

## Transformations in East-Central Europe from 6000 to 3000 BC: local vs. foreign patterns

Marek Nowak

Institute of Archaeology, Jagiellonian University, Kraków, Poland  
mniauj@interia.pl

**ABSTRACT** – *In the sixth, fifth and fourth millennium BC, in the basins of the Vistula and the Oder, extremely complex economic, social and ideological transformations took place. They consisted in the emergence and expansion of new systems of circulating information ('communicative communities'). The majority of these were connected with the Neolithic. The process involved a constant clash between foreign and local patterns. The latter, over time, prevailed. Hence the ultimate dominance of Neolithic communicative communities in the eastern part of Central Europe around the middle of the fourth millennium was essentially a local development. Nonetheless, a considerable portion of the territory continued to remain outside their influence. Therefore, throughout the three millennia, Mesolithic communicative communities not only gradually merged with or evolved into Neolithic ones. They also embraced such transformations, mainly concerning the material culture and ideology, which were completely independent from the advances of the Neolithic, or could have been competitive in relation to them.*

**IZVLEČEK** – *V šestem, petem in četrtem tisočletju BC so se ob Visli in Odri dogajale izjemno kompleksne ekonomske, socialne in ideološke spremembe. Vključevale so pojav in širjenje novih sistemov distribucije informacij ('skupnosti, ki komunicirajo'). Večina jih je bila povezanih z neolitikom. Proces je vključeval stalna nasprotja med tujimi in lokalnimi vzorci. Slednji so sčasoma prevladali. Zato je bila dokončna nadvlada neolitskih 'skupnosti, ki komunicirajo' v vzhodnem delu srednje Evrope okoli sredine četrtega tisočletja v bistvu lokalni razvoj. Vendar je ostal velik del omenjenega teritorija še naprej izven njihovega vpliva. Zato se mezolitske 'skupnosti, ki komunicirajo' skozi tri tisočletja niso le postopoma zlele z neolitskimi ali razvile v njih. Vključevale so tudi transformacije materialne kulture in ideologije, ki so bile popolnoma neodvisne od neolitskega napredka ali so mu bile celo konkurenčne.*

**KEY WORDS** – *East-Central Europe; Late Mesolithic; Neolithic; Neolithisation; foreign and local patterns*

### Introduction

The topic of this paper is the transformations that took place in the eastern part of Central Europe between 6000 and 3000 BC. My general thesis is that foreign influences and foreign systems in circulating information that were certainly present during that period caused indigenous reactions leading to the creation of such systems at the local level which consisted of indigenous elements, as well as select-

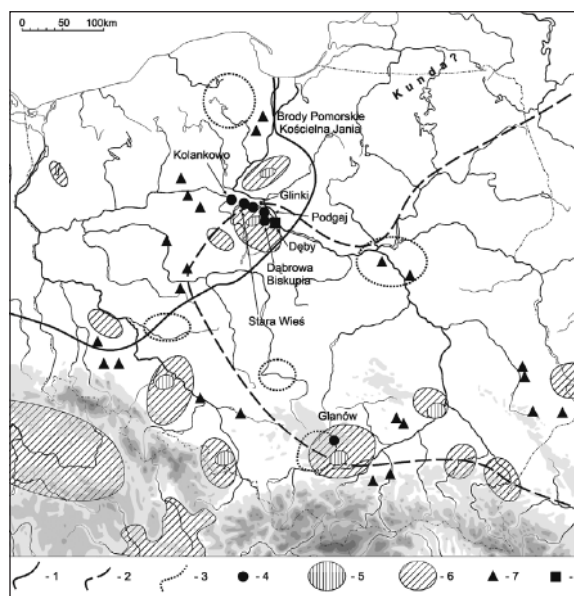
ed external ones. I took the liberty of calling these systems, both foreign and local, 'communicative communities' (*Verkehrsgemeinschaft*), using the term applied by a Polish philologist Ludwik Zabrocki (1963), whose work focused on German historical and geographical dialectology. It must be strongly stressed that his term is not, or in any case does not have to be, equivalent to a linguistic community.

*“It is not necessary for a communicative community to have at its disposal only one medium of communication. A communicative community may use various media of communication, that is various languages. (...) every linguistic community is or was also a communicative community, but not every communicative community is a linguistic community.”*

(Zabrocki 1963.27–28 translated by M. Kapera)

It appears that a communicative community may embrace a number, large or small, of linguistic communities. Basically, Zabrocki's approach pertained to the dimension of language, which is obviously connected with the fact that the quoted study discussed exclusively philological matters. However, it is my conviction that it is worthwhile transplanting the term 'communicative community' to other, non-linguistic fields (Parczewski 2000), although it remains debatable whether it should be actually linked with the traditional notion of archaeological culture. Such a correlation is problematic even due to the meanings embedded in material culture (Hodder 1992.12–14; 1995.16; Tilley 1999; Thomas 1996. 59). Yet this term should refer to the above mentioned system of circulating information, and strictly speaking to those parts of it whose meanings were understood and approved of (or perhaps also imposed on) particular people. It is to be concluded then that the term 'system of circulating information' is a more general one and, in a sense, more comprehensive than the term 'communicative community': thanks to circulating information, members of a community may become aware of things and behaviours which are not understood by them, the hidden meaning of which cannot be grasped by them. So, let me emphasise once again, a 'communicative community' would include this part of the system of circulating information that is understood and approved of, even subconsciously, as metaphorical meanings have to be taken into account, as well<sup>1</sup>. Usually the nature of the problem is concealed from us, and a given communicative community embraces a multitude of phenomena and meanings of various kinds. In the discussed period of time and area, there may have been very many such communities, not entirely overlapping from the point of view of chorology and chronology.

