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THE ORGANIZATION OF SILICEOUS ROCK SUPPLIES TO THE DANUBIAN EARLY FARMING COMMUNITIES (LBK): CENTRAL EUROPEAN EXAMPLES

An outline

The extraction, processing and distribution of siliceous rocks is an essential element not only in gaining knowledge of past technology and human behaviour, but also in understanding the social organization and economy of early farming communities. These specific kinds of activities, connected with gaining the supply of necessary raw material, in practice reflect not only certain material characteristics of an original culture but also, selectively, some attributes of its structure (Lech 1975, 1981; Schild *et al.* 1985; Kozlowski *et al.* 1988). By comparing the morphological and raw material structures of chipped inventories from mining fields, settlements and camps located at various distances from the deposits of siliceous rocks, one can reconstruct the organization of work which involved supplying the communities with raw materials. Moreover, comparative analysis of the structure of inventories makes it possible to reconstruct the ways of distributing siliceous rocks. It is also significant for evaluating the range of specialization of labour in the extraction and processing of flint (Lech 1975, 1980a, 1983, 1987; Kaczanowska 1985; Cahen *et al.* 1986; de Grooth 1988).

Settlement communities are the only units of social organization possible to perceive for the early Danubian - Linearbandkeramik (LBK) sites (Trigger 1968 : 20-23, 1978 : 115-121). As in all human societies, the division of labour and of social functions depending on sex and age must have existed among the Danubian communities (Nash 1966 : 21-22; Watson *et al.* 1971: 9-10; Sahlins 1974 : 78-79 and 187; Lech 1980a). Social anthropology studies show that all the inhabitants of little villages are linked by both social and economic relations as they are joint owners of the resources, joint producers or participators in a recompense for work, through various social channels (Firth 1956 : 138). The basic social phenomena among them are the following : coordination - foresight - responsibility - reciprocity (Firth 1956 : 75-79). Both in the analysis of mining fields, and in the distribution of siliceous rocks are found data testifying their existence (Lech 1980a, 1981, 1988; Cahen *et al.* 1986; de Grooth 1988).

The distribution of raw materials shows that there was increasingly close interaction between LBK settlement regions. Vast and multi-directional distribution of many raw materials, with the concurrence of numerous features in the cultural assemblages, must have been connected with the information flow and various kinds of contacts on a scale not seen in the earlier periods. In the light of this, it is probable that the Danubian communities also had the tribal type of social organization already existent in the LBK culture. The homogeneity of cultural attributes in vast areas of Europe, and quite separate features in comparison with the hunting and gathering groups of the local Mesolithic, seem to indicate this. Clearly marked contacts, and information flow between many settlement regions, proved by the multidirectional distribution of the siliceous rocks is an important argument (Figs 1, 3 and 4). It seems that the distribution of siliceous rocks in LBK testifies the existence of strong bonds linking sites, settlement stows, tracts and provinces (Löhr *et al.* 1977 : 148-186; Lech 1981 : 44-45, 1987 : 241-243; Kaczanowska 1985 : 54-73; Kozlowski 1988 : 559).

The existence in this period of flint mining - Tomaszów in Central Poland (Fig. 2), Sümeg in West Hungary and others (Bakels 1978 : 101-105; Lech 1980b : 47-51, 1988; Schild 1980, 1987; Schild *et al.* 1985; Bàcskay 1986) - of large settlements dealing with the processing of siliceous rocks - Cracow-Olszanica and Bolechowice-Zielona, dist. Cracow in the Polish Jura, Vedrovice-Zábrdovice, dist. Znojmo in South Moravia (Kozlowski *et al.* 1961; Ondrus 1976; Milisauskas 1986) - and the existence of other settlements obtaining systematically the necessary raw materials by means of exchange - Bylany in East Bohemia, Skoroszowice, Niemcza, Strachów in Lower Silesia (Lech 1981, 1987; Wojciechowski 1988) - all this testifies group specialization of some settlements in flint mining, processing and distribution already in the 2nd half of the 5th Mill. b.c. (Figs 3 and 4). This may well have provided a basis for individuals to begin specializing in making composite tools, such as the workshop for making, among other things, sickles found by V. Ondruš at Vedrovice-Zábrdovice (Ondruš 1976; Lech 1983 : 49-52). In regions situated a long distance from the deposits of siliceous rocks, some sites were secondary distribution centres of raw

Fig. 1: The distribution of siliceous rocks on LBK sites as a result of different types of past behaviour.

