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THE EVOLUTION OF CHIPPED STONE INDUSTRIES IN THE "POLGÁR ISLAND" FROM THE MIDDLE NEOLITHIC TO THE EARLY COPPER AGE

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A b s t r a c t. "Polgár Island" is a natural elevation delimited by river banks; its flat area covers 70 sq.km The "Polgár Island" is of particular importance for the study of interregional contacts as raw materials deposits are absent in this territory. The settlement in the "Polgár Island" can be seen from the Middle Neolithic to the Early Copper Age (ALP I-IV, Late Neolithic and Tiszpolgár Culture). In this time-span changes in raw material supply, technology and organization of lithic production took place. In the Early Phase obsidian played the most important role, and contacts developed along the north-south axis. In the Late Neolithic horizon (Polgár-Csöszhálom-dűlő) the flow of obsidian was smaller, replaced by limnoquartzites. A major change in the systems of raw material supply occured at the beginning of the Copper Age, Simultaneously with changes in the direction of raw material supply, diachronic changes took place in the organization of lithic production.

K e y w o r d s: Polgár Island, Middle, Late Neolithic, Copper Age, Eastern Linear Pottery Culture (ALP), Raw materials

The "Polgár Island" is situated on the left bank of the Tisza (Raczky, Anders 2009a). This is a natural elevation delimited by river banks; its flat area covers 70 sq.km. The "Polgár Island" is of particular importance for the study of interregional contacts in view of the fact that raw materials deposits are absent in this territory. The Middle, Late Neolithic and Copper Age sites in "Polgár Island" represent (Fig. 1), ALP I (in Polgár-Ferenci hat, Polgár-Kenderföldek, Polgár-Király-érpart, Polgár-Picási-dülő, Polgár-Rózsa-tanya híd), ALP II-III (Polgár-Ásotthalom, Polgár-Kása halmi-dűlő, Polgár-Kengyel-köz), ALP IV (Folyás-Szilmeg, Polgár-Bosnyák-domb, Polgár-Ferenci hat, Polgár-Kása-domb-dűlő, Polgár-Kenderföld-Majoros-tanya, Polgár-Nagy Kasziba, Újtikos-Demeterkút), the Late Neolithic (Polgár-Csöszhálom, Polgár-Bosnyákdomb) and the Copper Age (Tiszapolgár-Basatanya) (Raczky, Anders 2009; Raczky, Anders 2009b; Bognar-Kutzian 1963).

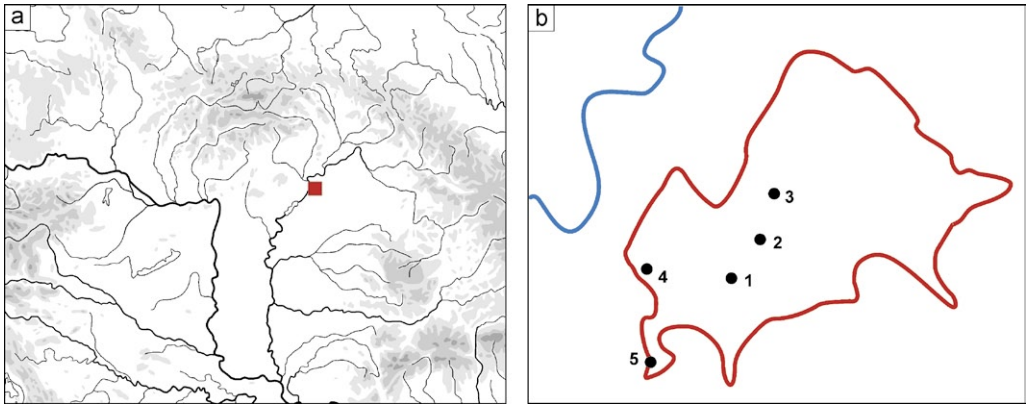

Fig. 1. Map of the "Polgár Island": a – situation in the Carpathian basin; b – "Polgár Island" with most important sites (1 – Polgár-Picási-dülő; 2 – Polgár-Ferenci hat; 3 – Polgár-Csöszhálom; 4 – Polgár-Bosnyákdomb; 5 – Tiszapolgár-Basatanya)

In the "Polgár Island" the beginning of the Middle Neolithic is represented by the Early Phase of the Eastern Linear Pottery Culture (ALP I). The chipped stone assemblage at Polgár-Picási-dülő (early phase) consists of 207 artefacts from the pits and post-houses, dated at between 5475 and 5200 cal BC (Gyöngyvér-Nagy et al. 2014).

In the assemblage obsidian distinctly dominates (94.6%) over limnoquartzites (Fig. 2). In this respect the early ALP differs from the Körös Culture where besides

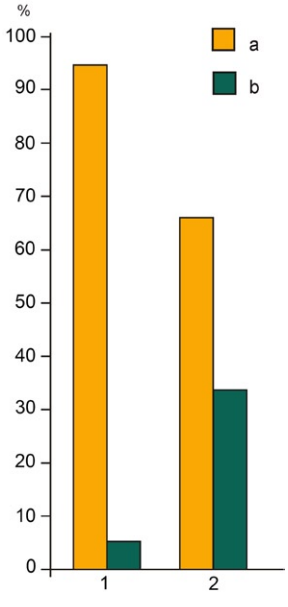

Fig. 2. Polgár-Picási-dülő – raw material structure: 1 – Early Phase of the settlement (a – obsidian; b – limnoquartzites/hydroquarzites); 2 – Late Phase of the settlement (a – obsidian; b – limnoquartzites/hydroquartzites)

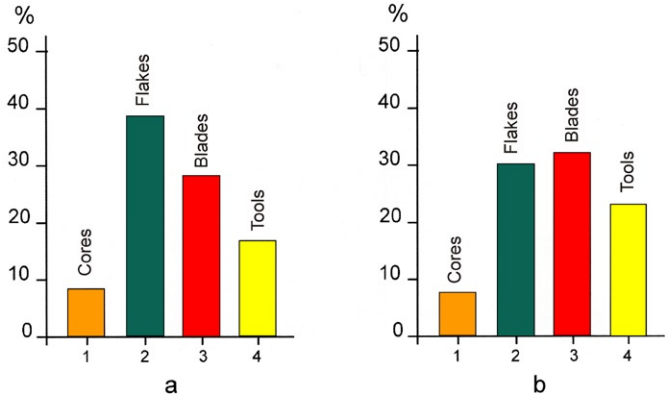

Fig. 3. Polgár-Picási-dülő – major technological groups (a – Early Phase, b – Late Phase)

obsidian, raw materials from the Pre-Balkan Platform also occur (Ecsegfalva – Matejiucova 2007; Tiszaszõlõs-Domaháza-Puszta – Domboroczki et al. 2010). The domination of obsidian is typical also of the "eastern variant" of the ALP in the Torysa and Ondava basins (Slavkovce, Zbudza, Moravany, Zalužice – Kozłowski ed. 1997; Kozlowski et al. eds 2015).

