

MAŁGORZATA KACZANOWSKA,
JANUSZ K. KOZŁOWSKI

»BARBOTINO« (STARČEVO—KÖRÖS) AND
LINEAR COMPLEX: EVOLUTION OR
INDEPENDENT DEVELOPMENT OF LITHIC
INDUSTRIES?

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Dr. Małgorzata Kaczanowska —
dr. Janusz K. Kozłowski
31-007 Kraków/Polska
Muzeum Archeologiczne; Uniwersytet
Jagiellonski, Instytut Archeologii

The genesis of linear complex is of topmost importance for the resolving of the problem of neolithization of Central Europe. The above mentioned problem is here treated on the basis of lithic inventories. Lithic industry of Alföld and East Slovakia linear circle leans on the Starčevo—Körös complex, and appears to be its continuation, both typologically and technologically. It is therefore possible to consider east linear ceramics as a later phase of »barbotino« complex. However, it is much more difficult to trace the origin of west linear complex. In its older phase it is quite different from »barbotino« circle, but is very similar to Vinča group from its middle phase. Although it does not explain the genesis of west linear complex, it is at least indisputable that from the middle phase it stands under strong Vinča influence.

1. Hypotheses concerning the genesis of the linear complex

1.1. Eastern linear complex

For many years, beginning with the work by F. Tompa (1929), the eastern linear complex remained in the background of the fairly well known Bükk culture, although already at that time the fact was realized that the classical Bükk culture was preceded by the »Proto-Bükk« phase later identified with the linear ceramics of Alföld (Great Hungarian Plain). With the passage of time the notion of »Alföld Linear Ceramics« was broadened, until in their last monograph N. Kalicz and J. Malkay (1977) endowed the notion with a primary taxonomic significance to comprise all the cultures of the Tisza basin which developed in the Early Neolithic, basically following the Körös culture but before the Theiss culture. The characteristic feature of all these

units is the occurrence of ceramics decorated with linear ornamentation straight and curved. N. Kalicz and J. Makkay assumed the following model of progressing territorial differentiation with the evolution of the unit: following the initial phase of the development of the Szatmar group which preceded the older phase of the eastern linear ceramics, we have to do with the line of development leading through the Tiszadob group to the late linear Bükk group, and with local groups of the late phase of linear ceramics whose affiliation has not been unquestionably established, such as the groups Esztar, Szilmege and Szákálhat.

Investigations into eastern linear groups are impeded by the fact that the area of the upper Tisza basin is divided by contemporary political borders between Hungary, Slovakia, Rumania and the USSR. In each of these countries the unit under discussion was investigated independently, different terminology was used. The outcome of this situation is that we are still wanting a uniform taxonomic system based on the same criteria of classification.

The views of Slovak investigators were biased by erroneous conceptions of J. Lichardus about the proto-linear phase of the Michalovce-Hrádok type (1972), in fact connected with the developed stage of the eastern linear ceramics, also by excessively detailed — without sufficient reason — inner chronological classification of linear ceramics (8 chronological horizons ascribed to 4 phases). Propositions put forward by S. Šiška (1979) can be regarded as equivalent to the Hungarian model of the development of linear ceramics, although the taxonomic level of particular units is different and two distinct lines of evolution are apparent. Šiška singled out from the linear complex the Bükk culture giving it the standing of a separate culture, while from the older phase of linear ceramics (referred to as eastern-Slovakian which corresponds precisely to the Alföld linear ceramics according to Hungarian scholars) of type Barca III he derives the development of the Tiszadob-Kapušany group, and from the east Slovakian Kopčany group with black-painted ceramics he traces the origins of Raškovce group (identified with Satoraljaujhely group which had been isolated earlier) also with blackpainted ceramics. In S. Šiška's system the position is not quite clear of the so-called Gemer type from the caves of the East-Slovakian Karst. The Bükk culture is, in Šiška's opinion, later than linear ceramics proper and in this he differed from both Hungarian investigators as well as J. Lichardus who assumed totally parallel development of the Tiszadob-Kapušany group and the Bükk culture.

The polyphyletic model of the evolution of the linear complex adopted by Kalicz and Makkay as well as the parallelistic hypothesis of S. Šiška induce, as regards the genesis of the complex, the admission of affiliation with the Körös culture. Hungarian authors hold that the basic cause of the transformation of the Körös culture after it had encroached upon the territories situated north of the line Tiszafüred-Berettyóújfalú, was the contact with the local Mesolithic groups supposedly represented by the so-called Eger culture (Grobgerätiges Mesolithikum). The hypothesis, however, has always remained within the sphere of

more theoretical assumptions rather than analysis of archeological materials, particularly since none of the investigators has yet analysed lithic materials from the linear complex. Moreover, the hypothesis about the existence of flake mesolithic industries with bifacially retouched tools (leaf-points) has in recent years been considerably undermined, and the results of the studies by L. Vértes (1965) and V. Tolnai-Dobosi (1972) have been subject to criticism.

In such a situation the problem of the genesis of the eastern linear complex must be posed afresh and calls for detailed analysis on the basis of the development of lithic inventories. When we look at the problem, just as it has been done up till now, exclusively from the point of view of ceramic forms, the following facts can be ascertained:

1. Szatmar group representing the oldest phase of linear ceramics concentrates in the Tisza basin, north of the line Tiszafüred—Debrecen, thus, to the north of the compact settlement of the Körös culture.

2. In the territory of the upper Tisza basin single assemblages are known of the Méhtelek type (also known from the adjacent part of Rumania and trans-Carpathian Ukraine) which constitute a peripheral variety of the Körös culture displaying features more Transylvanian (in ceramics and ornamentation) than of Alföld area.

3. There is unquestionable similarity between assemblages of the Szatmar group and those of the Méhtelek type in respect to both vessel forms and ornamentation. The similarity is manifested first of all in the occurrence in the two units of finger-nail ornamentation, impressed and in relief, also, to some extent black paint. But in assemblages of the Méhtelek type, however, linear incised ornamentation with angle motifs is missing which occurs in the Szatmar group.

4. Of course, we cannot overlook the fact that some of the elements of forms and ornamentation of ceramics characteristic for the Szatmar group may have originated from the Körös culture of the Great Hungarian Plain (Alföld).

The facts which have been summarily presented above, and whose documentation goes beyond the scope of the present paper, prompt us to put forward the following hypothesis about the genesis of the eastern linear ceramics:

1. Beyond the northern border of compact settlement of the Körös culture on the territory of the Tisza basin (Alföld) found their way only relatively few assemblages, probably of Transylvanian origin, therefore from the south-east and not from the south.

2. On this territory, through gradual transformation, the Szatmar group was formed, and then the groups of the older eastern linear ceramics of the Barca III and Kopčany type. The transformation of Körös culture assemblages consists in the introduction of linear incised motifs into ceramic ornamentation. The remaining features such as first of all the set of ceramic forms and many ornamentational motifs, do not display rapid changes. To evaluate the extent of the transformation statistical investigations are imperative and establishment of seriation elements in assemblages.

3. The basic motif of the transformation is not, however, the stylistic change mentioned above, which is merely its external manifestation, but the more essential changes in other elements of the cultural system brought about as a result of adaptation of the system of the Early Neolithic Körös—Starčevo complex to conditions of life in ecologically different, and above all more wooded, sub-Carpathian zone to which the upper section of the Tisza basin belongs.

4. The transformation of the cultural system was not, however, as deep in the eastern linear complex as it was in the western linear system. This is reflected in

a) the absence of any essential changes in the system of settling the area and type of settlement structures,

b) absence of essential changes, as we shall demonstrate further on, in chipped and polished lithic industries,

c) the occurrence of more ceramic elements linking the eastern linear complex with the Körös culture.

5. Owing to a poor degree of transformation of the whole cultural system, the population of the eastern linear complex was not capable of conquering the territories on the other side of the Carpathians nor any other areas with different and more varied elements of natural environment.

From the point of view of chronology the transformation took place within a comparatively short time-span as it is shown by radiocarbon dating. Dates for the Méhtelek type range from 4885 ± 60 b. c. and 4675 ± 50 b. c. while the older phase of linear ceramics is dated at Kopčany at 4470 ± 60 b. c., and the younger phase within 4490 (Korlat) and 4230 (Ostoros) as indicated by the dates obtained so far for the Tiszadob group, and 4318 (Devavanya) and 4170 (Tamazsady) for the Szakalhat group.

The development of the Szatmar group should therefore fall at the radiocarbon period from 4600 to 4500 b. c., which corresponds still to the period of development of the Körös culture (radiocarbon dates from Devavanya and Deszk between 4655 and 4420 years b. c.), and possibly, to the very beginning of the Vinča culture (radiocarbon dating — 4510 for Oszentivan VIII), i. e. to the units which, as we shall show, are partly contemporaneous. Such a situation would mean that the Szatmar group was contemporaneous with the western linear ceramics although there are no radiocarbon dates for the oldest parts of this complex.

Other elements to synchronize later phases in the evolution of the eastern linear complex are provided by the occurrence of imports of eastern linear ceramics in Vinča; they are stratified at the level of 8.3 m in the form of fragments bearing linear ornamentation of the older phase (resembling type Barca III), and then at the level of 7.3 m as sherds affiliated to the early Bükk group, and finally at the level of 6.6 m to 6.0 m as sherds representing Szakalhat style. All this would indicate that, basically, the whole development of the eastern linear ceramics, except for the Szatmar group, should be synchronous with the Vinča B1 and B2 phase.

1.2. Western linear complex

The formation of the Linear Pottery culture is one of the most mysterious processes in the Neolithic. To elucidate its genesis would at the same time — for many areas — constitute the explanation of the neolithization process.

The Linear Pottery appears in the territory of Central Europe as a culture already shaped, fully adapted to the Neolithic economy. Intangibility of the process of its formation and the fact that it is diametrically different from the poorly investigated Mesolithic base in the Carpathian Basin caused its appearance to be interpreted as the outcome of migration from the south.