I will also argue that the communicative communities present in East-Central Europe between 6000



**Fig. 1. East-Central Europe from 6000 to 4800 BC. 1 – post-Maglemosian units, 2 – Janisławice Culture, 3 – the latest Komornica Culture, 4 – selected late Mesolithic sites, 5 – early phase of the Linear Band Pottery Culture (LBK), 6 – maximal extent of the concentrations of LBK sites, 7 – selected, single sites of the LBK, 8 – site of Dęby 29.**

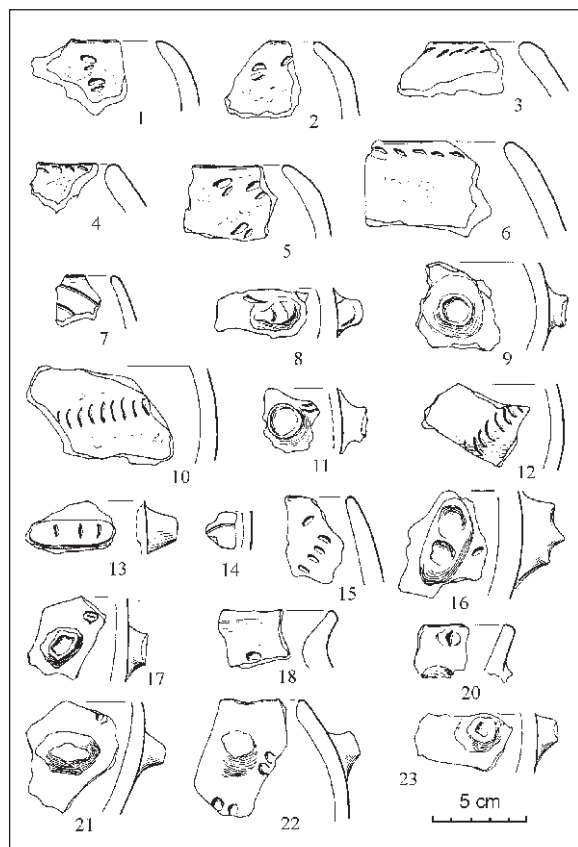
and 3000 BC, and that we can distinguish on the basis of the remains of their material culture, were not identical with genetic populations nor did they coincide with linguistic populations.

### From 6000 to 4800 BC

There are perhaps hundreds of Mesolithic sites, especially in northern and central Poland, that can be dated to the sixth millennium BC. They are grouped into two main divisions: the so-called Janisławice Culture and post-Maglemosian Complex (Fig. 1), comprising several smaller archaeological groupings. There are also relics of an older Duvensee archaeological tradition, which in Poland was distinguished as Komornica Culture (Galiński 2002; Kobusiewicz 1999; Kozłowski 1989; Kozłowski, Kozłowski 1986).

Whereas Neolithisation is the most important aspect here, one should also briefly mention the site of Dęby 29, in the region of Kuyavia (Fig. 1), which caused much controversy (Domańska 1989; 1990; 1998). In the fossil soil, under sand cover, numerous flints were found, as well as roughly two thousand animal bones. Among them, Lasota-Moskalewska

<sup>1</sup> Of course it is an open question whether such term is the most accurate, and reflects the essence of the problem. One can come across a variety of similar terms which in my view have approximately the same connotations: 'interaction sphere' (Caldwell, after Tabaczyński 2000.260), 'interpretative community' (Mamzer 2004.120–4), 'homologous lineages' (Shennan 2000.833), 'system of circulating cultural information' (Czebreszuk 2001.15), 'communication systems' (Raczky, Anders 2003.171).



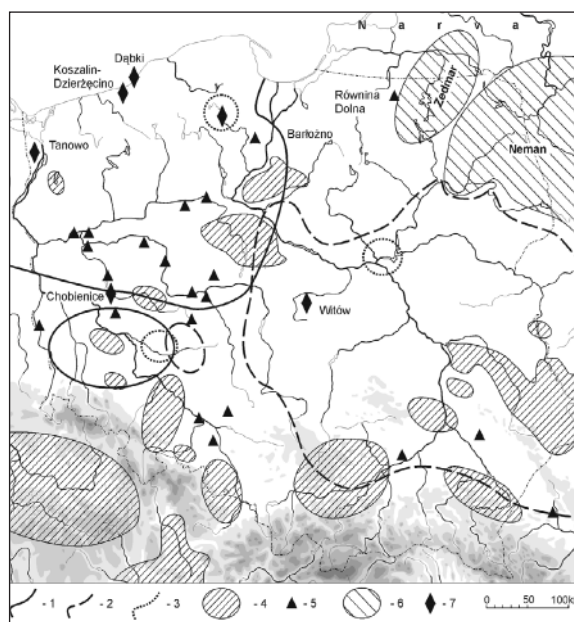
**Fig. 2. LBK-like pottery from the site of Podgaj 11 (Kuyavia, district Aleksandrów Kujawski); after Czerniak 1994.**

(1998) identified several tens as bones of domesticated animals. However, the site findings aroused an extremely lively discussion. Opponents argued that there was no proof of homogeneity of the fossil soil, and consequently, the bones of domesticates may have been an admixture from the humic soil. Besides, there were also some doubts as to whether the bones were actually from domesticated animals (Czerniak 1994.8–10; Kozłowski 1991; 1998; Niesiołowska-Śreniowska 1998b). To sum up, I would say that the site even to date is still open to interpretation. At the same time, it provides a good example of the serious problems involved in the homogeneity of sand sites.

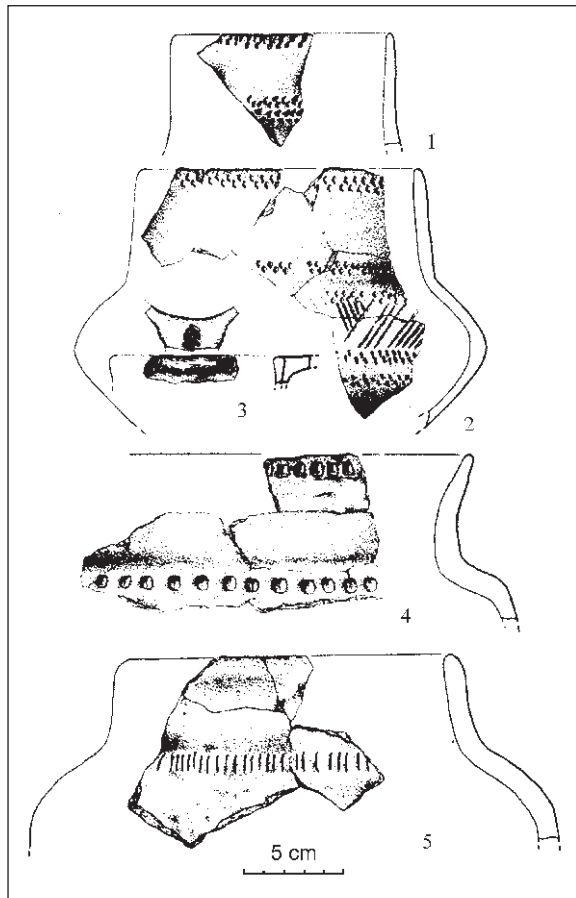
The first Neolithic sites in Poland (of Linear Band Pottery Culture, i.e. LBK) can be dated back to the beginning of the second half of the sixth millennium BC (Bogucki 2000; 2001; 2003; Czerniak 1994; Kulczycka-Leciejewiczowa 1988; 2000). They appear in southern Poland, as well as in the lowlands of Kuyavia and the Chełmno Land (Fig. 1). It is my belief, perhaps somewhat old-fashioned, that their appearance was a result of direct migrations by LBK farmers from the south, mainly from Moravia. From

