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CHAPTER V

A TALE OF TWO VILLAGES: BANDKERAMIK SOCIAL STRUCTURE

This fifth and final chapter draws together some lines of evidence to test a number of hypotheses on Bandkeramik social structure. The evidence (if one may call it that) is gathered from an analysis of decorated pottery from two LBK villages: the Dutch site of Elsloo, and the Bavarian site of Hienheim. The former has been extensively reported on in Modderman 1970; its graveyard was studied in some detail in the previous chapter; Hienheim, however, has only been partially described – and yet the present volume was originally conceived of as a monograph on the Neolithic pottery from that site.

The hypotheses to be tested against these data derive from two sources:

1. There is a pile of print dealing with the LBK, some of which is also concerned with its social aspect; from it, ideas can be collected which have been or are still to be tested in one form or another.

2. The study of the Elsloo cemetery reported on in Chapter IV has been written especially in view of generating hypotheses on LBK social structure.

From this, the contents of this chapter can be structured in the following way. In a short introduction (first section) I will signal some recent work on non-Bandkeramik, prehistoric, Neolithic social structure, just to provide a background. In the second section I will deal with some other studies explicitly discussing Bandkeramik social structure; I will also briefly summarize the "findings" of the previous chapter – together, these are the hypotheses to be tested. The third section is a very loosely structured one on method: several points are better presented separate from the evidence. They are mainly concerned with preliminary contemplations of the computer output to be inspected in the subsequent sections, especially the weight that should be accorded to the principal components analyses. Also, the subdivision into phases of the settlement data will be briefly treated there. The next two sections contain the confrontation of data and hypotheses; Elsloo and Hienheim are dealt with separately, and in that order. In both sections I will start with a short summary of what has been published on the site; then the statistical analyses will be presented, followed by a reflection on the second section's contents. The sixth and final section comprises a listing of what has been tested and what has not, plus a number of uncleared problems; as such it should serve as a summary of this chapter.

1. *Introduction*

If the previous chapter has implicitly given an impression of being the first one of its kind, this is patently wrong. I would like to correct that picture by the presentation of an array of examples directly concerned with the establishment of prehistoric social structures.[1] I will present a few general studies first, and then some on the more limited field of Neolithic archaeology, other than Bandkeramik. This is not and cannot be a synopsis; it is rather intended to give an impression of the state of the art insofar as it is relevant for the present study – therefore, it will be highly selective. Though most Neolithic studies touch upon both aspects, for ease of presentation they have been grouped under two

headings: those dealing with social structure on a regional (intersite) scale, and those concerned with intra-settlement patterns.

Let us first consider the *general, theoretical* writings on prehistoric *social structure*. In the previous chapter, Binford's 1972 article on morturay practices was used when analyzing some aspects of the Elsloo graveyard. The article itself is "positionally" biased (in the meaning of that word employed in Chapter IV), although it seeks to test the proposals of the more structurally minded Van Gennep on burial customs (Van Gennep 1977; orig. 1909). Explicitly theoretical, Binford deals with burials as a distinct class of variable phenomena, both within and between societies. His data basis is a sample of ethnographic descriptions of the mortuary practices in forty pre-state societes, ranging in complexity from the band society of the Bushman Kau to the federation of Ashanti; the sample was drawn from the Human Relations Area Files (which are files of standardized ethnographies; cf. Moore 1973; Lebar 1973). The major conclusion is: variability in burial customs in a society reflects the complexity of the status network of that society more than patterns of ideational innovation or communication between societies (Binford 1972: 238). For the present study, the generalization is interesting that social position (being equal to rank, according to Binford), sex, and "subgroup affiliation" (lineage alignment or "differentiation" in the previous chapter) are most commonly expressed in the mortuary practices of primitive agriculturalists. The article is of a general nature; for specific instances, further elaboration is of course necessary. There is only one criticism worth noting: the equation of wealth and rank, it has been stated earlier, is quite ethnocentric; especially in simple societies, there are very few things to be desired apart from influence and esteem. Consequently, these should be the criteria of rank.

Because he is much more structural in his emphasis on social patterns, Clarke (1968: 235-244) should be mentioned. For him, the social pattern behind an archaeological culture consists of a system of interacting subsystems or subcultures. Five broad varieties should register in the archaeological record: ethnic, regional, occupational, social ("the various sections of particular social hierarchies") and sexual subcultures. At this specific locus, Clarke does not consider the possible visibility of either familistic or sodality (Service 1971: 102) subcultures – though at other places Murdock's kinship studies (Murdock 1949) are frequently cited in an approving way (e.g. Clarke 1968: 109); also, general (e.g., p. 105) and specific (e.g., p. 605) references to kinship studies abound. But certainly an archaeologist writing on kinship in the 'sixties would have risked being laughed at by the entire "fraternity" even more than today. For all its dynamic qualities, the nature of the relations ("feedback loops") in this culture model seems to be so self-evident as to need no further discussion; similarly, how to observe them has never been stated in the literature – but then, are all these relations *only* in the mind of the observer?

Two further instances of general theoretical writing on prehistoric social structure are David 1971 (stressing the status network aspect, leaning heavily on Binford 1968), and Williams 1968 (with a structural bias); both are archaeological studies of ethnographic situations within single sites.

If the amount of general discussions on prehistoric social organization is small (and again I emphasize that the studies just mentioned are but a minor and unrepresentative selection), much more is to be found dealing with specific Early Neolithic status networks or social patterns. A subject I will only touch upon when dealing with the LBK is the *intersite aspect of social structure*. True, a supralocal mode of production has been presented (and will turn up again below), but this is not the last word of a systematic pan-site comparative analysis. A fine example of such a study on intersite scale is to be had in the article by Flannery and Coe (1968) on the Mesoamerican Early Neolithic (or "Forma-

tive" as it is called there). Based on fieldwork (mainly surveys) in the area, Sahlin's famous 1958 article, and upon ecological premises, two models are developed of Neolithic society in its intersite relations: an egalitarian and segmented model ("ranked" in the terms employed in Ch. IV) is posited against a hierarchical and segmented model ("stratified"), as these two types would be reflected in the locational distribution of villages. In ecologically similar locations, in ecologically zoned areas, different exploitative strategies (generalized *vs.* specialized) would result in clearly different settlement patterns. As a corollary, exchange of products generates an egalitarian (with but ceremonial goods exchanged) or a hierarchical social pattern (with trade of the various products of the different ecozones via a central "market" place). For Service, this is also essentially the motor of development at this stage of cultural evolution (Service 1975; cf., however, Earle 1977). Given the author's aims, the two models do provide insight into the mechanisms behind the different patterns of sites in the two areas. The suggestion of ecological (dis)similarity as a symptom of group hierarchy is of considerable interest for present purposes (though certainly not new; cf. Haggett 1965: Ch. 5). Also, the wording in terms of differentiation of kin sigments in the ranking case, and of hierarchical kinship segments in the stratified case, is in itself a valuable specification of the relational/structural paradigm. One fundamental criticism is that the patrilineal overtones of the models (not detailed above) are superfluous: matriliny can also be made to comply with the stratifying principle. Other roads towards a stratified society are conceivable as well (e.g. Friedman 1975; Lévi-Strauss 1969: 240). Whallon (1968) deals with variability in details of pottery design between (and also within) sites, as a gauge of matrilocal tendencies in an area, changing over time. His ideas are further developed in Engelbrecht (1974).

Ottoway and Strahm (1974), while only obliquely dealing with social organization as a whole in a fairly sophisticated article, look into some Neolithic exchange mechanisms within and between sites, referring to anthropological theories on economics. Philips (1972) also belongs in this context: from the general size of sites she concludes that the Early Neolithic French social formation has been of a pre-tribal character; tribes would have presumably lived in larger units. More "positional" (as defined in Ch. IV) is Hole (1968). Working with ethnographic parallels, he interprets the absence of wealth, village remains and distributions as vestiges of an egalitarian society without redistributive systems, practicing transhumance-pastoralism. Many more studies could be mentioned; intersite analysis seems to be *en vogue* these days. Among the more recent writings, the Grahame Clark Festschrift (Sieveking et al. 1976) and the acts of the Conference on Prehistoric Exchange (Earle and Ericson 1977) should be particularly emphasized. Regarding *intrasite analysis of social organization*, perhaps the best known modern research in Neolithic contexts is that of Longacre (Longacre 1968; and various other publications). Explicitly anchored in the White-Binford (or, materialist and evolutionist) paradigm, his investigations were directed at a clarification of the social pattern of an extinct Pueblo community; this was a preliminary for explaining adaptive changes following environmental deterioration. The latter aspect need not detain us here; rather the way in which the social organization was approached is of use. In view of ethnographical research among present day descendants of the Pueblo people, a matrilineal organization was hypothesized for the target society some 750 to 1000 years back in time. Assuming female potters, matri*locality* (not *matriliny*) should be archaeologically visible in a localized preference for details of ceramic design. Statistical (multiple regression) analysis of earthenware decoration excavated at Broken K Pueblo yielded results interpretable this way, which in its turn would suggest matrilineal

descent groups. A very comparable pattern was found among the burials: for every matri-group in the Pueblo a matching corner of the graveyard could be pinpointed. Likewise, on the basis of associated artifacts, modern male religious sodalities could be traced in the prehistoric remains.