Now the migration theory has been abandoned by investigators in favour of the theory about the autochthonous origin of this culture. Its protagonists are mainly investigators from Czechoslovakia and Hungary — the countries where numerous traces of settlement have been found connected with the oldest phases of the Linear Pottery culture. The theory maintains that the Linear Pottery culture developed on the territories of Transdanubia and Western Slovakia, partly also in Lower Austria and Burgenland, under the influence of impulses from the south. Moravia constitutes a separate cultural province. The autochthonistic theory basically admits of the possibility that small population groups shifted from the south and were then assimilated by the local base. Investigators who accept the hypothesis about the autochthonous genesis of the Linear Pottery culture differ on three points, namely:

1. Dating of the beginnings of neolithization of the western part of the Carpathian Basin.
2. Location of the genetic area of the Linear Pottery culture.
3. Identification of the centre which exerting influence on the local Mesolithic population induced its neolithization.

Investigators emphasize the links of the neolithization process in Central Europe with the Starčevo—Körös complex, generally assuming that the beginnings of the Linear Pottery culture fall at the later stages of this complex.

H. Quitta (1960, 1964) holds that the birth of the Linear Band Pottery culture must have taken place in the Starčevo III phase (acc. to D. Arandelović-Garašanin 1954). The process is analogous to the origins of the Vinča culture. Assuming that the beginnings of the Linear Pottery culture fall at the same chronological horizon N. Kalicz (1980) expresses his views more cautiously admitting of two possibilities: providing the earliest phases of the Linear Pottery culture developed on the territories taken up by the Starčevo culture, they cannot be older than the close of Starčevo, if, however, its original cradle was situated outside the range of the Starčevo complex, then the definition of mutual inter-relations becomes much more difficult.

R. Tichý (1960) places the date of the beginnings of the Linear Pottery culture much earlier maintaining that they fall at the period of Starčevo II. J. Pavúk (1976, 1980) assumes the existence of gradual changes, imperceptible at the moment in the mesolithic cultural units of Transdanubia and Western Slovakia, which led to neolithization of these territories. The process may have been long, but the beginnings of the formation of the Linear Pottery culture would have to fall at the linear phase B acc. to Dimitrijević (1974), which would correspond to the beginning of phase II according to Garašanin.

Such early dating of the beginnings of the Linear Pottery culture is not, according to Kalicz, corroborated by the evidence of archeological material. Kalicz points out to the presence in the oldest inventories known from Transdanubia, of elements bearing out the influence of the Vinča culture, mainly in the form of so-called »einpolierter Muster«. Assuming links of this type of pottery decoration and the Vinča culture — or, in fact, its oldest phase, J. Pavúk (1980) claims that it occurs only in the Biňa phase which may be synchronized with Vinča A₁. He also dates for this phase the Transdanubian materials from Medina and Bicske, and ascertains the existence in western Slovakia of two older phases, namely: Nitra and Hurbanovo. New materials from Transdanubia permit, in Kalicz's view, to make the chronology of the Linear Pottery culture more precise. In the light of most recent investigations the northern borders of the Starčevo culture should be moved to the north. At the same time, on this territory new sites were discovered connected with the earliest phase of the Linear Pottery culture (among others Becsehely). In the light of hitherto conducted investigations there are no grounds, as Kalicz maintains, to suppose that these inventories are later than materials from western Slovakia. Some minor dissimilarities the author puts down to territorial differentiation of the culture and does not ascribe to them any significance as chronological pointers. Since there is a zone in southern Transdanubia where the range of the earliest Linear Pottery culture and the latest Starčevo materials overlap, thus, says Kalicz, the possibility of synchronous evolution of these two cultures must be excluded.

The Starčevo culture is unquestionably older, therefore the development of the Linear Pottery culture could take place only at the close of the time of the Starčevo—Körös complex at the earliest. N. Kalicz precludes the existence on the territory of western Slovakia and Transdanubia of the pre-ceramic Neolithic whose hypothetical presence is suggested in some of his studies by J. Pavúk (1979 — discussion). This would constitute the stage to fill the hiatus between the Mesolithic and fully developed, palpable, Linear Band Pottery culture. The problem requires elucidation through further research.

There is a much greater uniformity of views among authors as to the area of final crystallization of the culture. The original cradle of the Linear Pottery culture is placed northmost by H. Quitta (1960, 1964) on the territory of Moravia and Lower Austria. J. Pavúk (1980) claims that it developed in south-western Slovakia and the adjacent part of Transdanubia, possibly also in Lower Austria and Burgenland. Al-

though the author stressed the separate territorial character of Moravia, yet we should be included in the area since materials from Žopy and Ujezd—Žadlovce and from Vitovice can be dated for the Nitra phase. Other areas, including Germany, Bohemia, Silesia and Little Poland, where the presence has been recorded of the latest Linear Pottery culture, were probably colonized relatively early, for already in the Biňa phase. N. Kalicz assumes its evolution to have taken place on the area similar to that proposed by Pavúk, but in the light of recent investigations he extends the area by southern Transdanubia.

Basically, all authors, both the adherents of the autochthonistic as well as of the migration theory of the evolution of the Linear Pottery culture, emphasized the links of the earliest phases of this culture and the Starčevo—Körös culture.

More recent investigations into the Balkan Neolithic enabled to identify similarities not only to the Starčevo—Körös complex or early phases of the Vinča culture, but also broader influence of the Balkan—Anatolian complex manifested mainly in various trends in ceramic decoration (e. g. »eimpolienten Muster« and barbotino decoration, spiral and meander motifs), in the shapes of vessels (occurrence of biconical forms), and in the technology of production (firing in the reducing atmosphere).

The genesis of the Linear Pottery culture and conspicuous, in its latest phases, influence of the Vinča culture are connected with yet another unresolved problem i. e. the formation and dating of the Vinča culture. Synchronousness of the earliest phases of the Vinča culture and the later phases of the Starčevo has been accepted in the literature for a long time now (V. Milošević 1949, M. Garašanin 1951, D. Arandjelović-Garašanin 1954, S. Dimitrijević 1974), but not without reservations on the part of the authors (J. Pavúk 1980). According to Z. Letica (1968) in Vinča itself a hiatus can be observed between Starčevo layers and Vinča layers. Yugoslavian archeologists (M. Garašanin 1979) are inclined to believe that the earliest materials of the Vinča culture originate from Transylvania. Inventories older than those which come from Vinča, were recorded by G. Lazarovici at site Gornea (1977). The possibility to lower the bottom chronological boundary of the Vinča culture, whose influence appears, according to J. Pavúk only in the middle phase of the older Linear Pottery culture, makes it feasible to lower the age of the Linear Pottery culture itself.

To clear up the genesis and relative and absolute chronology of the two cultures calls, however, for new investigations.

2. Definition of lithic industry of the Starčevo and Körös cultures

The model of chipped stone industry of the Starčevo culture has been relatively well defined, particularly in reference to the monochromic phase. The definition of the model is based on the comparatively rich series of artefacts from Anzabegovo (M. Gimbutas 1976, E. Elster 1976, 1977) and from Lepenski Vir III (D. Srejović 1969, J. K. Kozłowski, S. K. Kozłowski 1983). Thus, we may say with all certainty

that in this industry blade technique is predominant based on the well-prepared single-platform core from which blades were obtained of average length in Anzabegovo (layer III) up to 3.96 cm, and in Lepenski Vir (layer III) up to 6.46 cm. In both inventories numerically blades prevail whose length ranges from 3.5 to 5.5 cm.

The structure of lithic inventory points out to a clear ascendancy of retouched blades, while retouched flakes and end-scrapers come next:

	Anzabegovo I	Anzabegovo II—III	Lepenski Vir III
End-scrapers	5	39	7
Truncations	—	—	3
Perforators	2	9	1
Retouched blades	6	71	13
Notched and denticulated tools	—	—	3
Retouched flakes and side-scrapers	4	41	4
Core tranchets	—	—	1
Others	1	17	—
Total	18	177	32

Subsequent to this early period we can observe a divergent character of the evolution of lithic inventories: on one hand we are dealing with the continuation of the development of the model known from the early (monochromic) phase of the Starčevo culture, for which predominance of retouched blades and retouched flakes, also end-scrapers is a distinctive feature. This structure occurs at the majority of site of the late phase of the Starčevo culture such as e. g. Golokut in northern Yugoslavia (J. Petrović 1973, 1976, 1978, J. K. Kozłowski 1982). However, we find that at these sites flint artefacts (or from similar raw materials) became impoverished as regards quantity; this was probably caused by the fact that raw material deposits were accessible with difficulty, and that most areas were only unsystematically supplied with flint raw materials. On the other hand, we notice that the population of the Starčevo—Körös complex, especially after their passage into the territory of the Hungarian Plain, showed preference for wax-like flint originating from the deposits in the Balkan Platform. On the sites of the Körös culture located in the Hungarian Plain, which are as a rule poor in flint artefacts, the Balkan flint still occurs in the form of imported long blades (e. g. in the vicinity of Szarvas — J. K. Kozłowski 1982). Just how thriftily was this material used shows an interesting hoard discovered in a Körös culture vessel at site Endröd 32 consisting almost entirely of waste from core processing of a small number of blade cores (M. Kaczanowska, J. K. Kozłowski, J. Malkay 1981).