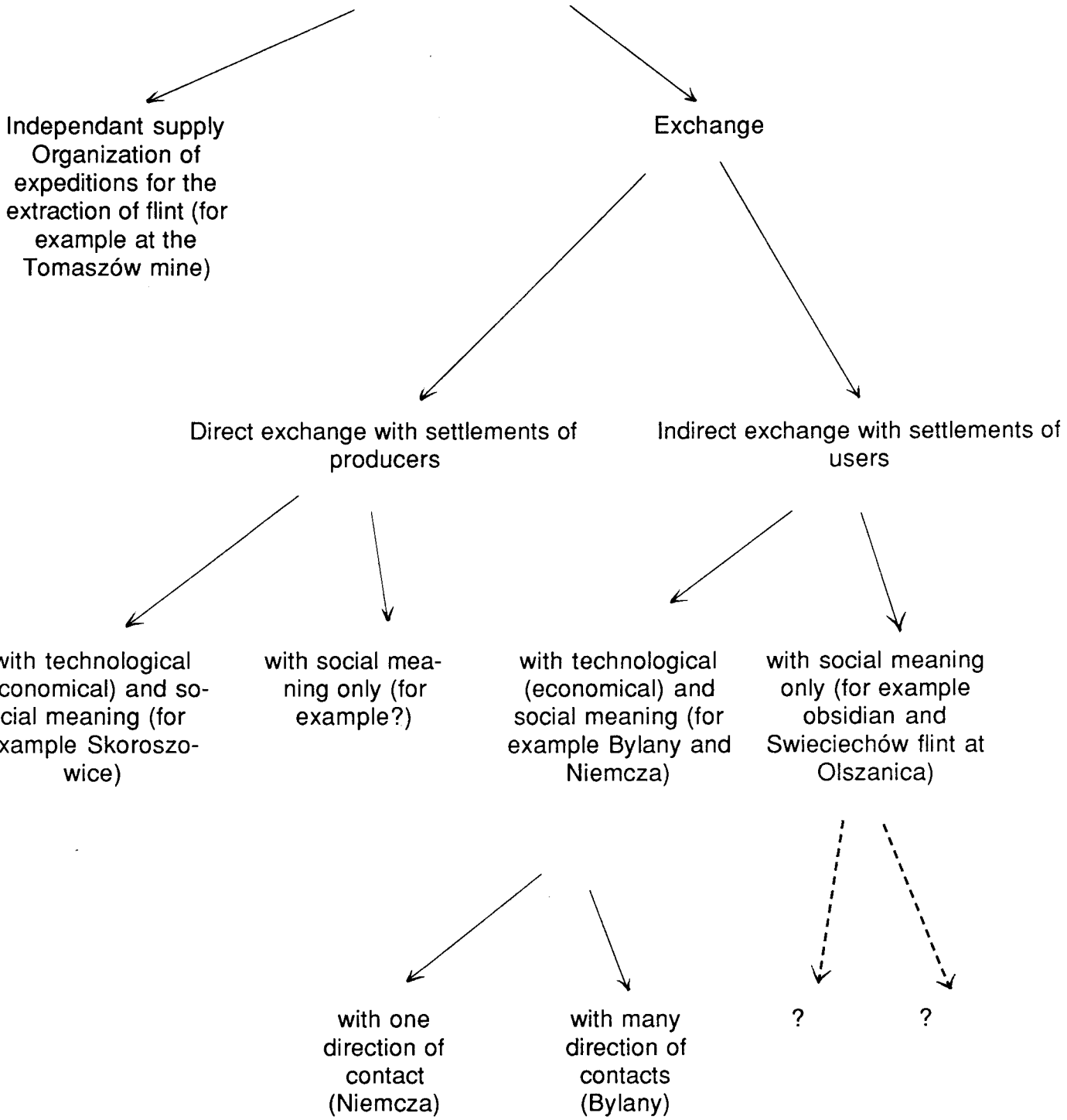
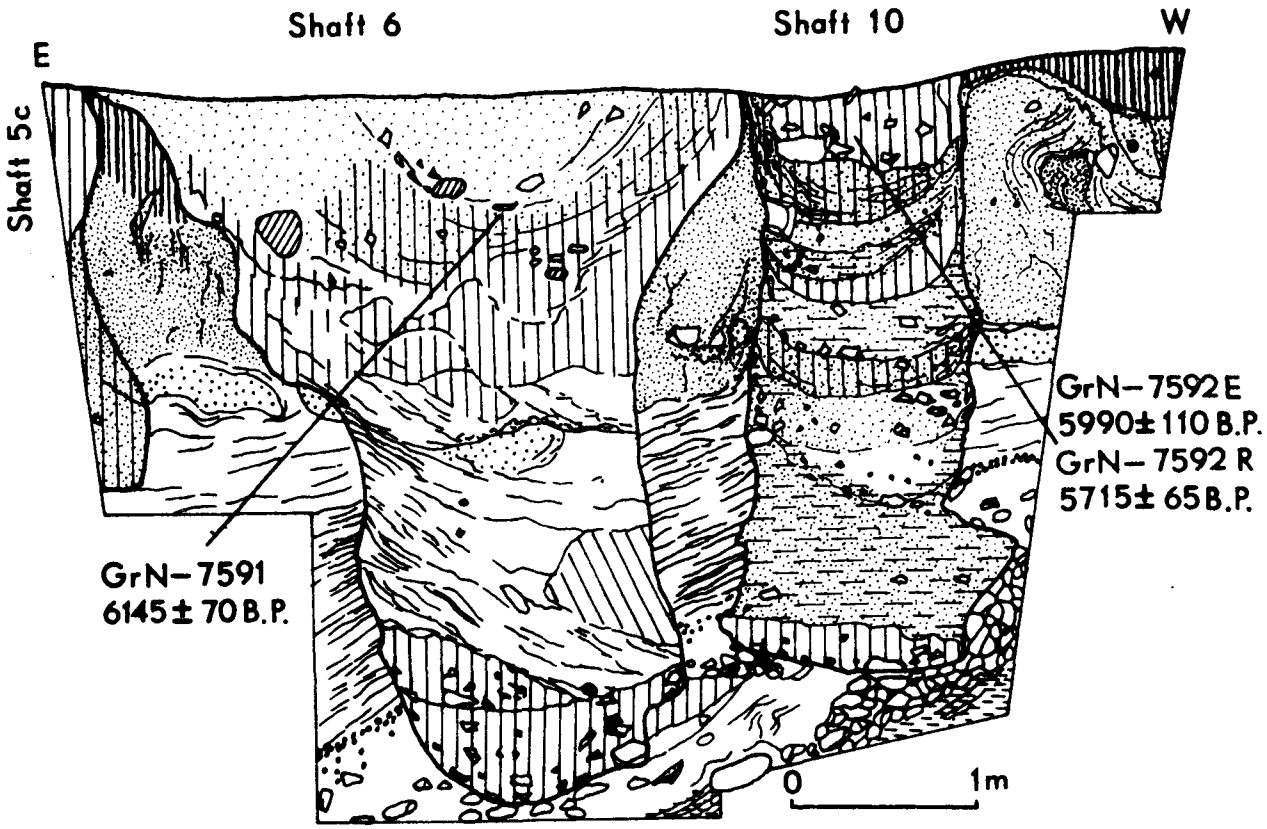