Longacre seems to have been heavily criticized for not having considered alternative possibilities (refer to DeGarmo 1977); in my opinion this omission can be better defended (as he was deductively testing) than his hesitating inference of matriliny (p. 100): given a matrilocal permanency over time like that found in the United States' Southwest, matrilineal organization is *inevitably* bound to follow (Murdock 1949: 221-222, 327; abstracted in Clarke 1968: 108; also, Fox 1967: 121). Worse even is Longacre's not having gone into the relations that existed between the matri-groups. For with such a heavy matri-imprint, there should also be a patri-component (De Josselin de Jong 1975: 17; 1977: 93); or, if this aspect were not archaeologically traceable, some other integrating mechanism should have been looked for (such as the religious sodalities actually found by Longacre), counterbalancing the centrifugal forces of the "bag of potatoes" of independent matri-groups.

Within the same research tradition, DeGarmo (1977) tries to correct some of the weaknesses in Longacre's analyses. He starts by noting that in subsequent research two male-associated tool kits were found with mutually exclusive distributions at Broken K, across the boundaries of the matri-local units. Though DeGarmo does not say so, he seems to think that this evidence runs counter to Longacre's; of course, under a uxorilocal regime males are necessarily dispersed: at marriage a man will move out of his mother's and sister's house. Without realizing it, DeGarmo takes no risks in his analysis of the Site 01 Pueblo. As he employs a wider notion of exchange than one associated only with bargain-hunting and retail trade counters, he is a rare exception (together with Ottaway and Strahm, quoted above; cf. Sahlins 1976: 95) – without reaping full profit from it, however. He uses the notion of reciprocity when he wants to explain productive specialization on the one hand and generalized consumption on the other by the two residential groups at Site 01 (the groups were established from an analysis of architectural details and of the distribution of artifacts). By not considering the "nature" of exchange and reciprocity further progress into Site 01's social organization is blocked: "*I do not know of any archaeological data with which to demonstrate whether kinship relations were present at Site 01, or, if present, what they might have been*" (p. 162). Of course, the apparent reciprocity in fact *implies* an alliance of the groups, and thus kinship (cf. for instance, Dalton 1977). And further investigation into the exchange mechanisms (not just those of the querns and of the arrowheads which were at the root of his system of two exchanging groups) might even have resulted in a definition of the groups' composition.

Another study of social organization with structural tendencies can be found in Renfrew (1975). Primarily based on Sahlins' article on African agriculturalist expansion (Sahlins 1961), Polynesian parallels, and fieldwork on the Orkney Islands off Scotland, a model of segmentary, egalitarian society is developed to account for the wide distribution of megalithic monuments in Europe. Assuming demographic growth, a corollary of neolithization, segmentation would be the mechanism to maintain local group size below limits ("segmentation" meaning splitting and subsequent mutual repulsion of groups). As soon as the Atlantic seaboard hindered further expansion, tensions would rise, causing groups to stress their territorial rights – clearly an instance of what Carneiro earlier had labelled "environmental circumscription" (Carneiro 1970; also 1974). These territorial rights might then be signified by the erection of something conspicuous as a focus of group consciousness: the megalithic monument as a general ceremonial playground. As segmentation

is a nearly universal feature of human social organization (Sahlins 1961: 90), Renfrew's model has the advantage of drawing attention to that phenomenon.

However, many megaliths (especially those of the tomb varity) are not conspicuous at all with their cobblestone or sod-hill camouflage, nor are their positions in the landscape very eye-catching. Therefore, Renfrew should have gone one step further: on the very same page Sahlins also mentions "complementary opposition" as a nearly universal structure: related, geneologically equivalent units will tend to stand together in many affairs (cf. e.g., the twin structure at Site 01, and perhaps at Broken K, too). If relations with the afterworld can be considered an important affair, one might expect concerted action (Van Gennep 1977: 148, 165) – which would explain the frequent twin arrangement of megalithic monuments (but these are not my concern). What remains of interest is that from a patterning of comparable monuments conclusions can be drawn regarding relations between groups. By Renfrew these are conceived of as between sites; in the present critique they are tuned down to a more domestic scale.

A third example of a study of prehistoric social organization, one already alluded to, is Randsborg 1974; his subject is not strictly relevant here, as it is directed at chiefdoms in the Early Bronze Age, but his sophisticated approach merits attention. Randsborg works with two possibly heterogeneous, even disjunctive notions of social organization. Within the chiefdoms an attempt is made to define the network of statuses, and between the chiefdoms, the relations are thought of as between groups (they are described in terms of dominance, etc.). As pointed out in the previous chapter, the latter is not necessarily opposed to the status network concept; moreover, Randsborg does not remain content with the strictly positional paradigm, for he also seeks to oppose groups (as sums of like statuses) within the chiefdoms. Specifically, with the background of Service 1971, Randsborg speculates about the geographical distribution of burial mounds as demonstrative of regional patterning, and about the differentials in grave gifts in them as clues to status difference. My first objection has already been voiced (Ch. III, Section 3): when Randsborg assumes weight of (bronze and golden) objects in the graves to be a function of their price (and thus of the material well-being of the deceased), he also takes "wealth" to be the principle according to which the chiefdom's hierarchy was rewarded, quite an ethnocentric view (Dumont 1970: 54-55; 104-105). My second criticism – even more lapidary than the first one – is his not having considered Binfords's 1972 article on mortuary practices from which perhaps other criteria for grouping within the chiefdom could have been derived. However, because his interst was centered on stratification (as seen in the essay's title), Randsborg cannot be reproached for not having gone further into social differentiation. Nevertheless, Randsberg's article presents a refined reworking of the initial positional approach towards a more balanced outcome.

Among the more recent writings on Neolithic social structure as observable in graveyards, the articles by Shennan (1975) and by Tainter (1975) should still be mentioned; both work from positional premises.

With this rough sketch of archaeologists' writings on prehistoric Neolithic social organization in general, the stage is set for a look into what is known about the social formation of the Bandkeramik.

2. *Ideas about Bandkeramik social structure*

In contrast to research traditions such as those for the southwestern United States' Basketmaker-Pueblo cultures (in the context of which DeGarmo and Longacre have been quoted; Plog has also been quoted in Ch. III, p. 57 and especially note 5 to

that chapter) or the New York State Iroquois (where Engelbrecht and Whallon have been cited and the writings of many others omitted: e.g., Tuck 1971) the writings on Bandkeramik social structure are more disparate. Perhaps this is due to the continuity of the subject cultures in the United States up to the present day, whereas for the Bandkeramik no such privileged status can be claimed: too many events have accumulated between then and now, and other structures have taken precedence. Be this as it may, writings about this particular social formation can be grouped in three categories. The first one, perhaps traceable to Childe, seems to be mainly concerned with intersite patterns (though the situation within the sites is sometimes also examined); this group consists of people with no direct acqaintance with the Bandkeramik through own excavations, but who use these data as an "illustration" of their models and other theoretical constructs. The second group consists of studies that are Marx-inspired, Marxist in content, dealing with the relations of production; a number of the authors in this group has worked directly with Bandkeramik materials; their orientation is deeply influenced by the historical materialist paradigm. The third category consists of disconnected studies mainly concerned with data description or excavation reports, from which carefully-phrased excursions into theory are made. As I place the present study in the third category, I will discuss it last.

In the first group – here represented by Clark and Piggott (1970); Clarke (1972b) and Sherrat (1972) – Clark and Piggott offer a synthesis of world prehistory, with an emphasis on the social aspect. To that end, for the LBK they accentuate the within-village aspect of social structure. In a general way house types (especially size) are assumed to reflect family types: the larger the houses, the more complicated the families that once inhabited them. Thus, LBK huts have housed "social units comprised within extended families" (1970: 240). It is implicit in their writing that these extended families were on equal footing; it is even more implicit that the settlements were mutually independent. To complete the picture, Clark and Piggott (1970: 237-241) look into the possible yields of the fields and arrive at a kind of rotational agriculture.

