ARTICLES

THE LATE NEOLITHIC GRAVE AT GYVAKARAI IN LITHUANIA IN THE CONTEXT OF CURRENT ARCHAEOLOGICAL AND ANTHROPOLOGICAL KNOWLEDGE

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Abstract

The paper discusses a rare archaeological and anthropological find – a Late Neolithic grave, found in the year 2000 in Gyvakarai village (Kupiškis region). The site was discovered by chance, when local inhabitants were digging gravel from the slope on the left bank of the Žvikė creek. Radiocarbon dating (two separate samples of bone analysed): 3745±70 bp (right tibia, Ki-9470) and 3710±80 bp (left ulna, Ki-9471) confirmed the initial supposition of Late Neolithic, and actually falls to the very end of this period. The following grave goods associated with the inhumation were found: boat-shaped polished stone axe with shaft-hole; hafted axe, produced from flint of a greyish colour; a blade-knife, produced from flint of a greyish colour; a hammer-headed bone (antler?) pin, found among disturbed bones of the burial (to our knowledge this is the first hammer headed pin in Lithuania).

The osteological analysis of the burial revealed that the bones belonged to one fragmentary skeleton. Bone fragments are well preserved, and were from parts of the skull vault, both maxillas, the right side of the mandible, five cervical, twelve thoracic, five lumbar vertebrae, fragments of ribs, the handle of the sternum, both clavicles and scapulae, humeri, ulnae, right radius, right and left hand bones, fragments of both coxal bones, femora, tibias, fibulas and bones of the feet. The skeleton belonged to an adult male that died at the age of 35-45 years. The skull vault was too fragmentary for measurement, visually it can be evaluated as hypermorphic, dolichocranic, with an average or even a broad face. The postcranial skeleton is hypermorphic, with marked muscle insertions. The reconstructed stature is 173-176 cm. Such a massive skeleton is typical of other Lithuanian Corded Ware/Boat Axe culture people, and similar to those found in Estonia, Prussia and later the Fatyanovo people from the Central Russian plain.

This new case forces us to revive the long-lasting discussions about the origins of Indo-Europeans and the Balts. Summarising the current empirical facts and hypotheses based on archaeological, linguistic, anthropological and genetic data, we can find support for both migration and acculturation models. All known Corded Ware/Boat Axe burials in Lithuania are singular, contain individuals of adult/mature age, are associated with a particular set of grave goods and characterised by a very specific phenotype – these facts would support the hypothesis of immigration. However, some facts would also speak for the acculturation hypothesis: probably the adoption of the Indo-European language was earlier, via cultural transfer, and migrants of Kurgan people already found communities with whom they could communicate. However, they left no significant impact on the local anthropological substrate.

Key words: Late Neolithic, Corded Ware/Boat Axe culture, migration model, acculturation model, grave.

Introduction

The area of the eastern Baltic shore is a place of long-term interactions between various cultures and people. These interactions can be analysed from different points of view, as the history of "ethnos" and "population" takes place in at least three autonomous and only partially overlapping arenas: 1) biogenetic (history of the gene pool), the object of bioarchaeology, physical anthropology and population genetics; 2) ethnocultural (the history of a material culture, here seen as the infrastructure, technologies, productive activities and adaptive strategies [Harris 1997]), as much as it can be derived by archaeological methods; 3) linguistic, with its corresponding methods. Thus the solution of ethnocultural and linguistic problems will not be complete if the biogenetic arena is not taken into account, and vice versa. In contemporary archaeology, various schools and traditions of interpretation and explanation of archaeological artefacts and their assemblages have been developed. The need for the theory is based on the need to sort out a plethora of archaeological facts.

Despite the many arguments and examples to the contrary, archaeologists, linguists and geneticists alike continue to identify genetically separate populations, with their own separate languages, material cultures and ethnic identities as single units and norms, rather than exceptions. The recognition of one separate phe-

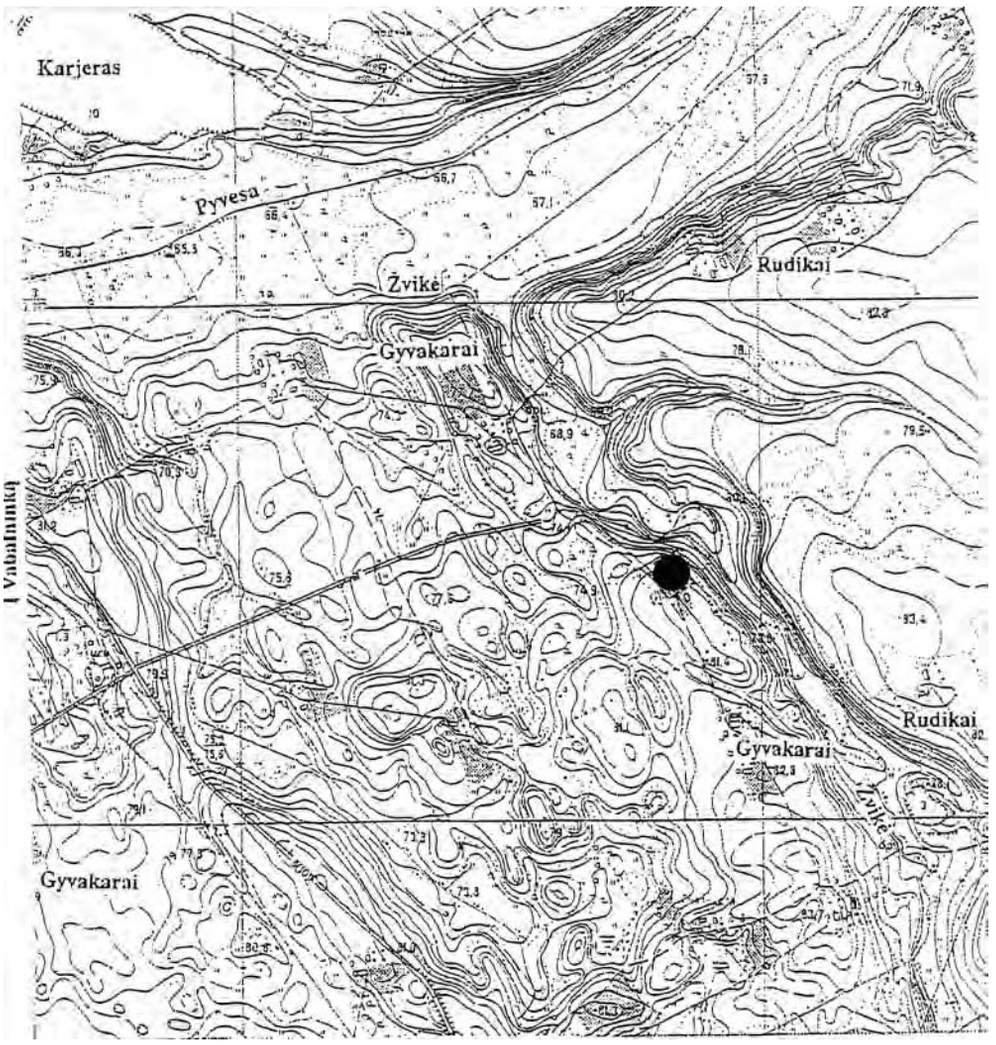

Fig. 1. The situation plan of the Late Neolithic grave in the village of Gyvakarai