Unworked obsidian nodules from the Zemplan Plateau were brought and processed on-site – which is indicated by the structure of major technological groups. In the Early Phase of Polgár-Piocasi-dulo flakes dominate over blades (Fig. 3a). The preserved cores allow to reconstruct *chaines operatoires:* in the early stages preparation was not used; in the advanced stages preparation was restricted mainly to the platform (Fig. 4).

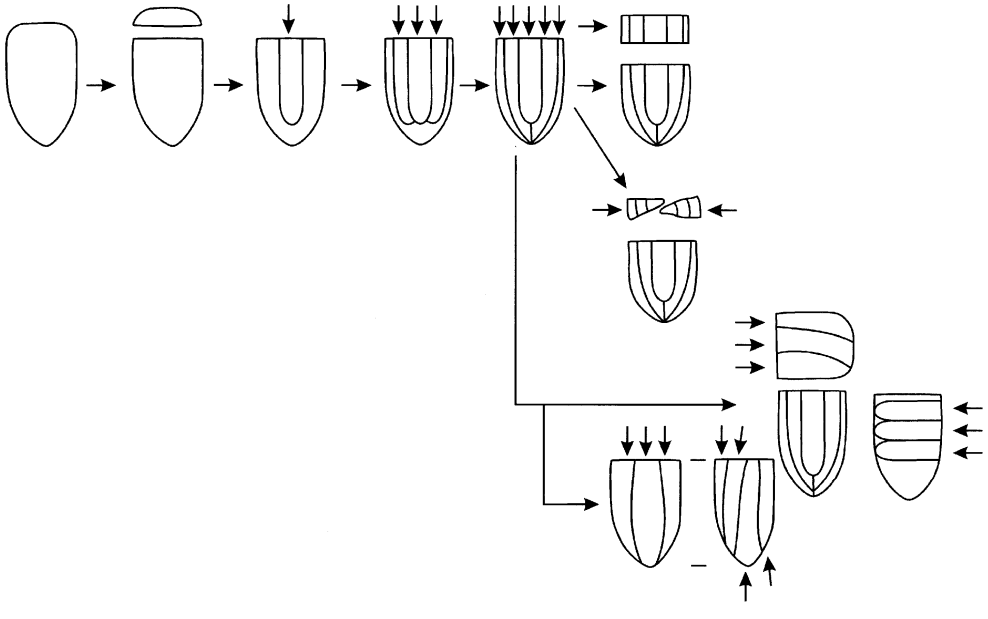

Fig. 4. Polgár-Picási-dülő – core reduction strategies

The coring techniques and the raw material structure of the Early ALP differ from those in the Early Neolithic. Continuation can be seen in the high ratio of laterally retouched blades typical for the Körös Culture (Fig. 5).

The Younger Phase of the Polgár-Piocási-dülő site corresponds to ALP Phase IV (Raczky, Anders 2009a). The small number of artefacts (65) in this phase comes mainly from post-houses (Gyöngyvér-Nagy et al. 2014).

