	'river'	PIE	-	-	-	-	+	-	-	-	-	1
*kuorǯōj	'cursed thing'	PIE	-	-	-	-	+	(+)	-	-	-	1
*suomęnę	'dialect'	PIE	-	-	-	-	+	-	-	-	-	1
*ćuońēk	'goose'	PIE/PreG	-	-	-	-	+	+	+	+	+	5
*ćiekę-	'to hide'	PIE/PreBS	+	+	+	+	+	+	+	+	+	9
*ęārē	'rain'	PIE/PreBS	+	+	-	+	+	+	+	+	+	8
*ćuormęs	'hail'	PIE/PreBS	-	-	+	+	+	+	+	+	+	7
*kuošše	'vessel'	PIE/PreBS	-	-	-	-	+	+	+	+	+	5
*vāǯem	'reindeer cow'	PIE/PA	-	+	+	+	+	+	+	+	+	8
*puohtęk	'opposite to'	PIE/PA	+	+	+	+	+	+	+	+	-	8
*ćuorēs	'brownish'	PIE/PA	+	-	+	+	+	(+)	-	-	-	4
*ćearpę	'tribe'	PIE/PA	-	-	-	+	+	-	-	-	-	2
*oaǰnē-	'to see'	PA	+	+	+	+	+	+	+	+	+	9
*oarǰē	'west/south'	PA	+	+	+	+	+	+	+	+	+	9
?*poarēs	'old'	PA	+	+	+	+	+	+	+	+	+	9
*poarhtē	'bark vessel'	PA	+	-	-	+	+	+	+	+	+	7
*soamēs	'some'	PA	+	+	-	+	+	(+)	-	-	-	4
*ćārēs	'coarse'	PA	+	-	-	+	+	-	-	-	-	3
*ruoǰsępē	'red'	Early PG	+	+	+	+	+	+	+	+	+	9
*ruomne	'side piece'	Early PG	-	-	-	+	+	+	+	+	-	5
*luojhkę-	'to borrow'	Early PG	-	+	-	+	+	+	+	-	-	4
*rękpę	'periphery'	Early PG	-	-	-	+	+	+	(+)	-	-	3
*sāŋgē	'pin'	PG	+	+	+	+	+	+	+	+	+	9
*kęhćę-	'to ask'	PG	+	+	+	+	+	+	+	+	+	9
*soamnē	'stick'	PG(?)	+	+	+	+	+	+	+	+	+	9
*(p)lieδē	'flower'	PG	+	+	-	-	+	-	(+)	-	-	3
*tievnō	'man'	PG	-	-	-	+	+	-	-	-	-	2
*muolītę	'to snow'	PBS	+	+	+	+	+	+	+	+	+	9
*šuovunję	'cleverdog'	PBS	+	+	-	+	+	-	-	-	-	4
*šearępē	'bright'	PBS	-	+	-	-	+	+	+	-	-	4
*vuoręs	'old'	PB	+	+	+	+	+	+	+	+	-	8
*piemmę-	'to feed'	PB	+	+	+	+	+	+	+	-	-	7
*kiepę	'soth'	PB	-	-	+	+	+	+	+	+	+	7
*sārpē	'heart (as food)'	PB	+	-	-	+	+	-	+	+	-	5
*leǰpē	'alder'	PB	+	+	+	+	+	-	-	-	-	5
*tęktārę	'daughter'	PB	+	-	-	-	-	-	-	-	-	1
*kuomuer	'mushroom'	PSL	+	+	+	+	+	+	+	+	+	9
*mulhtē	'soap'	PSL	-	-	-	-	+	+	+	+	+	5
	Total 45		26	24	21	36	44	29	30	23	20	5,6

The etymologies for most of these loanwords have been presented by Jorma Koivulehto (1995a; 1995b; 1995c; 1996; 1998; cf. also the list above by the present author). The number of attested old IE loanwords is highest in North Saami, but this may be a result of the history of the research. Among the Saami languages, North Saami has the highest number of speakers and is best documented. Furthermore, North Saami is the primary language for most scholars, and the other languages will be approached through it.

Although a slightly western distribution of PIE loanwords is discernible, there is no clear pattern. The figures become more interesting, however, when the PIE loanwords are grouped according to their distribution in the Uralic languages, but before going into these figures, an overview of the distribution of the oldest indigenous words (i.e. those with a Uralic or Finno-Ugric etymology only) in Saami is presented in the following table:

Table 2
The distribution of the oldest indigenous words in Saami

1. *Uralic indigenous contents words in Saami*

	S	U	P	L	N	I	Sk	K	T	Index
Total 69	65	58	62	62	62	58	57	55	51	7,5

2. *Finno-Ugric indigenous contents words in Saami*

	S	U	P	L	N	I	Sk	K	T	
Total 141	109	110	114	124	135	126	117	116	101	7.5

3. *Finno-Permic indigenous contents words in Saami*

	S	U	P	L	N	I	Sk	K	T	
Total 49	36	37	40	41	42	39	43	41	40	7.5

The distribution of these words is fairly even in Saami: the average number of Saami idioms where these words are found is 7.5 out of the 9 idioms taken into account. This figure is comparable with the distributional index of the PIE loanwords Saami shares with other Uralic languages (Table 3). For the purpose of illustration, a distributional profile based on the distributional indices is given for each group of loanwords:

Table 3
The distribution of the shared PIE loanwords

			S	U	P	L	N	I	Sk	K	T	Index	
1) loanwords shared with Finnic:													
**ǰiȅrmē*	'web'	PIE	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**nuoȓę*	'young'	PIE	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**keaĉē*	'end; point'	PIE/PreG	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**kę̀lē*	'how many'	PIE/PreBS	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**ęmęs*	'strange'	PIE	+	+	+	+	+	+	+	+	-	8	IIIIIIII
**tuoštę-*	'to dare'	PIE	+	+	+	+	+	+	+	+	-	8	IIIIIIII
**vęljē*	'abundance'	PIE	+	+	+	+	+	+	+	-	-	7	IIIIIII
**ęčē*	'toebb'	PIE/PreG	-	-	+	+	+	+	+	+	+	7	IIIIIII
**vęš(ē)*	'again'	PIE	+	-	?	+	+	+	+	-	-	5	IIIII
**sokę*	'kin, family'	PIE	-	-	-	-	+	+	+	-	-	3	III
	Total 10		9	8	9	10	11	11	11	8	6	7.4	
2) loanwords shared with the Volgaic and/or Permian languages:													
**ĉokō*	'to comb'	PIE	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**kunę*	'ashes'	PIE	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**kęĉę*	'to ask'	PIE	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**pęšę-*	'to wash'	PIE	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**ęštę-*	'to have time'	PIE/PreBS	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**kęlmęs*	'cold'	PIE/PreBS	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**keasē*	'summer'	PIE/PreG	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**lęštę*	'leaf'	PIE/PreG	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**vuoǹcę*	'fishing lure'	PIE/PreG	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**vęneš*	'boat'	PIE/PreA	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**nę δ̌ē*	'to tack'	PIE	-	-	+	+	+	+	+	+	+	7	IIIIIII
**reaĉmē*	'netrope'	PIE/PreA	+	+	+	+	+	+	-	-	-	6	IIIIII
	Total 12		11	11	12	12	12	12	11	11	11	8.8	
3) words shared with the Ugric or the Samoyedic languages:													
**kolgę-*	'to flow'	PIE	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**koškę-*	'to dry (intr.)'	PIE	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**lękę-*	'to count'	PIE	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**nęmę*	'name'	PIE	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**oarbēs*	'orphan'	PIE	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**pęlę-*	'to fear'	PIE	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**puolvę*	'knee'	PIE	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**sukę-*	'to row'	PIE	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**suoǹę*	'sinew'	PIE	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**tękę-*	'to do'	PIE	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**vęaśkē*	'copper'	PIE	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**vuojē-*	'to drive'	PIE	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**poǹē-*	'to plait'	PIE	+	+	+	+	+	+	+	+	-	8	IIIIIIII
**tolgē*	'feather'	PIE	-	+	+	+	+	+	+	+	+	8	IIIIIIII