nomenon (usually linguistic) sets off a search for the presence of others (Zvelebil 1995). Such a simplistic approach has its roots in the Romantic nationalism of the 19th century. Modern anthropology (in the broadest sense) rejects the normative view of archaeological culture. Different pots do not necessarily symbolise different people. The researcher must avoid overemphasising his own methods and finds. While working in his field, he must also take into account patterns of development in the gene pool, the material culture and language. We cannot assume a straightforward correlation between gene flow and the material culture pattern, nor one between material and non-material aspects of culture (Zvelebil 1998). Genetic analyses of living European populations, for example, show gross discrepancies between the genetic and linguistic affinities of a region's population (Guglielmino et al 1990) and provide evidence that genetic diversity is influenced more by geography than language (Rosser et al 2000). Thus, each particular find should be analysed in a broad context.

This paper is devoted to a rare archaeological and anthropological find, a Late Neolithic grave, found in 2000 in the village of Gyvakarai in the Kupiškis region.

Archaeological finds

The site was discovered by accident, when local inhabitants were digging gravel from a slope on the left bank of Žvikė creek (Fig. 1). During this, some bones and a stone axe were found, but the grave was disturbed. Later, when professional archaeologists arrived at the site, it was impossible to determine the direction and position of the body and the position of the axe. An area of 50 square metres was investigated, and the rest of the human bones, as well as some extra artefacts, were collected. Radiocarbon dating (two separate samples of bone were analysed) 3745±70 bp (right tibia, Ki-9470) and 3710±80 bp (left ulna, Ki-9471) confirmed the initial supposition of Late Neolithic, and actually falls at the very end of this period.

The following burial items associated with the inhumation were found:

1. A stone axe, boat-shaped, with a shaft-hole, symmetrical, polished, and produced from dark, fine-grained stone. The length of the axe is 15 centimetres, the biggest width 5.5 centimetres, the blade width 3.5 centimetres, the shaft-hole diameter 2.3 centimetres, the measurements of the butt 2.8×3.2 centimetres. The precise position in the grave is unknown, according to the words of the initial discoverer, it was located near the head (Fig. 2).

2. A hafted axe, produced from flint of a greyish colour. The height is 6.3 centimetres, the width at the butt 2.3 centimetres, at the blade 3.3 centimetres, maximum breadth 1.2 to 1.3 centimetres. The butt is of a quadrangular shape, 2.2×1.0 centimetres, the blade slightly convex. The precise position in the grave is unknown (Fig. 2).

3. A blade-knife, produced from flint of a greyish colour. The length is 8.6 centimetres, maximum breadth 3.3 centimetres, triangular in cross-section, slightly convex. The sides of the blade are chipped (Fig. 2).

4. A bone (antler?) pin, found among the disturbed bones of the burial. Broken into two pieces. The total length is 12.3 centimetres, the head length 2.8 centimetres, the width 0.46 centimetres, with an oval-shaped knob at one end. The upper part contains a hole (0.52