In the period under discussion, parallel to the traditional model of lithic industry of the Starčevo and Körös cultures, we can record the

appearance of another type of structure of stone assemblages. The structure is known mainly from Cuina Turcului Layers I—III in the Rumanian part of the Iron Gate (A. Păunescu 1970), Ostrovu Golu in Rumanian Banat (P. Roman, V. Boroneaț 1974), and from the site, farthest north, of the Körös-Méhtelek culture on the Upper Tisza (N. Kalicz, J. Makkay 1974). All these assemblages are characterized by a smaller proportion of retouched blades, while the share of geometric microliths (first of all trapezes) and truncations conspicuously increases:

CUINA TURCULUI, LAYERS:

	I	II	III	Méhtelek
Endscrapers	4	5	4	11
Truncations	12	13	11	27
Perforators	1	2	2	4
Retouched blades	70	56	47	39
Notched and denticulated tools	25	23	17	7
Retouched flakes and side-scrapers	—	—	—	28
Core tranchets	—	—	—	1
Burins	2	1	—	4
Microliths (mainly trapezes)	62	41	17	24
Splintered pieces	17	11	6	—
Total	195	152	106	149

Alongside the different structure of retouched implements also less painstaking preparation of cores is apparent, smaller dimensions of blades and less careful selection of raw material (in the case of Cuina Turcului), or the switch to local raw materials of the northern part of the Carpathian Basin (obsidian prevailing in Méhtelek). It should be stressed, however, that inventories of the type Cuina Turcului—Méhtelek contain as well single imported blades or blade implements made from wax-like flint originating from the Pre-Balkan Platform.

It is difficult to ascertain what were the reasons for the divergent development of lithic industry of the Starčevo—Körös complex. Two hypotheses can be formulated:

1. such development was the result of local adaptation to conditions enforcing a more important role of hunting, which — in turn — required a larger participation of geometric microliths (providing they were arrowheads). If this were the case then assemblages of the Cuina Turcului—Méhtelek type should be characterized by a smaller ratio of domestic breeds in the fauna. This, however, is not always a rule, though in the Körös complex strong fluctuations can be observed of the ratio of domesticated animals (S. Bökönyi 1974).

2. such development was the result of assimilation of the local Pre-Neolithic base, i. e. above all Late Mesolithic blade industries with trapezes. This hypothesis is difficult to verify, for although indeed assemblages with trapezes are encountered in this part of Central Europe, yet in the assemblages, trapezes together with irregular scrapers

constitute the only retouched implements. Thus, they could not act to produce modification of other elements of the Starčevo lithic inventory.

At the moment we do not have objective data to verify the hypotheses proposed above. They are antithetical only seemingly, because, in effect, the influence of the mesolithic base had to lead, in its consequence, to the increase of the role of hunting economy.

3. Characterization of lithic industry of the eastern Linear Pottery

Regretfully, relatively scant data are available to characterize lithic industry of the Szatmar group. A not particularly numerous assemblage of artefacts published by Titov (1980, fig. 63) from site Nagyecsed-Péterzug shows that obsidian was used as basic raw material. Among retouched implements blades with marginal retouch occur predominantly, while retouching is discontinuous and occurs both on the ventral and on the dorsal side. It can be either flat marginal or semi-steep. Next to retouched blades, flake end-scrapers and notched blades are recorded.

The later phase of the Linear Pottery can be described on the basis of Slovakian materials from sites Kopčany and Čečejevce. In both cases we have to do with sites where obsidian was used to a considerable extent (particularly in Kopčany — 97.6%), next to which radiolarite-like silicious rock occurs in Čečejevce (41.6%). At both sites there is ample evidence of local stone processing (particularly high proportion of flakes in Čečejevce — 63.8%, and a smaller ratio of retouched implements — 14.5%; in Kopčany the proportions are opposite — there are more retouched tools: 24.5%, and fewer debitage — 39.8%).

The two instances represent a developed blade technique based on the single-platform core: blade blanks were obtained of average length ca 3.8 and 4.2 cm, which was probably limited by the size of nodules. In Kopčany, however, the presence has been recorded of both the group of longer blades (5—7.5 cm) and the group of blades less than 3.0 cm long.

The structure of retouched implements, supplemented with the inventory of site Berea in north-west Rumania, is as follows:

	Number in %		
	Kopčany	Čečejevce	Berea
End-scrapers	12.3	22.4	1.7
Burins	7.1	3.4	0.8
Truncations	11.1	12.1	—
Retouched blades	43.2	19.0	54.7
Perforators	2.5	8.6	0.8
Microliths	1.2	1.7	9.4
Retouched flakes	7.4	8.6	—
Notched tools	8.6	—	20.5
Denticulated tools	3.7	20.7	—
Others	2.5	3.4	—
Total number	81	58	117

When we look at this typological composition, we find that basically all the groups which occur in the Cuina Turcului—Méhtelek type of the lithic industry of the Starčevo—Körös culture are present. The differences concern the frequency of some typological groups, namely: smaller proportion of geometric microliths (but represented exclusively by trapezes), a somewhat smaller proportion of retouched flakes (but compensated by denticulated specimens), and a slightly smaller proportion of truncations. Other differences pertain to only one of the discussed sites of the eastern Linear Pottery and might have been the effect of the chronological seriation process taking place between these sites. It appears, though, that the principal tool groups such as retouched blades, truncations and retouched flakes point out to the continuation of development between the Cuina Turcului-Méhtelek group and the inventories of the eastern Linear Pottery.

To demonstrate the continuation a number of technical and stylistic details connected with retouched implements are of vital importance. To such details belong:

1. Similarity of retouch on retouched blades, which is usually discontinuous, semi-steep or flat, ventral or dorsal. Also blades with notched retouch are found.

2. Similar structure of end-scrapers, and predominance of fairly short examples on blades, frequently with weakly convex fronts.

3. Similar method of producing trapezes, mostly by breaking off the blades at the lateral retouched notch, but without applying the microburin technique.

4. Occurrence in both units of characteristic truncations, slightly concave, retouched on the ventral side, truncations resembling the Kostienki type, and blades with the tip formed similarly as in chamfred pieces.

Such a conspicuous similarity of general structure (despite fluctuations of numerical indexes — we should bear in mind that the analysed series of retouched tools were not numerically strong), moreover, the coincidence of many stylistic elements and technical details, are indicative, with a high degree of probability, of genetic affiliation between lithic industry of the Cuina Turcului-Méhtelek group and the industry of the eastern Linear Pottery.

Taking into account lithic artefacts from sites of the later phase of the eastern Linear Pottery such as Prešov-Sarisske Louky, Tizsáscege-Homogbanya, Satoralyaújhely and others, we may assume that this industry does not display more distinct changes with the progress of the evolution of the Linear Pottery culture. Still later assemblages of the Bükk group are an exception being distinctly linked with the western linear complex.

4. The earliest phase of the western linear complex

Almost no lithic artefacts are known from the territory where the earliest phase of the western linear complex evolved, i. e. from the

territory of Transdanubia and south-western Slovakia. At sites such as Hurbanovo, Nitra, Milanovce, Biňa there were practically no chipped stone artefacts. This situation can be accounted for by the fact that the population of the earliest phase of the Linear Pottery culture moved into the area where flint deposits and sources of similar silicious rocks were rather poor, and a considerable time had to elapse before the non-autochthonous people acquainted themselves with local raw materials. A hypothesis is also plausible about the specific features of the early phase of the Linear Pottery culture when functions of stone tools were performed by specimens made of organic raw materials. Both hypotheses lead to the conclusion that the population of the Linear Pottery culture was allochthonous in its nature, further there were no contacts in that phase with the local base, finally that ties were broken off with genetic north Balkan territories possessed of radiolarite and flint deposits which the Neolithic population was using. Thus, none of the hypotheses put forward above, can unravel the total mystery of lack of chipped stone artefacts at the earliest sites of the Linear Pottery culture. Moreover, we should remember, that at the earliest sites of the Anatolian—Balkan complex represented by the oldest layer of the sites Anzabegovo, Vršnik and Porodin a small number of flint artefacts occurs increasing in later layers.

More numerous assemblages of chipped stone artefacts were encountered in Moravia at sites of the earliest phase of the Linear Pottery culture such as Mohélnice and Žopy. Materials from these sites have not been published fully which render difficult their proper description. We can assert that this is a blade industry based on the processing of a single-platform core. The blades were of medium size (3—4 cm). Among retouched tools occur end-scrapers, truncations, finely retouched blades (possibly these are use-wears), side-scrapers, perforators and trapezes. Numerical proportions between these tools are not known. Types of retouched implements, especially the presence of special perforators, show links with the later assemblages of the Linear Pottery culture in Moravia, from the »Notenkopf« phase. On the other hand, the set of types mentioned above is decidedly various from that known in the Starčevo—Körös complex and the eastern linear pottery.

In southern Poland, in the earliest phase of the Linear Pottery culture flint artefacts have not been identified (Samborzec) or are extremely rare (Gniechowice). In Gniechowice there are almost only cores, single-platform blade, with the carefully prepared platform, pieces with changed orientation, and double-platform cores with the common flaking face. Technological features of these cores reveal some differences in comparison to later specimens typical for the Linear Pottery culture.

Incomplete and scarce data at our disposal indicate that the lithic industry of the Linear Pottery culture was, from the very start, fairly differentiated, although it had certain features in common manifested in the ascendancy of end-scrapers and truncations. Local character, in the case of Moravian sites, is reflected in the occurrence of per-

forators and trapezes. The former are also typical of sites of the »Notenkopf« phase as we shall demonstrate further on. Elements of local variants may perhaps in the future elucidate the origins of the lithic industry of the Linear Pottery culture which at the moment remain unexplained.

5. Lithic industry of the »Notenkopf« phase of the Linear Pottery culture in Moravia

Materials most distinctive for the middle phase of the Linear Pottery culture on the territory of Moravia come from the site in Vedrovice—Zabrdovice. But the data concerning the whole of excavated material have not been elaborated yet, and materials from the site have not been published in a complete form. Inventories connected with the later part of the early phase of the Linear Pottery culture seem to be poor (R. Tichý 1962, V. Ondruš 1963), while the most numerous series come from features connected with its middle phase.

The general inventory structure in the examined sample is characterized by a fairly small participation of cores (4.9 %), conspicuous preponderance of flakes over other inventory groups (66.2 %), and almost equal, not very high proportion of blades and tools (13.9 % and 14.0 % respectively). Such structure points out to the exploitation of the nearby flint deposits and an important role of local flint processing, although not as significant as in the case of sites of this culture in Little Poland.