54/53 centuries BC onwards, there was a considerable increase in the number of the LBK sites and of the LBK territorial range; however, the most of the sites were still concentrated within enclaves. All these enclaves comprise the most fertile soils. Certainly, there are also single sites of the LBK outside these enclaves, which reflect a relatively frequent penetration of less fertile areas in mountain, upland and lowland zones (Fig. 1). Very interesting in this respect are the recently discovered sites of this culture in Eastern Pomerania (Bojarski *et al.* 2001.56; Bokinić *et al.* 2003.36; 2004.30; Paner *et al.* 2003), e. g. Brody Pomorskie and Kościelna Jania (Paner 2001.40; Paner *et al.* 2004.25), because they belong to the northernmost sites of the LBK.

Equally interesting seem to be sites of the Podgaj 32 type that contain Mesolithic-like flint tools and LBK pottery, but only its coarse variety (Fig. 2) (Czerniak 1994.54–58; Domańska 2003). These sites are located on sands, yet on the outskirts of a central Kuyavian patch of black soils (Fig. 1). Generally speaking, in this case two interpretations are applicable: i) this was a Mesolithic group, with selected LBK pottery; ii) this was an LBK group, with Mesolithic flints. Consequently, I am of the opinion that in the case of Podgaj 32 sites, we are dealing with a



**Fig. 3. East-Central Europe from 4800 to 4000 BC. 1 – post-Maglemosian units, 2 – Janistawice Culture, 3 – the latest Komornica Culture, 4 – concentrations of post-LBK (Stroke Band Pottery Culture) and Lengyel-Polgar sites, 5 – selected, single sites of the post-LBK and Lengyel-Polgar complexes, 6 – para-Neolithic units, 7 – single sites with para-Neolithic pottery.**



**Fig. 4.** Post-LBK (?) pottery from the site of Równina Dolna (Warmia and Masuria, district Kętrzyn); after Rybicka, Wysocki 2004.

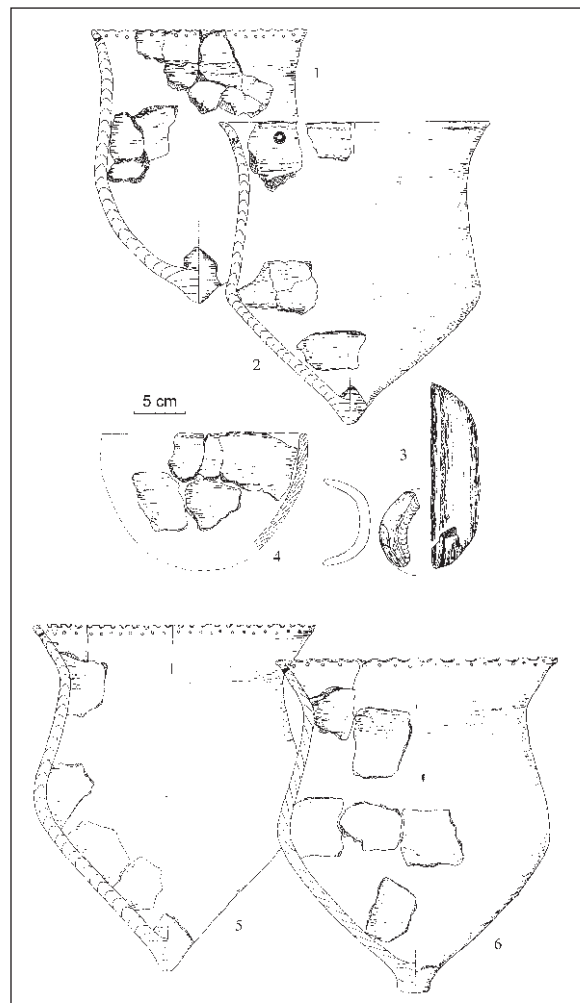
mixture of some foreign and local elements, irrespective of which interpretation is more probable.

Moreover, I would like to underline that there are a large number of Mesolithic sites that can be dated to the period between 5500 and 4800 BC (Bagniewski 1979; 1987; 1996; 1999; 2000; Kozłowski 1989; Kobusiewicz 1999), some of them either right within LBK enclaves or on their outskirts, like in the region of Kuyavia (Fig. 1) (Domańska 2003). One site of this kind is a recently excavated one at Głanów (Pazdur et al. 2005; Zajac 2001): a very large, multi-period settlement, actually located close to an LBK settlement area. The late Mesolithic phase of the settlement partly overlapped with the LBK.

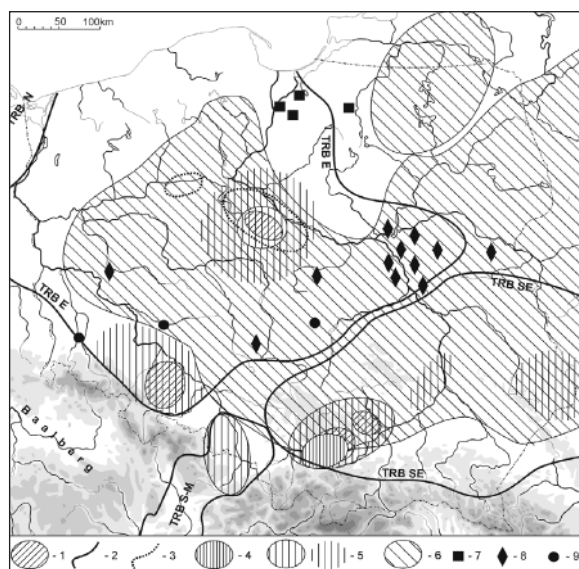
#### From 4800 to 4000 BC

When the LBK disappeared, the situation still remained bi-modal (Fig. 3). We have the same Mesolithic units, namely post-Maglemosian groups, including the so-called Bóbr group in Lower Silesia, Janisławice Culture, and the remnants of Komornica Cul-

ture (Bagniewski 1998; 2001; Kobusiewicz 1999; Kozłowski 1989). As regards Neolithic units, in theory, we have Stroke Band Pottery Culture in the aforementioned enclaves in western Poland and the Lengyel-Polgar Complex in south-eastern Poland. However, in practice, we observe very distinct stroke elements in the latter groups, as well as Lengyel-Polgar elements in a Stroke Band context (Czerniak 1994; Kaczanowska et al. 1986; Kaczanowska, Kozłowski 1994; Kadrow, Zakościelna 2000; Kamińska, Kozłowski 1990; Kirkowski 1994; Kozłowski 2004; Kulczycka-Leciejewiczowa 2002; Prus 1977). These phenomena sometimes lead to terminological disorientation. One of the suggested solutions to this problem was the term 'Late Band Pottery Culture', introduced and used by pre-historians of the Poznań school of Neolithic archaeology (Czerniak 1980; 1994). This term refers to lowland, post-LBK Neolithic communities, although the main reason it was introduced was a belief in the direct con-