In comparison with, e.g., the Longacre/DeGarmo studies, the very marked positional bias of Clark and Piggott becomes clear. If the former brood over matrilocal structures and end up with exchanging groups, the latter authors are mainly concerned with the similar statuses of the residential units. They (Clark and Piggott) even pass by a facile relation between hut size, wealth and authority in favour of size of the inhabitant unit: for them, hut size should be a sign of differentiation rather than of ranking. Having gone into the major dimensions of the positional paradigm (ranking, differentiation) I do not consider it proper to ask for further details: one cannot put everything into a Penguin Book.

Much less specific, but much more complicated and precise is Sherratt's essay (Sherratt 1972). Working from systems theory and ecological models of land use, a dynamic and evolutionary model is developed, parallel to Service 1971 – a model which interrelates economic surplus and degree of social stratification by means of redistributive and centralizing properties of the social formation. Pertinent to the LBK is his hypothesis of an acephalous (non-stratified, or egalitarian) society without much differentiation, integrated very loosely through exchange networks involving reciprocity. From this hypothesis, the conspicuous homogeneity of the material remains of the LBK over vast areas can be explained (Sherratt 1972: 511-512).

It is interesting that Sherratt arrives at a slightly different model of the socially stratifying mechanisms than Flanner and Coe do, as presented above. This may be due to the ethnological bases: the latter authors work from an article by Sahlins (1958), which is mainly concerned with hierarchy;

the former bases himself on Service (1971), a book with a more general intent. In that way, Flannery and Coe postulate ecological zonation and specialized production as conducive to stratification, and Sherratt the (more general) factor of an economic surplus; both articles, however posit the centralizing properties of the redistributive system as the intermediary toward the consitution of a hierarchy with differential access to desirable things. And regarding the mechanism driving towards a hierarchy it can be added here (as it was to the Flannery and Coe article) that factors other than ecological zoning can be causative: asymmetrical exchange may do the trick as well (Friedman 1975; Lévi-Strauss 1969: 240).

Clarke's model of the expansive process of the LBK is as general as Sherratt's (Clarke 1972b, especially pp. 20-24). He assumes shifting cultivation to be a cause of frequent settlement relocation, the effects of which were intensified (in the LBK case) by demographic growth and subsequent fissioning. A random walk process describes the process adequately; the model plus assumptions explain both distribution and expansion to Clarke's satisfaction (a mathematical formulation plus discussion of this random walk model in Ammerman and Cavalli-Sforza 1971). The model also provides for a maximum of contact between communities ("collisions" in terms of the model). Together with the inter-village mobility of families "suggested by the ethno-economic models", a "kinship solution" of "bilocal residence with 50% village endogamy and 50% exogamy" (p. 24) would explain the homogeneity observed in LBK culture.

Parts of Clarke's model are very attractive at first sight; especially the "random walk" part for the formal, descriptive side of the picture is luring – random walk being a kind of threshold condition (any directionality will improve results) which generates an outcome similar to observed reality (Ammerman and Cavalli-Sforza 1971). There are, however, a number of difficulties raised by its less abstract parts. The opening line of shifting cultivation leading to frequent settlement shifts has much of the old "*Wanderbauern*" idea, which is invalid: people simply did *not* often move their residences (for a point-by-point discussion of "nomadic cultivation" (Childe 1957: 105) see Modderman 1970 (I): 208-210, and Modderman 1971; also cf. Berlekamp 1975; Linke 1976:75-76; Soudský 1962: 198. The ethnographic parallel, often alluded to without further reference, is to be found in Buschan 1922 (II): 832). And then also, the LBK case of shifting cultivation (which is a somewhat less drastic form of agriculture than "nomadic agriculture" or "Wanderwirtschaft", as it does not imply a regular shift of residence; on the topic of shifting cultivation cf. Concklin 1961 and 1963) is far from settled: it is not even possible to choose between long- and short-term fallowing systems on the basis of present evidence (Bakels 1978: 146). Intervillage mobility of families can be better worded as "fissioning" (involving segments of lineages, not families). And with that we are on the same tack as Renfrew's mechanism of neolithization, above. Both a bilocal residence pattern and fissioning are compatible with a situation of pressure on local resources, which may or may not have been the case in LBK times; this "pressure" has not been proven or falsified as yet. Finally, the suggested 50/50 endo/exogamy is quite arbitrary as it stands; I prefer Sherratt's formulation in terms of exchange and reciprocity as emphasizing the *continuity* of the intervillage contacts.

The Clarke (1972b) model has been presented here as a stand-in for many other writings (within, and outside the Anglo-Saxon tradition) on the LBK expansion into Central Europe. The mechanism behind it has been discussed by many authors, and three possibilities have turned up: the shifting cultivation/*Wanderbauern* explanation (e.g., Butzer 1972: 574-580; also cf. above); more cautiously, community fissioning has been evoked (e.g., Clarke 1972b); and recently, simple diffusion of the agricultural economy in mesolithic, pre-adapted

society (Nandris 1972; and especially Modderman 1976a). Leaving aside the first option as archaic, it is clear that the nature of the problem is generally considered mainly a *social* one (and not primarily demographic, or ideological, or anything comparable). From this, I think it over-hasty to choose at present between the alternative mechanisms: we know next to nothing about the social structures that ran the mesolithic way of life, and we know only a bit of the social formation of the Bandkeramik.

It should still be pointed out why I regard this tradition traceable to Childe. In fact, in Childe's *Dawn of European civilization* (Childe 1957, which is quoted because of its wide diffusion; Childe has written much more on this topic) the various models of the authors discussed can already be found, albeit in fetal form; they differ only in emphasis on the various aspects. Thus both Clark and Piggott's picture of an LBK community as well as Sherratt's are foreshadowed in Childe's statements: "They were democratic and perhaps even communistic: there are no hints of chiefs [or deities, or ancestors] concentrating the communities' wealth" (p. 109). And Clarke's and Nandris' ideas about the expansion of Bandkeramik culture can be parallelled in the alternatives explicitly stated by Childe: nomadic or shifting cultivation (for Childe apparently identical – which they are not) leading to settlement relocation, or secondary neolithization (Childe 1957: 110).

Taken together, the ideas of Clark and Piggott, of Sherratt and of Clarke present a highly general and not too improbable account of LBK social patterns. It does tie in with social anthropology (especially Service 1971 and related work), yet because of its generality, the possibility for testing is quite remote except perhaps for the inter-site relations. In other words, the picture should be completed.

The writings in the second category of research (historical materialist) are much more down to earth, as they probe mainly intra-community patterns. I will briefly consider texts of three authors here: Behrens (1973 and 1975; a regional Neolithic specialist), Klejn (1976; a theorist), and Tabaczynski (1972; also a specialist).

Behrens deals quite extensively with the Early Neolithic social formation in Saxony (Sachsen). He observes that our present knowledge of the productive forces in the Bandkeramik is rather scanty – for instance, nothing sensible can be said about the relative importance of cattle and agriculture, not even on the form of production: swidden or any other type of fallowing (Behrens 1973: 186-187). Therefore, theoretical considerations are brought in to fill this gap in a hypothetical way. The largest cooperative unit of production will have been the population of the village; for smaller undertakings, the household or even the matrimonial couple will have made up the working team. There will have been a minimal division of labour, probably between the sexes only, and more in emphasis than in quality. Specialist production of special purpose pots or tools will have been insufficient to generate a constant surplus for trade (and thus, for centralized redistribution). Similarly, the soil will have been communal property, cattle probably family property, and tools individual property. Archaeological findings indicate settlement autarky, which may be taken as substantiating the above in a general way. The unimposing amount of valuables (amber, obsidian, spondyli) may have been acquired by inter-village barter. In the egalitarian society thus envisaged, social relations will have hinged upon three components interactive with the productive forces: matriliny, male dominance, and ranking. An informal leader of the village, perhaps seconded by a council of the heads of the local clan segments, will have been the general manager of affairs; however, hierarchy will have been at a minimum, as indicated by grave contents. The huts were inhabited by a number of nuclear families, together constituting a matri-sib (matrilineage-segment). Inter-village relations on egalitarian footing will

certainly have existed (how else could cultural homogeneity be achieved?), as did partial exogamy ("still not a norm"; Behrens 1973: 213). There is no need to assume any more comprehensive social formation than the village (Behrens 1973: 184-214; Behrens 1975).

Apart from some minor points (e.g., "property" had better be replaced by "rights of use"; inter-village barter will have had ends beyond simple exchange, such as to insure friendly relations or the handing over of wives, etc.; also, I wonder whether village autarky testifies to intra-village egalitarianism) I want to note that Behrens leaves no room for chiefs but rather thinks of the dominance of lineage elders, with an informal leader presumably from among them. But if so, he apparently equates the "matri-sibs" (households) with lineages, and from his wording subordinate status of the domestic mode of production can then be read, if it did exist at all. On the other hand, whatever division of labour existed was between the sexes only, and at various places the matrimonial couple, nuclear family, etc. are mentioned. Therefore I think that a discussion of relative dominance would have cleared the issue.