*kel̓ge-	'to must'	PIE	+	+	+	+	+	+	+	-	-	7	IIIIIII
*kālōj(-)	'sister-in-law'	PIE	+	+	+	+	+	+	+	-	-	7	IIIIIII
*pe̯s̓ē-	'to bake'	PIE	+	+	+	+	+	+	+	-	-	7	IIIIIII
*ćuolgōj	'pole'	PIE	+	-	+	+	+	+	-	-	-	5	IIIII
*miekḙ-	'to sell'	PIE	-	-	-	-	-	-	+	+	+	3	III
*tuokḙ-	'to bring'	PIE	+	+	+	-	-	-	-	-	-	3	III
	Total 20		18	18	19	18	18	18	18	15	14	7.8	

The distributional index of the loanwords shared with the Volgaic and/or Permic languages is especially high (8.8) but the small number of these words may be the reason. The overall picture is that the distribution of old loanwords (8) is about the same as that of the old indigenous words (7.5). There is a change, however, when one looks at the PIE loanwords confined to Saami (Table 4):

Table 4
The PIE loanwords confined to Saami

			S	U	P	L	N	I	Sk	K	T	Index	
*kuoksōj	'dawn'	PIE	+	+	+	+	+	+	+	+	+	9	IIIIIIII
*vāǯḙm	'reindeer cow'	PIE/PA	-	+	+	+	+	+	+	+	+	8	IIIIIIII
*ḙr̓ē-	'rain'	PIE/PreB	+	+	-	+	+	+	+	+	+	8	IIIIIIII
*puohtḙk	'opposite to'	PIE/PA	+	+	+	+	+	+	+	+	-	8	IIIIIIII
*ćuormes	'hail'	PIE/PreBS	-	-	+	+	+	+	+	+	+	7	IIIIIII
*kuolʁen	'heath, dry plain'	PIE	+	+	+	-	+	+	+	+	-	7	IIIIIII
*ćeḙ-	'to tie'	PIE	-	+	+	+	+	+	+	-	-	6	IIIIII
*kār̓ǯē	'cramped'	PIE	+	+	-	+	+	+	+	-	-	6	IIIII
*keḙ	'dandruff'	PIE	+	-	-	+	+	+	+	-	-	5	IIIII
*kuoš̓še	'vessel'	PIE/PreBS	-	-	-	-	+	+	+	+	+	5	IIIII
*ćeaŕō	'top'	PIE	-	-	-	+	+	-	+	+	+	5	IIIII
*ćuońēk	'goose'	PIE/PreG	-	-	-	-	+	+	+	+	+	5	IIIII
*ćuorēs	'brownish'	PIE/PA	+	-	+	+	+	(+)	-	-	-	4	IIII
*ćeaŕpe	'tribe'	PIE/PA	-	-	-	+	+	-	-	-	-	2	II
*puoŕʁē-	'to forbid'	PIE	-	-	-	+	+	-	-	-	-	2	II
*teaŕiō	'river'	PIE	-	-	-	-	+	-	-	-	-	1	I
*kuorǯōj	'cursed thing'	PIE	-	-	-	-	+	(+)	-	-	-	1	I
*suomḙ	'dialect'	PIE	-	-	-	-	+	-	-	-	-	1	I
*keŕhtḙ-	'to tie'	PIE/PreGBS	-	-	-	-	-	+	(+)	-	-	1	I
	Total 19		7	7	7	12	18	12	12	9	7	4.7	

The distributional index of these loanwords is significantly lower than in the rest of the old vocabulary, and they are concentrated in the central idioms of Saami. It should also be noted that the eastern and south-western peripheries don't show PIE loanwords of their own: the central idioms mediated the loans to the eastern and south-western peripheries of the Saami area. The distribution of the postPIE loanwords is presented in the following tables (tables 5-9):

Table 5
The distribution of the Proto-Aryan/Aryan loanwords

			S	U	P	L	N	I	Sk	K	T	Index	
1) words confined to Saami:													
*oajnē-	'to see'	PA	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*oarjē	'west/south'	PA	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
?*poarēs	'old'	PA	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*poarhtē	'bark vessel'	PA**	+	-	-	+	+	+	+	+	+	7	IIIIIII
*soamēs	'some'	PA	+	+	-	+	+	(+)	-	-	-	4	IIII
*čārēs	'coarse'	PA	+	-	-	+	+	-	-	-	-	3	III
	Total 6		6	4	3	6	6	4	4	4	4	6.8	
2) words shared with Finnic:													
*cuomšōj	'frog'	A	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*juonē	'twin'	A	+	+	+	+	+	+	+	-	-	7	IIIIIII
	Total 2		2	2	2	2	2	2	2	1	1	8.0	
3) words shared with the Volgaic and/or Permian languages:													
*-vuolē	'-hood'	PA	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*earhtē	'flank'	A	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
?*poarhtē	'bark vessel'	A/Iran**	+	-	-	+	+	+	+	+	+	7	IIIIIII
*juonē	'trail'	A	+	-	-	-	(+)	(+)	+	+	-	3	III
	Total 4		4	2	2	3	3	3	4	4	3	7.0	
4) words shared with the Ugric or the Samoyedic languages:													
*vuojē	'butter, oil'	PA	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*čoalē	'gut'	PA	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*jukē-	'to drink'	PA	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*čoarvē	'horn'	A	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*čuolē	'hundred'	A	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*koalē	'hut'	A	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*oanǯē	'flesh; meat'	A	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*mielē	'honey'	A	-	-	+	+	+	+	+	+	-	6	IIIIII
	Total 8		7	7	8	8	8	8	8	8	7	8.5	

Table 6
The distribution of the Proto-Germanic/Germanic loanwords

			S	U	P	L	N	I	Sk	K	T	Index	
1) words confined to Saami:													
*ruoþsɐþē	'red'	EarlyPG	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*sāiŋgē	'pin'	PG	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*kehčɐ-	'to ask'	PG	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*soarnɪɐ̄	'stick'	PG(?)	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*ruomɪɐ	'edge'	Early PG	-	-	-	+	+	+	+	+	-	5	IIIII
*luojhkɐ-	'to borrow'	Early PG	-	+	-	+	+	+	+	-	-	5	IIII
*rɐmɪɐ	'periphery'	Early PG	-	-	-	+	+	+	(+)	-	-	3	III
*(p)lieδē	'flower'	PG	+	+	-	-	+	-	(+)	-	-	3	III
*tievɪɐ̄	'man'	PG	-	-	-	+	+	-	-	-	-	2	II
	Total 9		5	6	4	8	9	7	6	5	4	6.0	
2) words shared with Finnic:													
*ɐśkē	'lap'	G	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*kuośsē	'guest'	G	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*pɐrɐ-	'to work'	G	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*vuorɪɐ̄	'lot; destiny'	G	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*vuorɪɐ̄	'to wait'	G	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*puojɪɐ̄	'fat'	G	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*suovδē	'guilt'	G	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*ruovɪɐ̄	'iron'	G	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*sɐjē	'site, place'	G	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*tohpɐ	'sheeth'	G	+	-	+	+	+	+	+	+	+	8	IIIIIIII
*pɐsē	'sacred'	G	+	+	+	+	+	+	+	-	-	7	IIIIIII
*vieɐ-	'to get tired'	G	?	+	-	+	+	+	+	+	+	7	IIIIIII
*vuonɐk	'brogue band'	G	+	+	+	+	+	+	+	-	-	7	IIIIIII
*soalŋ-	'to pick (teeth)'	G	+	-	-	+	+	+	+	+	-	6	IIIIII
*rɐpsɐ	'diapers'	G	+	-	-	+	+	+	-	-	-	4	IIII
*vuośs(ēj)ē	'handle'	PG/PB	+	-	+	+	+	-	-	-	-	4	IIII
*kieŋgē	'runner'	G	-	-	-	-	+	+	-	-	-	2	II
	Total 17		15	12	13	16	17	16	14	12	11	7.4	
3) words shared with the Volgaic languages:													
*kieɐrɐ	'to endure'	G	+	+	+	+	+	+	+	-	-	7	IIIIII
*moδē	'mud'	G	-	-	-	+	+	-	-	-	-	2	II
	Total 2		1	1	1	2	2	1	1	0	0	4.5	