Fig. 2: Tomaszów, Radom district. Cross-section of shafts N° 6, 10 and portion of shaft N° 5c according to R. Schild, H. Królik and M. Marczak.



materials such as Skoroszowice in Lower Silesia according to W. Wojciechowski (1988 : 45-47) and maybe Langweiler 8 from the Aldenhovener Platte according to A. Zimmermann (1982).

The organization of siliceous rock supplies to the Danubian early farming communities was differentiated (Fig. 1). In some cases it is possible to confirm an independent supply for particular communities, when expeditions were organized to the mines for flint extraction. A good example of this can be seen in the flint mine at Tomaszów situated in an area with unfavorable conditions for an early farming economy. The most important mechanism in the distribution of siliceous rocks was played by exchange. The exchange always had a social meaning, but quite often among LBK communities was important too from a technological and economical point of view. Many LBK settlements used mainly siliceous rocks from far-off deposits, and a supply of raw materials to these communities was a result of direct or indirect exchange (Figs 1,3-6). The best examples of this type of exchange are inventories from the settlement at Bylany, where Jurassic-Cracow flint from the Polish Jura was the most popular siliceous rock (Figs 5h, 6a, 6b, 6i, 6m). Sometimes we can observe evidence of exchange with a purely social meaning. In LBK chipped inventories the proofs of such an exchange are small quantities of raw materials which originated from remote areas in settlements already rich in good quality local flint. For example, such was the meaning of rare specimens of obsidian and some exotic flints at the Cracow-Olszanica settlement (Fig. 5c), which was connected with the mining exploitation of Jurassic-Cracow flint from nearby deposits[1].