**Fig. 5.** Para-Neolithic pottery from the site of Tanowo 3 (Western Pomerania, district Police; after Gałiński 1992).



**Fig. 6. East-Central Europe from 4000 to 3000 BC.** 1 – the latest Lengyel-Polgar groups, 2 – Eastern (TRB E), South-Eastern (SE TRB) and Silesian-Moravian (TRB S-M) groups of the Funnel Beaker Culture, 3 – initial stages of the Globular Amphorae Culture, 4 – Baden Culture, 5 – regions of the strong and weak Baden influences on later TRB, 6 – para-Neolithic units (Zedmar and Neman), 7 – para-Neolithic Comb Pottery Culture, 8 – selected sites with early Linin pottery, 9 – the latest Mesolithic sites, without pottery.

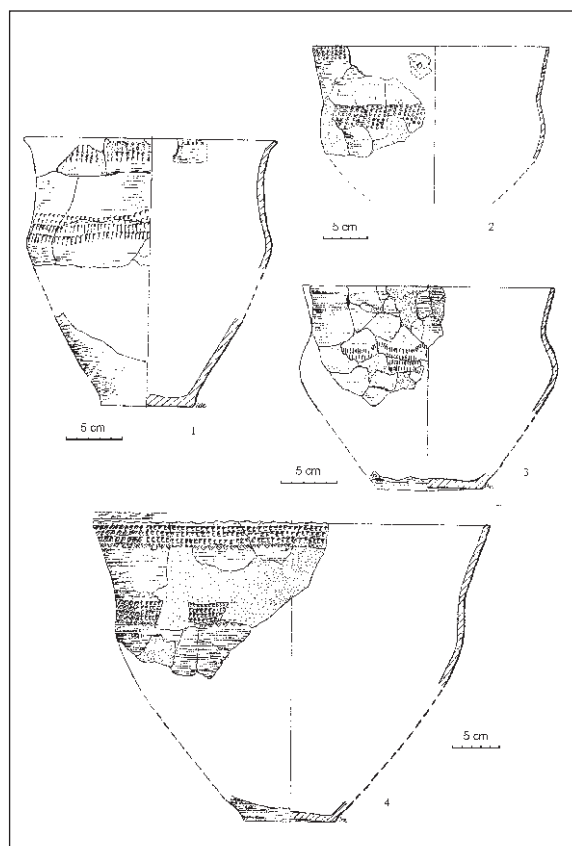
tinuity of the LBK and post-LBK developments in this zone. Luckily, after ca. 4500 BC, the situation becomes clearer, because Stroke Band Pottery ceased to exist, replaced by the Lengyel-Polgar. There are also single Neolithic, post-LBK sites outside early Neolithic enclaves (Bagniewski 2002; Bojarski et al. 2001.55; Felczak 1998; 2005; Jankowska 1999; 2001). Of particular interest in this case are the recently discovered northernmost sites at Barłożno (Paner 2001.38–42; Paner et al. 2004.22–24) and Równina Dolna (Fig. 4) (Rybicka, Rzepecki 2001; Rybicka, Wysocki 2004).

Most probably, in this period there appeared also groupings that can be included in the para-Neolithic formation, i.e. foraging populations that produced and used their own, unique pottery. They generally knew agriculture, but did not apply it in practice in any greater measure (Dolukhanov et al. 2005; Rimantiene 1992; Werbart 1998; Zvebil 1993). Referring to the “Polish” para-Neolithic in the fifth millennium, we can speak of the early stages of Neman Culture and Zedmar Culture (Fig. 3) (Gumiński 1998; 1999a; 2003b; Józwiak 2003; Kempisty 1986; Kempisty, Sulgostowska 1991; Kempisty, Więckowska 1983).

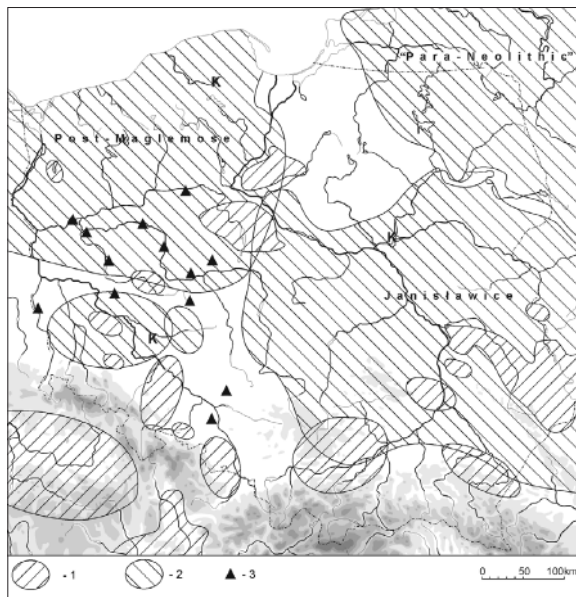
There are also single Mesolithic sites with pottery outside the scope of the aforementioned units dated to the period under consideration. Four of them (Dąbki, Koszalin-Dzierżęcino, Tanowo, Chobienice) contain pottery (Fig. 5) that is similar to the pottery of Ertebølle Culture (Galiński 1987; 1988; 1992; Ilkiewicz 1989; 1997; Kabaciński 2001; Kobusiewicz, Kabaciński 1998); therefore they are very often considered as the south-easternmost sites of this culture. As a matter of fact, they belong to Ertebølle Culture only as regards ceramics. The flint assemblages are of purely local, that is post-Maglemsian, type (*ibid.*). So, overall, we can again notice here a blend of local and foreign elements.