Table 7
The distribution of the Proto-Balto-Slavic loanwords

			S	U	P	L	N	I	Sk	K	T	Index	
1) words confined to Saami:													
*muoh̀tē	'to snow'	PBS	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*šuovunję	'cleverdog'	PBS	+	+	-	+	+	-	-	-	-	4	IIII
*šeaŕępē	'bright'	PBS	-	-	-	-	+	+	+	-	-	3	III
	Total 3		2	2	1	2	3	2	2	1	1	5.3	

Table 8
The distribution of the Proto-Slavic loanwords

			S	U	P	L	N	I	Sk	K	T	Index	
1) words confined to Saami:													
*kuomɐr	'mushroom'	PSL	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*mulh̀tē	'soap'	PSL	-	-	-	-	+	+	+	+	+	5	IIIII
	Total 2		1	1	1	1	2	2	2	2	2	7.0	

Table 9
The distribution of the Proto-Baltic loanwords

			S	U	P	L	N	I	Sk	K	T	Index	
1) words confined to Saami:													
*čiekę-	'to hide'	PB	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*vuoręs	'old'	PB	+	+	+	+	+	+	+	+	-	8	IIIIIIII
*piemmę-	'to feed'	PB	+	+	+	+	+	+	+	-	-	7	IIIIIII
*kiepę	'soth'	PB	-	-	+	+	+	+	+	+	+	7	IIIIIII
*leajpē	'alder'	PB	+	+	+	+	+	-	-	-	-	5	IIIII
*sär̀pē	'heart (as food)'	PB	+	-	-	+	+	-	+	+	-	5	IIIII
*tęktārę	'daughter'	PB	+	-	-	-	-	-	-	-	-	I	I
	Total 7		6	4	5	6	6	4	5	4	2	6.0	
2) words shared with Finnic:													
*kuksē	'dipper'	PB	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*kuoj̀mē	'companion'	PB	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*luokt̀ę	'bay'	PB	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*sāmē	'Saami'	PB	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
*sęr̀vēs	'reindeer bull'	PB	+	+	+	+	+	+	+	+	+	9	IIIIIIIII

**suojnē*	'hay'	PB	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**ṣuolōj*	'island'	PB	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**luoṣe*	'salmon'	PB	+	+	+	+	+	+	+	+	-	8	IIIIIIII
**luovpē*	'board'	PB	-	+	+	+	+	+	+	+	+	8	IIIIIIII
**luovē*	'platform'	PB	-	+	+	+	+	+	+	+	+	8	IIIIIIII
**neapē*	'nephew'	PB	+	+	-	+	+	+	+	+	+	8	IIIIIIII
**rājcē*	'hole'	PB	+	+	+	+	+	+	+	+	+	8	IIIIIIII
**ruojpe*	'leg'	PB	+	+	+	+	+	+	+	+	-	8	IIIIIIII
**suolnē*	'night frost; dew'	PB	+	-	+	+	+	+	+	+	+	8	IIIIIIII
**tuovlē*	'tinder'	PB	+	+	+	+	+	+	+	+	-	8	IIIIIIII
**kelpe*	'log'	PB	+	-	-	-	+	+	+	+	+	6	IIIIII
**seaʙrē*	'company'	PB	-	+	-	+	+	+	+	+	-	6	IIIIII
**luopē*	'blade'	PB	-	-	-	-	-	+	+	+	+	4	IIII
**sęstē*	'tanned leather'	PB	+	+	+	+	-	-	-	-	-	4	IIII
**vuovjē*	'wedge'	PB	+	+	+	+	-	-	-	-	-	4	IIII
**kuovlęs*	'yoke'	PB	-	-	-	-	+	+	-	-	-	2	II
	Total 21		16	17	16	19	18	19	18	18	14	7.3	

3) words shared with the Volgaic languages:

*?*jāvrē*	'lake'	PB	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**kearpē*	'time, case'	PB	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**loamē*	'space between'	PB	+	+	+	+	+	+	+	+	+	9	IIIIIIIII
**siemęn*	'seed'	PB	-	-	-	-	+	+	+	+	+	5	IIIII
	Total 4		3	3	3	3	4	4	4	4	4	8.0	

The distributional index of the post-PIE loanwords confined to Saami is a little higher (5.7) than that of the PIE loanwords (4.7). The index for post-PIE loanwords shared with Finnic, however, is significantly higher (7.4) and comes close to the distributional index of the indigenous words which go back to the Finnic-Saami protolanguage.

The distribution of the old IE loanwords in Saami varies from a very narrow distribution (the loanword is found in one Saami idiom only) to a pan-Uralic one. It is striking that both Saamic and Finnic have several independent loans from Proto-Indo-European and its immediate daughter languages Proto-Germanic, Proto-Balto-Slavic and Proto-Aryan. At the same time, the Ugric languages seem to share their Proto-Indo-European or Proto-Aryan loanwords with other Uralic or Finno-Ugric languages (cf. Korenchy 1972: 46-84) and have very few separate old IE loanwords, and the same goes for Mordvin as well. It would be reasonable to think – since the Ugric languages and Mordvin were closest to the Indo-European area where Proto-Aryan emerged – that Ugric and Mordvin would possess about as many independent old IE loanwords as the westernmost Uralic idioms (Saami and Finnic), but this is not the case.

The obvious explanation is the pattern of communication in the early Neolithic Uralic/Finno-Ugric area: after the advent of agriculture south of the Uralic area and its impact on the culture and economy there, the southern parts of the Uralic/Finno-Ugric area became the centre from where not only linguistic innovations such as loanwords and structural changes but also cultural innovations found their way into the north-western and northern peripheries. There were very few influences taking the opposite direction from the peripheries towards the centre: one can suggest only a couple of possible North-Western loanwords in Volgaic and Permic (cf. Hertzen 1973). The loanwords adopted in the centre spread to the peripheries but those adopted in the peripheries did not find their way to the centre (or centres). The same goes for other innovations as well, whether linguistic or cultural.

A further implication is that Uralic/Finno-Ugric-speaking groups had simultaneous contacts with Proto-Indo-European-speaking groups in the South-East (the Pre-Aryan area), in the West (the Pre-Germanic area) and in the South-West (the Pre-Balto-Slavic area). This, in turn, means that the Proto-Finno-Ugric and probably also the Proto-Uralic area stretched from the Baltic to the Urals. This area can be defined as an exogamic system with internal distribution of linguistic, cultural and genetic influences from the centres to the peripheries and small egalitarian societies with hardly any surplus production. The area represented the stage in language history R. M. W. Dixon (1997: 67-75) calls equilibrium; this was punctuated by the advent of agriculture south of the Proto-Uralic/Proto-Finno-Ugric area, and new patterns of communication arose. The southern or south-eastern part of the Proto-Uralic/Proto-Finno-Ugric area closest to the area of agricultural surplus production became a new centre from where innovations spread to the rest of the area. Eventually, as the population grew denser and developed more advanced economic and social systems, the different peripheries developed identities and centres of their own, and the individual language areas (Finnic, Saamic, Mari, Mordvin, Permic, Ugric, Samoyed) emerged as a result of innovations that spread from these centres and were accepted by the speakers as a sign of areal identity. These areas disintegrated into smaller and smaller areas because of the new innovation centres that developed as a consequence of socio-economic change and ensuing new areal identities.