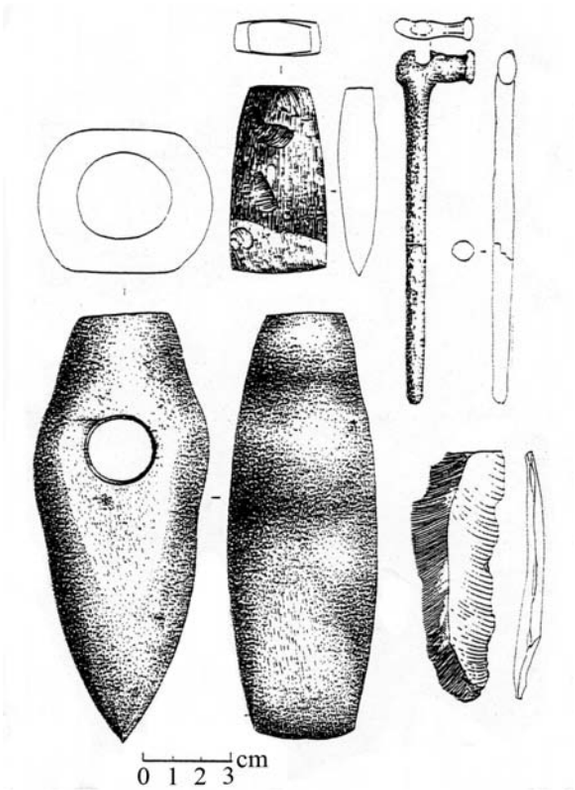

Fig. 2. Inventory of the grave

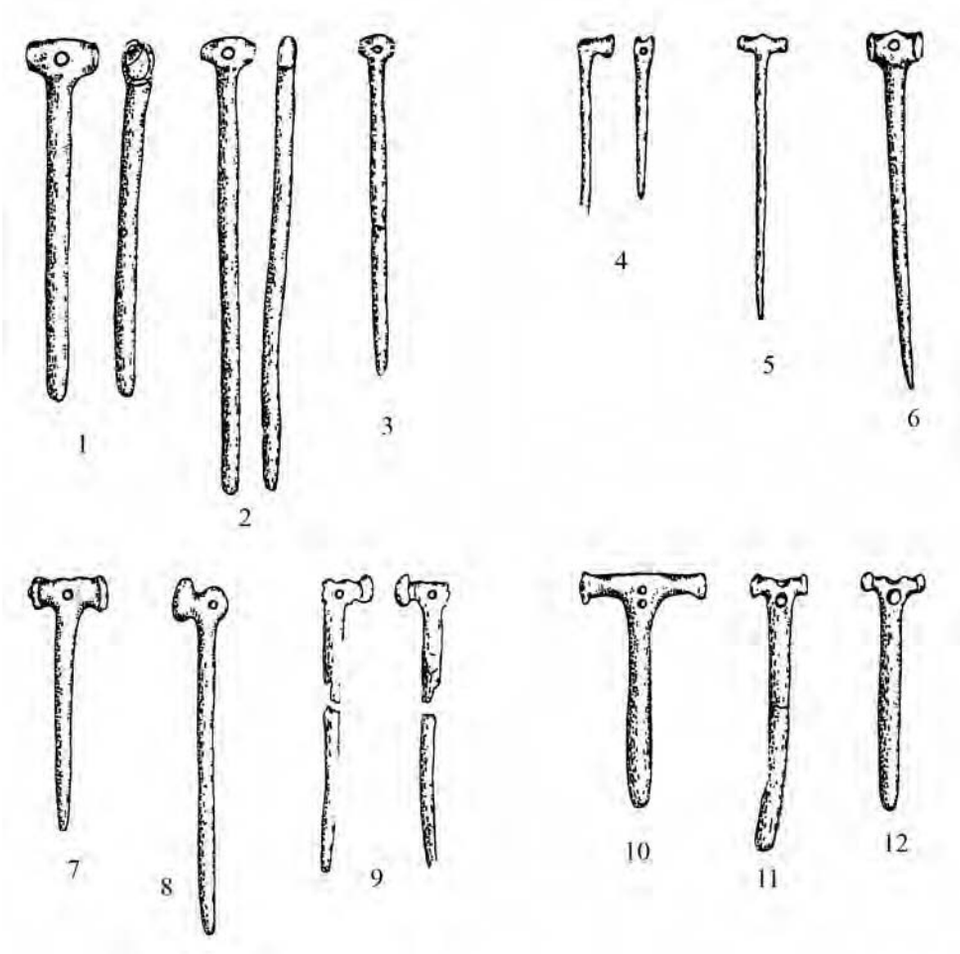

Fig. 3. Hammer-headed pins:
1 Gromovo (Hohenbruch);
2 Bischofsburg (both former East Prussia); 3 Biskupiec (Poland);
4 Chuderice (Czech Republic); 5 Vinelz (Switzerland);
6 Denmark;
7 Novosiolki (Ukraine);
8 Ivachny (Ukraine);
9 Novochernomorye (Ukraine);
10-11 Chanev;
12 Voronkovo (both Russia)

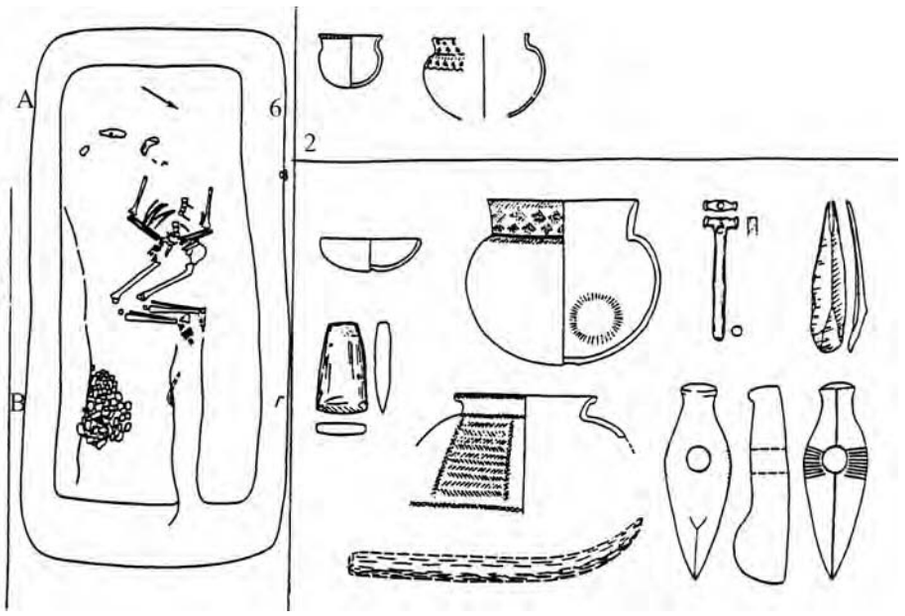

Fig. 4. Grave 3 in the Voronkovo burial ground (Yaroslavl area) and its inventory

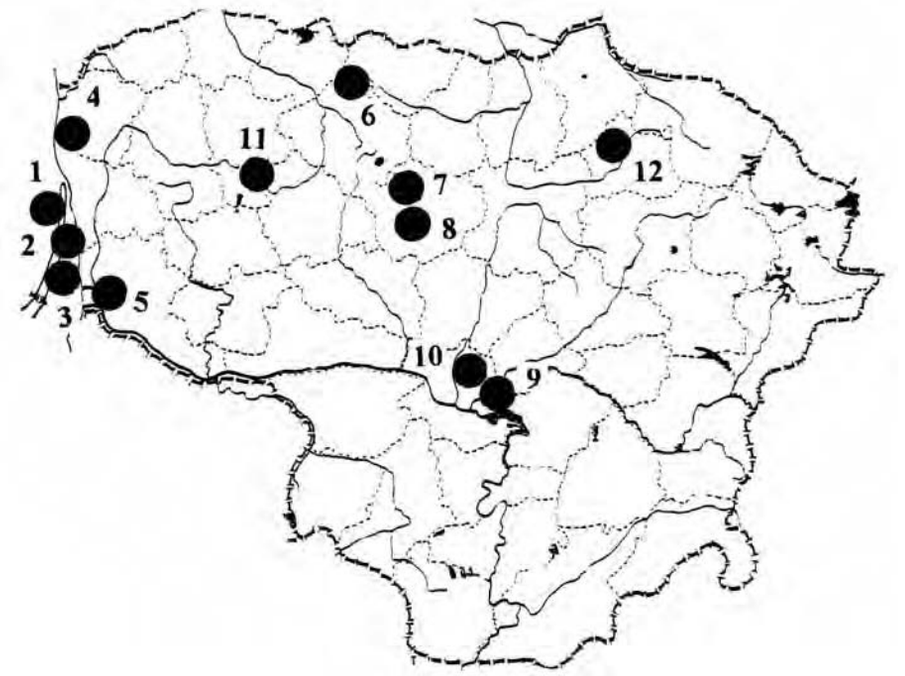

Fig. 5. Burials of Corded Ware/Boat Axe culture in Lithuania: 1 Meškos galva; 2 Alksnynė; 3 Juodkrantė; 4 Kurmaičiai; 5 Lankupiai; 6 Šakyna; 7 Grinkiškis; 8 Plinkaigalis; 9 Veršvai; 10 Paštuva; 11 Spiginas; 12 Gyvakarai

centimetres in diameter). The diameter of the needle near the head is 0.6 to 0.9 centimetres, in the middle 0.7 centimetres, and near the blunt tip 0.7 centimetres. The surface of the pin is polished (Fig. 2). The position in the grave remains obscure. To our knowledge, this is the first hammer-headed pin found in Lithuania. The closest analogies of such pins (Fig. 3) are in today's Kaliningrad region and Poland: single pins of