### From 4000 to 3000 BC

After ca. 4000 BC the situation changed significantly (Fig. 6). The Lengyel-Polgar tradition was gradually vanishing, whereas a new Neolithic unit had appeared: Funnel Beaker Culture (i.e. TRB) (Burchard et al. 1991; Czerniak et al. 1990; Midgley 1992; 2002). This unit is the first Neolithic phenomenon that was



**Fig. 7. Early Linin pottery (with TRB traits), from the territory of Masovia; after Kempisty 1972.1 – Dąbrowa (district Wołomin), 2 – Wiazowna (district Otwock), 3 – Grzegorzewo (district Wołomin), 4 – Działy Czarnowskie (district Wołomin).**



**Fig. 8. East-Central Europe from 6000 to 4000 BC; flint perspective. 1 - Early Neolithic flint industry (LBK, SBK and early Lengyel-Polgar), 2 - Late Mesolithic type of flint industry (late Mesolithic and para-Neolithic), 3 - selected, single Early Neolithic sites, K - the latest sites of the Komornica Culture.**

present literally everywhere, and not only within small enclaves (Kruk 1980; Kruk, Milisauskas 1999; Nowak 1993; 2001; Pelisiak 2003; Rybicka 2004). Therefore, we can consider the spread of this culture as the second stage of Neolithisation of East-Central Europe.

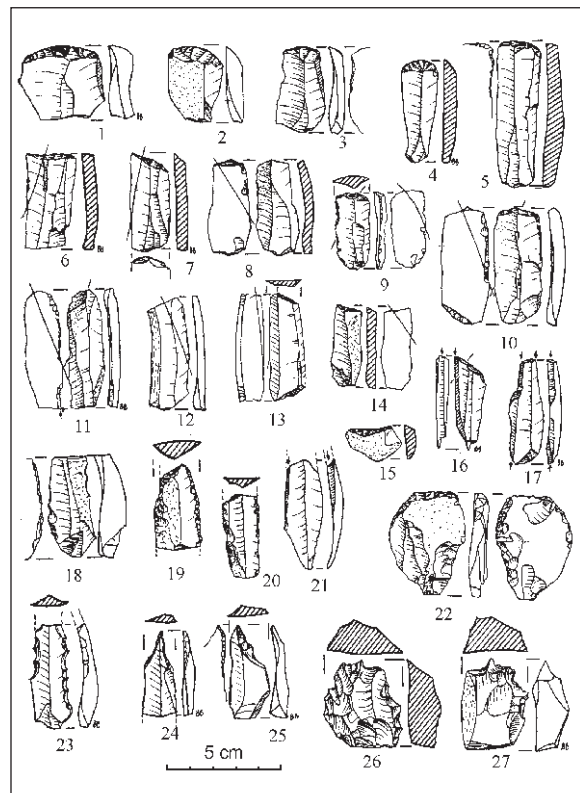
There are also differences between the spatial layout of the LBK, post-LBK and TRB in the aforementioned enclaves of early Neolithic settlement. Relatively few LBK and Lengyel-Polgar sites tend to be concentrated in clusters. As to TRB sites, there are much more of them, usually scattered throughout the area (Czeraniak 1994; Kruk et al. 1996; Milisauskas, Kruk 1984; Sosnowski 1994).

The genesis of the TRB is one of the most disputed and controversial issues in European prehistory (Bogucki 1996; 1998; Czeraniak 1994; Czeraniak, Koško 1993; Domańska 1995; Galiński 1991; Gebauer 1995; Jankowska, Wiślański 1991; Jennbert 1998; Keeley 1992; Kukawka 1997; Price 1996; Price, Gebauer, Keely 1995; Rzepecki 2004; Sherratt 1990; Whittle 1996.204-10; Wiślański 1979; Zvelebil 2001; Zvelebil, Dolukhanov 1991). Although many Polish archaeologists would surely argue against this statement, I think that we should seek the roots of 'Polish' TRB pottery outside, in Schleswig-Holstein and the area of the lower Elbe. This does not imply north-western migration, but a very extensive and relative

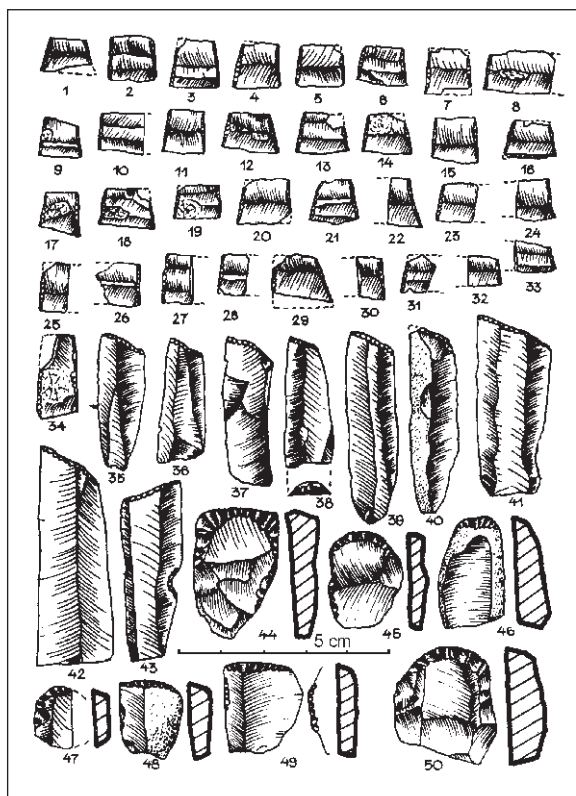
quick spread of a new ceramic fashion among both farming and foraging populations in East-Central Europe. Certainly, with time, 'Polish' TRB pottery acquired more and more unique features, as compared to pottery from the areas of primary origin. Thus the TRB in Poland, in its entirety, is in fact a combination of foreign patterns, as well as many local traditions in pottery-making.

At about 4500 BC, the last Lengyel-Polgar groups disappeared, but a new southern factor emerged, Baden Culture (Fig. 6). It was probably a result of direct migration from south-western Slovakia to Little Poland (the region of Kraków) (Zastawny 1999; 2000). Again, an intense process occurred through which Baden pottery stylistics were adopted by some TRB populations. This blend was very strong in western Little Poland (Kruk, Milisauskas 1983; 1990; 1999), Upper Silesia (Bukowska-Gedigowa 1980) and Kuyavia (Koško 1989; Wiślański 1979.194-197), and it is noticeable in some other regions, albeit in a weaker form.