The old IE loanwords in Saami are concentrated, as already demonstrated, in the central idioms Lule, North, Inari and Skolt Saami. Their number in North Saami is especially high, and searches for independent PIE loanwords in the south-western languages South, Ume and Pite Saami as well as in the east

ern languages Kildin and Ter Saami have been fruitless. I see no other explanation for this state of affairs other than this: when the PIE loanwords were adopted, the Uralic idioms which later developed into Saami must have been in the area where their descendants – the present Saami languages – are now spoken. It is inconceivable that the loanwords would have been adopted somewhere else and that the pre-Saami speakers would have moved into the present Saami areas *after* the adoption of the loanwords. If this were the case, the distribution of the PIE loanwords confined to Saami should be as even as that of the rest of the old vocabulary, but it is not.

The old indigenous vocabulary or parts of it and the old IE loanwords shared with other Uralic languages represent linguistic innovations which spread from the centre, and the old IE loanwords confined to Saami reflect linguistic and cultural contacts in the periphery. The area from where the PIE loanwords spread to the pre-Saami area of the time is easy to locate: it is the Gulf of Bothnia. Along the main rivers that flow into it, the PIE loanwords found their way into the surrounding Lule, North and Eastern Saami areas from where they spread to the rest of the area.

Proto-Indo-European began dissolving into daughter languages around 3000 BC, and the oldest loanwords were adopted into Saami before the evolution of the characteristic features of the daughter languages. This dating together with the distribution of the loanwords gives us a possibility to account for the cultural context in which the loanwords were adopted. Towards the middle of the fourth millennium BC the climate in Northern Europe became warmer and the seals in the Baltic sea which were an important resource at the time retreated to those areas in the north where there was enough ice for nesting which was essential for their reproduction, i.e. to the Gulf of Bothnia. Seal oil and probably other seal products as well were important commodities at the time, and the local population around the Gulf of Bothnia experienced a strong and unprecedented economic upswing, lately documented in archaeological excavations of the area (Pentti Koivunen, personal communication). The amber finds indicate lively contacts with the south-eastern Baltic coast where Proto-Indo-European was spoken at the time. The Proto-Indo-European loanwords brought from the south were then transmitted to the surrounding areas along the main rivers that flow into the Gulf of Bothnia.

Together with other research results this means that the Proto-Finno-Ugric/Proto-Uralic speaking area stretched from the Scandinavian peninsula at least to the Ural mountains at the time of the Proto-Indo-European contacts. Since there is no clear indication of a population replacement between the time

when North Finland was initially colonized and 3000 BC, I conclude that the earliest colonizers belonged to the same Uralic-speaking linguistic sphere as the rest of northeastern Europe. As there was no surplus production, it was expedient to relate to communities which had the same strategies for coping with the environment as one's own. The relative linguistic and cultural uniformity of the Uralic area was maintained by innovations such as Comb Ceramics, which spread from its centres. The cultural innovations did not always reach the extreme Uralic peripheries, whereas most of the discernible linguistic innovations did, until the different subdivisions of the Uralic area developed identities of their own and expressed them by their own innovations.

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LOST LANGUAGES IN NORTHERN EUROPE

Peter Schrijver

As we now know, not least from the recent work of Jorma Koivulehto, Finno-Ugric languages abound with loanwords that were taken from Indo-European at various stages of its development. Yet this statement does not sum up all there is to say about the relation between Uralic and Indo-European. Leaving aside the issue that Indo-European and Uralic are probably ultimately genetically related, I shall concentrate on another subject, which so far has attracted little attention: the nature and origin of words of non-IndoEuropean stock in northern Indo-European languages (Germanic, Celtic) which have cognates in Lappish and/or Finnish.

Many of the supposed Germanic loanwords in Finnish and Lappish have no reliable Indo-European etymology whatsoever. While the Uralist usually ascribes a Germanic, and hence Indo-European, origin to such words, the Indo-Europeanist would be perfectly happy to accept a Finnish or Lappish origin. A case in point is a word for 'fish roe, fish sausage'. This occurs as *guttâ* in Norwegian Lappish and the etymon is widespread throughout the Lappish dialects (Lehtiranta 1989, no. 501). The attested forms all go back to **kūti-*. This shows a striking resemblance to Middle Low German *kūt, kūte*, Modern Low German (dialect of Mecklenburg) *kū(h)t* 'entrails, weak parts of the animal body, roe, calf of the leg', Middle Dutch *cute, cuut, kiet, kijte*, which reflect **kūti-* or a derived **kūtian-*. The Dutch – Low-German form was borrowed by other Germanic languages, e.g. Modern Icelandic *kút-magi* 'fish stomach', *kýta* 'fish stomach, roe', Frisian *kūt* 'roe, calf'. The details of the etymology have been worked out by Koivulehto (1992: 88-90), who regards the Lappish word as a particularly early borrowing from Germanic (Germanic **ū* → Proto-Lappish **ū*, not *uv*; Germanic **t* → Proto-Lappish **t*, not **tt*: Koivulehto 1992:

89). Yet it remains a mystery where Germanic got the word from, as it is doubtlessly not of Indo-European origin. If one does consider an Indo-European origin, one would have to reconstruct **guHd-i-*. This is phonotactically inadmissible, with its two voiced unaspirated stops, or, according to the glottalic theory, glottalized stops. Moreover, there are no reliable cognates in any other Indo-European language. Pokorny's **gēu, *gəu, *gu̯ĕ, *gu* 'bend, arch' (IEW, p. 393) is very much a mixed bag, both formally and semantically, which, moreover, does not account for the final **d*. The supposedly Macedonian form γόδα· ἔντερα. Μακεδόνες (Hesychius) seems at first sight to correspond to the Germanic forms, but as we know next to nothing about the historical phonology of Macedonian this impression may be an illusion. Moreover, various suggestions have been made to interpret γόδα in a completely different way (see Frisk 1960-73, I: 319, III: 64; Chantraine 1968, I: 232). Vedic *gúdā-* 'bowel', *gudá-* 'bowel, rectum, vagina' corresponds more closely to the Germanic forms, but its un-Indo-European root structure (two glottalized stops) and the irregular correspondence between Germanic **ū* and Vedic **ŭ* throw up serious problems.

Now if **kūti* does not have an Indo-European origin, and a Uralic origin is most unlikely in view of the absence of the etymon outside Lappish, the question of where the word came from arises. The answer no doubt is: from a lost non-Indo-European, non-Uralic language that was once spoken in northern Europe.