Settlements like Bylany and Niemcza obtained most of their raw materials by indirect exchange (Figs 3 and 4). Their acquisition was a technological necessity for the communities which lived there. The above-mentioned sites represent typical settlements of siliceous rock users. Siliceous rock exploitation was carried out by settlements of the Cracow-Olszanica type (Kozlowski *et al.* 1961 : 37-38; Lech 1975 : 71, 1981 : 44-45; Milisauskas 1986 : 167-173). They were connected by a network of muti-directional indirect exchange not to be met on such a scale in later periods of the Neolithic (Lech 1987). The great development of exchange systems among the first Danubian farmers is clearly linked with a low level of the adaptation of the LBK communities to the varied conditions of siliceous rock supply in central Europe.

The analysis of LBK siliceous inventories from many sites shows that the exchange network of the first farmers comprised the movement of blade blanks, finished tools as well as pre-cores and early core forms (Figs 5 and 6). The exchange of blade blanks in the LBK culture is best indicated by specimens of large blades of Jurassic-Cracow flint found in settlements situated far from the deposits - Šturovo, West Slovakia, Bylany, East Bohemia and depots of blades - Borovce,

West Slovakia, Vedrovice-Zábrdovice, South Moravia (Lech 1982-1983 : 6-13, 1983 : 50). On the other hand, an exchange of tools is indicated unambiguously by two truncated pieces of chocolate flints from the mines of Wierzbica "Zele" and Tomaszów in Central Poland, in materials from phases IIa (Fig. 6n) and III (Fig.6 o) from the Bylany settlement. Also, the only specimen of Świeciechów flint from Central Poland at Bylany is a scraper in materials of phase I (Fig.6r). It is difficult to presume that in all three cases single tool specimens from flints coming from deposits lying in a straight line about 450-500 km reached Bylany in the form of pre-cores or blade blanks.

The cores prepared from Jurassic-Cracow flint were found in many settlements situated far away from the deposits - for example : Bylany, dist. Kutná Hora in Bohemia (Fig. 5h), Żalecino, dist. Szczecin in North-West Poland and Boguszewo, dist. Toruń in North Poland, approx. 300-500 km from sources of raw material. Therefore the existence in the LBK culture of long-range exchange, including both pre-cores, initially worked core forms, blade blanks and tools, should raise no doubts. Settlements wich extracted flint and used it were connected by a multi-directional network of exchange. What is essential for the credibility of the conclusions made here is that to a large extent they are based mostly on analyses of materials from large, well-studied and published sites, such as the flint mine at Tomaszów, settlements at Bylany, Vedrovice-Zábrdovice and Olszanica (Ondruš 1976; Lech 1983 : 49-52; Schild *et al.* 1985; Milisauskas 1986; Pavlů *et al.* 1986 - with further references).

Fig. 3: Bylany siliceous rock exchange network from phase I of the LBK settlement : a. settlement; b. mine; c. direction of erratic "Baltic" flint distribution; d. direction of Jurassic-Cracow flint distribution; e. direction of grey-white spotted flint distribution from the Świeciechów mine; f. direction of Moravský Krumlov hornstone distribution; g. direction of radiolarite distribution; A. Bylany, Kutná Hora district; B. Cracow-Olszanica; C. Vedrovice-Zábrdovice, Znojmo district; 1. Swieciechów, Tarnobrzeg district.