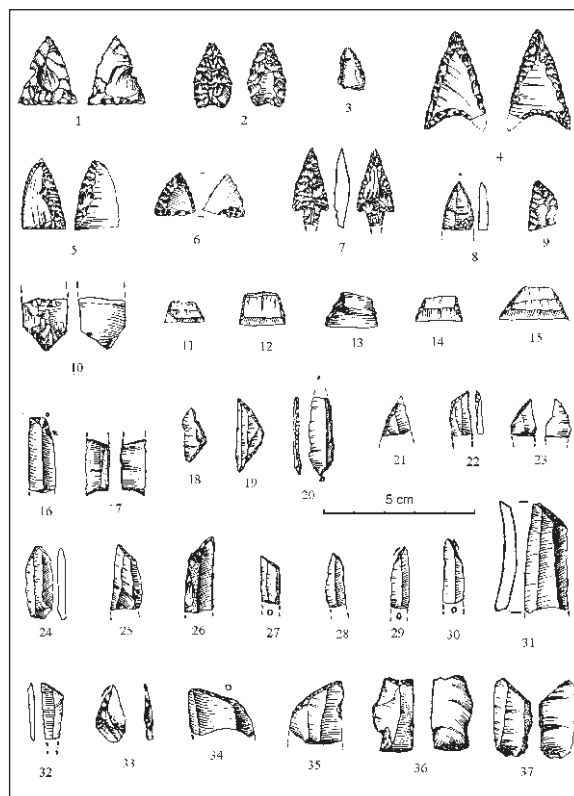
The mid-fourth millennium BC was also, in my opinion, the starting point of the next pottery style of local origin, that is Globular Amphorae Culture, although, according to Marzena Szmyt (1996), its beginnings are even earlier.



**Fig. 9. Flint tools of the LBK; after Balcer 1983.**



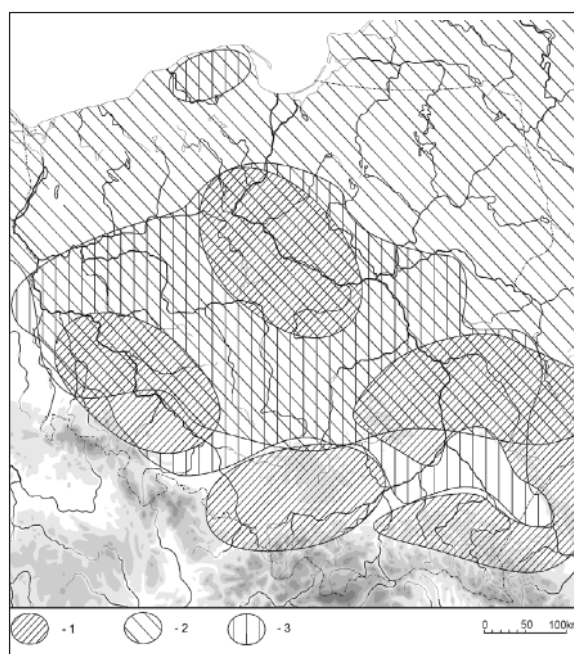
**Fig. 10.** Late Mesolithic flint tools from Dąbrowa Krępica (Lower Silesia, district Bolesławiec); after Bagniewski 1982.



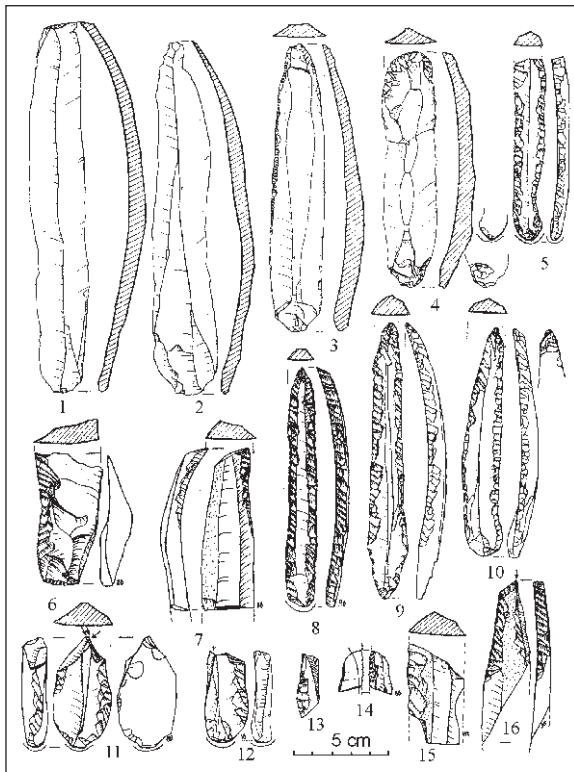
**Fig. 11.** Late Mesolithic (with para-Neolithic elements) flint tools from Sośnia (Podlasie, district Grajewo); after Kempisty, Więckowska 1983.

Another fascinating phenomenon is the widespread presence of para-Neolithic pottery in the basins of the Vistula and the Oder (Fig. 6). It is connected mainly with Neman Culture and Zedmar Culture and, to some extent, with Comb Pottery Culture (Cyrek 1990; Cyrek et al. 1985; Galiński 1991; Gumiński 1998; 1999a; 1999b; 2003a; 2003b; Józwiak 2003; Kempisty 1986; Kempisty, Sulgostowska 1991; Kempisty, Więckowska 1983; Kobusiewicz, Kabański 1993). In my opinion, pottery of this kind was taken by local Mesolithic communities from their eastern foraging neighbours and incorporated into their information system. Traces of possible eastern migrations can be seen only on the north-eastern fringes of today's Poland. To make the picture of the fourth millennium BC complete, it must be added that some Mesolithic sites that do not include pottery are radiocarbon-dated to that period (Fig. 6) (Bagniewski 1982; 1990; Niesiołowska-Śreniowska 1990; 1998a).

However, this is not the end of the story of mergers. There is also para-Neolithic pottery that contains some Neolithic, Funnel Beaker features, and perhaps also Globular Amphorae features (Figs. 6, 7). In Poland, pottery of this kind is respectively defined as



**Fig. 12.** East-Central Europe from 4000 to 3000 BC; flint perspective. 1 - 'macrolithic' Middle Neolithic flint industry (late Lengyel-Polgar and part of the TRB), 2 - 'Late Mesolithic' type of flint industry (the latest Mesolithic, para-Neolithic, and part of the TRB), 3 - Middle Neolithic flint industry based on local raw materials (part of the TRB).