In the last decade, some progress has been achieved in the identification of non-Indo-European substratum languages in Middle and Northern Europe. At the moment it is too soon to present a well-balanced account. Research into the various lexical layers of the Indo-European languages of the area has just started to be conducted within the framework of the *Indo-European Etymological Dictionary Project* at Leiden University. For the moment it seems safe to say that at least three substratum languages can be identified:

(1) The language of the so-called "Old European hydronymy". It is the great merit of Hans Krahe to have collected and evaluated large amounts of hydronyms and to have argued persuasively that these belong to one and the same language (Krahe 1954; 1964). Krahe thought that the language was Indo-European, an idea that is still occasionally entertained, mainly among scholars specializing in onomastics (e.g. Kitson 1996). However, weighty arguments have been produced to show that this cannot be the case (Vennemann 1994; Kuiper 1995), such as the nearly complete failure of elements in the Old European hydronymy to turn up as lexical items in Indo-European languages. Furthermore, the language of the Old European hydronymy has remarkable

phonotactics: the vowel *a* is by far the most frequent vowel, whereas it did not exist, or was at best very rare, in Proto-Indo-European; another point is the inordinately high frequency of resonants and *s* as opposed to stops, which, again, is an un-Indo-European situation. Judging from the distribution of Old-European hydronyms, the language reflected in them was spoken over large areas of western and northern Europe, including the British Isles, Scandinavia, Germany, Poland and the Baltic region. According to Vennemann (1994), the language is related to Basque. Incidentally, Vennemann (most recently 1998, with references to earlier articles) and Beekes (1998) have claimed that this language has indeed donated loanwords to Indo-European languages. None of the alleged instances carries conviction, however.

In view of the extreme rarity with which elements belonging to this language turn up as lexical items in the languages of Europe, it is not to be expected that this substratum played an important part in donating lexical material to the Indo-European and Uralic languages of Northern Europe.

(2) The second substratum language I shall label "the language of bird names", as a number of non-Indo-European bird names in western Indo-European languages provide evidence on some significant points of the structure of that language (Schrijver 1997). Most importantly, it had a prefix *a-*, which was probably stressed and accompanied by syncope of vowels in the rest of the word; the language had fricatives such as *x*, *δ*, and it had a diphthong alien to Germanic and Celtic, something like [aə], which was rendered as *a* in British Celtic and *ai* in Germanic. Note the following examples:

> **mesVl-*, **a₁m(V)sl-* 'blackbird' → Welsh *mwyalch*, Latin *merula*; Old High German *amsla, amasla, amisla, amusla*, Old English *ōsle*
>
> **laəwaδ-*, **a-lawδ-* 'lark' → Old Icelandic *lævirki*, Old English *lāwerce*, Old High German *lērahha, lērihha*, Middle Dutch *lēwerke*, Finnish *leivo(nen)*; Gaulish (in Latin) *alauda*
>
> **raud₁-*, **a-rud₁-* 'ore' → Latin *raudus* 'lump of ore', Old High German *aruz, ariz*, Old Saxon *arut* (also Finnish *rauta*, Northern Lappish *ruow'de*, Old Icelandic *rauðr*; or these directly from a descendant of Proto-Indo-European **h₁roud^h-* 'red')
>
> **steroP-*, **a₁str(a)P-* 'lightning, sulphur' → Greek (ἀ)στεροπή, (ἀ)στραπή 'lightning', Old Irish *straif, sraib* 'sulphur'
>
> Other examples include: **krəxar-* 'heron' → Welsh *crehyr*, Proto-Germanic **h(r)aiγar-*, Finnish *haikara*; **spraəw* → Breton *fraó* 'crow, jackdaw', Proto-Germanic **spraiw-* 'starling'; **baəs-* 'boar' → Welsh *baedd*, Proto-Germanic **baiza-*.

The "language of bird names" is attested through Germanic, Celtic, Italic and, probably, through Greek as well, which would make up a sizeable territory

in Middle Europe. Its relation to certain elements of Vennemann's (1995) "Atlantic", Kuiper's (1995) A1, Huld's (1990) "North Balkan Substrate" and Beekes' (1996) "European" is unclear, but there is as yet no reason to separate these from the language of bird names. So far there is no evidence for direct contact between this language and Uralic languages: the Finnish and Lappish forms mentioned above can easily be explained as borrowings from Germanic.

(3) The third substratum language will be of more immediate concern. Kuiper (1995), who may be credited with the identification of this substratum, prosaically called it A2, but I shall label it here the "language of geminates". This substratum is heavily present in Germanic (see e.g. Boutkan 1998), but there is also some material in Celtic and Balto-Slavic. As a consequence, the territory of this language may be sought somewhere in Northern Europe, however vague this may be. Relevant etyma can probably be found among the materials in Polomé 1986 and 1992.

A highly characteristic feature of words deriving from this language is the variation of the final root consonant, which may be single or double, voiced or voiceless, and prenasalized. To illustrate this, I present one of Kuiper's examples:

Proto-Germanic **dūß-*: OldIcelandic *dūfa* 'to immerse'
Proto-Germanic **duff-*: Facroese *duffa* 'to bob up and down (of a ship)'
Proto-Germanic **dubb-*: Norwegian *dubba* 'to stoop', Middle Dutch *dubben* 'to immerse'
Proto-Germanic **dūp*: Dutch *duypen* 'to hang one's head',
Proto-Germanic **dupp-*: German *düppen*, Norwegian *duppa* 'to dive'
Proto-Gennanic **dump-*: Norwegian, English, Danish *dump* 'hole, pit, pond', East Frisian *dumpen* 'dive'
Cognates: Lithuanian *dubùs* 'deep', *dumblas* 'mud in water, marsh'; Old Irish *domuin*, Welsh *dwfn* 'deep' < **dubni-* and others.

The background of this alternation is unknown, but it seems likely that the alternation found in Gennanic reflects a similar alternation in the substratum language. The only regularity is that after a long vowel no geminate consonants seem to occur. Incidentally, the language of geminates cannot be Uralic, as another of its characteristics is the frequent occurrence of word-initial **kn-* and **kl-*, and Uralic languages do not allow consonant clusters at the beginning of the word. On the other hand, and at the risk of explaining *obscura per obscuriora*, one might consider the possibility that the consonant gradation of Lappish and Baltic Finnic is somehow connected with the alternation of consonants at the end of the first syllable in the "language of geminates". Since most Uralists now agree that consonant gradation is an innovation of Lappish and Baltic Finnic, its

rise may be connected with the phonetic peculiarities of speakers of the language of geminates who turned to speaking Finno-Ugric (but see Helimski 1995 for a plea for Proto-Uralic gradation). Such a scenario would not necessarily be incompatible with the traditional connection of consonant gradation with Verner's law in Germanic, but the details lie outside the scope of this article.

We may now return to our word for 'roe, calf, weak body parts', which was reconstructed as **kūti(-)* for both Lappish and Germanic. It turns out that a number of other cognates within Germanic indicate that the etymon ultimately goes back to the language of geminates:

> **kunt-*: Middle Low German *kunte*, Dutch *kont*, English *cunt* 'buttocks, *cunnus*'
> **kutt-*: Dutch *kut* '*cunnus*', Bavarian *kütze* 'part of intestines', Middle High German *kotze* 'prostitute', Middle LowGerman *kutte* '*cunnus*'

In view of this conclusion, various scenarios to account for the history of Proto-Lappish **kūti* and Proto-Germanic **kūti-* present themselves. Either the word was borrowed by Germanic from the language of geminates, and Lappish borrowed the word from Germanic; or Proto-Lappish borrowed the word from the language of geminates, and Germanic borrowed it from Proto-Lappish; or, finally, Germanic and Lappish borrowed the word from the language of geminates independently.

In view of this relatively wide range of possible scenarios, one could maintain that there is as yet no compelling evidence for direct contact between Uralic and the language of geminates. Yet some such evidence can be produced.