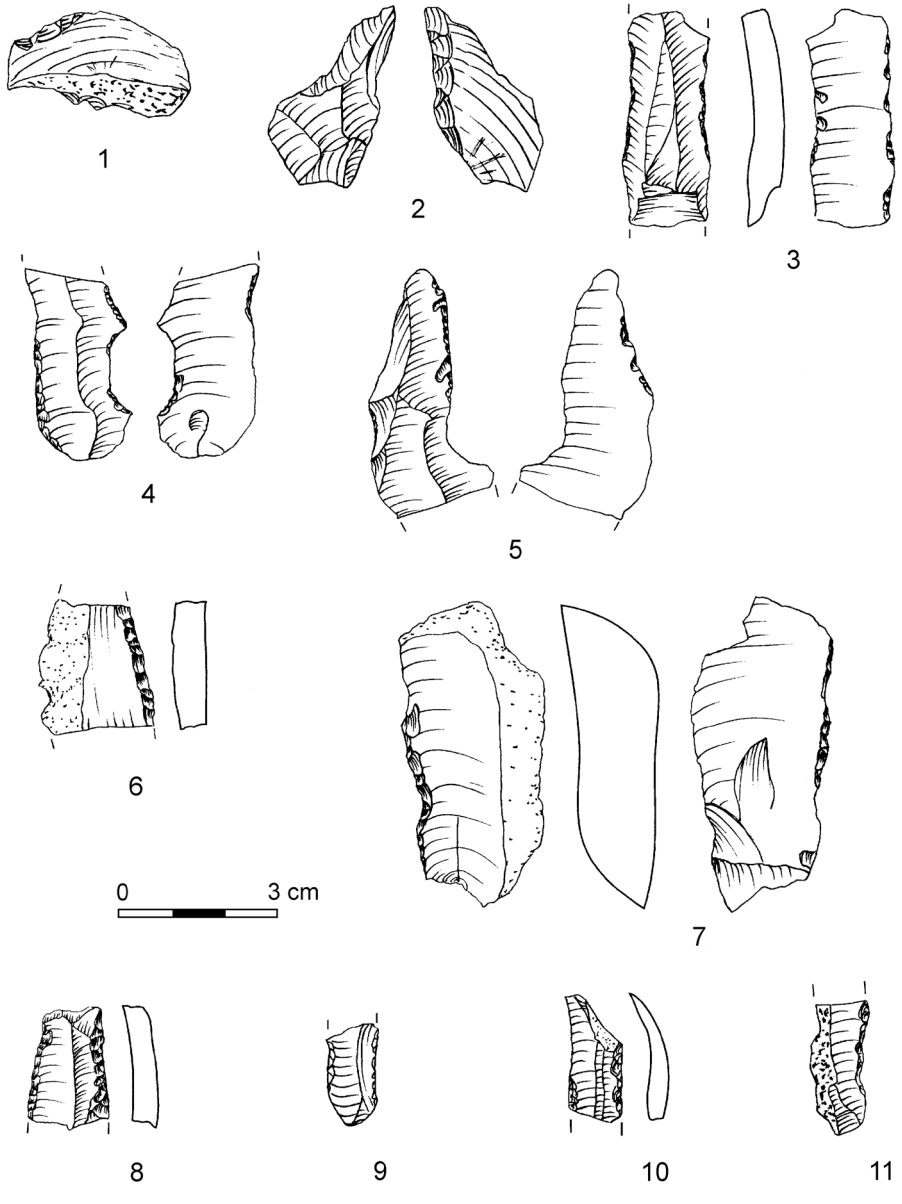

Fig. 5. Polgár-Picási-dülő, Early Phase. 1–11 – tools

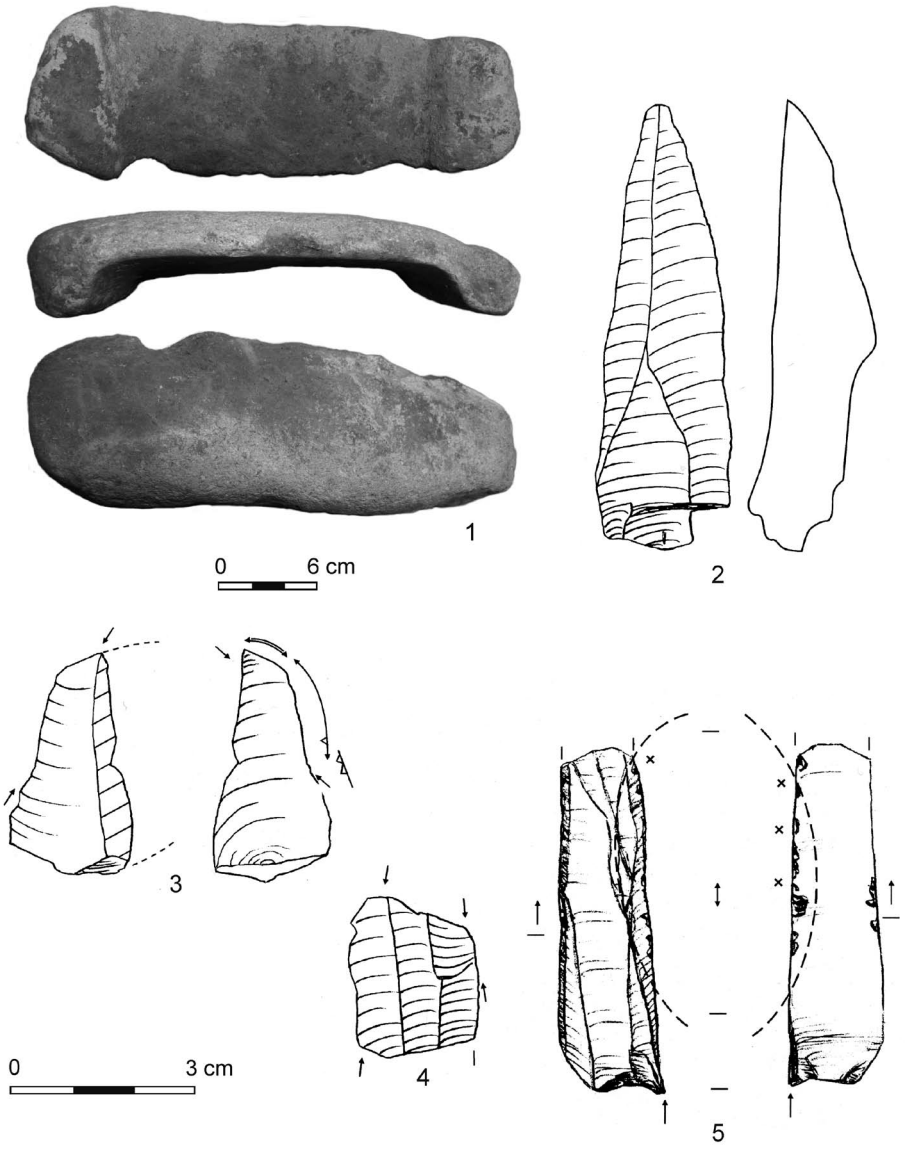

Fig. 6. Polgár-Picási-dülő, Late Phase: 1 – upper grinding stone, 2–5 blades (3–5 – used as sickle inserts)

In comparison with the Early Phase (ALP I), in ALP IV obsidian drops to 66.2%, and is replaced by limnoquartzites (Fig. 2). The structure of major technological groups points to on-site production (Fig. 3a). However, the larger, more regular blades suggest import of completed blades. The component of sickle inserts is larger (possibly, the effect of better preservation of macrowears on blades from limnoquartzite than on obsidian blades) and correlates with a larger component of grinding stones and grinders (Fig. 6).

The site of Polgár 31-Ferenci hat is situated about 2 km north of Polgár-Piocási--dülő. The traces of occupation are dated, mainly, at ALP IV (between 5293 and 5068 cal BC – Raczky, Anders 2009a) (Fig. 1).

Obsidian continues to be the most important raw material for tool production (69.4%); Transcarpathian flints (Jurassic and "chocolate"– 0.4%), limnoquartzites (27.0%) are less frequent (Fig. 7). The drop in the proportion of obsidian as compared with ALP I is consistent with changes in the methods of obsidian procurement. The system where unworked nodules were brought to the settlement is gradually replaced by supplying fairly large, carefully prepared cores for further processing (Fig. 8). The structure of major technological groups changes too: flakes from preliminary stages of core reduction are less numerous (27.6%), while blades (27.6%) and tools (23.2%) are more frequent. Some blades from hydro- and limnoquartzites were supplied as complete forms. Although in trace amounts Transcarapthian flints (0.4%): Jurassic and, possibly, erratic flint from Silesia also appear (Kaczanowska et al., this volume). These changes suggest that among the inhabitants of settlement individual knappers appear who specialized in the processing and/or exchange of raw materials. Strontium isotope analysis shows that they were members of a local group not visitors from Zemplen Plateau (Bickle, Whittle 2010). This is confirmed by the graves with obsidian cores placed at the head of the body. One of the graves contained besides a vessel filled with mineral dye (Fig. 9).

In Polgár 31-Ferenci-hát the tool-kit does not, basically, change which confirms continuity of technological tradition and occupations of the inhabitants.

Various types of grinding stones are numerous, made from rocks from the Matra Mts and the Tokai region (around Mad). The tools were used for food preparation and – in the final stage – for crushing mineral dyes. Some tools were intentionally broken as part of rituals (Kaczanowska et al. 2016).