Very strongly (though implicitly) in line with Behrens is Tabaczynski (1972). He goes a bit further in stressing the egalitarian character of Early Neolithic society. According to him there has been neither a division of labour between the groups (which is in line with Behrens) nor within the groups (as opposed to Behrens' differences in emphasis between the sexes; Tabaczynski 1972: 62).

I would like to register my profound disagreement with the latter statement. Neither on theoretical nor on empirical grounds can it be sustained: theoretically, a cursory reading of even Morgan's and Engels' writings reveals that at the Lower and Middle stages of Barbarism (the Neolithic) the development of the productive forces had gone so far as to result in a division of labour between the sexes and consequently in the formation of the polygonous family as a productive unit. More recently, other authors have substantiated this point (e.g., Sahlins 1968, 1972; Service 1971). Empirically, the objection stands because at every Bandkeramik cemetery a sexually differentiated tool kit is found (cf. the previous chapter plus its references).

Klejn (1976) discusses only the relations between settlements in Neolithic Europe; there was some exchange and some trade, yet these did not affect the economic base (p. 13). Rare basic materials and valuables were occasionally passed down distributive channels in small quantities. Whatever contacts existed (political, military, matrimonial), they were neither intensive nor incessant (p. 14).

I have introduced Klejn as a complementary to Behrens: the latter is less specific about inter-village contacts. It should especially be noted that Klejn differentiates exchange and trade; both are apparently conducted along "distributive channels", which from the sequel can be thought of as of an "alliance" nature (in the meaning attributed to that term in the structuralist paradigm). One would like to know, additionally, who conducted what trade exchange: chiefs (probably not, it can be read into Klejn's account), lineage prominents, or simply anybody old enough to walk and talk.

These Marxist authors treat social relations as an economic epiphenomenon; there is no room for relative autonomy of each of the several levels of the social formation. If this is a matter of taste I have announced my different views in the previous chapter; if it is open to testing, other scholars will have to decide.

The third category of research into the social organization of the LBK is difficult to summarize, as what has been done on the subject is usually hidden in lengthy site reports and the like; Lüning (1976) provides a critical bibliography of the more general literature. The sample below can claim no more representativity than the other two categories, not to mention exhaustiveness. Still, one of

the major foci of research interest in the non-pot, non-hut aspect of the Bandkeramik is easily perceived: the size of the population of a settlement. This is clearly linked to probing into the economic base: was it possble for the Bandkeramik people to live off the land they occupied?

This type of investigation generally starts with considerations on the number of people that once inhabited a hut. Careful as always, Modderman starts from a comparison of the different types of huts on LBK sites. From it, the "central" part is postulated to have been the living area – its format is constant from the smallest to the largest hut (the size of the central part may differ, though; Modderman sees this as a function of relative wealth rather than as being connected with the number of inhabitants). This room will have been inhabited by an extended family: at the most three generations, one married couple with their children, plus grandparent(s), say, six to ten people. The village of Elsloo will have counted eleven to seventeen huts at any given time, which will have sheltered 85 ± 25 inhabitants (in the estimate, the graveyard's population has been taken into account; Modderman 1979 (I): 110, 203, 205, 207; also cf. Modderman 1968).

Soudský, too, has been dealing with the number of people per hut and per village. Partially because of different circumstances, partially on different societal models, he arrives at a result which differs fundamentally from that of Modderman. The LBK houses in Bohemia are less differentiated in form than are those in western areas; for instance, the northwestern parts are less often "emphasized" by wall trenches (16% of the huts at Bylany, 48% at Elsloo; Modderman 1970 (I): 116-118); in fact the larger types ("*Grossbauten*") prevail (Soudský and Pavlů 1972: 317). As in western Central Europe, sizes differ (sometimes the central parts are doubled; also, the southeastern parts are larger than in western Europe; Modderman 1970 (I): 116-118) which is interpreted by Soudský as a sign of different household size. The number of couples in a hut is gathered from a comparison with the size of the Middle Neolithic houses at Postoloprty where four hearths were found (LBK huts never show traces of fireplaces); hence, this has been inhabited by four families (the "hearth" interpretation of the Postoloprty data has been contested: Modderman 1973: 132). Simple division of one into the other yields the relation: for every six metres of *hut*-length (*not* central part) one family should be postulated. That is, 200 people (among whom were 40 to 50 adults) were living at the settlement (Soudský 1966a: 75,78; a more moderate account in Soudský and Pavlů 1972; more extensive, Soudský 1969).

An evaluation of both views seems difficult. In my opinion, which is based upon anthropological literature, Soudský assumes a society too egalitarian in outlook when he relates size *only* to number of people; conversely, Modderman's account passes by the established fact of the (statistical) heterogeneity of family types in every society (e.g., Murdock 1949: 27, 28; Shryock and Siegel 1976: 173). Also, the derivation of a relation of length of hut to number of people from one instance seems to be a bit risky, even if the original interpretation is accepted. And with regard to Modderman's estimate of six to ten people to a hut: Naroll estimated from a cross-cultural sample ca. ten square metres of living space per individual (Naroll 1962). Given the range of sizes of the central part (35-112 square metres; Modderman 1970 (I):205) the six to ten people estimate may be a little on the conservative side. Soudský's figures (one family to every five or six metres of hut length) would come down to ca. 30 square metres per family, an area approximately half the Naroll/Modderman estimate. A general conversion formula should be of the form $y = ax + b$, of course; for the majority of societies, Naroll's figure will be a reasonable approximation of the most popular size and form of household groups (cf. Bakels 1978: 143-145 and Phillips 1972: 43-44 for a discussion of these estimates).

Not so much a focus of archaeological research as a basic assumption is the type of family supposed to have lived in the "long houses" of the LBK. Both Modderman and Soudský appear to agree of the idea of an extended family, thought of as being composed of members of three successive generations (technically, a "stem" family; cf. below, Section 4). Recently, Kuper and Lüning (1975) expressed a similar opinion. Only Soudský has specified its matrilocal constitution, for which he alludes to "material proof, like, for instance, the 'familial' tradition of ceramic production" (not further detailed; Soudský 1966: 81).

Several authors have dealt with the social relations within the LBK settlements in one way or another. In a number of reports from the Aldenhovener Platte the coexistence of several huts close together, grouped in small hamlets, is demonstrated. These, and separate, individual farmsteads were strewn along the Merzbach. Moreover, most dwelling places show signs of continuous occupation: when a hut became old and dilapidated, a new one was built in the vicinity. In that way, every cluster of hut remains represents the locus of a lineage (Kuper et al. 1977: 326-328; Kuper and Lüning 1975: 92). In these writings, the Aldenhovener Platte Group is "merely" presenting its data plus initial interpretations; further elaboration and interpretation is delayed until a final synthesis can be made.

The synchronic existence of a number of huts is attested by many authors: Kulczycka-Leciejewiczowa (1970: 46), Modderman (1970 (I): 203), Pavlů (1977: 51), to mention a few of them, all agree on this point. Yet, ideas concerning the mechanism by which the social body's continuity was secured – i.e., the diachronic within settlement relations – differ from one author to another. For Modderman, an abandoned hut was replaced in a nearby place when necessary; accordingly the settlement moved within a very limited area; Kulczycka-Leciejewiczowa, though not giving further details, thinks that filiation of the lineages living in the huts occasioned the setting up of new dwellings, together with the normal rebuilding of shaky houses.[2] Pavlů arrives at still another mechanism. Having outlined some of the possibilities (such as intermittent site occupation, permanent occupation of a village site with rebuilding in adjacent plots; and isolated farmsteads in a limited area with rebuilding as necessity arises), Pavlů cannot find ways to test these alternatives: some sites are densely packed and others are not. There may have thus been different settlement types. To account for the denser sites, he proposes that all huts of a single phase were destroyed together and rebuilt at another place in the same general area, at least once per generation.

While a combination of the Modderman and Kulczycka-Leciejewiczowa standpoints seem probable (if these views are not identical in reality), the Pavlů hypothesis strikes me as bizarre. For even in the capitalistic mode of production capital is not scrapped at that rate – so much less so in any of the precapitalistic modes, I presume (besides, it can be partially tested, as in Sections 4 and 5 below). Again, all the mathematical rigour of the article does not do away with the weak assumption at its root: the cyclical renewals of Bandkeramik villages are postulated as analogous to activities at tell-settlements in southeastern Europe (Pavlů 1976: 51). Even if such purposively destructive activities could be demonstrated for the Balkan Neolithic, still no parallel can be taken for granted without proof of cyclical renewals in LBK villages. If not a reification of the "phase" concept, in my opinion Pavlů attempts to save the settlement relocation part of the old nomadic agriculturalist theory: "micro area" and "period of inhabitation" are but new coins for old values.