The inhabitants of the settlement in Vedrovice used the local raw material of rather poor quality occurring in fairly small concretions from which blade blanks were obtained without special initial preparation. The most frequent cores are examples with a prepared platform, the core angle approximating the right angle, and a weakly rounded flaking face. From these a relatively fine blanks were obtained (average length 44.4 mm), but, as a rule, longer than blanks from the Early Lengyel sites in the area.

The structure of the inventory from the site in Vedrovice is as follows:

	Number in %
End-scrapers	30.6
Burins	1.8
Truncations	18.0
Backed pieces	2.7
Retouched blades	3.7
Perforators	24.4
Combined tools	0.9
Trapezes	0.9
Side-scrapers	7.2
Blades and retouched flakes	9.9
Total number	111

In comparison to sites of the Linear Pottery culture from other area (Slovakia, Little Poland) a relatively low index of end-scrapers is

notable, slightly higher proportion of truncations, and first of all a high of perforators. Even if we overlook their high proportion in the sample examined in this place, we should still focus more attention on their different form. These tools have been singled out as Vedrovice type perforators (M. Kaczanowska 1980). Similar perforators, alongside commonly known types, occurred as well on the site in Bylany. Much the same though shorter forms were recorded in Becsehely. The tools probably have a local origin which is corroborated by the presence of specimens with similarly shaped points discovered in the earliest phase of the Linear Pottery culture in Mohelnice.

Summing up, a certain individual character has been asserted of lithic industry of the Linear Pottery culture from the territory of Moravia, especially from its southern part, residing in the pronounced presence of elements — possibly of local origin. Unfortunately, a lack of data from adjacent territories renders impossible a precise definition of the range of this phenomenon. The copiousness of south Moravian inventories is noteworthy. Their detailed analysis in the future, may provide new information concerning the Linear Pottery culture. We should bear in mind, that only in Moravia is the earliest phase of the Linear Pottery culture possessed of identifiable, fairly rich lithic industry. Sites from other territories which may be acknowledged as the cradleland of the Linear Pottery culture, have yielded practically no lithic inventories.

Moreover, we must stress, that some differences have been recorded between the lithic industry from Vedrovice and the oldest lithic industry of the Lengyel Culture in that area. The dissimilarities are of more importance than in the case of western Slovakia and Little Poland, which may bear out the theory of V. Podborsky (1974) about the allochthonous genesis of the Lengyel Culture in Moravia.

6. *Želiezovce phase and Vinča*

The problems of the influence of the Vinča culture on the Linear Pottery culture has been taken up by numerous authors, also touched upon in chapter 1.2. Leaving out of account, in this place, all the difficulties as to the synchronization of the two cultural complexes, we may say that inasmuch as there are distinct differences between the known inventories of the Starčevo type and the earliest assemblages of the Linear Pottery culture, lithic industries of the Vinča culture, or strictly speaking, its Serbian variant, make up one whole together with the known industries of the Linear Pottery culture. Specifically, we are referring to inventories representing its later phases of evolution, together with the Želiezovce group. Attempts have been made at linking distinct similarities between these industries with the influence of the Vinča milieu apparent also in other cultural aspects (J. Pavúk 1976). The impact of the Vinča culture is not limited only to the linear complex. Many authors emphasize the strong influence of this culture on the rise of the Sopot complex (J. Pa-

vúk 1976; S. Dimitrijević 1979). Also other groups or cultures covering the area of the Tisza Basin assimilated powerful influences exerted by the Vinča complex (Szakallat group, Bükk group or culture) (N. Kalicz, J. Makkay 1977).

In order to identify precisely the impact of the Vinča culture lithic industry on the linear complex, the characterization of the Vinča industry itself is requisite. But the present state of investigation precludes this. Attempts undertaken so far (M. Kaczanowska, J. K. Kozłowski, 1983) point out to the heterogeneous character of lithic industry. It seems that eastern groups of the Vinča culture revealed links with the local base to a greater extent, manifested in a strong microlithic component in the form of geometric inserts and the occurrence of small, microlithic perforators. For the northwestern block of this culture, whose characterization we base mainly on the inventory of the latest phase of Gomolava, the inventory structure is distinctive with clear ascendancy of perforators over other tool forms, and a fairly high frequency of truncations. A similar structure was recorded at Transdanubian sites of the Sopot—Bicske complex (Becsehely II, Bicske), at the sites, known to us, of the Želiezovce group and from Slovakia and Little Poland. Local differences are inconspicuous. In chapter 4 and 5 we showed, on the example of material from Moravia, that it is conceivable to identify in some areas — local trends in lithic industry of the earlier and classical phases of the Linear Pottery culture. In the following chronological horizon a considerable homogeneity was observed of lithic industries in the extensive territories of the Carpathian Basin, that is both in Transdanubia as well as in the territory embraced by the Bükk culture, which testify that the process of unification took place under the influence of one factor. Such a homogenizing role may have been played, as it is assumed (M. Kaczanowska 1982), by the Vinča culture through direct influence or through the mediation of the Sopot—Bicske group. If we decide that the lithic industry with end-scrapers in predominance (over 40 %), high frequency of truncations and a considerable proportion of retouched blades, is the effect of the influence of the Vinča culture, then simultaneously we must claim that:

1. lithic industry like this is typical for the earliest inventories of the Lengyel culture over the whole area of its occurrence.
2. In Little Poland a similar inventory structure was recorded already in the »Notenkopf« phase of the Linear Pottery culture (M. Kaczanowska 1980).

General similitude of industries of the early phase of the Lengyel Culture and the Vinča culture may corroborate J. Pavúk's hypothesis (1976) about the role — among others — of the Vinča culture in the formation of the Lengyel complex.

The supposition that the impact of the Vinča industry was already strongly marked in the »Notenkopf« phase of the Linear Pottery culture may be of some value for the chronology i. e. that the »Notenkopf« phase is contemporaneous with the fully shaped Vinča culture. Assum-

ing that action of factors leading to some degree of unification must have taken up a certain time-span, then, in the light of our present knowledge of lithic industries we do not find grounds to maintain that the formation of the Linear Pottery culture preceded appreciably the beginnings of the Vinča culture — as J. Pavúk (1980) claims. His hypothesis calls for ascertaining that changes were taking place in the inventories of the Starčevo culture already in the linear phase B, in the direction of increase of the role of end-scrapers and truncations at the cost of retouched blades, i. e.: towards the approximation of the structure of the inventories to the model represented by the Linear Pottery culture and the Vinča culture.

7. Conclusions

Consideration presented above entitle us to formulate the following conclusions:

1. development of lithic industry of the Starčevo—Körös complex has a divergent character: alongside macrolithic blade industry assemblages occur with high frequency of microlithic elements, first of all trapezes.
2. the second development trend of the Starčevo—Körös complex creates a basis for the evolution of lithic industry of the eastern linear complex. Genetic affiliation has been confirmed by numerous technological and stylistic features.
3. In the present state of investigations none of the hypotheses concerning the genesis of the western linear complex can be convincingly substantiated. The lithic industry of this phase is, despite poverty of assemblages, territorially differentiated, and certain technological (e. g. core processing in Silesia) and morphological elements (perforators of the Vedrovice type in Moravia) possibly point out to the local Pre-Neolithic basis.
4. All the data indicate that the beginnings of the western linear complex did not precede chronologically the outset of the Vinča complex.
5. Lithic industry of the Vinča complex is strongly differentiated falling into, at least, two groups: western (Serbia, Vojvodina) and eastern (Transylvania, Banat).
6. The western variant of lithic industry of the Vinča complex played, in all probability, a major role in unification of lithic industry of the western linear complex (at least from the »Notenkopf« phase), and of Transdanubian groups of Sopot—Bicske, and then of the early phase of the Lengyel complex.

Rad prihvaćen na sjednici Razreda od 15. veljače 1984.