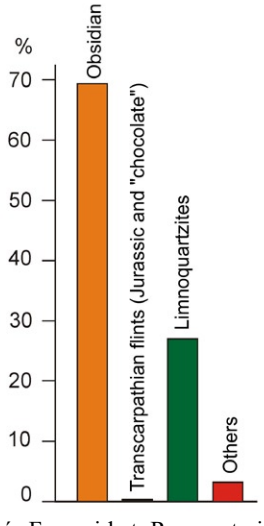

Fig. 7. Polgár-Ferenci hat. Raw material structure

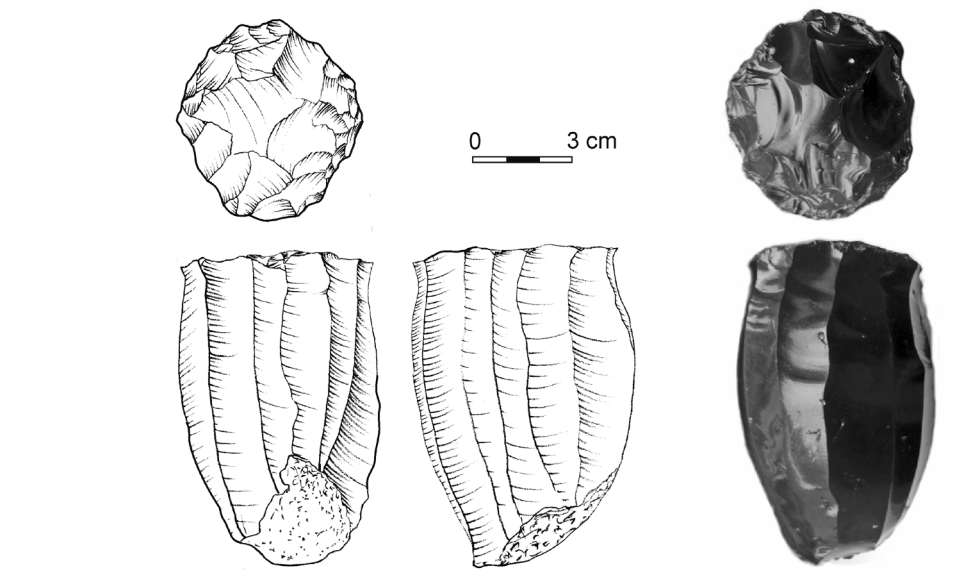

Fig. 8. Polgár-Ferenci hat. Obsidian core from the grave 867

Fig. 9. Polgár-Ferenci hat. Grave with vessel containing mineral dye and the core (according to Bickle, Whittle 2010)

The next phase of the occupation of the "Polgár Island" is the site of Polgár-Csöszhálom-dűlő. The site consists of a tell surrounded by a system of ditches and a horizontal settlement (Raczky et al. 2002). The four phases are dated at between 4940 and 4500 cal BC (Fig. 10).

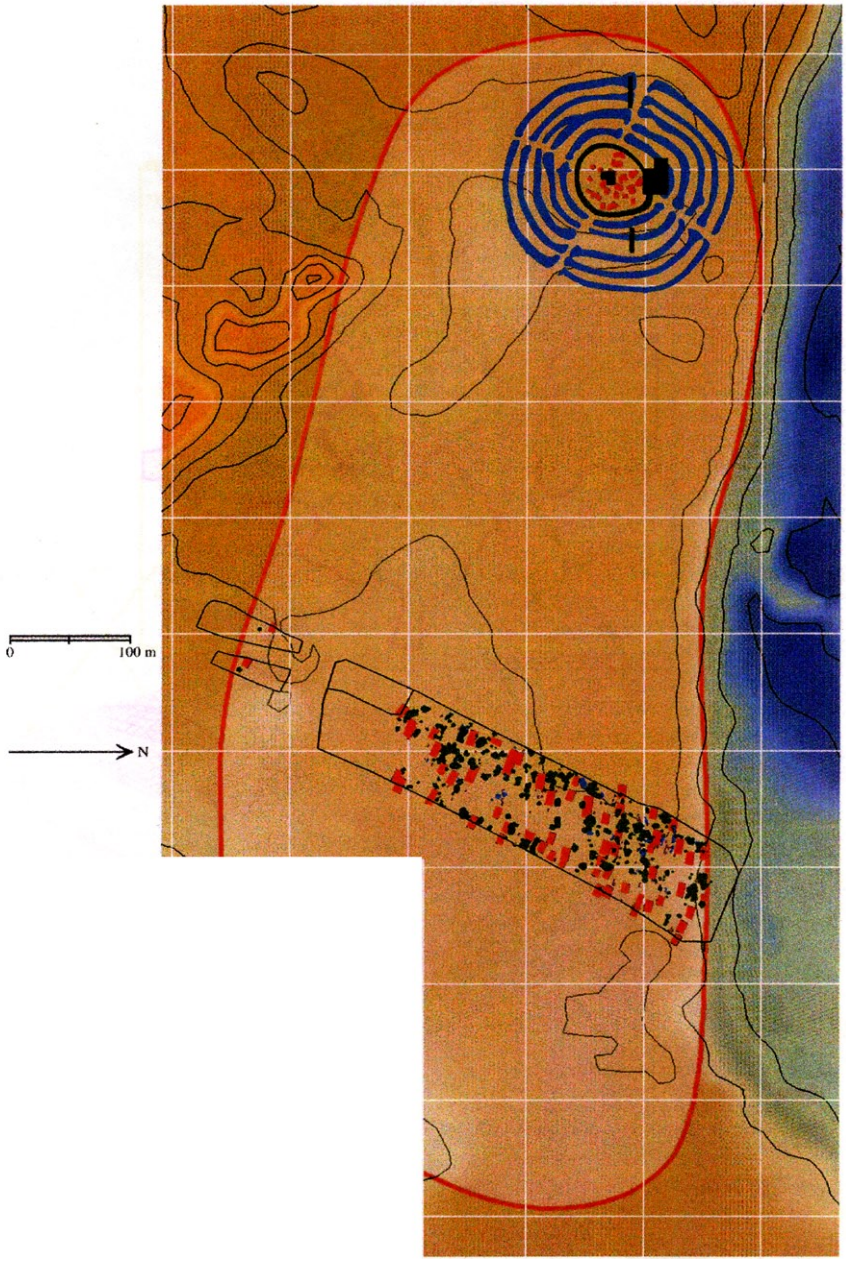

Fig. 10. Polgár-Csöszhálom. Map of the site (according to Raczky et al. 2002)