Table 1. Radiocarbon dated Lithuanian Late Neolithic Corded Ware/Boat Axe burials

Site	Sex, age	Dating (uncalibrated), years bp	Calibrated dating (BC ± 1 σ) (Girininkas 2002)	Author
Plinkaigalis 241	F, mature	4030±55 (OxA-5928)	2620-2470	Butrimas, Kazakevičius 1985; C^{14} – Ramsey et al 2000
Plinkaigalis 242	F, mature	4280±75 (OxA-5936)	2920-2880	Butrimas, Kazakevičius 1985; C^{14} – Ramsey et al 2000
Spiginas 2	M, 50-55	4080±50 (GIN-5571)	2880-2470	Butrimas 1992
Gyvakarai	M, 35-45	3745±70 (Ki-9470), 3710±80 (Ki-9471)	2281-2035 2269-1977	

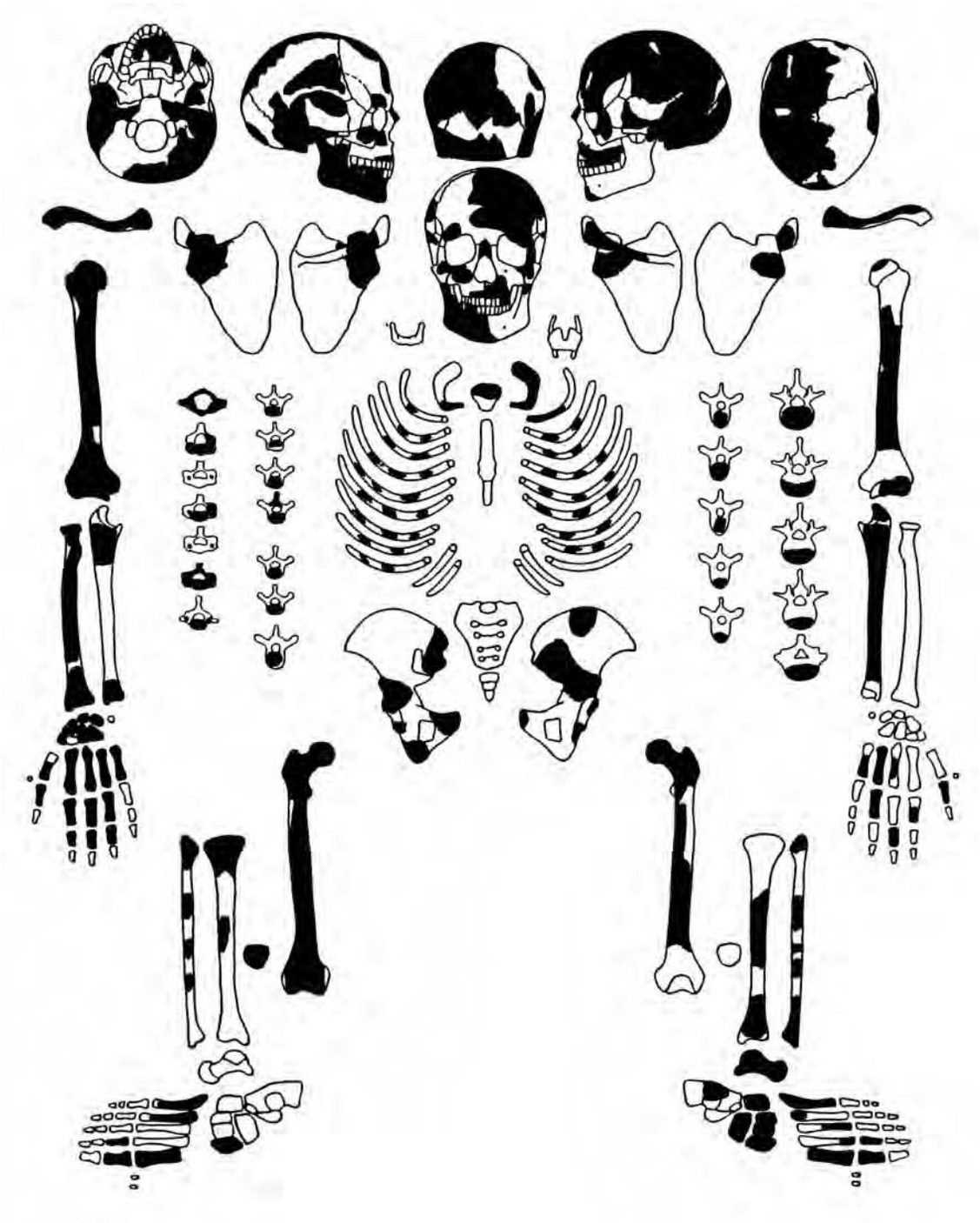

Fig. 6. Skeleton inventory of the Late Neolithic grave in the village of Gyvakarai

such a type were found in Gromovo (Hohenbruch), Bischofsburg (Gimbutas 1956) and Biskupiec (Okulicz 1973). Similar pins are known from Denmark (Gimbutas 1956), the Czech Republic, Switzerland (Behrens 1952), Ukraine (Artemenko 1967, Latynin 1967), burials of Fatyanovo culture (Khanevo, Voronkovo) in the Moscow and Yaroslavl areas, where some graves (eg Voronkovo 3) contain a very similar inventory as in our case (a stone axe with a shaft hole, a hafted axe, a blade-knife and a hammer-headed pin, plus two ceramic vessels and a heavily eroded bone instrument) (Fig. 4) (Krainov, Gadziatskaya 1987). All these burials are dated approximately to the middle of the second quarter of the second millennium BC. But the highest number of such hammer-headed pins (over 100) comes from the territory north of the Black Sea and the northern Caucasus. Latynin (1987) considers that these pins (manufactured not from bone, but from elk or deer antlers) should be associated with Yamna (Kurgan, according to Gimbutas) culture and dated to the second half of the third millennium BC. Thus, the hammer-headed pin from Gyvakarai fits well into

the area of Kurgan culture expansion, and such finds should be considered as (proto) Indo-European.