Little is written about the relation between the households living together in a settlement. Filiation (see note 2 above) should account for the smaller huts in a village according to Soudský (1962: 198). Relations between the lineages are nowhere dealt

with; that is, the relations in the alliance and kin sphere. Above I discussed statements by Modderman and Soudský on the score of a more or less egalitarian society. Milisauskas, basing himself on ethnology, goes furthest in specification and interpretation. Consonant with earlier writings (Milisauskas 1972, 1973) he recently produced a picture of egalitarian communities with big men and men's societies. Yet some households should have been wealthier than others, as more imported materials were found in the vicinity of some huts at Olszanica B1 (Milisauskas 1976b: 41). Big men should have dwelt in the slightly deviant type 1a "longhouses", where the men's clubs also convened: "if the size of a longhouse depended upon the size of the social unit inhabiting it, no structural difference would be expected" (Millisauskas 1976a: 70). By relating status to age, sex and charisma (with no hereditary aspects), a big man comes out as slightly different; his living in the deviantly constructed hut is derived from the higher concentration of rare, imported materials around it, which were involved in the maintenance and expansion of social relations. And the men's societies ("or some such other type of tribal association") meeting there can be inferred from the concentration of (male-associated) adzes around the deviant hut (Millisauskas 1976a: 67-71; 1976b: 35-40).

Less explicitly ethnological, but entirely in line with Milisauskas, is Reinecke's view on Bandkeramik society, based upon the grave gifts excavated in three Lesser Bavarian cemeteries (Reinecke 1978). For him, status was "the expression of the relations of an individual to his family and kin group"; i.e., rank. The community provided an "intact model of society" rather than the divided image of stratification (Reinecke 1978: 14). Pavúk (1972b: 97) arrives at a similar conclusion, also from a graveyard study.

Regarding Milisauskas there is only one thing to criticize in his account: the "big men" part of the story is derived from ethnology (which is acceptable), but not tested (which cannot be done or is very difficult at best on a settlement site; cf. Ch. IV, Section 3). And although the ceremonial meeting place interpretation of the type 1a houses does sound likely, one would like to have it checked against data from more than one such hut. In all fairness, it should be added that Soudský (1966a: 75) and later Soudský and Pavlů (1972: 325) also postulate an assembly hall function for the largest huts. Modderman, however, considers the men's clubhouses interpretation as hinging too much on ethnographic parallels; for him, the identical interior construction/post mold configuration pleads for an explanation similar to that of the other huts (Modderman 1970 (I): 207).

By-passing the "*Wanderbauern*" issue as well as the fissioning aspect, opinions about the inter-village relations do not differ much: the autarky without surplus-production (Reinecke 1978: 14) of a non-centralized political and economic organization (Milisauskas 1976b: 35) provide for an egalitarian footing for the various settlements. Additionally, there was some trade, about the nature of which all authors referred to are quite vague. The things exchanged (rarities like exotic materials) are relevant to a "socio-technic" use (Binford 1972: 24) – say, status symbols – as comparable items were locally available (Milisauskas 1976b: 40).

If the accounts on the village-village contacts are rare and vague, research into the ecological preferences of the Bandkeramik has provided concrete results; e.g., Linke (1976), Sielman (1976) and Bakels (1978). Especially the last-mentioned publication is highly relevant. Bakels analyzes the find material from three Dutch Limburg LBK sites and from Hienheim, as it bears upon the relations of the Bandkeramik to meteorological and pedological factors, to the floral, faunal and demographic components of the environment. From it, a site territory of approximately 200 hectares is derived, probably exploited by one village exclusively; the area beyond ("home range") will have been in joint use

by several villages (Bakels 1978: 141). Apart from an almost total village autarky (exceptions: pigments, adzes) perhaps her most important finding is that the size of the site territory is sufficient to carry on with any system between short-term fallowing and swidden cultivation: from 1/3 to 1/10 of its size is enough to feed the population of a Bandkeramik village (Bakels 1978: 146). Milisauskas thinks that even less would suffice: 12.5 to 31 hectares in cultivation (Millisauskas 1976a: 63). But Soudský (1966a: 79) states that at Bylany only 30 hectares were *available* per settlement, so there cannot have been much scope for even a short-term fallowing agricultural technique (however, in a later article this area was more than doubled: both the *a/b* and *d/e* sites, and possibly the *c* settlement as well, are reported to have had 60 to 63 hectares of arable land available; Soudský and Pavlů 1972: 325).

In discussing the views on Bandkeramik social structure, I have restricted my discussion to writings of the last ten years, preferring later to earlier texts. The heterogeneity of the third research category and the coherence of the second made such a limitation feasible. For the first, the Anglo-Saxon category, I had to make an exception: without mentioning Childe's continuous concern for the Central European Neolithic no unity could be suggested for that research. It might be argued that incorporation of Buttler (especially Buttler 1938) and of Sangmeister (1951) would have resulted in a more uniform picture of the third research "tradition", but I do not think so. This is in the first place because Buttler's ethnological concepts were largely based upon the "*Kulturkreis*" paradigm (which has been conclusively proved untenable, and also officially renounced by its latest adherents: Haekel 1956). And secondly my skepticism stands because Buttler's data base has been abandoned: "pit dwellings" are no longer part of the Bandkeramik inventory; Buttler's lasting contribution is in the field of ceramic decoration typology. Then, the influence of Sangmeister's settlement phases as derived from differential house orientation does not go any further than providing one of the pillars of the nomadic-agriculturalist theory, for which I have not the slightest affinity. In fact, the writings of advocates of that theory are mainly interesting because of what they say on other topics.

Thus, the various writings can be summarized in a nutshell as follows:

1. The huts are generally conceived of as being the dwellings of one extended family each (Behrens, Clark and Piggott, Kuper and Lüning, Modderman), the composition of which seems to be open to some debate (Behrens, Modderman, Soudský, Soudský and Pavlů): either a set of related nuclear families (Behrens) or a group of related people from three successive generations (Modderman, Soudský). Whenever the nature of these relations is discussed, some "matri"-adjective turns up (Behrens, Soudský).

2. With the exception of Tabaczynski, the other authors either explicitly agree on a slight division of labour along the sex line (Behrens) or implicitly do so, which is in line with ethnography. When this has led to the constitution of a domestic mode of production, its position relative to the lineage as a unit remains unspecified, though perhaps subordinate (Behrens).

3. On the relations between households no statement has been found; regarding relative status, most authors seem to agree on some form of ranking: there seem to be differences in wealth (Behrens, Milisauskas, Pavúk, Reinecke) although some may deny this (Soudský, and also Clark and Piggott?). The village community was acephalous, i.e., without true chiefs (Sherratt). A council of clan elders may have elected a *primus inter pares* (Behrens); or leadership capacity and ambition may have crystallized in the institution of a big man (Milisauskas). Men's clubs (Milisauskas) are postulated, which should have convened in special clubhouses (Milisauskas, Soudský, Soudský and Pavlů), which are at the same time the huts of the

community's leaders (Milisauskas); a particular (for example ceremonial) function of the special house type is denied by Modderman. The huts stood for periods of between 15 years (Pavlů) and 30 or 40 years (most other authors).

4. As the settlements were economically self-sufficient (Bakels, Behrens, Clark & Piggott, Klejn, Milisauskas, Reinecke, Sherratt) their relations were of a transient nature (Klejn) involving some exchange of rare goods (Behrens, Clarke, Klejn, Sherratt) and women (Behrens, Clarke) or even trade (Milisauskas, Klejn). Also, groups of settlements may have jointly exploited a home range (Bakels).

Since the present study is mainly concerned with the social structure of a mature stage in the development of the Bandkeramik, I have refrained from first detailing and then summarizing the various ideas on the expansion of that culture when it was still young. As the focus of my research is mainly *social* I have also abstained from an extensive exposé on the economic/agricultural basis of Bandkeramik society. Although the development of both the productive forces and the remainder of the social formation are limited by environment and economy, the indeterminateness within these constraints suggests a more direct approach to the social structure (including, even, the relations of production) than by means of the productive forces.

A number of the above hypotheses have been tested, others go uncontested and untested. Several of them find some corroboration in the previous chapter, although I did not mention them there; it seemed better to draw them together, expand the set with the hypotheses from the pilot study and then see what might be tested in the Elsloo and Hienheim data. After all, the graveyard study was explicitly concerned with social structure, whereas that subject was only a sideline in the investigations of the authors discussed. For that reason also, systemization of these latter writings could only be partial.