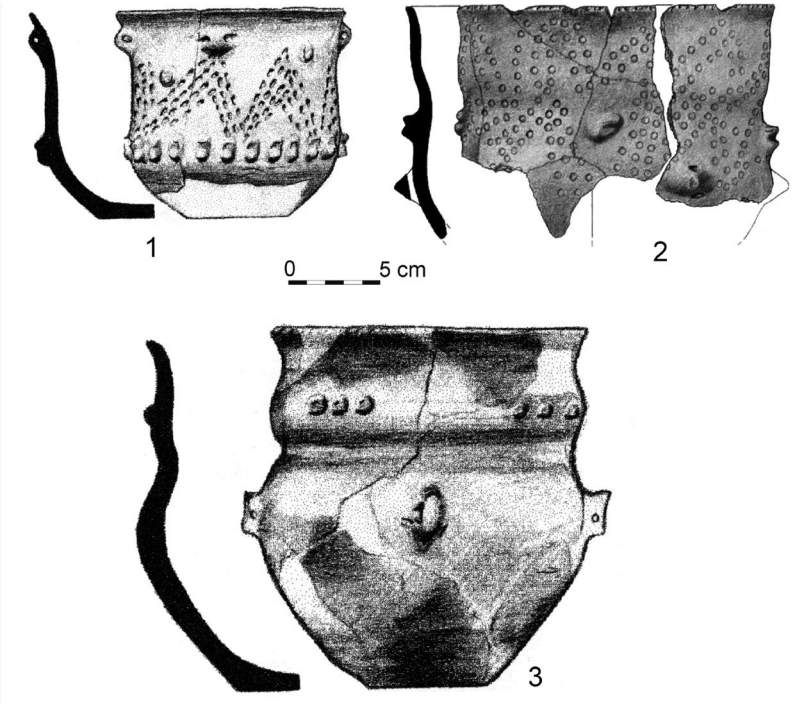

Fig. 11. Polgár-Csöszhálom. 1–3 – pottery forms and ornaments typical for Samborzec-Opatów Group (Lesser Poland) (according to Raczky et al. 2007)

The ceramics from the oldest phase of the Polgár-Csöszhálom-dűlő site (Raczky et al. 2002, 2015; Raczky, Anders 2009a) shows forms and decorative motifs known from Lesser Poland (Samborzec-Opatów Group) (Fig. 11). However, the raw materials from this region are only 1.1%. Although contacts – probably indirect – with the Transcarpathian territories did exist, yet raw material exchange played a minor role.

A rich series of chipped stones known from this site has been, unfortunately, only partially described (695 artefacts) (Raczky et al. 2002). Mainly hydro- and limno-quartzites from outcrops at the foot of the southern slopes of the Tokai Mts (86.2%) were used. Obsidian is only 9.3% (Fig. 12). Recent investigations by N. Farago indicate important differences in the structure of major raw material groups between horizontal and tell settlements. Lithic production was conducted on-site in the horizontal settlement, possibly near some of the dwellings. The tool-kit changes: of importance are forms shaped by transversal retouches (end-scrapers and truncations) (Fig. 13; Farago 2015). Chipped stones are rarely found among grave furnishing. An exception is grave 489 with 10 blades of which seven come from the same core.

The site of Polgár-Bosnyákdomb corresponds to the final phase of the Polgár-Csöszhálom-dűlő settlement. The site is situated in the southern part of the "Polgár Island" and dated at 4612–4503/4581–4461 cal BC (Raczky, Anders 2009b). The taxonomic position of the site is defined by Proto-Tiszpolgár elements (Fig. 14).

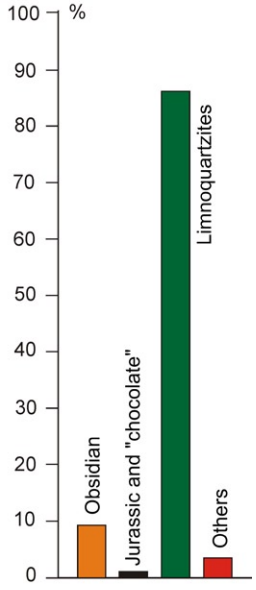

Fig. 12. Polgár-Csöszhálom. Raw material structure (according to T. Biro in Raczky et al. 2002)

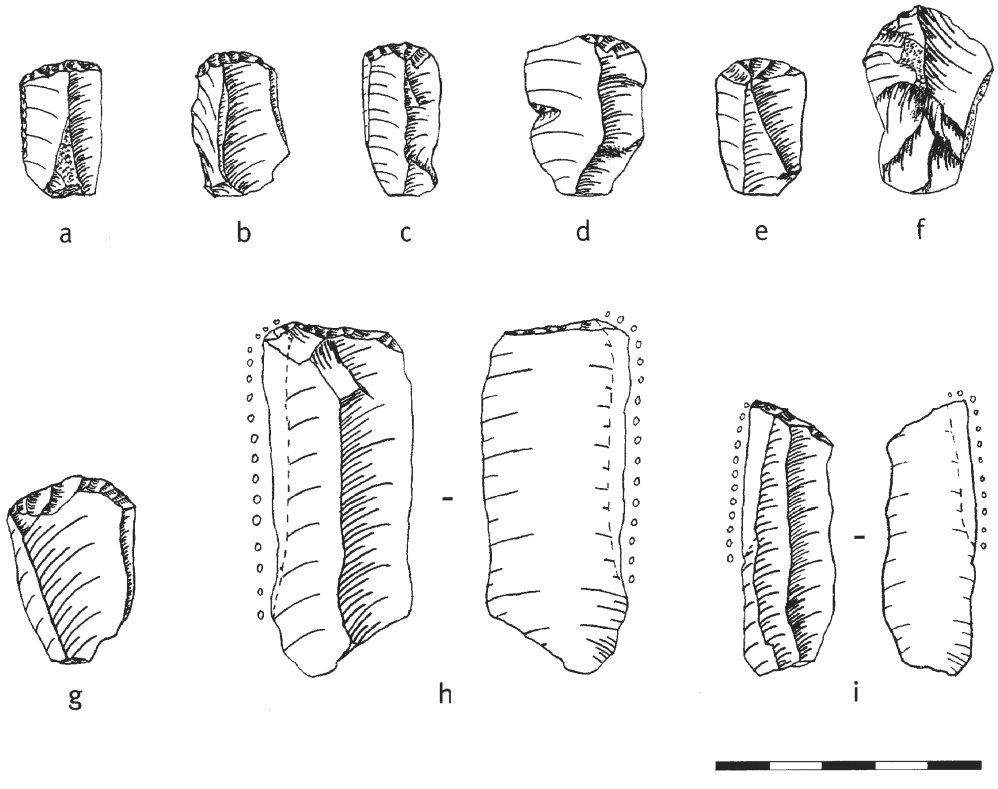

Fig. 13. Polgár-Csöszhálom: a–i – tools (according to N. Faragó 2015)