The uniqueness of the Gyvakarai find is illustrated by the fact that till now in Lithuania only 12 such supposedly Late Neolithic Corded Ware/Boat Axe burial places with 21 graves are known (Fig. 5) (Butrimas, Kazakevičius 1985; Girininkas 2002). Unfortunately, some of them, found in the 19th and first half of the 20th centuries, are known only from descriptions, and a new analysis of these archaeological and anthropological finds, especially radiocarbon dating, is impossible. The most recent and radiocarbon dated ones are from Plinkaigalis and Spiginas, thus Gyvakarai is the fourth and the latest dated Late Neolithic grave in Lithuania (Table 1). Fourteen Neolithic Corded Ware/Boat Axe culture burial places with 44 graves are known in Latvia (Grasis 1996; Girininkas 2002) and 20, with 40 graves, in Estonia (Girininkas 2002).

Anthropological data

The osteological analysis of the burial revealed that the bones belonged to one fragmented skeleton (Fig. 6). The bone fragments are well preserved, and were from parts of the skull vault, both maxillas, the right side of the mandible, five cervical, twelve thoracic, five lumbar vertebrae, fragments of ribs, the handle of the sternum, both clavicles and scapulae, humeri, ulnae, the right radius, the right and left hand bones, fragments of both coxal bones, femora, tibias, fibulas and bones of the feet. The skeleton belonged to an adult male (according to the morphology of the pelvic bones and skull), that died at the age of 35 to 45 years (according to the pubic symphysis, cranial suture closure and dental wear). The skull vault was too fragmented for measurement; visually it can be evaluated as hypermorphic, dolichocranic, with an average or even a broad face. The postcranial skeleton is hypermorphic, with marked muscle insertions. The reconstructed stature is 173 to 176 centimetres (Table 2).

Such a massive skeleton is typical of other Lithuanian Corded Ware/Boat Axe culture people (see also Table 2). This very specific phenotype of the Corded Ware/Boat Axe bearers (extreme hypermorphy, pronounced dolichocrany, a high, broad and strongly profiled face, and robust body build), is characteristic of Spiginas 2, Plinkaigalis 241 and 242 individuals, (Česnys 1985a), and similar to those found in Estonia (Mark 1956), Prussia (for summary, see Česnys 1991a, 1991b, 1991c), and later Fatyanovo people from the Central Russian plain. This type has no precedent in this area (Early Neolithic Kretuonas 1B male average stature is only 157.9 cm, and Early and Late Bronze Age from Kirsna-Turlojiškės is 165.8 cm).

Table 2. Measurements (according to Martin, Saller 1957) of postcranial skeletons of two Neolithic Corded Ware/Boat Axe culture male graves

Measurement	Gyvakarai (M, 35-45)		Spiginas 2 (M, 50-55)	
	Right	Left	Right	Left
Clavicula				
1	174			
6	40			
Humerus				
1	347			
2	342			
4	64			
5	26	26		22
6	20	19		19
7	69	69		66
7a	76	77		72
10	51			
Radius				
1			269	
2			253	
3	45		41	44
4	19			18
5	12		13	13
5(6)			34	
Ulna				
1				285
2				241
3	39	40	37	38
11	15	16		14
12	19	20		19
13	21			21
14	29			29
Femur				
1	478			
2	474			
6	32		28	28
7			27	28
8			88	88
9	36		34	34
10	29		25	26
18			49	
19	48		49	
20			156	
Tibia				
8	33		33	32
8a			39	40
9	22		22	22
9a			23	23
10	88		90	89
10b	79	77		86
Stature (Trotter-Gleser), cm	176,3		180,2	
Stature (Nainys), cm	172,7		179,0	

Discussion

This new Gyvakarai grave forces us to revive the long-lasting discussions about the origins of the Indo-Europeans and the Balts that have continued for the last 150 years. At least three hypotheses of Indo-European dispersal in the eastern Baltic, combining mostly archaeological, anthropological and genetic data, should be taken into consideration.

Hypothesis 1 (Adams, Otte 1999). Hunter-gatherer colonisation. The primary cause of the Indo-European spread was oscillations in the climate, each of which would have been capable of causing changes in population density. Intense cold and dry phases caused population contraction in some areas and low population densities or almost complete depopulation. A transition to a warmer and moister climate could be followed by exponential expansion. Any population group that acquired both general adaptive cultural traits and technologies enabling its expansion could spread rapidly to areas relatively free of other hunter-gatherer groups and to make a substantial contribution to the gene pool and linguistic legacy of Europe. At least three possible periods of such climate change can be traced.

1a. Late Glacial (c. 15,000–10,000 BP). A gradual colonisation of the ice-free areas of northern Europe during this period occurred, with most migrations taking place during the Late Glacial Bolling (12,800–12,000 BP) and especially Allerod (11,800–11,000 BP) interstadials, when environmental conditions in most of northern Eurasia were particularly mild. Anthropological finds from this period are scarce. However, Late Palaeolithic individuals from both the Last Glacial Maximum and Recession (c. 23,000–15,000 BP) and the Late Glacial in Central and Eastern Europe (Sungir, Dolní Věstonice, Předmosti, Maszycka, Kostenki) almost everywhere are quite uniformly hypermorphic, dolichocranic, with average or wide flattened faces and robust body build (Alekseev 1978; Gochman 1986; Vlček, Klima 1986). We can speculate about the low intensity gene flow between small mobile hunter-gatherer groups because of their small population size and similar modes of subsistence, causing a uniformity of anthropological traits. Adaptations to a cold environment also cannot be excluded. Population genetic data on mitochondrial DNA (mtDNA) (Richards et al 1996; Lell, Wallace 2000) points out that the great majority (70%–80%) of modern European lineages are derived even before this period, during the initial colonisation of Europe that started c. 45,000 BP.

1b. The transition to the warm and moist Holocene period after the Younger Dryas cold event (10,800–10,000 BP) was especially impactful on both the environment and humans. "… changes from a mild climate to full glacial and from glacial back to something similar to the present took place within a few decades. The warming may not even have required more than 20 years" (Lundqvist 1996). This could have caused a complete or almost complete depopulation in northern and Central Europe during the Younger Dryas, and an inflow of population at the subsequent beginning of the Holocene, which also corresponds to the beginning of the Mesolithic. Archaeologically, noticeable changes in more effective technologies (microlithic stone tools, more individual hunting in forests with the bow and arrow, intensive fishing) (*Antropologicheskiye tipy*, 1988) are noteworthy, as they might have led directly to a population wave. The Mesolithic saw a gradual increase in population size, more settled communities and the development of a more complex social structure and ideology (O'Shea, Zvelebil 1984; Dolukhanov 1997; Zvelebil 1998). Although the Mesolithic should not be treated as a homogeneous entity, classic anthropological data related to the Mesolithic in general noted a certain trend towards gracilisation: hypermassive dolichocranic people with broad flat faces were replaced by more gracile dolichocranic, with narrower and more profiled faces (Vasilyevka 1 and 3) or mesocranic flat-faced people (eg Zveinieki, Oleniy Ostrov, Janislawice). Two Lithuanian (Late) Mesolithic individuals, (Spiginas 4, Donkalnis 4) fit into the range of the second complex (Butrimas 1992; Antanaitis, Jacobs in Ramsey et al 2000). Some investigators have suggested eastern immigrations already in the tenth to eighth millennia BP (Denisova 1975), resulting in metisation with the Mongoloid stem. However, other morphological peculiarities, including odontometry, contradict this opinion (Balčiūnienė et al 1992) and support regionalisation due to the development of more localised mating networks (Petersen 1997). Jacobs (1992) presents strong arguments for the presence of at least two quasi-isolated human mating networks in Mesolithic northern Europe. Population genetic analyses mtDNA of recent populations, to our knowledge, have not been able to trace any significant Mesolithic migrations (Simoni et al 2000), although this statement is being discussed (Torroni et al 2001).