Proto-Finno-Ugric **urå* 'man, male' (Sammallahti 1988: 542; UEW, p. 545) is represented by Hungarian *úr* 'lord, sir', Finnish *uros* genitive singular *ur(h)oon* 'hero', *uros* genitive singular *uroksen* 'male (of animals)', *urho* 'hero, fighter', Proto-Lappish **orēs* 'male' (Lehtiranta 1989, no. 811). The Hungarian form has received various alternative explanations, which render the Finno-Ugric etymology somewhat less secure. Semantically, the application of Finnish *uros* to male animals is matched by various Lappish forms, such as Southern Lappish *orra* (Meraker) 'male reindeer', *hurrä* 'one year old male reindeer', and Western Lappish *hurriɛ* 'grouse' (Lagercrantz 1939: 1511-1513, 4516, 8356; orthography simplified; note, however, that the latter has been explained as a loan from the Scandinavian word for 'grouse', on which see below).

This application of **urå* to fauna offers a possible clue to the understanding of an element **ūr-*, **urr-* in Germanic words for 'aurochs' and 'capercaillie, black grouse', in other words, two of the biggest and most majestic animals of Northern Europe: Old High German *ūro* 'aurochs' < **ūrōn*, Old High Gennan *ūr-ochso*, Old English *ūr*, Old Icelandic *úrr* 'id.' < **ūraz*, Old High Gennan

ūr-hano 'male capercaillie'; Old High German *orre-huon* 'female capercaillie', Old Icelandic *orri* 'black grouse', Modern Norwegian, Modern Swedish *orre* 'id.' < **urr-*.

Proto-Germanic **urr-* is usually explained on the basis of Proto-Indo-European **wr̥s-* or **h₁r̥s-* 'male', but the former would have yielded ***wurr-* (cf. **wl̥kʷos* 'wolf' > Gothic *wulfs*), while **h₁r̥s-* would account for **urr-* but not for **ūr-*. It seems more likely that **ūr-* and **urr-*, showing as they do an alternation of single and double *r* and a concomitant alternation of long and short **u*, were borrowed by Germanic from the language of geminates. The language of geminates would then have borrowed the item from Finno-Ugric if Hungarian *úr* is cognate; if not, Lappish and Finnish may have borrowed the word from the language of geminates. It is possible to bypass the language of geminates, however, by assuming that Germanic borrowed the etymon directly from Proto-Lappish, including the consonant gradation *r* - *rr*. Either way, it is more likely that Finno-Ugric was the donor language than that Germanic was.

A second example of direct contact between the language of geminates and a branch of Uralic is the Germanic word *hand* (Gothic *handus* etc.) < Proto-Germanic **hand-*. All attempts at an Indo-European etymology of this word remain unconvincing (see recently Kluge & Seebold 1989: 353). Yet if we take Grimm's and Verner's Laws into account, we may reconstruct **hand-* as **kant-*. This looks strikingly like a cognate of Proto-Finno-Ugric **käti* 'hand, arm', but with a nasal infixed into the root. Since this nasalization is not a feature of Finno-Ugric, or of Indo-European (outside the nasal presents, that is), and since it is a feature of the language of geminates, it is reasonable to conclude that Finno-Ugric **käti* was borrowed by the language of geminates, from which it subsequently entered Germanic before Verner's Law and Grimm's Law.

Another word that one may suspect of having been borrowed from Finno-Ugric is Proto-Germanic **manag-*, **manig-* 'many' (German *manche*, Dutch *menig* etc.), Old Church Slavonic *мьногъ* 'much', and Proto-Celtic **menekki-* 'often' (Welsh *mynych*, OIr. *menic*): the erratic vocalism, the alternation of **g(ʰ)* and **kk* and the limited geographical distribution brand this etymon as of non-Indo-European origin (cf. Boutkan 1998: 124-125). The alternation of the final velar consonant suggests that the etymon was taken over from the language of geminates, but it is hard to deny an ultimate connection with Finno-Permian **moni* (> Finnish *moni* 'many a'; UEW, p. 279). I suggest, with due hesitation, that either Finno-Ugric or the language of geminates, but certainly not Indo-European, is the ultimate source of this etymon.

The idea that the Northern European language of geminates could play an intermediary role in loan contacts between Northern and Western Indo-European on the one hand and Finno-Ugric on the other may also account for the fact that Finno-Ugric words could end up as far away as Celtic, which as far as we know was never in direct contact with a branch of Uralic. I would like to suggest two candidates. The first is Finno-Ugric **mïxï* 'land' > **mëxi* > **maxï* > Finnish *maa* (Sammallahti 1988: 546; UEW, p. 263 reconstructs **mɣe*). This shows an uncanny resemblance to Proto-Celtic **magos*, phonetically [maɣos], which means 'field, plain', and which has no cognates in Germanic and no etymology whatsoever. The second etymon is Proto-Finno-Ugric **kårkï* 'crane' > LpN *guor'gâ*, and Finnish *kurki* (which has irregular *-u-*). This resembles **korkijos* or **kurkijos* 'heron', which underlies Welsh *crychydd*, Breton *kerc'heiz* (Wagner 1962-64: 301; Schrijver 1997: 297-298 and note 10).

Another etymon that may originally have belonged to the language of geminates is **sug^{h}-*, **sug-*, **sūk-* 'to suck', which is found in Italic (Latin *sūgere* 'to suck', *sūcus* 'sap'), Celtic (Welsh *sugno* 'to suck' < **seuk-*, Old Irish *súgid* < **sūg(^{h})-*), Baltic (Latvian *sùkt* 'to suck') and, notably, Germanic (Old English *sūcan*, Dutch *zuiken* < **sūg-*, Old English *socian* 'to soak' < **sug-*; Old English and Old High German *sūgan* 'to suck' < **sūk/g^{h}-*, with various ablaut grades; and also Germanic **sūp-* > Germ. *saufen*, **supp-* > German *Suppe*, etc.). An interchange of voiced and voiceless velar stops and also of velar and labial stops is one of the characteristics of the language of geminates, as Kuiper has pointed out. In an etymon such as this one might admittedly expect erratic changes of a sound-symbolic nature, but the fact remains that what we find here closely resembles the pattern seen in other, non-expressive etyma belonging to the language of geminates. Now these forms show more than a passing resemblance to the Proto-Uralic word for 'mouth', **šoxï*, which developed into Proto-Finno-Ugric **śuxï* (> Finnish *suu*, perhaps Northern Lappish *čovvâ*; Sammallahti 1988: 540; UEW, p. 492 reconstructs **śuwe*). One might again argue that the Uralic word was borrowed by the language of geminates, which passed it on, after processing, to Indo-European languages in the neighbourhood. For those who may doubt that Uralic words could have been passed on to such remote Indo-European branches as Italic, there is a perfectly plausible parallel, namely the Uralic word for 'fish', **kålå* (Sammallahti 1988: 538, UEW, p. 119) > Finnish *kala*, Northern Lappish *guolle* etc. This was borrowed into Indo-European languages as Latin *squalus* 'a big seafish', Old Icelandic *hvalr*, English *whale*, and Old Prussian *kalis* (Burrow 1955: 24, note 1; Koivu-

lehto 1995: 101; cf. Joki 1973: 266). The reconstructable proto-form for these Indo-European forms is *$k^{w}olos$ or *$k^{w}alos$.

In conclusion, there is evidence, however limited, for Finno-Ugric loanwords in Indo-European (see also Hofstra 1996), and there is evidence that "the language of geminates", which is neiter Indo-European nor Uralic (but see Kortlandt 1997), played an intennediary role in transmitting such loanwords. It seems likely that our understanding of the structure of the language of geminates will continue to grow for some time to come. Subtle questions, such as the affiliation of this language, will have to be postponed for the future. Meanwhile, however, nothing prevents the archeologist interested in such matters to search for the speakers of this language somewhere in Northern Europe.