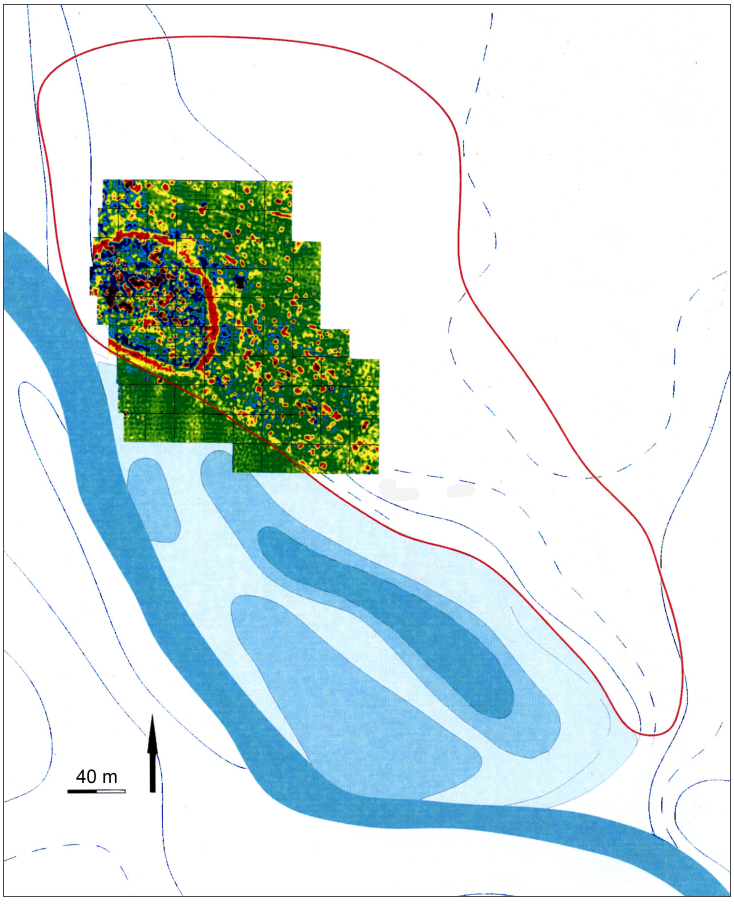

Fig. 14. Polgár-Bosnyákdomb. Map of the site (according to Raczky, Anders 2009b)

The chipped stone assemblage at Polgár-Bosnyákdomb (Kozłowski, Kaczanowska 2009) is made from hydro-and limnoquartzites and siliceous rocks from some mezosoic deposits. Obsidian accounts for 13.2%. Transcarpathian raw materials (Jurassic flint and "chocolate" flint from southern Poland) occur in trace amounts; Cretaceous flint from the Podole-Volhynian Plateau is 4.0% (Fig. 15). Preliminary processing of raw materials was carried out off-sites, whereas tool production and repair were done on-site. The structure of major technological groups is characterized by relatively high index of tools and blades, but also by a major ratio of flakes (Fig. 16). Tools are predominantly with transversal retouch (end-scrapers and truncations) (Fig. 17).

The Early Copper Age is represented by materials from the cemetery at Tiszapolgár-Basatanya (Bognar-Kutzian 1963, 1972). Unfortunately we have no lithics from the settlements of this culture. Generally the grave furnishing and the assemblages from the houses were determined by different various motivation; because the grave furnishing was intentionally selected by users of the cemetery.

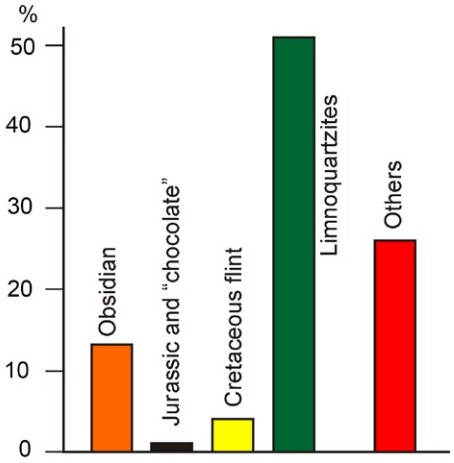

Fig. 15. Polgár-Bosnyákdomb. Raw material structure

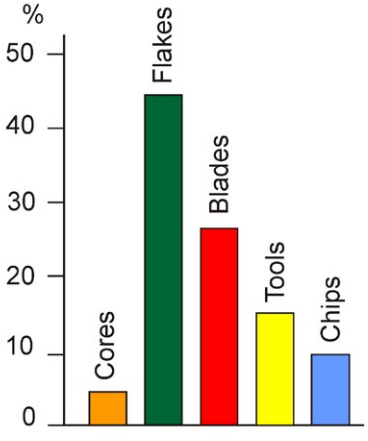

Fig. 16. Polgár-Bosnyákdomb. Major technological groups

In the case of finds from Tiszapolgár-Basatanya graves the raw material structure shows that obsidian was not commonly used, and the most important role belonged to Cretaceous flint from the Volhynian-Podolian Plateau (27.5% - this index could in fact, be higher as only part of material was available for study). For example in the cemetery at Hajdúböszőrmény Ficsori-dülő, situated 7 km beyond the "Polgár Island" – Cretaceous flint is nearly 50% of the grave inventories (Fig. 19) (Kovacs, Vaczi 2007). Grave furnishing are mostly macroblades (Fig. 18).

The raw material structure in the Copper Age indicates the growing importance of Transcarpathian contacts with the Dniester basin.