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Note

1 All the siliceous rocks mentioned in the text have been described in detail in previous papers (Lech 1980b, 1981).

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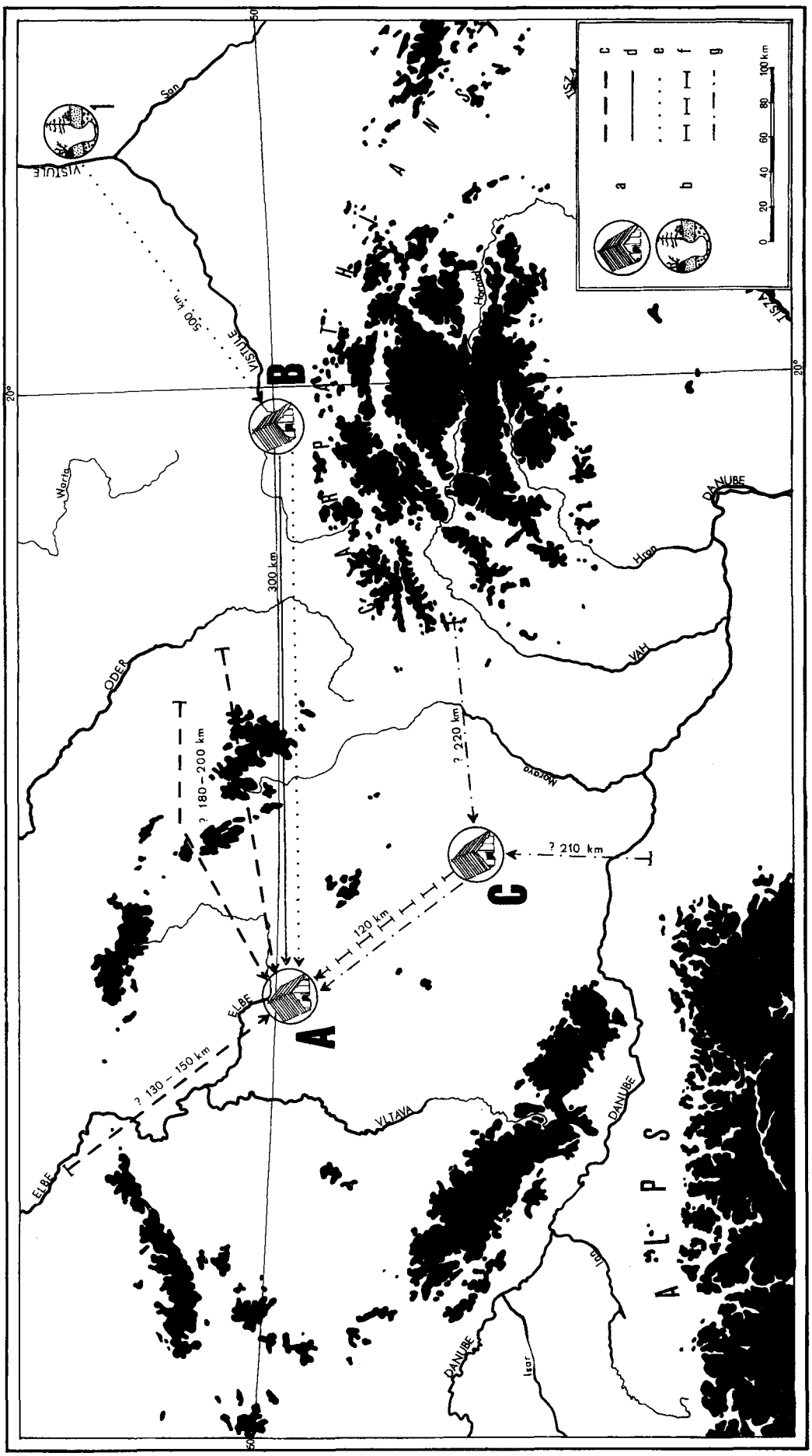
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Fig. 4: Bylany siliceous rock exchange network from phase IV of the LBK settlement : a. settlement; b. mine; c. direction of erratic "Baltic" flint distribution; d. direction of Jurassic-Cracow flint distribution - a thick line indicate the predominant significance of Jurassic-Cracow flint at the Bylany settlement; e. direction of Skršín quartzite distribution; f. direction of Tušimice quartzite distribution; g. direction of Bavarian tabular striped hornstone distribution; h. deposit of Skršín quartzite; A. Bylany, Kutná Hora district; B. Cracow-Olszanica; D. Křimice, Pilsen-North district; 2. unknown flint mine of Jurassic-Cracow flint connected with the Cracow-Olszanica settlement; 3. Arnhofen, Kelheim district; 4. Tušimice, Chomutov district.