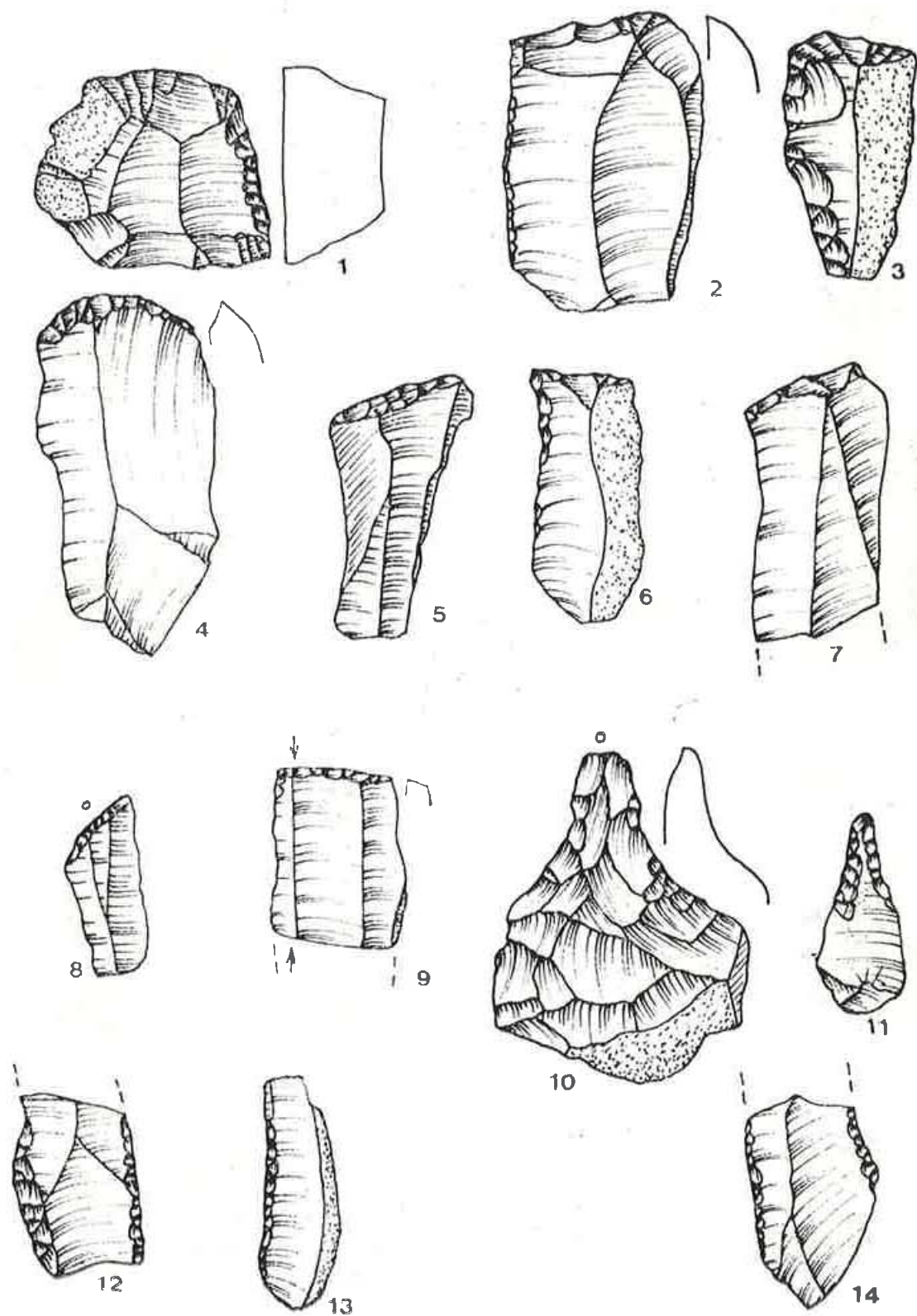


Fig. 1. Méhtelek, North-Eastern Hungary, lithic artefacts: 1—4 — end-scrapers, 5—9 — retouched truncations, 10, 11 — perforators, 12—14 — retouched blades. Excavation of N. Kalicz and J. Makkay. Collection of the Institute of Archaeology Hungarian Academy of Sciences.

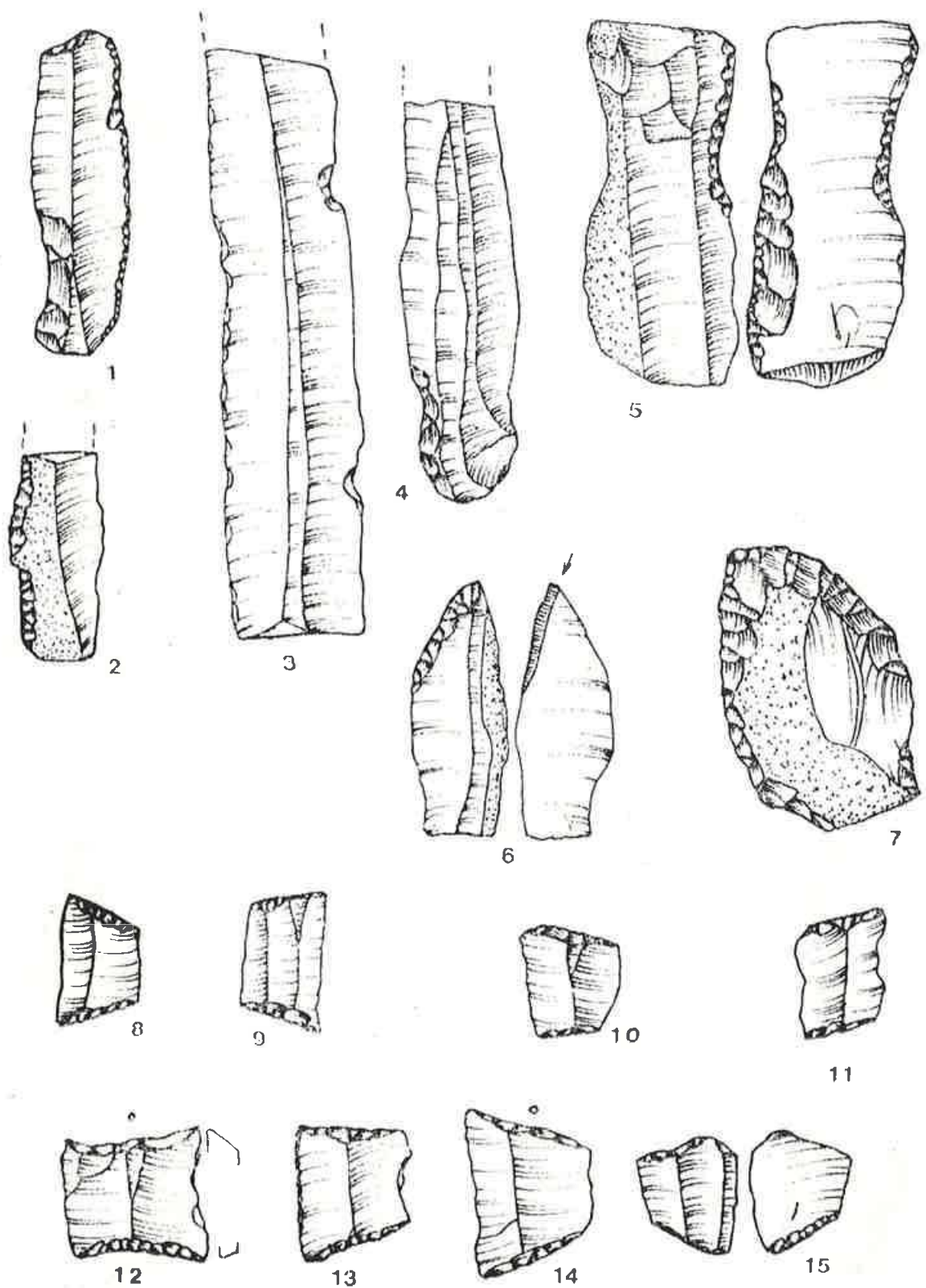


Fig. 2. Méhtelek, North-Eastern Hungary, lithic artefacts: 1, 2 — retouched blades, 3—5 — notched blades (no 3 wax-coloured imported flint from Northern Balkans), 6 — burin, 7 — side scraper, 8—15 — microliths. Excavation of N. Kalicz and J. Makkay. Collection of the Institute of Archaeology, Hungarian Academy of Sciences.

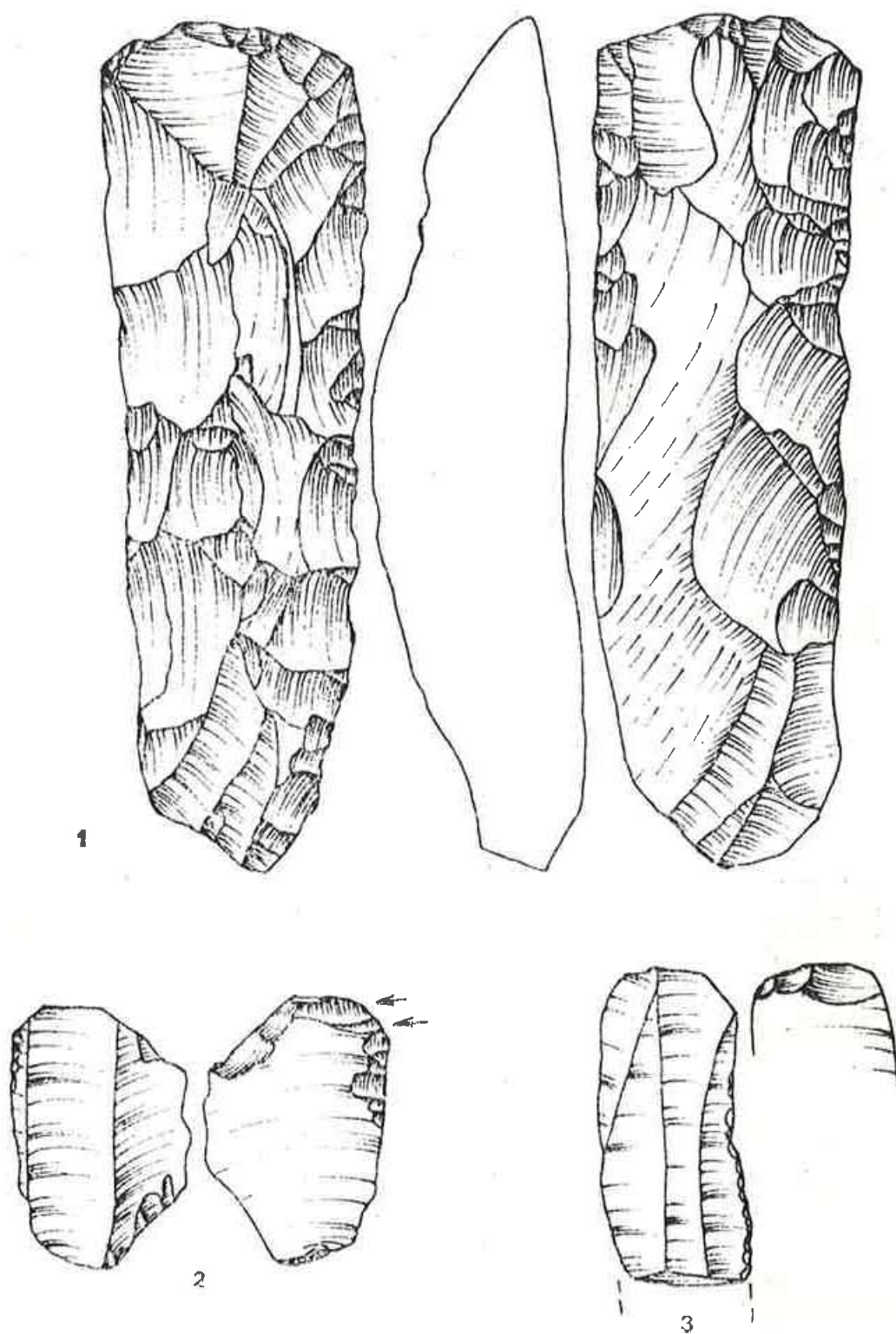


Fig. 3. Méhtelek, North-Eastern Hungary, lithic artefacts: 1 — chipped core tranchet, 2, 3 — blades with inversly thinned distal end. Excavation of N. Kalicz and J. Makay. Collection of the Institute of Archaeology, Hungarian Academy of Sciences.