1c. Finally, a less severe cold and dry event corresponding to the "elm decline" in north-west and north central Europe c. 5,200 or 5,000 BP (Behre 1988; Regnell et al 1995) with a subsequent warmer and moister climate period than today. In this case, the hunter-gatherer population wave could be supplemented with a slower one of early farmers. This potential event overlaps partially with Hypothesis 2.

Hypothesis 2. Neolithisation. Two hypotheses that relate the Indo-European spread due to this process are known.

2a. Renfrew's (1987) language-farming hypothesis. According to this, farming was introduced to Europe from Anatolia by immigrant farmers or demic diffusion some 8,000 years ago, and those farmers, who were the original proto-Indo-European speakers, colonised most of Europe. Major technological advances and the transition to farming caused an increase in production and population growth, which in turn fuelled the need for the colonisation of new habitats. The "wave of advance" model requires only local migratory movement (Cavalli-Sforza et al 1994). This model does not exclude a limited admixture of the indigenous hunter-gatherer population; however, the spread of farming and languages from the Near East should have determined clines in gene pools, defined by languages (Barbujani et al 1994).

2b. The acculturation model (Zvelebil 1995; Zvelebil 1998). According to this hypothesis, the indigenous forager population acquires farming techniques, along with plant and animal domesticates, mostly by contact through trade and exchange. In this case, spatial distribution of allele frequencies does not predict clines.

The demic diffusion model in Europe and the Near East is supported by the data of many gene frequencies – nearly half of the alleles studied show clinal patterns (Barbujani et al 1994), which may reflect regularities related to the origin of agriculture in Europe (Sokal 1991). On the other hand, classic craniometry does not provide data supporting the demic diffusion hypothesis (Harding et al 1990). Recent investigations of mitochondrial and Y chromosome polymorphisms have fuelled further discussion. The data of Richards et al (1996), based on mtDNA, points out that the major extant lineages throughout Europe predate the Neolithic expansion and that the spread of agriculture was accompanied by only a relatively minor component of contemporary Middle East agriculturists (only ~12% in north and north-central Europe), thus supporting the acculturation, or the technology transfer, hypothesis. Data obtained by new methods, taken separately, often brings more confusion, instead of elucidating the problem of Indo-European origins. So, where is the truth, and who is right? In our opinion, both demic diffusion and acculturation may have been in operation, when generalisations are avoided. Zvelebil's "Neolithic creolisation" hypothesis (1995) is a good synthesis of both. It envisages three stages of Indo-European dispersal in Neolithic Europe:

A. The introduction of agro-pastoral farming to Europe from Anatolia, which took place in 8,000–6,000 BP, occurred essentially in the same way as postulated by Renfrew for the whole of Europe. Language dispersal during this stage would occur through replacement by demic diffusion into the cultural provinces of the Balkan Neolithic, the Linear Pottery and the Tripolye cultures. Recent data on mtDNA also proves Neolithic demic diffusion only in southern, but not northern Europe (Simoni et al 2000), as the frequencies of Neolithic haplogroups were lowest in Scandinavia (Lell, Wallace 2000).

B. Adoption of farming by indigenous hunter-gatherers via contact-induced language shift c. 6,500–4,000 BP. The farming economy was adopted and modified by the needs of indigenous hunter-gatherer communities. This stage's duration is uneven chronologically and regionally, lasting some 2,500 years or longer on the pan-European scale. Zvelebil (1995) argues that the adoption of an Indo-European language as a *lingua franca* was probably the most common course of events. The language of farmers, as the language of innovation and desired resources, would have enjoyed prestige status. This mode of change probably took place in the circum-Baltic area, as the mapping of the agro-pastoral spread, according to archaeological data, points to very gradual changes in subsistence patterns and suggests similar changes in the gene pool of the first farmers (Zvelebil 1998). Traces of Globular Amphora culture settlements in Lithuania (Brazaitis 2002; Rimantienė 2002) from the middle of the third millennium BC prove the presence of a long-lasting frontier of interaction between agricultural and foraging modes of subsistence. Indeed, it took about 1,500 years for the agricultural frontier to shift from southwest Lithuania to southern Finland, and an extra 1,000 years to Karelia. The transition itself was also very gradual. The availability phase, when farming is known to foraging groups and there is an exchange of materials and information between foragers and farmers, by presently published data, took about 1,500–2,000 years in western Lithuania, (c. 6,600–4,400 BP), embracing all Early and Middle Neolithic (Daugnora, Girininkas 1996). In eastern Lithuania and central Latvia, the availability phase continued up to 3,800–3,600 BP, including also all the Late Neolithic. The process was indeed diachronic, uneven and long-lasting, and it is no wonder that it causes discussions on chronology among archaeologists.

The burial pattern in the Spiginas site supports the concept of a gradual change of cultures: in the Spiginas site, four graves were unearthed in a 420-square-metre area. Two of them are attributed to Late Mesolithic: grave 3 – 7780+/-65 years bp (OxA-5925); grave 4 – 7470+/-60 years bp (GIN-5571), the distance between the graves is one metre. But grave 1's date is Middle Neolithic, 5020+/-200 years bp (GIN-5569); and grave

2 – 4080+/-120 bp (GIN-5570), and attributed to Late Neolithic (Butrimas 1992).

