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Conclusion

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9. CONCLUSION

In central Europe, the beginnings of the Neolithic, i.e. the first occurrence of economically productive communities, are associated above all with the spread of the LBK.

This study is the first synthetic treatment of LBK chipped stone industry from Moravia since the work of Slavomil Vencl (1960; 1971). In its assessment of the chipped artefacts from Lower Austria, it also builds on the more recent work of D. Gronenborn (1997).

In this study, I have attempted to set out the basic characteristics of LBK chipped stone industry in both regions. The chipped industry at particular sites is studied from the perspectives of the raw materials employed and the technology of blank production, while attention has also been devoted to individual tool types. Given that the available information from a large proportion of the sites is incomplete – meaning that there are no related, detailed, relative chronological studies or reports on other archaeological materials (ceramics, zoological material, polished stone industry etc.) – I have not been able to carry out detailed spatial analyses of chipped stone artefacts within the framework of individual settlements and their phases. Therefore, I have not attempted to characterise the sites from the point of view of spatial organisation (workshops, dwelling areas etc.).

Given that the available chipped stone material from modern excavations came in large part from the earliest phase of the LBK, an important and naturally arising theme of this study has been the question of the culture's origin. This is especially the case since during the period in which the study was carried out, discussions on the origins of the central European Neolithic were re-awakened, with a major role being played by evidence from the chipped stone industry. For these reasons, and to enable further comparisons aimed at answering particular questions, I have also studied chipped stone material from several Mesolithic sites, and from sites dated to the Körös and Starčevo cultures.

The beginnings of the Neolithic and the origin of LBK chipped stone industry were considered from the following points of view:
1) the technology of blade blank production;
2) the distribution of raw materials.

In assessing and comparing the technology of blade blank production within the framework of the LBK and in the Mesolithic and Balkan Neolithic, I have found the experiments of W. Migal of the State Archaeological Museum in Warsaw and their comparison with relevant published data to be of fundamental importance. This is the first time experimental archaeological methods have been used for solving specific problems linked with the beginning of the Neolithic in the region under discussion.

For most researchers considering the beginnings of the Neolithic on the basis of the chipped stone industry, the phenomenon of regular blades has served as one of the main arguments both for the hypothesis of an autochthonous origin of the central European Neolithic and for the hypothesis of an allochthonous origin. In addition, it is for the most part impossible to distinguish when the term 'regular blade' is understood in the narrower sense as meaning a blade produced by pressure flaking, or in the broader sense as meaning simply any regular blade that might also have been produced by the punch technique. For both these reasons I have, on the basis of an analysis of experimentally produced blades, attempted to establish criteria that could be used to separate the two technologies from each other.

The criteria so defined were used to compare blade production techniques at Mesolithic and Early Neolithic sites in south-eastern and southern central Europe. This resulted in the identification of two blade production traditions (**figs 3–6**) in the Early Neolithic period – the *Danubian Tradition*, associated with blade production by punch technique, and the *Medi-*

terranean Tradition, associated with blade production by pressure technique.

The Danubian tradition has been recognised across the range of the early LBK, and was used in part in the Starčevo and Körös cultures as well. The Starčevo-Körös-Criş complex is, however, associated primarily with the Mediterranean tradition of blade production.

The origin of the Mediterranean tradition can be found in the Epi-Palaeolithic and proto-Neolithic cultures of central Asia and the Near East, from whence it spread to the Mediterranean and the Balkans during the Late Mesolithic and Early Neolithic periods (i.e. the Early Neolithic of south-east Europe, the Impresso-Cardial culture complex). The Mediterranean tradition did not spread northwards into central Europe, and its expansion is limited to the areas of the earliest Neolithisation in Europe. Evidence of the Mediterranean tradition has not been found in northern Transdanubia, Moravia or Lower Austria.

I therefore interpret the Danubian tradition as being a local, Late Mesolithic tradition, which developed in southern and south-eastern parts of central Europe and possibly in the Balkans as a local answer to innovations and new ideas from the Near East, and later from the Mediterranean. This adaptation is termed a *variation on the Mediterranean tradition*. I do not claim that blade production by punch technique was unknown in the Mediterranean or the Near East. It is sometimes difficult to distinguish blades made by punch technique from those made by certain variations of the pressure technique. It is also likely that blade production by punch technique existed in parallel to the pressure technique. It is apparent that blade production by pressure flaking did not occur in central Europe, with rare exceptions in the Late Mesolithic and the Early Neolithic periods.

The identification of different traditions in parts of south-eastern central Europe indicates that:

- the process of Neolithisation in central Europe was not unified;
- indigenous Mesolithic populations played an important role in some regions, and were gradually acculturated; and
- the Balkan cultural complex (including the Starčevo and Körös cultures) most likely contributed to the Neolithisation of central Europe through mediation, the transfer of information and the medium of contacts relating to the exchange of raw materials, products and partners.

The local Mesolithic population, at least in some regions, participated in the formation of the Körös culture and perhaps also the Starčevo culture. This is indicated by the Danubian tradition of blade production, which originated in the Late Mesolithic as a local response to technological changes in the Mediterranean (i.e. as a *variation on the Mediterranean tradition*).