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ABSTRACTS

ANCIENT METALLURGY IN NORTHERN EURASIA: ON THE PROBLEM OF CONTACTS BETWEEN THE INDO-EUROPEAN- AND URALIC-SPEAKING PEOPLES

(ABSTRACT)

E. N. Chernykh
S. V. Kuz'minykh

In the Early Metal Period, a succession of contacts and interactions between the Indo-European- and Uralic-speaking peoples in the field of mining and metallurgical production can be reconstructed. There is no reliable evidence on metalworking in the archaeological cultures of the forest zone dated to the period corresponding to the Eneolithic in southeastern Europe.

The earliest testimonies of metal use appeared in the Volga-Kama region and Karelia as early as late fourth – early third millennium BC (according to calibrated radiocarbon dates). The emergence of initial mining and metallurgical production in the region of the Lake Onega is clearly of a spontaneous nature.

The origin of metallurgical innovations in the forest-steppe and southern taiga zones in the Volga-Kama region, the Urals and western Siberia are dated to the middle of the third millennium BC and is linked with the Circumpontic Metallurgical Province (CMP). We mean Pit Grave, post-Repino, Fat'yanovo and Balanovo cultures, as well as the problematic reminiscence of the CMP in Central Asia – the Afanas'evo culture. The forest and forest steppe peoples continuously practised their hunting and fishing type of economy.

In the 18th-17th centuries BC, the process of destruction of the CMP was finished and a quite new and active process of formation of the Eurasian Metal-

lurgical Province (EAMP) began, and that designated the beginning of the Late Bronze Age in northern Eurasia. During the initial stage of its formation, metallurgical knowledge had no significant changes among the aboriginal taiga population, in spite of partial occupation of their territory by the Abashevo and especially Sejma-Turbino tribes.

Active innovations in metalworking among the forest cultures are noted from the 16th-15th centuries BC after these peoples were included in the EAMP system. The production centres of the Timber Grave (Srubnaya) and Andronovo cultural communities were the core of the system. Later on, it was forest-steppe and forest cultures who became the main consumers of metal. The metal was brought from mining and metallurgical centres of the Urals, Kazakhstan and the Sayano-Altai as before.

The EAMP system increasingly degenerated in connection with the transformation taking place in Srubnaya and Andronovo communities. The EAMP system was totally destroyed by the 9th-8th centuries BC. At the beginning of the Iron Age, settled "forest" peoples and "steppe" nomads were separated. No doubt, a mass incorporation of alien vocabulary concerning metallurgy and stock-breeding among the forest population took place during the Late Bronze Age within the framework of the dynamic system of the EAMP production centres.

CHRONOLOGY OF THE VOLGA-OKA VALLEY NEOLITHIC AND THE LYALOVO MIGRATIONS

(ABSTRACT)

Asya **Engovatova**

Until recently, there was very little information on ethnic history and migration in the Neolithic period due to an insufficient Neolithic chronology.

As a result of excavations carried out by the Moscow and Upper Volga expeditions during the past five years, a number of important sites of the Upper Volga culture were discovered: Vojmezhnoe 1; Ozerki 5, 17; Okaemovo 5, 18. Palynological data as well as radiocarbon datings of these sites were analyzed. The complex analysis of the materials found at the sites led to a more accurate dating of the Neolithic cultures.

The data let us date the origin of the Upper Volga culture to the sixth-fifth millennia BC. The middle stage of the Upper Volga culture is dated from the middle of the fifth millennium BC to the second half of the fifth millennium BC. The dating of the later and the final stages of the Upper Volga culture changed considerably; those had been dated to the middle of the fourth millennium BC. According to our materials, the final stage of the Upper Volga culture can be dated to the fifth fourth millennia BC. Our results allowed us to answer an important question: Did the late Upper Volga culture and the archaic Lyalovo culture exist at the same time? The Lyalovo culture is dated from about the 4000 BC to the c. 3000 BC. The archaic stage of the Lyalovo culture stretches from about the 4000 BC to the c. 3750 BC. The early stage lasts from the first quarter to the middle of the fourth millennium BC. The middle stage stretches from the middle of the fourth millennium BC to the last quarter of the fourth millennium

BC. The late stage of the Lyalovo culture is dated from the last quarter of the fourth millennium BC to the beginning of the third millennium BC.

The new data contradict D. A. Krajnov's theory according to which Lyalovo tribes migrated to the Valley from the north.

MIGRATIONS, DIFFUSION AND UNINTERRUPTED DEVELOPMENT IN THE STONE AGE OF THE FOREST ZONE OF EASTERN EUROPE: SOME REMARKS

(ABSTRACT)

V. I. Timofeev

The first populations in the territory of the modern eastern European forest zone appeared at least in the Middle Palaeolithic and in several cases even before this period but their contribution to the later developments remains unclear. The problem of the Upper Palaeolithic roots of the Epipalaeolithic – Early Mesolithic cultures needs special investigation.

The first real migrations of human populations were connected with the very end of the last glaciation; they marked the first settling of the area which became free from the ice-sheet. Most recognizable is the movement of the Swidry culture population and its successors from the nuclear area of the culture (Poland, Byelorussia, Lithuania) to the east and northeast. The process has been studied by a number of scholars (R. Schild, L. V. Koltsov, I. L. Zaliznyak and others). This migration was the most important one for the later development of the forest zone cultures. Some groups of human populations of Scandinavian origin (Bromme, Ahrensburg) appeared at the same time, even in Central Russia, (M. G. Zhilin, A. E. Kravtsov, G. V. Sinitsyna and others). The data suggesting possible movements from the east to the west in the Epipalaeolithic – Early Mesolithic proposed by some scholars (Bryusov 1947; Pankrushev 1978; Sidorov 1998 and others) are rare and mainly debatable.

It must be mentioned that a peculiar trait of the Final Palaeolithic occupation was the co-existence of populations of different origin in the same regions and areas.

The main part of the Mesolithic industries in a large part of the forest zone originates to a greater or lesser degree with the Swidry culture heritage (first of all Kunda and Butovo; the idea of the movement of these cultures from the west was retracted by L. V. Koltsov and M. G. Zhilin). The definition of some "Post-Ahrensburgian" assemblages results from a discovery in recent years (I. L. Zaliznyak). During the Mesolithic, some western or southern elements could be recognized in the industries of the main part of the area. The problem of the formation of the Mesolithic of Finland is also part of a broader problem connected to a large degree with the formation of the neighbouring more southern and southeastern cultures (of which the Kunda, Onega and Verete are the most important). Uralic or west Siberian elements could be traced in the eastern and north-eastern parts of eastern Europe only (Oshibkina 1997).

The territorial integrity was characteristic of the Mesolithic cultures, and, at the same time, probably the new situation resembled the "Neolithic" pattern of occupation with bilingualism in the contact areas, as suggested by A. and S. Sherrat (1988). This situation probably existed in the forest zone for a long time. We must also remember that during the Mesolithic period and even later, until 7000-6500 BP (uncal.), the whole European area was one interrelated world and there was no sharp cultural border between "west" and "east". The real west-east demarcation appeared after the spread of farming into central Europe with the Linear Band pottery culture population.

The Early Neolithic (the period of the first ceramic culture formation and development) in the forest zone has not yielded indisputable evidence for migration processes. Continuity in the development of the industries is debated by different researchers in many regions of the zone. The idea of pottery making spread to this vast area from the south and south-east, from the steppe and forest-steppe zone. The new chronological data show that pottery production appeared in the Russian steppe and forest-steppe regions in a very early period – no later than 8000 BP (uncal.). The Early Neolithic in the forest zone could be considered as the period when the processes of diffusion of the pottery production skill are clearly recognizable (L. P. Khlobystin, M. Nunez, V. I. Timofeev and others). The independent appearance of several centres of early pottery could be defined in southern Russia and Ukraine. Probably, the diffusion of ideas had followed small scale demic diffusion in a south-north direction, but there is no evidence of large movements of people which would interrupt the

development of the local cultures. Uralic influences are obvious in the eastern and north-eastern districts of eastern Europe only.