A comparison of Lithuanian Mesolithic (Spiginas 3 and 4, Donkalnis 4) and Early Neolithic (Kretuonas 1B) skeletal material does not show any dramatic changes in people's physique (in both cases, mesomorphic mesocranic middle to broad face Europids with short stature and brachymorphic body build) (Česnys 1985b; Balčiūnienė et al 1992). However, odontometric data indicates a slight reduction of the teeth size (in the frame of the same massive Central European type) (Balčiūnienė 1985; Balčiūnienė et al 1992). It suggests that we should not suspect any substantial changes in the gene pool, and the above-mentioned slight dental reduction could be explained by the well-established general processes of gracilisation during the transition to Neolithic (Calcagno, Gibson 1988). This way the majority of current data supposes a cultural rather than demic diffusion of agriculture during at least the Early/Middle Neolithic, or availability phase, till about 2000 BC. Lithuanian data also supports Zvelebil's opinion that hunter-gatherers of the coastal and lakeshore zone were better equipped demographically and technologically to interact with the farming communities on an equal basis than the more mobile groups of the continental interior.

Hypothesis 3. Kurgan culture migrations (Childe 1950; Gimbutas 1980). According to this model, in the mid-fourth millennium BC, the indigenous Late Neolithic communities in the forest-steppe between the Dnieper and the Volga and the surrounding areas developed horse riding skills and concentrated on the pastoral element of the Neolithic economy. These developments provided an economic rationale for dispersal. The addition of wheeled transport from about 3000 BC increased the mobility of these groups, and created conditions radically different from before. In contact with more sedentary agriculturists, nomadic pastoralists are known to assume the role of the social elite, thus enabling another Indo-European language dispersal stage, the elite dominance stage (Zvelebil 1995). Cultural and linguistic data points to this way of Indo-European dispersal into Central Asia and back to southeast Europe.

In the eastern Baltic, these migrants are associated with Corded Ware/Boat Axe Culture and its bearers, and their arrival is dated about 2400 to 2000 BC. This roughly coincides with the beginning of the Late Neolithic, or substitution phase. This would mean that the wave of agricultural spread (by acculturation or demic diffusion) was reached by the second wave, Boat Axe people migrations. Although population genetic data of extant European populations reveals only a slight impact of supposed Kurgan culture migrations in today's gene pool (Cavalli-Sforza et al 1994) and largely reflect the Neolithic expansion (Barbujani et al 1995), archaeological and anthropological data often suggests the opposite. A very specific phenotype of Corded Ware/Boat Axe bearers (extreme hypermorphy, pronounced dolichocrany, high, broad and strongly profiled face and robust body build) is characteristic of Spiginas 2, Plinkaigalis 241 and 242 and Gyvakarai individuals. Till now, the immigrant character of Corded Ware/Boat Axe bearers was insufficiently disputed. It is possible to suppose that the newcomers were not so numerous to change the gene pool of the autochthonous population (Butrimas, Česnys 1990). Probably, these nomads often acted as trade intermediators and could be more or less integrated into local communities (Girininkas 2002). In western Lithuania, the hybridisation of local Narva early farmers and foragers and Corded Ware/Boat Axe bearers resulted in the synthetic Baltic Coastal (Pamarių, Rzucewo, Baltic Haff) culture. If the assumption that other Donkalnis graves are indeed Late Neolithic is proven, we will also have an example of the metisation of those people. In eastern Lithuania, pre-Corded Ware traditions were stronger and existed through all the Late Neolithic to the Bronze Age (Rimantienė 1996). No wonder that Girininkas (1996) comes to the conclusion that Baltic culture reaches back to Mesolithic times. Other researchers have also recently disputed the purely immigrant character of Corded Ware/Boat Axe culture and its bearers and propose new models, taking into account the relatively broad dispersal of available radiocarbon dates and stressing the autochthonous developments of subsistence and settlement patterns, society and ideology, and not uniform craniometric features (Lang 1998). In contrast with "classic" genetic markers and mtDNA data, the diversity of the Y chromosome points to a much stronger pre-Indo-European substrate among contemporary Lithuanians and Latvians, thus diminishing the contribution of Kurgan migrations: haplogroup 16 (Tat C allele) frequencies among Lithuanians (47%) and Latvians (32%) are closer to Estonians (37%) and Finns (61%), than to Ukrainians (11%), Poles (4%), Byelorussians (2%) and Czechs (0%) (Rootsi et al 2000; Rosser et al 2000).

This way notwithstanding, long-lasting discussions about the homeland of Indo-Europeans and their emergence in the eastern Baltic still go on. Thus, when a problem has remained unresolved for so long, and all the time new hypotheses are created, it seems that we are dealing with a methodological crisis of serious difficulty (Mallory 1996). It becomes evident that each discipline involved (first linguistics, later archaeology and classic physical anthropology, and recently population genetics, including DNA studies) after the initial

stage of enthusiasm later faces these difficulties. First of all, the possibilities and limits of each approach should be clearly realised, and also that they are dealing with relatively independent processes. Concerning archaeology and linguistics, a conflict for primacy between these two fields exists. There is no way in which an archaeological record can be read as a clear expression of a linguistic entity. On the other hand, when linguists wish to place their reconstructions in real time and space, they are at the mercy of other disciplines (Mallory 1996). The same can also be applied to physical anthropology, with its own methodological difficulties (the opposition between typological and evolutionary approaches), as well as for genetic studies of recent populations: we have no reliable means to track the genealogies of individuals back to such a deep past. Many recent gene pools can be affected by later migrations. We have to wait for the analysis of ancient DNA from sufficient samples of Mesolithic/Neolithic populations for more conclusive results. Another major problem would be the as clear as possible elucidation of all cultural patterns and variables: the availability of resources, subsistence strategies, technological skills, exchange patterns, artefact function (both direct and symbolic), the social context of production, status and prestige, mobility patterns, descent, residence and marriage rules, etc (Zvelebil 1998). These cultural variables influence to a great extent the biological characteristics of a population (density, life expectancy, reproduction rates, morbidity and possible vectors of selection, mating networks) that are reflected in the gene pool of the population. This implies an inter-disciplinary approach, and close collaboration between different disciplines. As we have tried to summarise in our report, what is true for one arena, does not necessarily work in another. Thus we have no grounds to reject any of the hypotheses discussed; it just depends which approach, biogenetic, cultural or linguistic, is given priority.