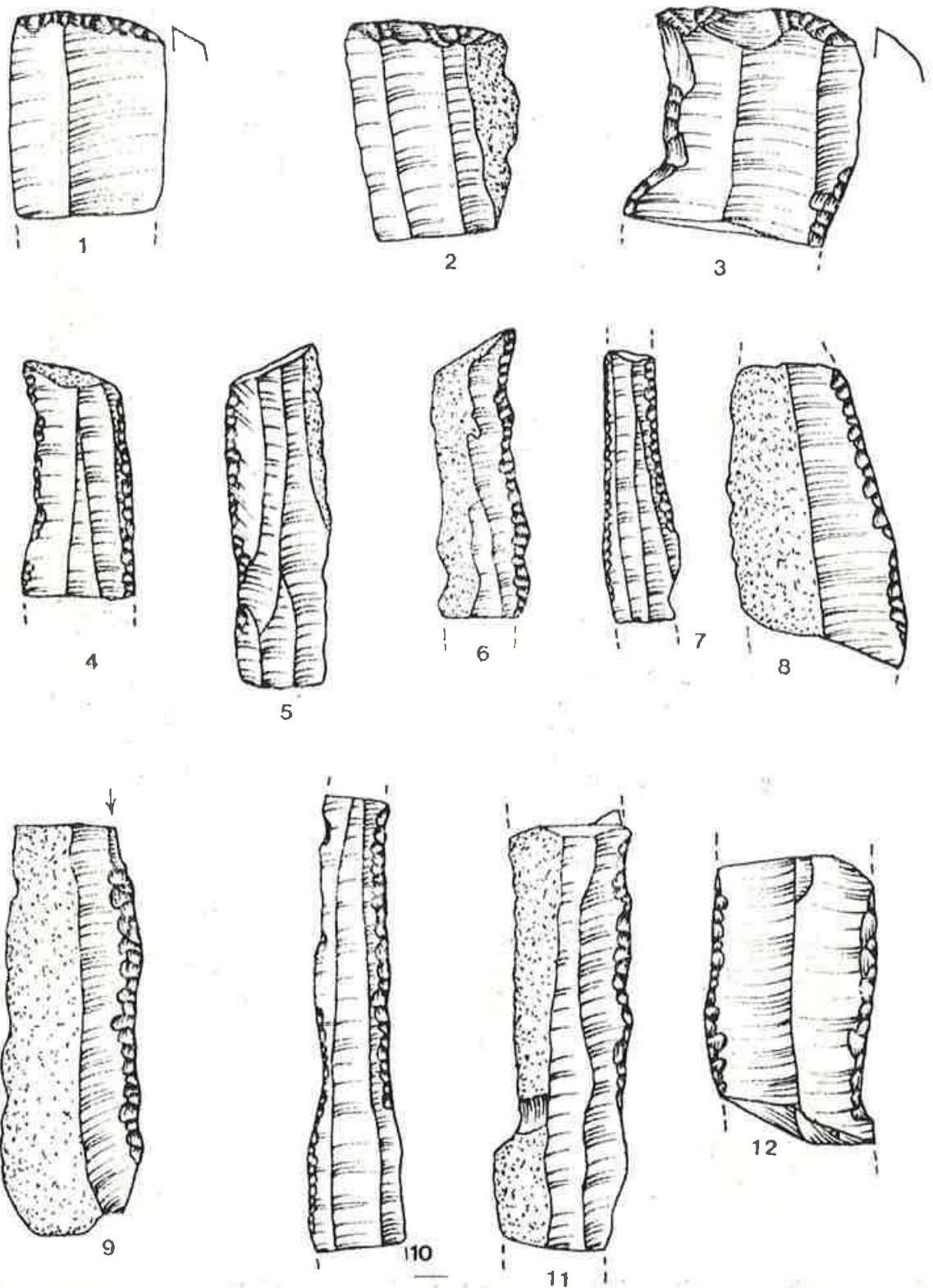


Fig. 4. Kopčany, Eastern Slovakia, lithic artefacts: 1—3 — end-scrapers, 4—12 — retouched blades. Excavation of S. Siska. Collection of the Institute of Archaeology, Slovak Academy of Sciences in Nitra.

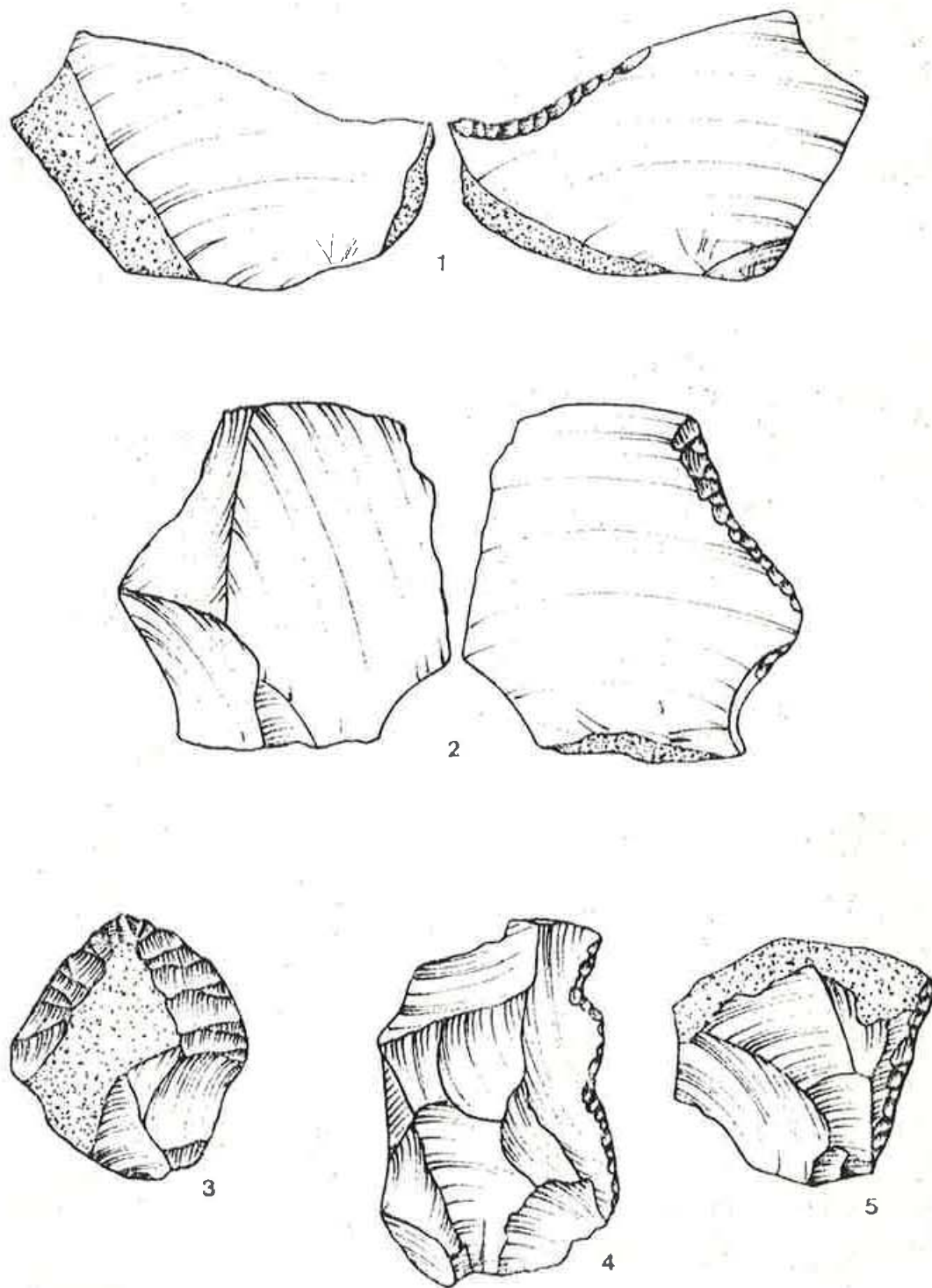


Fig. 5. Kopčany, Eastern Slovakia, lithic artefacts: 1, 2, 4, 5 — retouched flakes, 3 — irregular scraper. Excavation of S. Siska. Collection of the Institute of Archaeology, Slovak Academy of Sciences in Nitra.