There are a number of changes in the "Ethnocultural" map of the Developed (or Middle) Neolithic of the forest zone if compared with the Early Neolithic period. New archaeological cultures appeared at this time, more often as results of interaction between populations of different origin. Some migrations of different populations are known for this period, but no distant and large-scale movements of people from the Urals or western Siberia to the west can be defined indisputably. By the end of the Neolithic, a large part of the area became occupied by the population of the Volosovo entity and some cultures with elements similar to the Volosovo. In my opinion, the most convincing explanation for the origin of the Volosovo was suggested by V. V. Nikitin (1996). He showed that the Volosovo was formed as the result of the interactions of the Pit-and-Comb Ware population with the Kama culture population in the east and with the Upper Volga culture population in central Russia.

The next period shows the classic cases of migration processes from the west and south-west (the spread of the Corded Ware, Fat'yanovo and related cultures). These processes had principal differences if compared with preceding migrations in the forest zone. The situation is comparable with the Neolithization of central Europe by the populations of the Linear Band pottery culture.

THE PROBLEM OF INTERACTION OF CULTURAL TRADITIONS IN THE BRONZE AGE IN CENTRAL RUSSIA (VOLGA-OKA BASIN)

(ABSTRACT)

Konstantin V. Voronin

The paper presents results of an analysis of the ethnocultural situation in central Russia in the Bronze Age. In my opinion, the Volga-Oka basin in the first half of the second millennium BC is characterized by the coexistence of different cultures – a phenomenon reflected in the dynamic interrelation of complexes belonging to various archaeological cultures. Some of the sites are connected with the aboriginal population of Uralic speakers. The final Volosovo, the Shagara complexes, as well as the complexes with the early Net Ware belong here. Yet another part is related to the archaeological cultures originating from the territories outside the Volga-Oka basin (the Fat'yanovo-Balanovo, the Middle Dnieper and the Abashevo cultures – all representing Indo-European speakers). The remainder, namely the complexes with Chirkovo materials, seems to be the result of interrelations of the final Volosovo (Uralic speakers) and the Fat'yanovo-Balanovo (Indo-European speaking) cultural traditions.

The author supposes that the climatic warming which occurred in the first half of the second millennium BC was one of the factors leading to the multiplicity of archaeological cultures in the Volga-Oka basin in that period. This is supported by palynological analysis of the habitation layers. The rise in temperature led to the border of the forest-and-steppe zone shifting closer to the Volga-Oka region, as well as to the possible penetration of the southern forest-and-steppe Bronze Age cultures into the Volga-Oka territories. An integrated culture

with material complexes homogeneous in design, which bear the influence of the aboriginal Finno-Ugric culture of the forest zone, appears in the Volga-Oka basin in the second half of the second millennium BC. The material marker indicating the formation of this culture is the net-ornamented ceramics distribution throughout the Volga-Oka basin, which in its turn indicates the dominating role of the cultural traditions of the native Finno-Ugric population of the region. The latter adopted the innovations of the alien Bronze Age cultures, thus putting an end to the multiple penetration of the neighbouring cultures' traditions into the Volga-Oka region.

CONTRIBUTORS

DAVID W. ANTHONY
Anthrolopogy Department
Hartwick College
Onconta, N.Y. 13820
U.S.A.
e-mail: anthonyd@hartwick.edu

CHRISTIAN CARPELAN
Department of Archaeology
P.O. Box 59
00014 University of Helsinki
FINLAND
e-mail: christian.carpelan@helsinki.fi

EVGENIJ N. CHERNYKH
Institute of Archaeology
Russian Academy of Sciences
19 Dm. Ulyanova
117036 Moscow
RUSSIA
e-mail: chernykh@labns.iaras.msk.ru

ASYA V. ENGOVATOVA
Institute of Archaeology
Russian Academy of Scieoces
19 Dm. Ulyanova
117036 Moscow
RUSSIA
e-mail: ndubrovsk@game.exe.ru

HENRI-PAUL FRANCFORT
Mission archéologique française
en Asie Centrale
Maison Réne Ginouvès
21 allée de l'Université
F-92023 Nanterre Cedex
FRANCE
e-mail: francfor@mae.u-paris10.fr

KAISA HÄKKINEN
Department of Finnish
Henrikinkatu 3
20014 University of Turku
FINLAND
e-mail: kahakki@utu.fi

EUGENE HELIMSKI
Finnisch-ugrisches Seminar
Universität Hamburg
Bogenallee 11
D-20144 Hamburg
GERMANY
e-mail: helimski@public.uni-hamburg.de

JUHA JANHUNEN
Institute for Asian and African Studies
P.O. Box 59
00014 University of Helsinki
FINLAND
e-mail: juha.janhunen@helsinki.fi

PETRI KALLIO
Dept of Comparative Linguistics
Leiden University
P.O. Box 9515
2300 RA Leiden
THE NETHERLANDS
e-mail: p.j.kallio@let.leidenuniv.nl

ALEXANDER M. LUBOTSKY
Dept of Comparative Linguistics
Leiden University
P.O. Box 9515
2300 RA Leiden
THE NETHERLANDS
e-mail: lubotsky@let.leidenuniv.nl

JORMA KOIVULEHTO
Department of Gennan
P.O. Box 4
00014 University of Helsinki
FINLAND
e-mail: jorma.koivulehto@helsinki.fi

JÁNOS MAKKAY
MTA Régészeti Intézet
Országház u. 30
H-1014 Budapest
HUNGARY
e-mail: makkay@uze.net

LYUBOV L. KOSINSKAYA
Laboratory for Archaeological Research
Urals State University
51 Lenin av.
620083 Ekaterinburg
RUSSIA
e-mail: lyubov.kosinskaya@usu.ru

JAMES P. MALLORY
Archaeology/School of Geosciences
The Queen's University
Belfast BT7 1NN
U.K.
e-mail: j.mallory@qub.ac.uk

ELENA E. KUZ'MINA
Institute of Culture
Russian Academy of Sciences
20 Bersenevskaya nab.
109072 Moscow
RUSSIA
e-mail: ekuzmina@yahoo.com

VLADIMIR V. NAPOL'SKIKH
Udmurt Institute for History, Language and Literature
Russian Academy of Science
Lomonosova 4
426004 Izhevsk
RUSSIA
e-mail: vovia@ni.udm.ru

SERGEI V. KUZ'MINYKH
Institute of Archaeology
Russian Academy of Sciences
19 Dm. Ulyanova
117036 Moscow
RUSSIA

ASKO PARPOLA
Institute for Asian and African Studies
P.O. Box 59
00014 University of Helsinki
FINLAND
e-mail: asko.parpola@helsinki.fi

TAPANI SALMINEN
Department of Finno-Ugrian Studies
P.O. Box 25
00014 University of Helsinki
FINLAND
e-mail: tapani.salminen@helsinki.fi

PEKKA SAMMALLAHTI
Giellagas Institute
P.O. Box 1000
90014 University of Oulu
FINLAND
e-mail: pekka.sammallahti@oulu.fi

PETER SCHRIJVER
Institut für allgemeine und indogermanische
Sprachwissenschaft
Ludwig-Maximilians-Universität München
Geschwister-Scholl-Platz 1
D-80539 München
GERMANY
e-mail: schrijver@lrz.uni-muenchen.de

VLADIMIR I. TIMOFEEV
Institute for the History of Material Culture
Russian Academy of Science
19 Dvortsovaya nab.
191186 St. Petersburg
RUSSIA

KONSTANTIN V. VORONIN
Institute of Archaeology
Russian Academy of Science
19 Dm. Ulyanova
117036 Moscow
RUSSIA

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