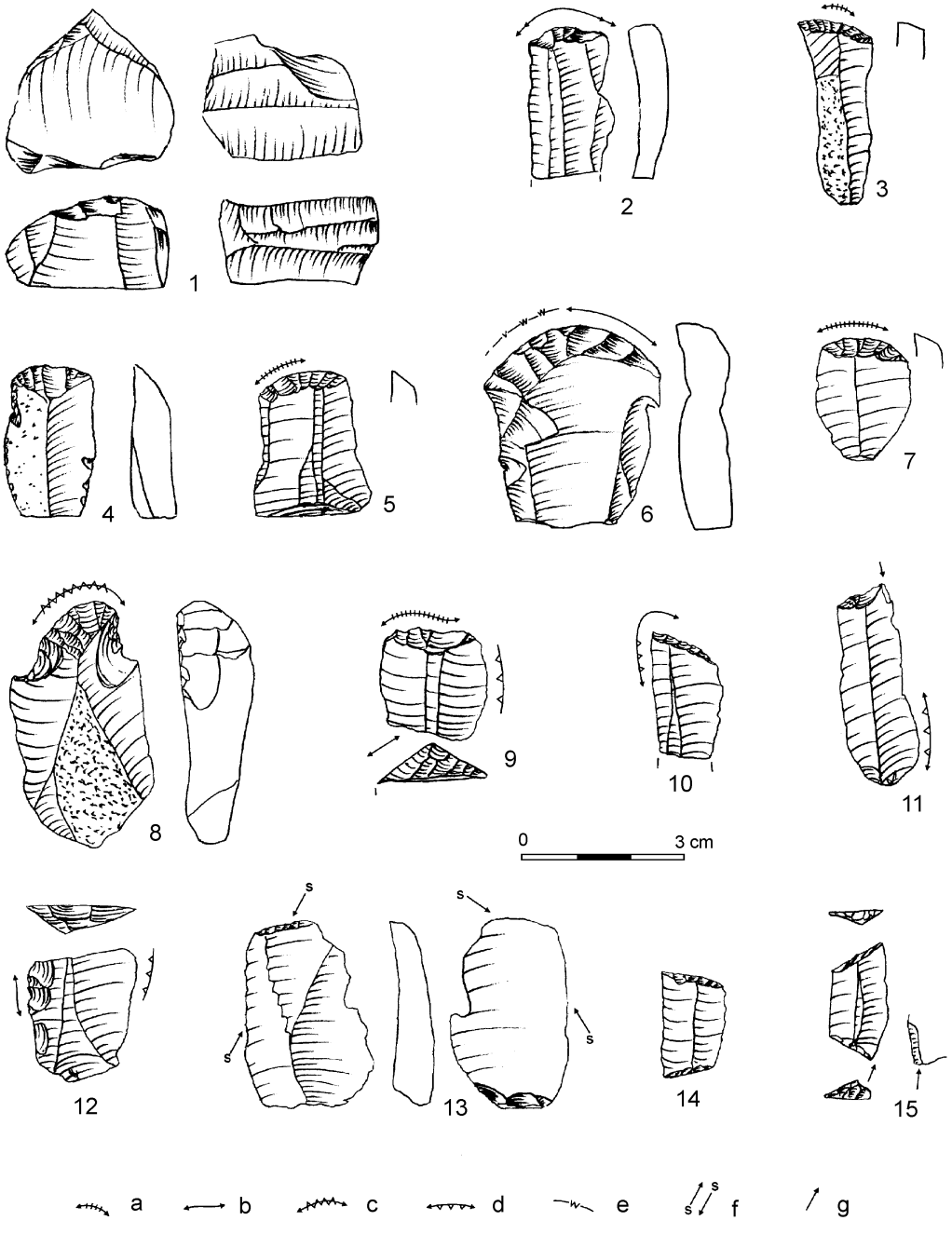

Fig. 17. Polgár-Bosnyákdomb. 1–15 – tools. a – rounding of the edge and perpendicular striations, b – rounding of the edge, c – crushing of the edge, d – rounding of the edge and microscars, e – crushing of interscar ridges, f – sickle gloss, g – impact fractures