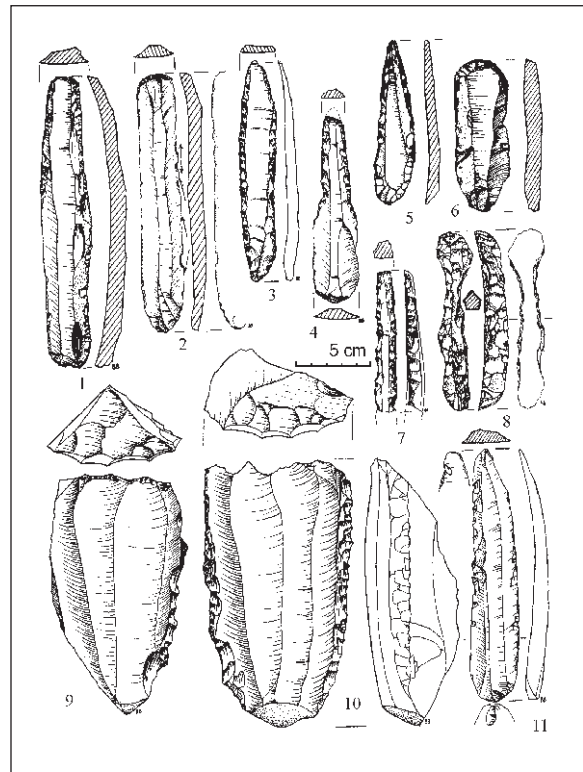
**Fig. 13. Late Lengyel-Polgar flint tools; after Balcer 1983.**

Linin types A and B, according to Elzbieta Kempisty (1986). In fact, the pottery of Zedmar Culture also displays distinct Neolithic characteristics, as claimed by Witold Gumiński (1999b; 2003b).

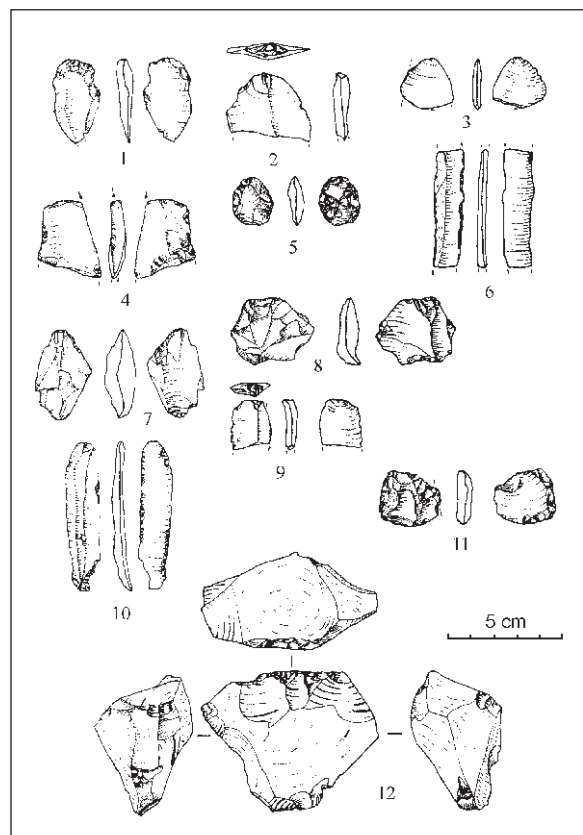
### Flint perspective

The previously presented transformations referred to traditional archaeological units; they were distinguished mainly on the basis of pottery in the Neolithic, and of flints in the Mesolithic. So, in my view, an inconsistency occurs here: flints did not dematerialize in the Neolithic period. Quite the contrary, flint working still flourished. Let us look then at the discussed period solely from a generalized flint perspective. The picture is different.

First of all, we have early Neolithic industry that joins LBK and early post-LBK units (Fig. 8), which Bogdan Balcer calls 'mediolithic' (Balcer 1983; 1988). This kind of industry is based on medium-sized blades, with end-scrapers, truncations, and borers as main tools (Fig. 9). On the other hand, in point of fact, there is only one important late Mesolithic industry with a highly unified character, with just a few regional modifications (Fig. 8). It contains primarily trapezes, long truncations, end-scrapers and side-scrapers as the main tool types (Fig. 10). Actually

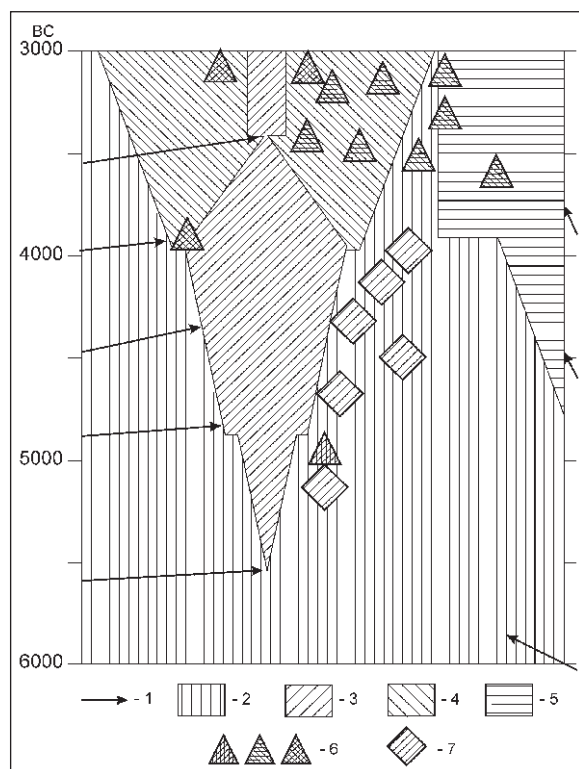


**Fig. 14. Macrolithic flint tools and cores of the TRB; after Balcer 1983.**



**Fig. 15. Flint industry based on local raw materials from site of the TRB at Kawczyce (Little Poland, district Busko-Zdrój); after Nowak 1994.**





**Fig. 16. Schematic view of the 'communicative communities' development in East-Central Europe from 6000 to 3000 BC. 1 - foreign migrations and stimuli, 2 - 'Mesolithic communicative community', 3 - 'Foreign Neolithic communicative community', 4 - 'Local Neolithic communicative community', 5 - 'Para-Neolithic communicative community', 6 - amalgamation of the elements of different 'communicative communities', 7 - 'Foreign Neolithic communicative community' outside its compact area.**

para-Neolithic flints in Poland are of the same kind, with only some specific tools, such as several types of points and some specific retouch techniques (Fig. 11).