To summarize the hypotheses following from the study of the Elsloo cemetery:

1. From a "positional" viewpoint, Bandkeramik society knew differentiation according to sex and according to some specialization (most notably: the deceased in the perpendicularly oriented graves). Ranking was found in the Bandkeramik social structure, rather than stratification, with age as a major component. Also, some specialisms were found (those bound to hunting equipment, or to pots), and a chiefly position found expression in high ranking statuses.

2. The structuralist approach resulted in a system of four groups tied to locality. The relations were of an asymmetrical and linear (or circulating) exchange type; marital relations thus must have been predicated upon a preference for the matrilateral cross-cousin (male Ego). Membership in the social groups was bilineally established: apart from virilocal residence, matrilineal descent played a role. The arrangement of the groups must have been a division into moieties on the matrilineal principle, plus in the Elsloo graveyard case there were four virilocal groups or lineages; at other times and/or other places the latter number may have been different (for asymmetrical arrangements, a minimum of three groups are necessary).

3. The neo-Marxist entry was of necessity restricted to the organizational part of production and reproduction: the scant items accompanying the dead, which are also difficult to interpret, do not allow any substantial statement on the factors. A domestic mode of production must have operated on the basis of a division of labour among the sexes, organized in matrimonial couples (presumably in conjunction with offspring); a higher order organization existed in the lineage mode of production, in which individuals had a different status regarding the allocation of their group's surplus production. The lineages were matrilineal. Then, a loose mode of production indicated the existence of non-hereditary specialisms; those that could be made out in the graveyard were in some

way linked to arrows and knives (blades) or to pots. Perhaps the perpendicularly oriented graves should be included as well. Finally, a supralocal mode of production accounts for the import of people and things (presumably also going in the reverse direction), especially towards the end of the Dutch LBK. The lineage mode of production should have been dominant over the other modes. In the end the balance may have shifted, though, in "favour" of a domination by the inter-communal relations – but that is mere speculation.

After a brief consideration in the next section of some minor methodical issues, the fourth and fifth sections will be devoted to testing the above sets of hypotheses.

3. *Some preliminary remarks on method*

Both settlements to be discussed span a considerable time: in Elsloo perhaps some 400 ± 50 years (6350 b.p. to 6000 b.p.: Modderman 1970 (I): 201), and in Hienheim probably even 450 years (6235±45 b.p. to 5780±50 b.p.) to judge from the radiocarbon dates. It would be strange if social structure had remained unchanged during those years; indeed, in the graveyard, an expansion of the kinship system could be made visible (Chapter IV, Section 5). As I do not know of methods capable of handling social dynamics directly, the phenomenon can be approached only in an indirect way. The easiest way to accomplish this is to cut the material into chronological slices in order to attempt a description for such a phase and then to see what changed, and how, in between. Phases have been introduced in Chapter III already; a considerable amount of print was spent in discussing the merits of several ways of partitioning the finds. The rather gloomy conclusion was that after drudgery, toiling and moiling with the various models, the best phasing very much resembled the initial distribution of the data on the unrotated chronology principal component. I will therefore stick to the latter; yet solely to facilitate computation, some of the phases of Chapter III have been lumped together (when there were too few finds to produce a decent analysis) and some others split up (when there were so many finds that an attempt to derive a finer picture made sense) as appears in Table 52. Let it be re-emphasized that *these phases are analytical tools and nothing else:* they have nothing in common with the concept of the same name in writings like Pavlů (1976; cf. previous section). The chronological subdivision here is on the basis of the distribution of the finds over the factor scores (finds being decorated pottery). Factor scores are units expressing amounts of difference; one may imagine equal amounts of change in the data set being mapped onto equal differences in factor scores. (Real) change quantified over (real) time will follow a Gaussian or normal curve *per variable* (as defined in Chapter I; also cf. Fig. 9); the length of the period of change or adoptive period, however, will be *different* per variable (see Fig. 11) and statistical procedures like multiple regression and principal components analysis are not corrected for that phenomenon. Then, the chronological axis is "defined" by a number of variables, each and all liable to run a similar course. The distribution of the changes on the different variables over inferred time will be true to the real distribution when stated as "earlier" or "later than", but not "... years later/earlier". The speed of change per variable being unknown, the quantification and subsequent translation of change into differences in factor scores would inevitably lead to a distorted picture. When from such a distorted picture a partition of the data set into phases is derived, nothing can be said about the length of these "phases"; only their relative chronological positions are to be trusted.

The phases in the Elsloo settlement are not the same as those defined by Modderman: the latter are not based only on decorated ware, but also on details in hut construction and on stratigraphic

observations. The former are exclusively ceramic (in Fig. 17 the two arrays are compared). The arbitrariness of phases as meant here will become even clearer when they are further subdivided into occupation or habitation phases.

Having cut up the data into these slices, the variables originally "measuring" time are reincorporated: there may be some social systematics behind the first appearance and subsequent spreading of something innovative or the distribution of the conservatives clinging to old ways. Having subdivided the data into phases, per phase a general principal components analysis was made on all decoration variables represented. In Chapter IV non-ceramic grave gifts were incorporated in the analysis as well; the present chapter deal primarily with ceramic variables. Regarding the principal components analysis, in previous chapters I have already worked with it and explained a number of its aspects; here, I will mention some details not yet discussed.

The number of variables differed from phase to phase: some phases offer more variance to be explained than others. This has its consequences for the number of components; with little variation, only a few factors can be meaningful. The number of factors to work with further was chosen from the three criteria customarily employed: that is, λ should be greater than 1.00; or, at least 5% of the variance accounted for by the smallest component; or, before the relatively largest jump in variance between two adjacent components. $\Lambda = 1.00$ provided the absolute bottom below which no analysis was attempted; otherwise, the middle cut-off value was taken. Thus, in phase 1 at Elsloo the three criteria resulted in an identical number of components to be incorporated (7); whereas in phase 5 of that settlement $\lambda \geq 1.00$ resulted in six components, the 5% of variation criterium in 5, and the largest jump in percentage of variation occurred between the seventh and the eight component; accordingly, six (middle number, and also $\lambda = 1.00$) components were retained.

A technical point should be mentioned: in the present computations the "missing data" declaration was much alleviated in comparison with that in Chapter III in order to lose as little information as possible. This was partially compensated for by retaining the same threshold values for "noise" regarding the numbers of sherds per find as in that chapter: from the Hienheim file, finds with less than five sherds were omitted, and at Elsloo, huts with less than three sherds in certain association were thrown out. Yet the liberalization of the missing data option must have resulted in a slight veiling of the factor patterns, as inevitably more "noise" had gone into the computations.

The components that were retained were then VARIMAX rotated, a rotation maximizing the differences in loadings of the variables (Nie et al. 1975: 485). This means that usually a small number of attributes correlate highly (positively and/or negatively), and the remainder are more or less neutral. Through this rotation the relative weight of the factors is changed; the amount of variance incorporated in an unrotated principal component has no relation at all with that locked up in its rotated counterpart. Also, the original ordering (component no. 1 being the most important, no. 2 next, etc.) is lost: the importance of the rotated factor no. 1 need not be any greater than that of no. 2, in fact it is equally likely to be smaller. What is reained, however, is the independence of the components (the factors are perpendicular to one another). The VARIMAX rotated factor pattern provided the basis for parts of the analyses and interpretations below. Because the number of units per phase was hardly ever very impressive, the importance of any individual factor (or even of the whole output per phase) was assumed to be quite low by itself. Only if a similar factor turned up in an adjacent phase were they considered noteworthy (two factors are considered "similar" when the same variables load high in the same pattern; when a variable is not consistently associated with a factor this will be signalled). This, together

with the different numbers of factors per phase resulted in some drop-outs on the one hand, but on the other also in a fairly consistent picture of what happened to the various factors throughout a site's occupation, i.e., a dynamic picture.

There are important differences between the outputs for the Hienheim and Elsloo villages. Most conspicuous is the constancy of the factor pattern emerging from the Elsloo analyses, and the much more fluid, almost elusive Hienheim summaries. To some extent this will relate to "properties" of the sites themselves, but for the largest part differences in the data base will be responsible: for Elsloo, huts were the units fed to the computer; for Hienheim, finds. As "huts" are compounds of "finds", fewer gaps in the data ("missing values") will occur among the former. Descriptions of individual finds incorporate more missing data. That is, much more of the variance in the Hienheim data is spurious. Also, the data set from Hienheim is more heterogeneous than that from Elsloo: the latter is composed of finds relating directly to the dwellings; the former incorporates finds from find complexes and silos as well, and these do not directly relate to habitation units; and moreover, a substantial part is *Middle* Neolithic. At first sight this may appear to be a formidable handicap; in reality things are not that bad. For, as will become clear in the next section, even in Elsloo with its fine factor pattern, relatively little can be done with it, and several factors remain unexplained. Yet the social structure can be brought out without many difficulties. And this holds positively for Hienheim as well. Conversely, only a limited number of aspects of the social structure are represented in the output of the principal components analysis. Not unexpectedly, in order to analyze social structure more data than those on decoration alone should be incorporated – as was empirically demonstrated in Chapter IV.