The second focus of this study has involved the distribution of stone raw materials. Changes in the distribution of raw materials from the Mesolithic to the end of the Neolithic have been assessed, with an emphasis on the raw materials that may have played an important part in the Neolithisation process in central Europe (Szentgál radiolarite, Carpathian obsidian, Krakow Jurassic silicites). The distribution of raw materials indicates that the boundaries between central and south-east Europe were not distinct, and that a network of contacts already existed in some areas at the end of the Early Mesolithic.

a) During the Mesolithic the inhabitants of Moravia, Lower Austria and northern Hungary used a broad spectrum of raw materials of predominantly local and regional origin, marked for the most part by their poor quality and often coming from gravels. Demands for quality in raw materials changed in central Europe in the Late and especially the Final Mesolithic, and related to a new technology of blank production oriented towards the creation of regular blades.
b) In the late phase of the Early Mesolithic and in the Late Mesolithic, chipped stone assemblages from Moravia and northern Hungary began to include raw materials imported from great distances (Krakow Jurassic silicite, chocolate silicite, Szentgál radiolarite, Carpathian obsidian). Their extensive distribution formed the ideal basis for the later rise of the Neolithic.
c) In the early phase of the LBK, raw materials of higher quality than in the Mesolithic were preferred. Gradually, an orientation towards a single raw material type – either local or imported – emerged. This was related to shrinking territories and the sedentary way of life, with raw materials obtained either directly from the immediate area or through an exchange network. Nevertheless, in this period regional raw materials made up a far higher proportion of the total than in the middle phase, which could relate to a certain mobility of the early LBK communities. In northern Moravia, there is a preponderance of Krakow Jurassic silicites over local and regional raw materials even in this earliest phase. In southern and central Moravia, local raw material sources predominate. Along the Danube in

Lower Austria, Transdanubian (particularly Szentgál) radiolarites are the most important raw material, even at sites up to 250 km from the source. Radiolarites predominate over local raw materials in spite of the nearby rich sources of suitable stone.

d) In the middle phase of the LBK, settlements are conspicuously oriented towards a single type of raw material. The use of a single type is probably linked to the extraction of raw materials and to demands for its higher quality. A stable and organised distribution network may be inferred in this period. In central and north-eastern Moravia, Krakow Jurassic silicites continue to dominate; in southern Moravia, raw materials of local origin are in use in this period as well. Conspicuous changes occur above all in Lower Austria, where raw materials of local and regional origin begin to be used instead of imported Transdanubian radiolarites.

e) Pronounced changes occurred in Moravia and Lower Austria at the end of the LBK and during the Stroke-Ornamented Ware period; these are linked to the dissolution of the earlier distribution network. During this period, the mass movement of Krakow Jurassic silicites into Moravia and other more distant regions ceases. The lack of raw material is compensated for by the use of more accessible raw materials, particularly erratic silicites. In south Moravia and Lower Austria, too, raw materials from gravels are used more often. At the end of the LBK, Moravia and Lower Austria again see imports of south-eastern origin (Transdanubian radiolarites, Carpathian obsidian). This is associated with influences from the Želiezovce group and the Bükk culture and with the formation of the Lengyel complex. Raw materials of western provenance (north-west Bohemian quartzites, Bavarian Abensberg-Arnhofen chert) also appear. They are associated with the Šárka phase and with the penetration and formation of the Stroke-Ornamented Ware culture.

On the basis of the information assembled so far and further personal observations, I believe that the LBK developed autochthonously from the local Mesolithic substrate in Transdanubia and immediately adjacent areas, but under the influence of contacts and partial mixing with the Starčevo culture communities. In essence, however, it was a "variation on a Balkan and Mediterranean tradition" that began as early as the Late Mesolithic.

The means by which the LBK spread into other regions remains a question and a challenge for future research. Before attempting to answer this question, it will be necessary to focus on the chronological synchronisation of settlements from the early phase of the LBK. Studies in this direction, in connection with raw material distribution, will make it possible to ascertain in which direction Neolithisation advanced and whether this was predominantly due to physical movement or to the acculturation of local Mesolithic communities. On this matter, I am inclined to support the hypothesis of D. Gronenborn, which assumes that the centres of further Neolithisation were pioneer settlements spreading out from previously Neolithisised areas.

In addition, it is necessary to continue the study of blade blank production technologies and the possibilities for their diffusion. Assemblages of LBK chipped stone artefacts, but also those of Late Mesolithic date, could be studied from the perspective of how blade production technology developed.

To test the hypothesis of the beginnings of the Neolithic in the south-eastern part of central Europe and the genesis of the LBK, great importance will in future need to be accorded to the detailed study of recently investigated earliest LBK and Starčevo sites in Transdanubia (Szentgyörgyvölgy-Pityerdomb, Gellénháza-Városrét and Vörs-Máriaasszonysziget) and Lower Austria (the Brunn sites). Such studies should be undertaken using comparable classification systems.

To further study the beginnings of the LBK, it will also be necessary to thoroughly investigate surface sites with microlithic artefacts in Transdanubia and Burgenland, the dating of which is uncertain. It is possible that some microlithic assemblages with regular blades, so far regarded as Neolithic, might actually date to the Late or 'Final' Mesolithic, known in central Europe mainly from southern Germany.