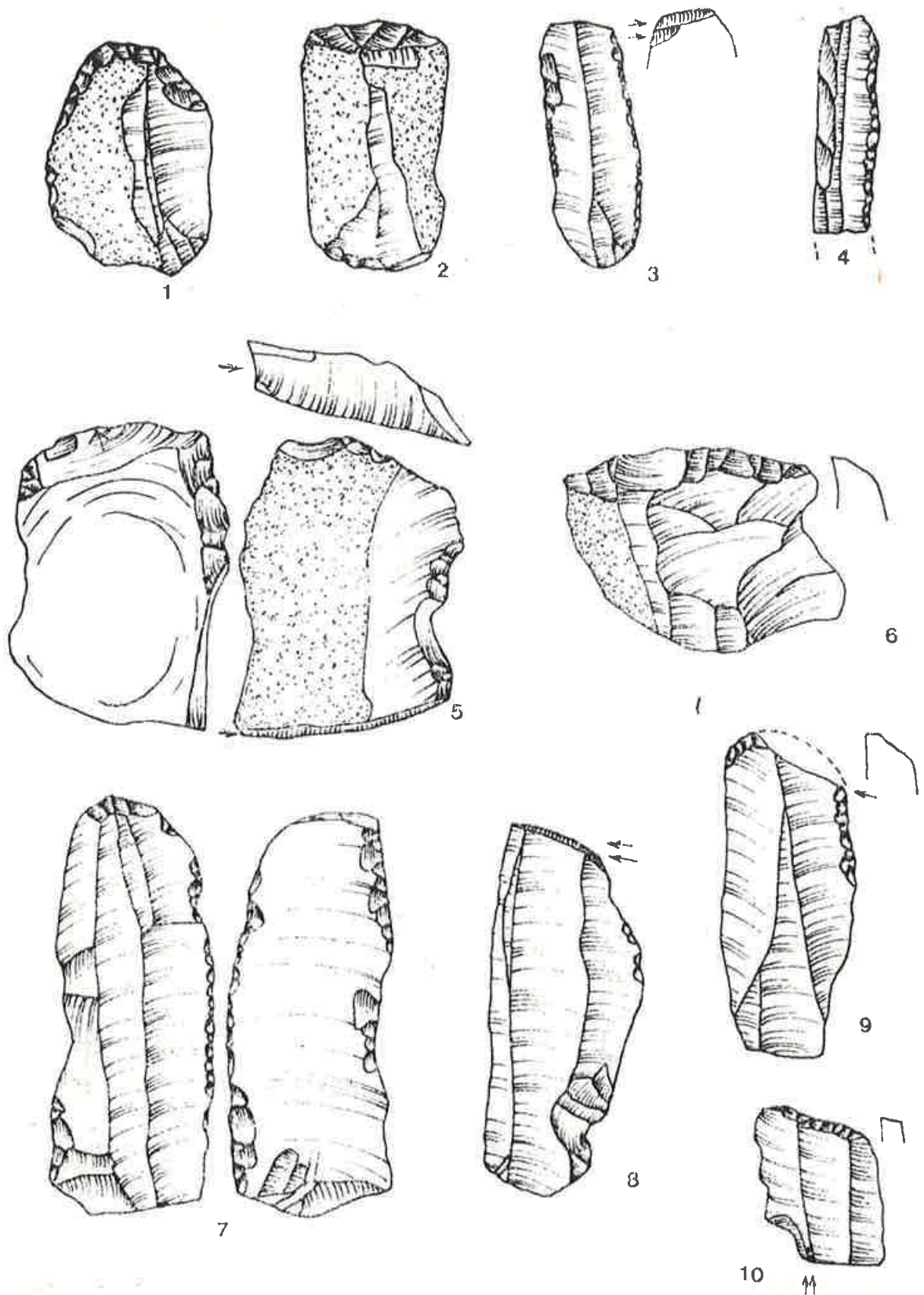


Fig. 6. Tiszacsege-Homokbanya, North-Eastern Hungary. Lithic artefacts of the Alföld Linear Pottery Culture: 1—2 — end-scrapers, 3, 4 — retouched blades, 5 — burin, 6 — side-scraper; collection of the Institute of Archaeology — Hungarian Academy of Sciences. Prešov-Šarisske Louky, Eastern Slovakia. Lithic artefacts of the Eastern Linear Pottery Complex — late phase: 7 — retouched blade, 8 — burin, 9 — end-scraper, 10 — obliquely retouched truncation (fragment of a trapeze?). Collection of the Institute of Archaeology — Slovak Academy of Sciences in Nitra.

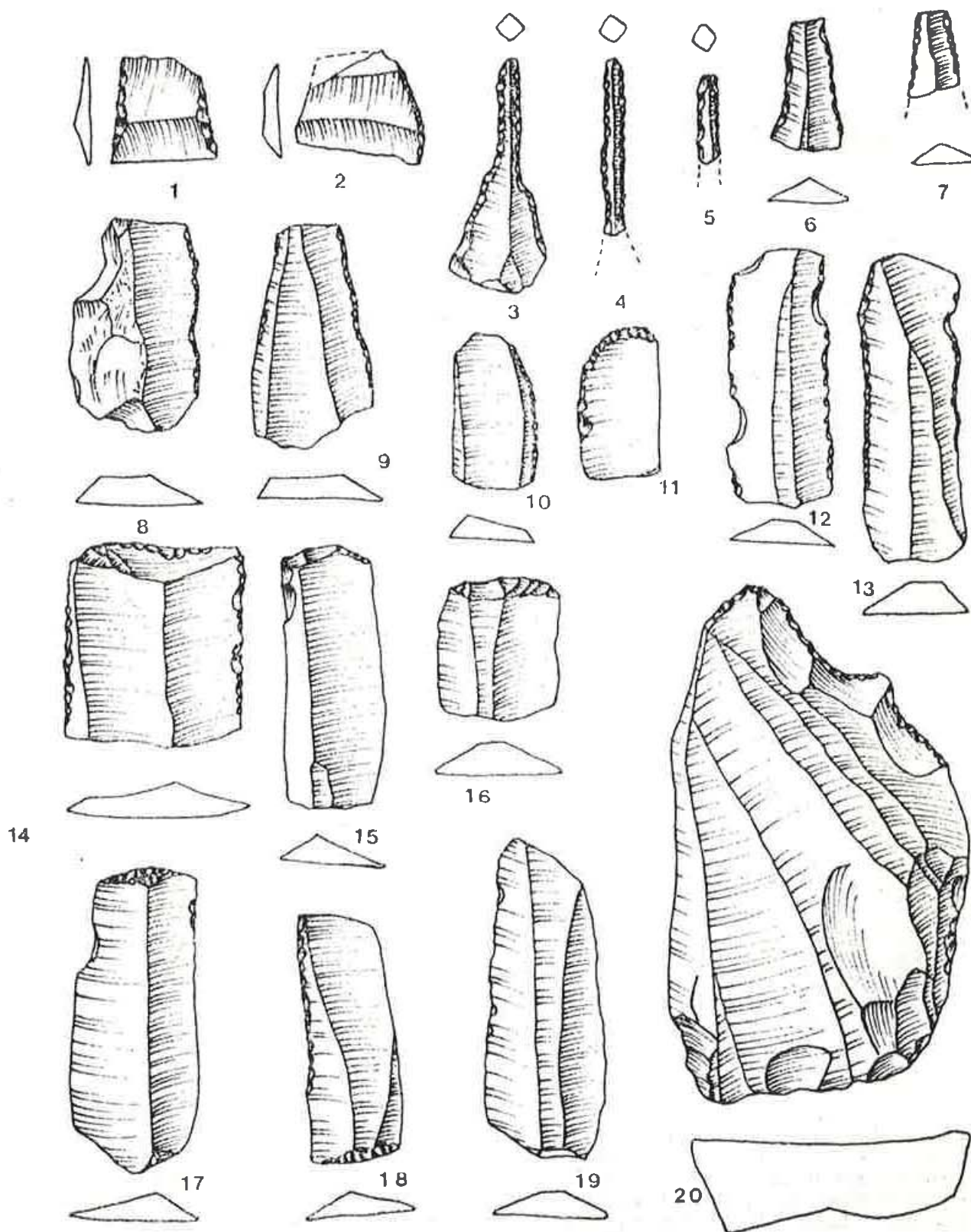


Fig. 7. Mohelnice, Northern Moravia, lithic artefacts of the Linear Band Pottery Culture — Early Phase: 1, 2 — trapezes, 3—7 — perforators, 8—13 — retouched blades, 14—17 — end-scrapers, 18 — retouched truncation on the proximal end, 19 — unretouched blade, 20 — fragment of blade core with notches in the distal part. Acc. to R. Tichý.