Concluding remarks

Summarising the current empirical facts and hypotheses based on archaeological, linguistic, anthropological and genetic data, we can find support for both migration and acculturation models. All known Corded Ware/Boat Axe burials in Lithuania are singular, contain individuals of adult/mature age, are associated with a particular set of grave goods, and are characterised by a very specific phenotype. These facts would support the immigration hypothesis. A stable isotope analysis of *Linearbandkeramik* people in Central Europe (5200 to 5000 BC) proves that a number of individuals even 2,000 years earlier could migrate to different locations during their life (Price et al 2001). However, some facts would also speak for the acculturation hypothesis: the Spiginas 2 individual was buried in the same site as two Mesolithic and one Middle Neolithic individual, pointing to the use of the same site for inhumations for around 3000 years (!); genetic data of extant populations in Lithuania and Latvia does not contain any evident traces of a substantial inflow of immigrants, and their gene pool has more affinities with the pre-Indo-European substrate. An analysis of zooarchaeological finds (Daugnora, Girininkas 1996) and nutrition based on stable isotope analysis (Antanaitis, Ogrinc 2000) proves a very gradual transition to an agricultural mode of subsistence. Probably, the adoption of the Indo-European language was earlier, via cultural transfer, and Kurgan migrants already found communities with whom they could communicate. However, they left no significant impact on the local anthropological substrate.

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VĖLYVOJO NEOLITO KAPAS IŠ GYVAKARŲ DABARTINIŲ ARCHEOLOGIJOS IR ANTROPOLOGIJOS ŽINIŲ KONTEKSTE

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Santrauka

Etnoso ir populiacijos istoriją reikia nagrinėti atsižvelgiant į biogenetinių, materialinės kultūros ir lingvistinių procesų sąveiką. Šiuolaikinė antropologija pabrėžia teorinių modelių svarbą siekiant susiorientuoti įvairių faktų gausybėje. Archeologai, lingvistai ir genetikai neretai linkę pervertinti savo metodų reikšmę ir turimus faktus nagrinėti izoliuotai, nors vis daugiau duomenų liudija, kad ne visada galima nustatyti tiesioginius ryšius tarp biogenetinių procesų ir materialinės kultūros vystymosi, taip pat tarp materialinių ir nematerialinių kultūros pusių. Todėl kiekvienas naujas radinys turi būti nagrinėjamas tokiame plačiame kontekste.

Straipsnyje aptariamas unikalus archeologinis ir antropologinis radinys – apardytas vėlyvojo neolito kapas iš Gyvakarų (Kupiškio raj.), aptiktas 2000 m. Radiokarbono datavimas – 3745±70 (dešinysis blauzdikaulis, Ki-9470), 3710±80 (kairysis alkūnkaulis, Ki-9471) – patvirtino vėlyvojo neolito (jo pačios pabaigos) datą. Kape rasti iš tamsios spalvos šlifuoto smulkiagrūdžio akmens pagamintas akmeninis laivinis kovos kirvis, titnaginis įtveriamasis kirvukas, titnaginė skeltė-peilis ir kol kas vienintelis Lietuvoje kaulinis (raginis?) kūjagalvis smeigtukas, analogijų kuriam randama Vidurio Europoje, Fatjanovo kultūros kapinynuose, tačiau didžiausias skaičius – teritorijoje į šiaurę nuo Juodosios jūros ir Šiaurės Prieškaukazėje. Iki pastarojo meto Lietuvoje žinoma 11 vėlyvojo neolito virvelinės keramikos / laivinių kovos kirvių kultūros palaidojimų, iš jų radiokarbonu datuoti 4. Skeletas fragmentiškas, priklausęs 35–45 m. vyrui, kurio kaukolė vizualiai įvertinta (išmatuoti dėl fragmentiškumo nepavyko) kaip hipermorfiška, dolichokraninė, vidutinio pločio ar net plačiu veidu. Postkranijinis skeletas labai masyvus, rekonstruotas ūgis – 173–176 cm. Tokios fenotipo ypatybės būdingos ir kitiems Lietuvos virvelinės keramikos / laivinių kovos kirvių kultūros atstovams (Spiginas 2, Plinkaigalis 241 ir 242), analogijų jam randama Estijoje, Prūsijoje ir Fatjanovo kultūroje. Šis radinys paskatino sugrįžti prie diskusijų apie indoeuropiečių atsiradimą ir plitimą Rytų Baltijos regione. Straipsnyje aptariamos kelios archeologiniais, antropologiniais ir genetiniais duomenimis paremtos hipotezės. Genetikos

duomenys (mitochondrinės DNR, perduodamos motinos linija, tyrimai) liudija, kad didžioji dalis Europos gyventojų yra pirmosios kolonizacijos bangos vėlyvojo paleolito pabaigoje palikuonys, o mezolito kolonizacijos po paskutinio ledynmečio reikšmė ginčijama. Neolitizacijai Europoje aiškinti naudojami deminės difuzijos iš Artimųjų Rytų („kylančios bangos“) arba kultūros difuzijos (žemdirbystės kultūros perdavimo) modeliai. Kartu su žemės ūkiu plito ir indoeuropiečių kalbos. Archeologijos ir genetikos duomenų sugretinimas liudija, kad deminė difuzija iš tikrųjų galėjo vykti Pietų Europoje, tačiau Šiaurės Europai tinkamesnis laipsniško kultūros (kartu ir kalbos) perėmimo modelis. Kurganų kultūros antrosios bangos žmonių imigracija, kaip liudija genetikos duomenys, nepaliko žymesnio pėdsako dabartinių visos Europos, taip pat ir Rytų Baltijos regiono žmonių genofonde. Apibendrinant archeologijos, lingvistikos, antropologijos ir genetikos duomenis, galutinės išvados neretai priklauso nuo to, kuriai sričiai – biogenetinei, materialinės kultūros ar kalbos – tyrinėtojas teikia pirmenybę. Jei faktai ištraukiami iš bendro konteksto, galima pasirinkti ir migracijas, ir kultūros perdavimą paremiančių duomenų. Visi iki pastarojo meto Lietuvoje žinomi virvelinės keramikos / laivinių kovos kirvių kultūros kapai yra pavieniai, juose palaidoti suaugę ar brandaus amžiaus žmonės, visuose yra savitos įkapės ir visi pasižymi ypatingu fenotipu – tai paremtų jų imigracijos hipotezę. Savo ruožtu kiti faktai paremia akultūracijos modelį: Spigino kapas Nr. 2 yra greta dviejų mezolito ir vieno vidurinio neolito individų – toje pat vietoje buvo laidojama apie 3000 metų. Dabartinių Lietuvos ir Latvijos gyventojų genofonde iki šiol nerasta to laikotarpio imigracijos pėdsakų – jis artimesnis ikiindoeuropietiškajam substratui. Zooarcheologijos ir stabiliųjų izotopų tyrimų duomenys įrodo labai lėtą perėjimą prie žemdirbystės. Gali būti, kad indoeuropiečių kalba buvo perimta jau anksčiau, ir pavieniai Kurganų kultūros imigrantai jau rado bendruomenes, su kuriomis galėjo bendrauti. Kad ir kaip ten būtų, vietos bioantropologiniame substrate ryškesnio pėdsako jie nepaliko.