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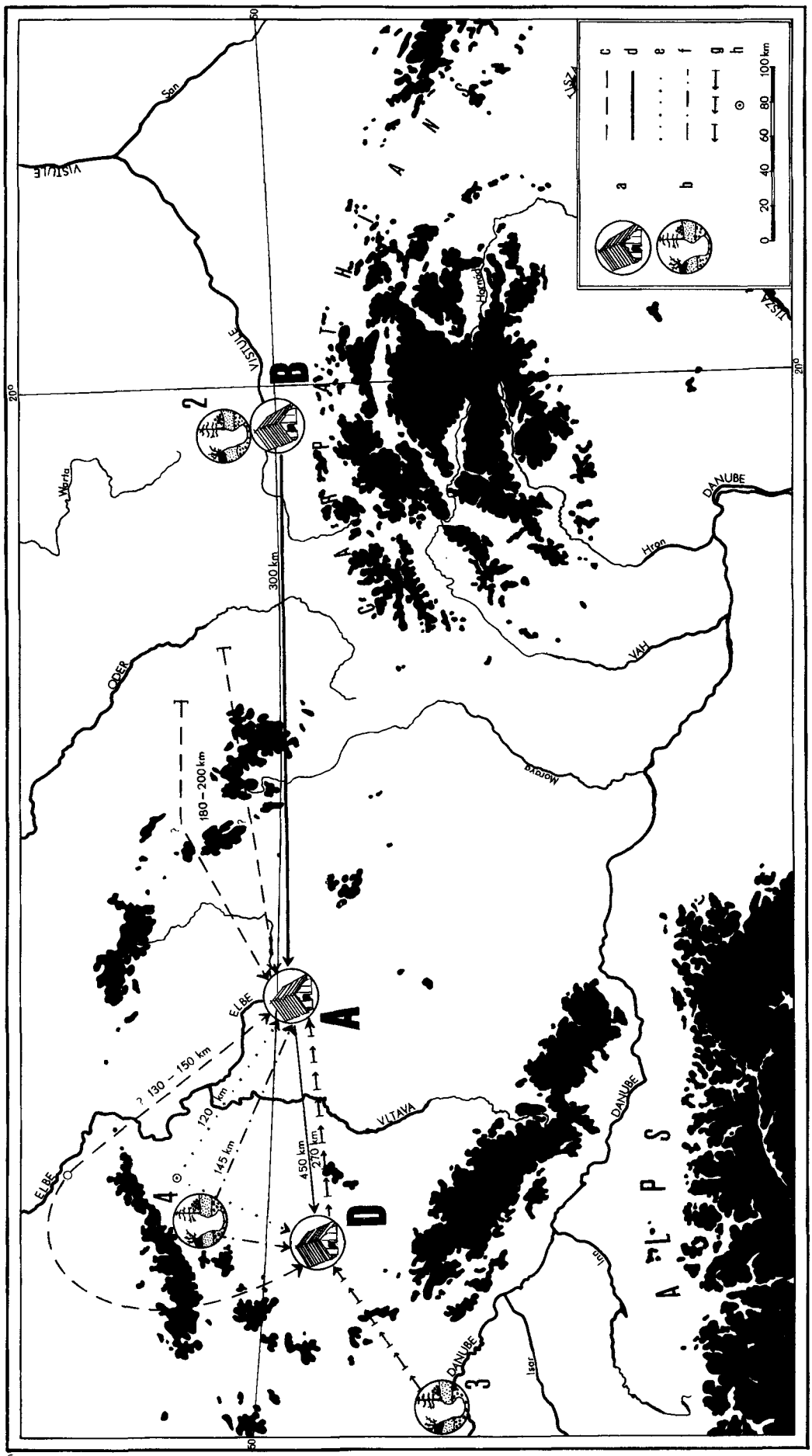
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Fig. 5: Flint industry of the LBK from Cracow-Olszanica (a-g) and Bylany, Kutná Hora district (h-k) : a, b, d-h. Jurassic-Cracow flint; c. obsidian; i. plasma of the Boskvstejn type; j. erratic "Baltic" flint; k.porcelanite.