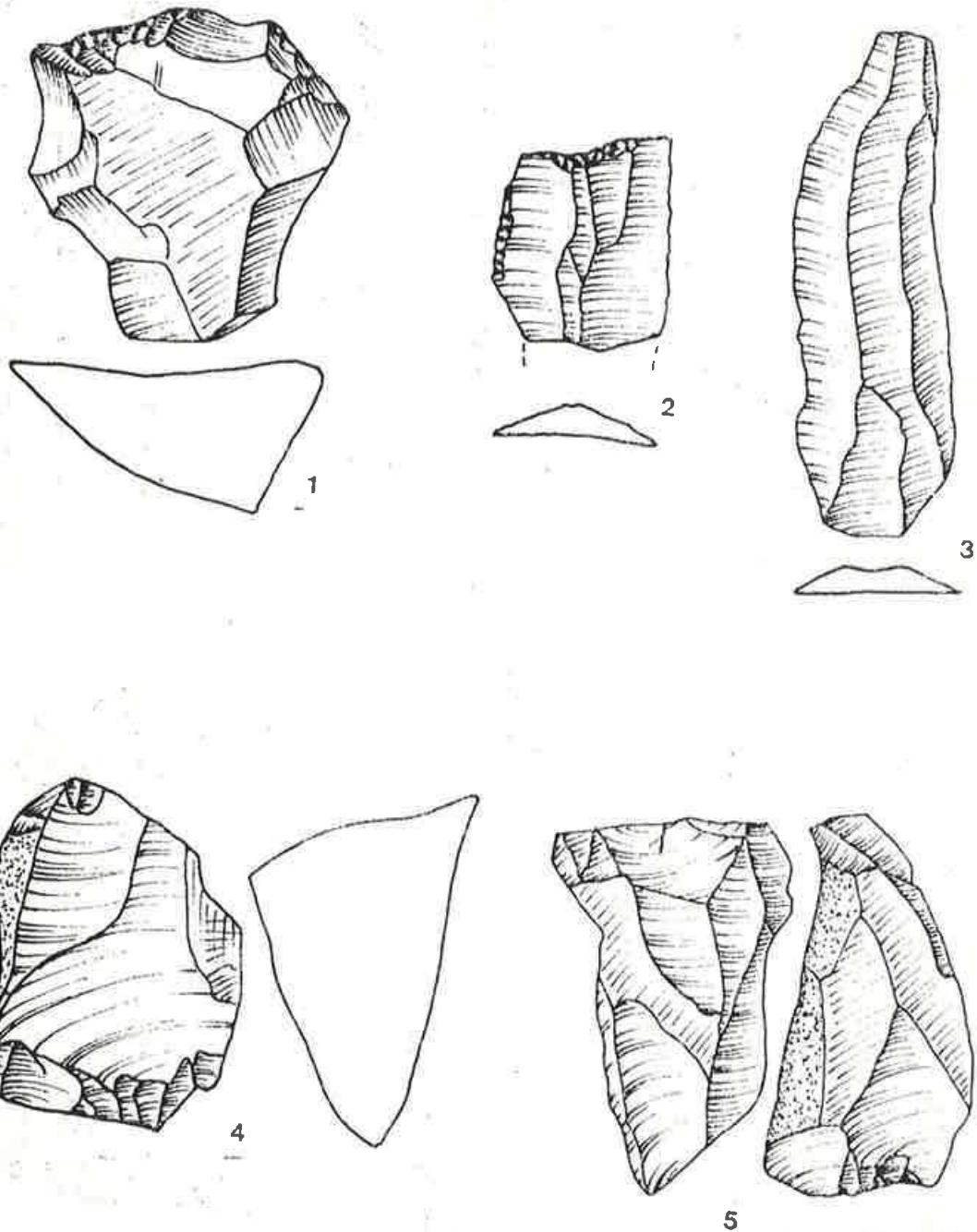


Fig. 8. Mohelnice, Northern Moravia, lithic implements of the Linear Band Pottery Culture — Early Phase: 1 — flake end-scraper, 2 — retouched truncation, 3 — unretouched blade. Collection of the Institute of Archaeology, Czechoslovak Academy of Sciences in Brno. Gniechowice, Lower Silesia, Poland: 4—5 — cores from the early Linear Band Pottery site. Excavation of P. Romanow, Archaeological Museum in Wrocław.

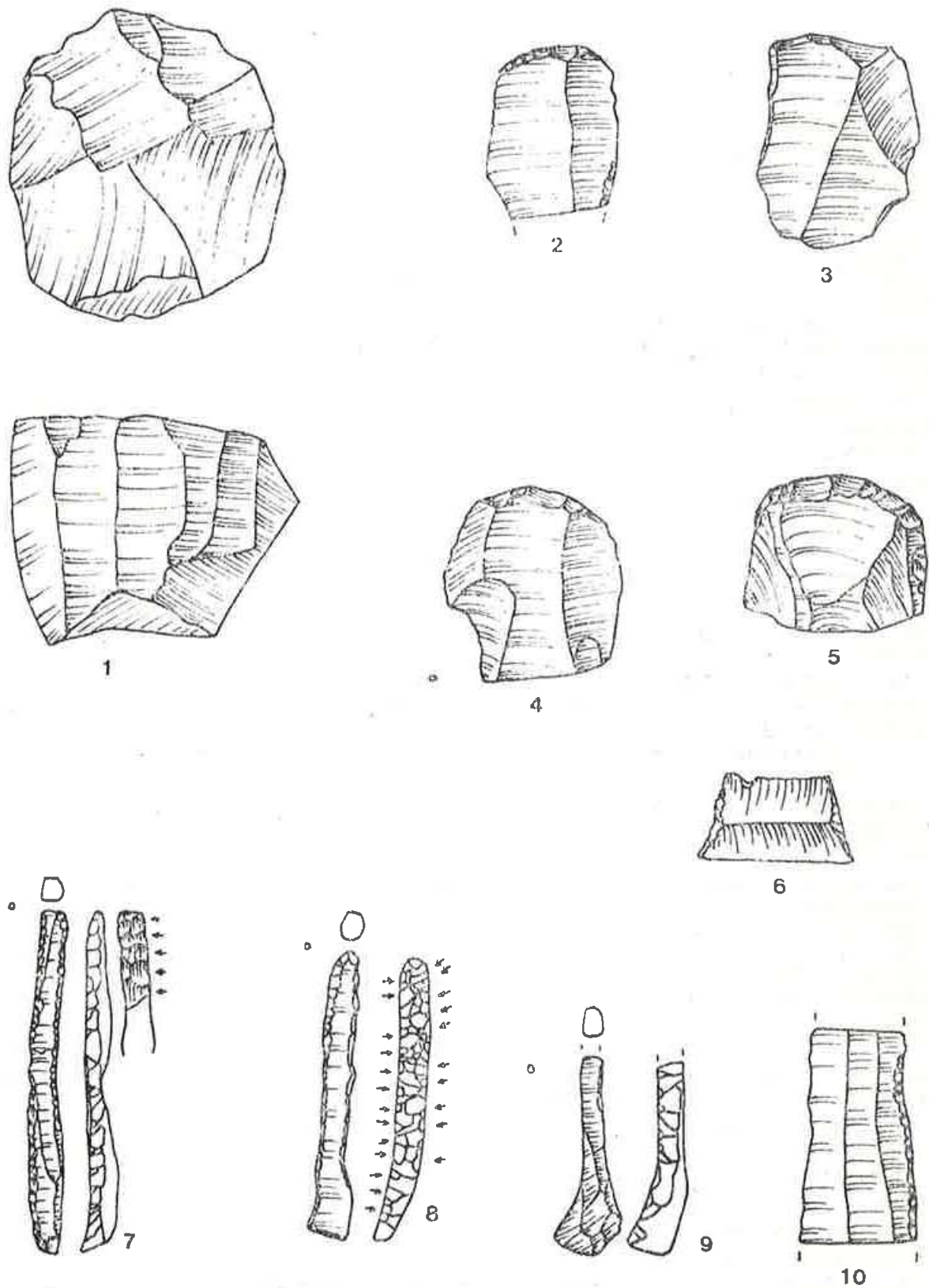


Fig. 9. Vedrovice, Southern Moravia, lithic implements of the »Notenkopf« Phase of the Linear Band Pottery Culture: 1 — single platform blade core, 2—5 — end-scrapers, 6 — trapeze, 7—9 — perforators, 10 — retouched blade. Collection of the Moravia Museum in Brno.

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Sažetak

»BARBOTIN« (STARČEVO-KÖRÖS) I LINEARNI KOMPLEKS EVOLUCIJA ILI NEZAVISNI RAZVITAK LITIČKE INDUSTRIJE

U uvodu se prikazuju različite hipoteze o porijeklu linearnog kompleksa, kako istočnog (linearno vrpčasta keramika — Alföld) tako i zapadnog (linearno vrpčasta keramika). Taj je problem od temeljnog značenja za razjašnjenje karaktera procesa neolitizacije u srednjoj Evropi. U svjetlu razvoja industrije kremenca, koje su pratile keramiku ovog ranoneolitskog kompleksa, podvrgnute su te hipoteze ispitivanju.

Razvoj industrije kremenca u barbotinskom kompleksu (Starčevo-Körös) ima, s iznimkom najstarije monokromne faze, divergentan karakter: s jedne strane nadovezuje se na najstariju fazu, gdje dolazi do izražaja u tradiciji velikih oštrica, prije svega oštrica s retuširanim uzdužnim bridovima i oštrica prerađenih u strugače (nalazišta starčevačke kulture u sjevernoj Jugoslaviji i neka nalazišta kereške kulture Mađarske nizine), a s druge strane odlikuje se drugi facijes prisutnošću mikrolitskih i geometrijskih elemenata (industrija gornjih slojeva iz Cuine Turcului, Méhteleka i dr.). Između tih facijesa bez sumnje postoje međusobne veze, što dolazi do izražaja u importu balkanskog kremenca, koji prodire u obliku velikih oštrica iz prvoga facijesa u drugi. Drugi facijes mogao je nastati kao rezultat kontakta s lokalnom predneolitskom okolinom, ili pak kao rezultat prilagođavanja stanovništva starčevačke i kereške kulture lokalnim ekološkim uvjetima srednjeg Podunavlja.

Kremena industrija istočne linearne vrpčaste keramike Mađarske nizine i istočne Slovačke nadovezuje se na drugi facijes industrije starčevačko-kereškog kompleksa i predstavlja kako tehnološki tako i tipološki njegov nastavak. Istočna linearna vrpčasta keramika mogla bi se dakle smatrati mlađom fazom barbotinskog kompleksa, a međufaza je ovdje satmarska grupa.

Mnogo kompliciranije je pitanje o porijeklu zapadnog linearog kompleksa (linearna vrpčasta keramika). Njegova najstarija faza odlikuje se npr. u zapadnoj Slovačkoj malim brojem kremenih produkata, što se vjerojatno može tumačiti zamjenom kamena organskim materijalom u proizvodnji oruđa. Veće količine kamenog materijala zastupljene su u Moravskoj, gdje su takva nalazišta, kao Žopy i Mohelnice, karakteristična po vrlo neobičnoj kolekciji oruđa (oštrice s retuširanim završetkom, svrdla, oštrice s finim retušem). Pojava trapeza i drugih mikrolitskih elemenata mogla je nastati kao rezultat djelovanja lokalnih predneolitskih uvjeta. Neke elemente predneolitske tehnologije susrećemo na poljskim nalazištima najstarije faze (Gniechowice). U cjelini pokazuje industrija starije faze linearne vrpčaste keramike znatne razlike u odnosu na keramiku barbotinskog kruga. Od srednje, tzv. »Notenkopfphase«, tj. linearne vrpčaste keramike s ornamentom nalik na note, nadalje primjećuje se da je kremena industrija cjelovitija i snažnije razvijena, i da pokazuje u to vrijeme najviše sličnosti s industrijom vinčanske kulture, naročito s varijantom poznatom u Srbiji i Vojvodini. Ove analogije ne objašnjavaju posve porijeklo kremene industrije linearne vrpčaste keramike, ali upućuju na to da je ona od srednje faze nadalje dospjela pod utjecajnu sferu vinčanske kulture.