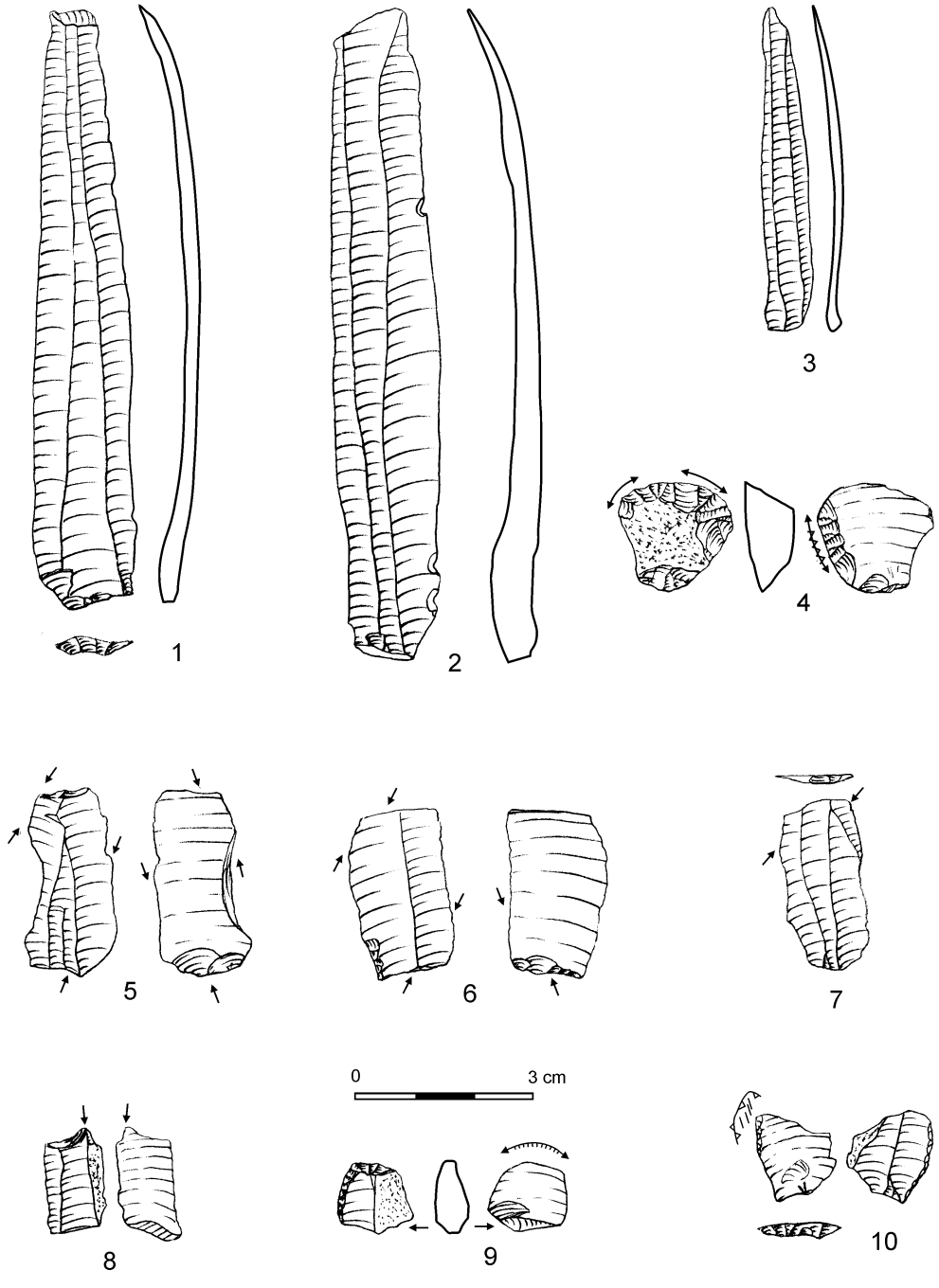

Fig. 18. Hajdúböszörmény Ficsori-dülő. 1–10 – lithic artefacts from graves

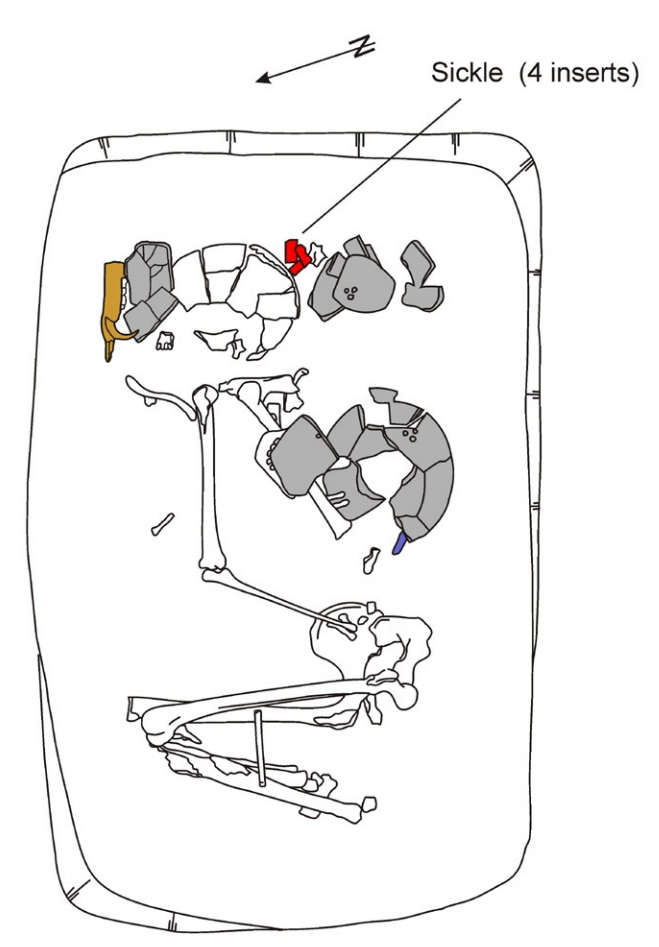

Fig. 19. Hajdúböszőrmény Ficsori-dülő. Grave with lithic artefacts

CONCLUSIONS

For the reconstruction of the interregional contacts of the inhabitants of the “Polgár Island” the derivation of lithic raw materials is of basic importance (Fig. 20a, b):

a) in the evolution of the ALP obsidian, mainly from the Zemplen Plateau, played a major role, mostly in the early phase. The distribution of obsidian indicates that most of contacts developed along the north-south axis.

b) In the Late Neolithic horizon (Polgár-Csöszhálom-dűlő) the flow of obsidian is smaller, replaced by limnoquartzites. This could be the effect of the breakdown of north-south contacts due to the changes of ethno-political boundaries, or could reflect the need for larger blanks than those obtained from obsidian nodules. The first Transcarpathian contacts with southern Poland (Samborzec-Opatów Group) are initiated but have little importance for raw material procurement.

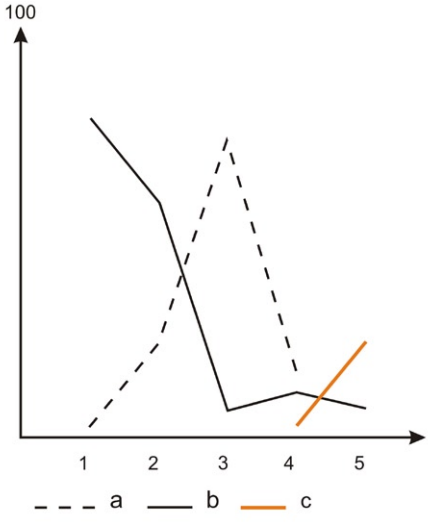

Fig. 20a. Changes in raw material structure in chronological horizons on "Polgár Island": a – limnoquartzites/ hydroquartzites, b – obsidian, c – Cretaceous flint from the Dniester basin. Sites: 1 – Polgár-Picási-dülő, 2 – Polgár-Ferenci hat, 3 – Polgár-Csöszhálom, 4 – Polgár-Bosnyákdomb, 5 – Tiszapolgár-Basatanya

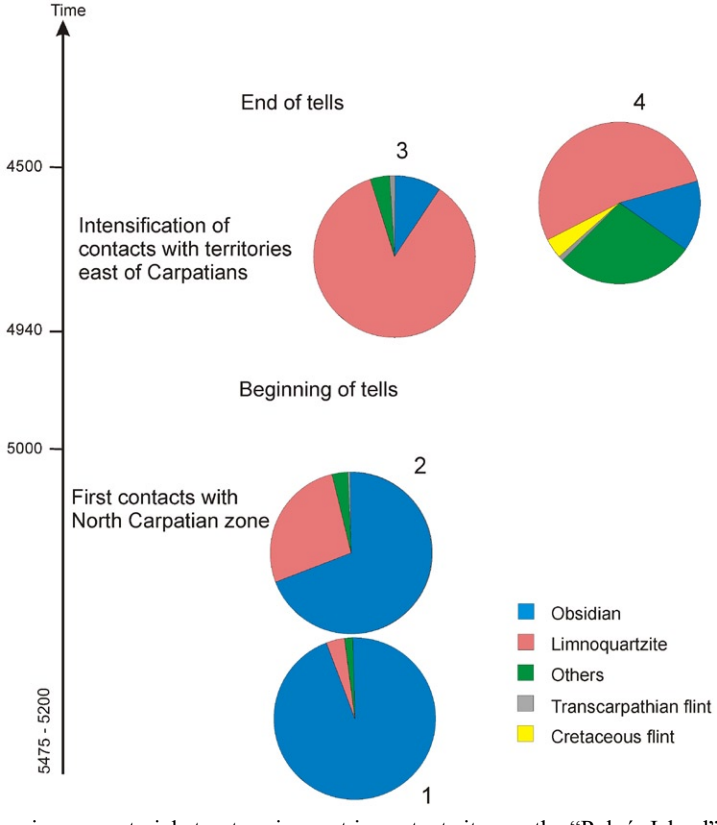

Fig. 20b. Changes in raw material structure in most important sites on the "Polgár Island". Sites: 1 – Polgár-Picási-dülő, 2 – Polgár-Ferenci hat, 3 – Polgár-Csöszhálom, 4 – Polgár-Bosnyákdomb

c) A major change in the systems of raw material supply take place at the beginning of the Copper Age, when in the grave furnishing appear long blades from Cretaceous flint from Dniester basin, produced in specialized workshops.

Simultaneously with changes in the direction of raw material supply, diachronic changes take place in the organization of lithic production. While in the Early ALP production takes place on the household level, beginning from the end of the ALP (Polgár-Ferenci hát) materials from graves evidence the incipients of individual specialization. The final stage of this process in the Early Copper Age is documented by numerous graves of highly specialized knappers. Production is transferred to workshops outside settlements. Some regions gradually become defined by a single, common system of procurement of various goods such as metals and lithics. This is related to the process of social stratification and the emergence of elites participating in the exchange of prestige goods.

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