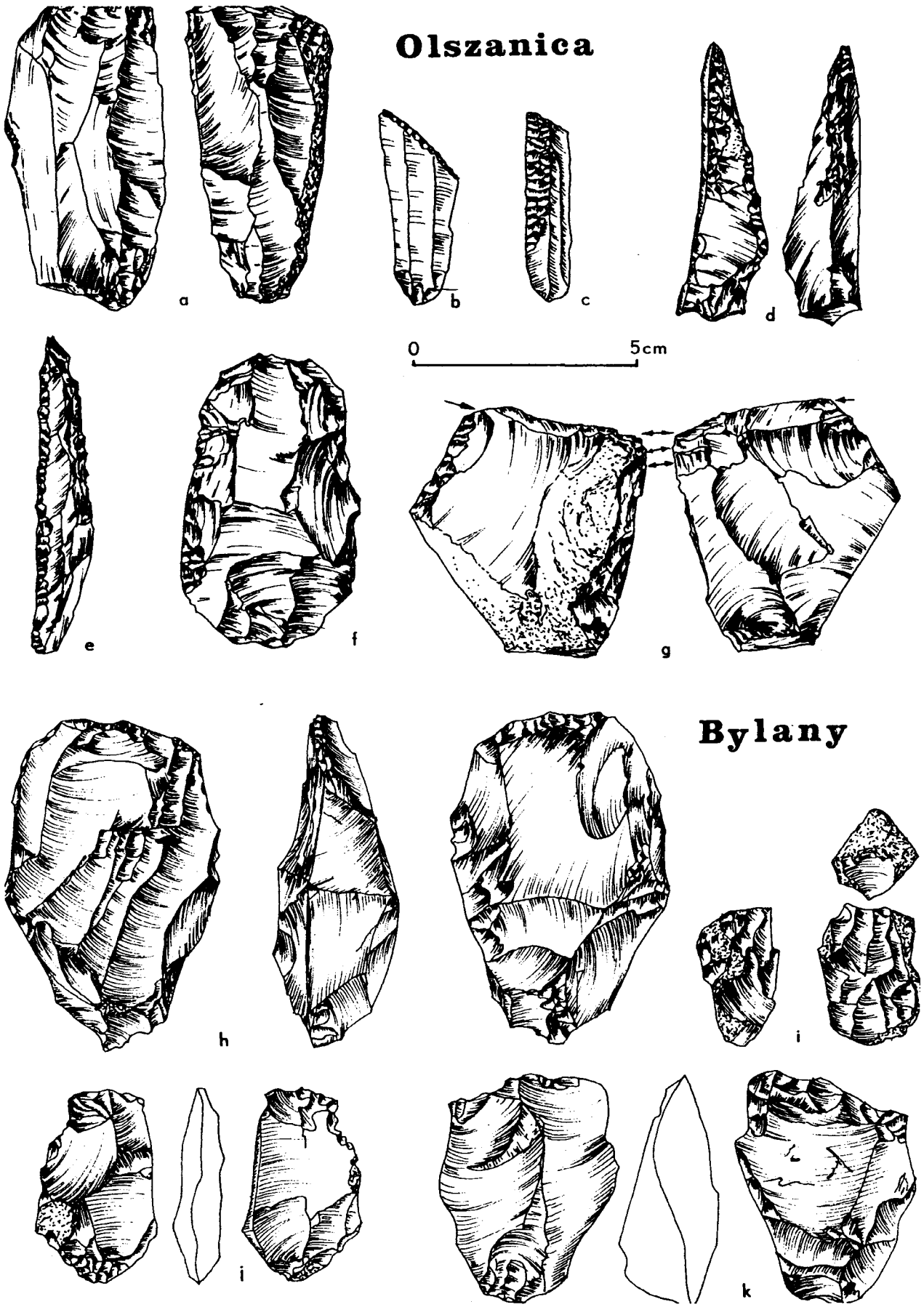

Fig. 6: Flint industry of the LBK from Bylany, Kutná Hora district (a-s) : a, b, i, m. Jurassic-Cracow flint; c-e. erratic "Baltic" flint; f, g, k, p. quarzite of the Skršín type; h. porcelanite; j, l. quartzite from the Tušimice mine; n. "chocolate" flint from the Tomaszów mine; o. "chocolate" flint from Wierzbica "Zele" mine; r. grey-white spotted flint from the Świeciechów mine; s. hornstone of the Moravský Krumlov type.