The present analysis is explanatory in a vague sense only; its main purpose is a *description* in ethnological terms of the ancient social organization. It is "explanatory" insofar as artifact-distributions are related to social patterns. In archaeological practice this is one or two steps removed from excavatable and directly observable things. It is descriptive inasmuch as I am content with a (partially) tested image of the Bandkeramik social structure; no attempt is made to go beyond the social level. Such should be the next step, after further testing, amendment, and elaboration of the statements in the sixth section.

To that purpose, if not for the completion of the testing program, the data base should be expanded to incorporate data on flint artifact and adze distributions, quantitative and qualitative descriptions of huts and other structures (including the geographical dispersion of so-called silos, pit complexes, etc.); but most of all, the data should be *representative* for an entire site, and not just cover part (unspecified) of a settlement only. It is especially this latter aspect which is lacking here: the Elsloo graveyard has been excavated almost completely; the Hienheim settlement for one-third, and Elsloo is known for two-thirds to one-fifth of its territory only, depending upon the period. Therefore, the most could be said concerning the cemetery and the least about the latest phases of Elsloo. When it is added that ecological data should also be introduced into a causal analysis, it is clear that such an attempt is beyond the capacities of one single researcher – I for one am eagerly awaiting the results of the Aldenhovener Platte team, where indeed such an all-encompassing approach is tried.

Finally, I want to return to the distinction between mechanical and statistical models introduced in Ch. IV, Section 1. It was stated there that rules can never be fully observed, no matter whether these are known to the participants (for example, social) or only to the observer (such as statistical norms). And even in a special abode like a graveyard all rules made visible were accompanied by exceptions: besides the normally asymmetric exchange model, two distributions pointed to generalized exchange; besides the normal pairing ("normal", of course, in a statistical sense; cf. Lévi-Strauss

1967: 276) of the sexes in couples as an indicator of the domestic mode of production, graves without partner occurred, too, etc.

When in an analysis of a graveyard in which considerable attention has been paid to the various kinds of goods – from decorated pots to pieces of charcoal – the statistical or empirical distribution differs in a visible way from the distribution expected from the mechanical model, how much more will this be the case in the study of a part comprised only of the settlement debris. That is to say, the observability of the various models may be quite low, and also in an unpredictable way. Thus, chiefs are not visible in the decorated ware of the settlement, and neither is asymmetrical exchange; yet the effects of bilineal group composition are very clearly visible in the distributional patterns of ceramic decoration.

To provide some continuity, the two following sections are set up partially parallel to the previous chapter. In that way, there will be checks on the positional, the structural, and the neo-Marxian hypotheses, in that order; intermittently I shall also dwell upom some of the hypotheses from the second section of this chapter.

4. *The LBK village of Elsloo*

The Linear Band Keramik village of Elsloo was built on the middle terrace of the Maas River overblown by loess in the southern part of Dutch Limburg. The settlement site itself is almost flat; it is bordered to the west, the north and the east by small gullies (which did not carry water in LBK times), and to the south by the high terrace (a more extensive description of the site's surroundings can be found in Bakels 1978: 15-22). The settlement did not completely occupy the available space: in every direction there were at least 150 metres of "open" land between the village and the site's natural boundaries. There will have been little solifluction, because of the flatness of the terrain. Across the western dell another Bandkeramik village was situated, one more of the seven to nine contemporary settlements in the area. The graveyard, discussed in Chapter IV, was lying in the fork of the two valleys (Modderman 1970(II): Pl. 2). The existence of the village has been known since the 1930's, when the modern villages of Elsloo was relocated due to the digging of a shipping canal as a substitute for the Maas River. The site was assigned to become a new housing estate. Until 1950, the site was filed under the name "Koolweg" ("Cabbage Road"), then a first trial pit was dug (Modderman 1950; –1958/9). Large-scale excavations at the site, led by P.J.R. Modderman, were conducted by the Dutch State Service for Archaeological Investigations, R.O.B., in 1958, 1959 and 1963. The graveyard was examined in 1959 and 1966. From the viewpoint of a history of science, these excavations are interesting, as it was here in Elsloo, that for the first time (in 1959) a dragline was introduced to uncover the vast areas necessary for studying house remains, the main purpose of the research. No fine horizontal "stratigraphy" was found at Elsloo, although a partial relocation of the LBK settlement had taken place. The area uncovered in the northwest and west of the site contained vestiges of all periods (LBK 1b to and including 2d), whereas the excavations further to the east revealed traces of the later phases only. The total area of the site is estimated at ten hectares, of which one-third has been dug out. The remains of 95 huts were found; 26 belonged to the Older LBK (i.e., phases 1b-d), and 56 to the Younger period (phases 2a-d); 58 huts could be dated more exactly, but ten huts could not be chronologically filed at all. Extrapolating from the whole site, some 200 or 250 huts must have been built there in the course of time. If each of them was used for twenty-five years, then anywhere between eleven and seventeen of them must have been contemporaneous. In the older LBK the village occupied an estimated area of ca. two to three hectares only (much of which has been uncovered); in the younger LBK a much larger area was inhabited. In the latest phases (i.e., those contem-

poraneous with the graveyard) the northwestern part of the site was apparently deserted. Consequently, in the earlier phases the number of huts will have tended towards the lower figure, and later the upper figure should have been the closer approximation. In every phase the buildings were more or less evenly distributed over the area. It can also be established that probably only one "*Grossbau*" (hut of type 1a) was standing at any moment. When no more than six sherds could be attributed to a hut, these sherds were not published (Modderman 1970 (I): 1-6, 75-76, 203-207). The data from Elsloo have been published in Modderman (1970).

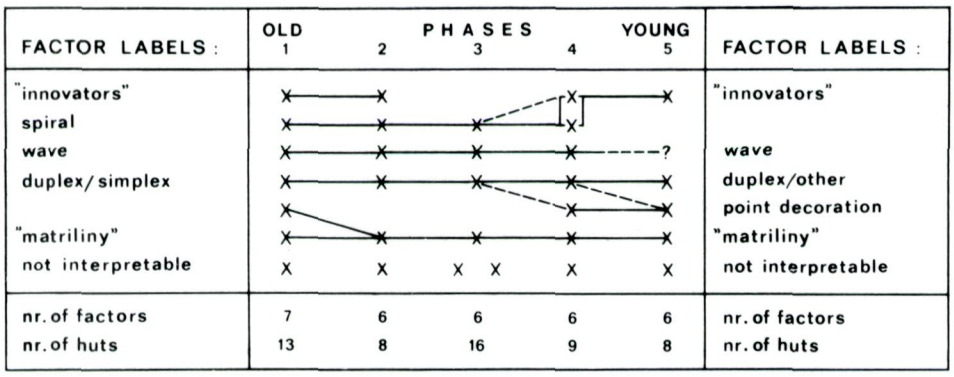
Across the five phases into which the Elsloo material has been divided in the third section, a fairly consistent pattern of constancy and of change among the factors emerges (Fig. 45); this pattern can also be read from Figs. 18-21. To start with the constant factors in the pottery decoration:

– The *wave* and the *spiral:* At the level of the model, the two were considered alternate attributes of the variable MAIN MOTIFS (p. 000). Their distribution in the data set, however, suggests a higher standing than that of *traits:* they behave independently, in every phase a separate component is occupied by each of them (except in the latest phase, where this pattern becomes blurred). Of course, in the cemetry *waves* and *spirals* were never found in the same grave (p. 21).

Associated with the *wave* motif, the following variables occurred: type of FILLINGS (with *uninterrupted* fillings loading similarly, ENDS (with *no ends* regularly accompanying, and AUXILIARY LINES diminishing in importance (with first, *symmetry axes* loading high, gradually becoming neutral). The other attributes of the variables mentioned loaded oppositely.

With the *spiral* motif, the major association is with the *triplex* attribute, sometimes loading slightly higher, sometimes slightly lower than this motif; the other attributes of the variable NUMERICITY constitute a component on their own (see below). None of the other variables is regularly associated with the *spiral*; the stippled line in Fig. 45 drawn from "spirals" to "innovators" stands for a negative association: attributes indicating innovations in the repertory are loading very much opposed to the *spiral*.

– The NUMERICITY factor: As with *wave* and *spiral*, at the level of the model of Chapter I, *simplex*, *duplex*



---- variable hopping over.
? hardly perceptible, not absent.
—— constancy of pattern loadings.