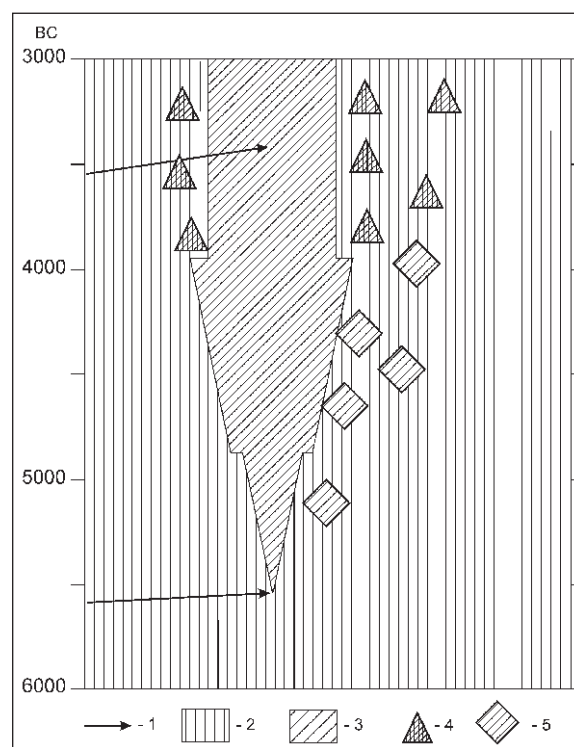
As to the Neolithic, the most important change took place in the middle of the fifth millennium BC as a result of contacts with Cucuteni-Trypole Culture (Fig. 12). Macrolithic industries, based on very long blades made of the best raw materials (Figs. 13, 14), appeared within later Lengyel-Polgar communities and this continued within the TRB (Budziszewski 2000; Balcer 1983; 1988; Matecka-Kukawka 1992; Zakoscielna 1996; 2000). However, this type of industry did not amount to the entire TRB Culture. Northern groups used late Mesolithic flints, just like para-Neolithic and the last Mesolithic groups (Fig. 12) (Domańska 1995; Jankowska 1990). To make the matter more complicated, we can discern a third type of flint manufacturing connected with some TRB groups. This industry is in a sense a little primitive. It is

based mainly on local raw materials; it uses splintered technique very frequently, so the blade blanks are mostly small and irregular (Jankowska 1980; Nowak 1994; Swiderski, Wierzbicki 1995; Wierzbicki 1992; 1999). I am not sure how we should label this kind of industry; the description 'based on local raw materials' seems to be the best solution at the moment.

## Conclusion

'Communicative communities' were units where information circulated without serious obstacles, and where the information package was accepted and understood consciously or even unconsciously. I think that in the period under discussion it is possible to discern at least four such units (Fig. 16).

The first should be called Mesolithic. The second I would call 'foreign Neolithic'; it appeared in the mid-sixth millennium, then gained in significance a little, but in the fourth millennium it declined considerably. The third is 'local Neolithic', which for me embraces most of the TRB. In my view, this community was the main local response to earlier foreign impul-



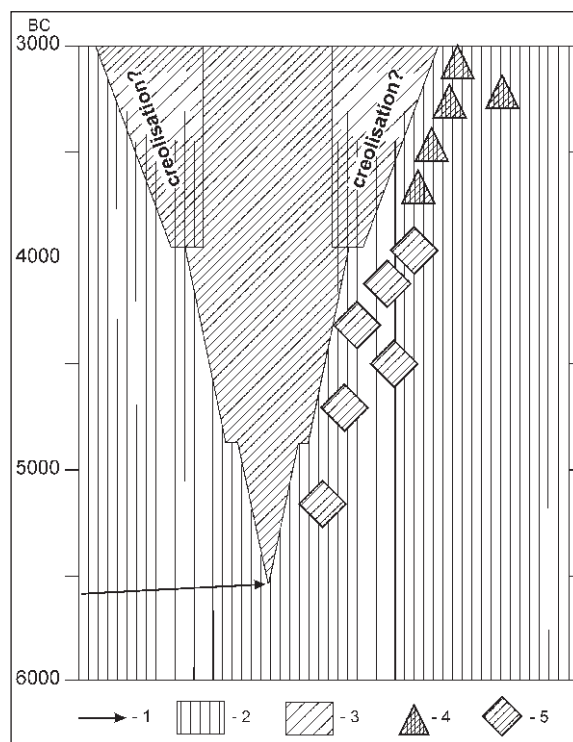
**Fig. 17. Schematic view of the genetic development in East-Central Europe from 6000 to 3000 BC. 1 - foreign migrations, 2 - 'local' genetic pool, 3 - 'foreign' genetic pool, 4 - amalgamation of the genetic pools, 5 - 'foreign' genetic pool outside its compact area.**

ses; so we can describe it not only as a second stage of Neolithisation, but also as its 'northern' version. Importantly, this was not the only version of 'northern' Neolithisation; there was also an alternative form, the para-Neolithic. It was also a reaction to foreign influences, but of a different kind: para-Neolithic groups used elements that did not originate in Neolithic agro-pastoral communities, but in foraging, east European ones, which mentally were perhaps much closer to 'our' foragers.

However, this picture does not correspond with the gene pools in the territories under discussion. Taking into account, *inter alia*, much less varied flint industries that I regard more resistant to the quick changes in fashion which are visible in pottery, I think that there were only two general genetic units (Fig. 17). From the very beginning of the Mesolithic, there existed a local gene pool. In the mid-sixth millennium, as a result of migration, a foreign one appeared, and grew in later periods, but never became predominant. In archaeological terms, this can be connected with the LBK, SBK, Lengyel-Polgar and with part of the TRB.

To proceed one step further, let us consider the linguistic situation (Fig. 18). The linguistic variety did not exactly mirror the genetic variety, i.e. the two basic gene pools. If we accept Marek Zvelebil's hypothesis about Creolisation (Zvelebil 1995), the range of influence of foreign languages must have been greater than the extent of the foreign gene pool. Strictly speaking, I would perceive the majority of TRB groups as affected by the Creolisation process.

Finally, it must be underlined that the date of 3000 BC is not the absolute time limit for the existence of foraging people in Polish territories. Their existence



**Fig. 18. Schematic view of the language development in East-Central Europe from 6000 to 3000 BC. 1 – foreign migrations, 2 – 'local' languages, 3 – 'foreign' languages (Indo-European ?), 4 – amalgamation of different languages, 5 – 'foreign' languages outside its compact area.**

in the region ended owing to equally complicated transformations in the third millennium BC, and during the early Bronze Age.

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