Fig. 45. ELSLOO VILLAGE. Constancy and change in factor patterns.

and *triplex* should be mutually exclusive attributes of the NUMERICITY variable. Regarding *simplex* and *duplex* this can be sustained, but *triplex* seems to be an independent feature: in the first three phases *triplex* is strongly associated with *spiral* motifs, giving rise to a separate factor; in the final two phases *triplex* and *duplex* are loading bipolarly (with also *duplex* and *simplex* loading oppositely on another factor). There is only one attribute consistently related to the *simplex* and *duplex* factor: *uninterrupted* FILLINGS have similar loadings (as was the case with the *wave*).

– The most constant factor in all of the output is a bipolar one, on which *curvilinear* and *rectilinear* STRUCTURES stand very much opposed; from the graveyard, this factor can be called "matriliny": ANGLE OF FILLINGS defines a separate factor in the first phase, but in the other phases this variable always loads moderately on this factor. In some phases still other variables are associated: in phase 1, FILLINGS; in phases 3 and 5 LIMITS; and in phase 4, *simplex* (with *curvilinearity*) and *duplex*. The real matri-markers load very extremely on this factor, the other variables just mentioned only moderately so; their influence will therefore be restricted.

A marked contrast of this factor with those involving the MAIN MOTIFS is apparent. While the latter define a separate factor each (that is, independent of one another), the former is a bipolar one, and its attributes are real *attributes* in that they are in opposition on the same factor.

– Among the non-constant factors, twice during the settlement's occupation factors turned up that have been dubbed "innovators": In the first two phases (which belong to the older Bandkeramik) the huts where neck decoration was applied to the pots were singled out by a specific factor; no other variables seem to be associated. In the latest two phases of the settlement (which fall in the younger period) the *multidented spatula* – a major innovation in the potter's craft towards the end of the Early Neolithic – is singled out by a factor which opposes it to its *single-dented* predecessor. None of the other variables is consistently associated with this factor (although when speaking of two phases only, "consistency" is a somewhat loaded term).

– One non-permanent factor remains to be introduced; in Fig. 45 it has the name "point decoration": In the latest two phases, *point* COMPONENTS of decoration plus the concomitant *indeterminate* ANGLE OF FILLINGS show against all other COMPONENTS (and the other attributes of ANGLE). Once this pattern is known, it can be recognized one phase earlier, when still associated with the *simplex/duplex* factor. In phase 5, the FILLINGS variable also becomes associated, which before had been tied to the *simplex/duplex* factor.

– Finally, in every phase at least one factor has remained uninterpretable – simply because no consistent pattern exists, even no partial concurrence can be found in adjacent phases: Thus, in phase 1, a factor is made of FILLINGS; in phase 2, of the ANGLE OF FILLINGS; in phase 3, of FILLINGS again, and of *elaborated* ENDS; in phase 4 of ANGLE OF FILLINGS, which is as a rule moderately associated with the markers of matriliny; and in phase 5 a factor points to *lines* in the neck decoration.

This completes the generalized description of the decoration on the LBK pottery from Elsloo.

The first analysis attempted in the previous chapter was according to status. There, sex was made visible by specified sets of tools, with decorated ware *not* among them. Any specialization in the use of parts of the site according to sex cannot be determined, therefore, from the data *presently* at hand (cf. e.g., the differential distributions of artifacts at the Olszanica B1 and the Langweiler 9 sites; respectively Milisauskas 1976a: 67-69; and Kuper et al. 1977: 252-254, 259-263).

While the principal differentiating criterion of sex cannot be introduced here, a lot more can be said on ranking. For instance, along the same lines of reasoning as in the graveyard, the considerable differences in the sizes of the huts can be thought of as marking a ranking (or even a stratified) rather than an egalitarian society. To distinguish between these cases several considerations apply:

At a very general level, a hut may have been constructed at a determinate point in the life cycle (e.g., at marriage). In that case, the builders were of approximately equal age, the ranking criterion of egalitarian and ranking society. Then, the differences in type/size must reflect other criteria; i.e., be indicators of ranking or even stratification. Below (pp. 150-151), such a tie will be rejected; the founding date and life cycle are disconnected; from this it necessarily follows that in the aggregate, huts were built at all possible moments in the life cycle of the inhabitants. To separate ranking from stratification we must come down to a more specific level: the different size of the central part of the huts (the living quarters, according to Modderman 1970(I): 110) might be interpreted as reflecting the number of inhabitants, which would be correlated in a general sense to the life cycle:

1. A simple marital couple without, later with, children, polygynous or not, and in the end again by themselves, will count different numbers of people, and accordingly need different areas of floor space at different periods of time. Thus, a conjugal couple will pass through a cycle from two to six or seven (four or five children) and back to two: a fluctuation by a factor of over 2 (on the number of children, cf. Burguière 1974: 80-84; Goubert 1960; Zuidberg 1975: 22, Appendix 3.1; who provide demographic data on both "pre-Malthusian" peasantries and pre-state societies).

2. Yet this variation will be dampened through the effects of agglomeration inherent in the formation of extended households. The extended family will count a couple of grandparents, one or two marital couples plus children, plus some unmarried kin, together some six to twelve people, but this figure will be relatively constant: when the children grow to maturity, the grandparents are on their way to passing out of the picture and all in all the fluctuation may be by at best a factor 2, probably less. (For discussion of the extended family see Wolf 1966; 61-73; also below, pp. 149-150).

When the actual figures are considered (Table 53, which gives the lengths of the central parts) the overall variation is seen to be relatively small: with few exceptions the maximal length is less than double the minimal length. In other words, the table documents the constancy of the household size, a constancy which can be accomplished by extended families alone. Thus, parallel distributions of age/rank (graveyard) and of hut size (village) (Table 54), though suggestive, are spurious.

Still, larger central parts are found in the larger types of houses (Table 55).[3] It is as if larger households with their more extensibe resources (labour power) need more roof to protect their produce from the weather. The important constructional differences between the hut types (or, rather, the additions to the basic central part) seem to point to different functions (Modderman 1970(I): 109-110), and hence for differentiated tasks performed by the members of the households living in these dwellings. Such was precisely the operationalization of "dignity" developed in the graveyard study. When some families needed more space (were larger) they also performed more, and different jobs: the households as units held different positions in a hierarchy. *Part of this ranking must have occurred on criteria other than age.* That is, the Elsloo community will have been ranked. (Lacking data on the distribution of tools, the possibility of specialization cannot be investigated here.)

The argument hinges (among other things) upon the assumption that huts were built in one stroke. From observations during excavations no argument can be formulated against this assumption (Modderman, pers.comm. 200978); also, if it were customary to expand buildings when necessary, a tendency towards type 1b should be observable, which is not the case.

Up till now, I have carefully omitted reference to type 1a huts. Some authors consider these dwellings to indicate more wealthy households, possibly even of chiefs, and others hold to a function such as a men's clubhouse (cf. p. 131); the two views do not

exclude one another. Without an exhaustive analysis of tool distributions the point will be impossible to decide. Yet, four weak arguments may be brought forward:

– From a different construction, a different function should be concluded, at least as a working hypothesis. That is, if type 1a huts also had a function as living quarters, then some other function not shared by the other dwellings was fulfilled by them as well.

– Men's clubhouses are fairly common (refer to Milisauskas 1976a for references; other ethnographic examples can be seen in, e.g., Kloos 1971, Rappaport 1968, or Salisbury 1962; a general ethnological discussion on this topic, e.g., in Lévi-Strauss 1969: 118).

– Empirically, at Elsloo, type 1a huts are not selected by the principal components; that is, there is no special type of pot decoration peculiar to them. Also, these huts are not to be distinguished from the other huts on the basis of the number of sherds found near them: the distribution of finds with/without decorated sherds over the huts of type 1a and the other types looks very similar (Table 56). The same is true for their internal construction, which is identical to that of type 1b.

– Chiefly persons were visible in the graveyard because of both a quantative and a qualitative superiority of grave gifts: they were accompanied by more gifts which consisted of more complete tool kits. At least in the grave some differential association with productive means was visible. And it is this latter aspect which set them apart from the ranking order which was seen to operate on the simple principle of quantity. This qualitative difference in the graveyard *may* tally with the qualitative difference of the type 1a hut.

In my opinion, the third point argues for a regular dwelling unit, the first and fourth points for a chiefly status of the household living in it, and the second point is ambiguous: some ethnographical men's houses are lived in by the males of the village, with among them the big man/big men (but in this case, a clear separation of the sexes exists, which in archaeological contexts should be visible in the differential distributions of categories of refuse).

Taken together, a ranked society seems to be attestable from the data for Elsloo; part of the variation cannot be retraced to egalitarian standards. Stratification, however, cannot be substantiated unequivocally; only when pushed into that direction, may some data from both the graveyard and the village) point to incipient stratification.

The other differentiating criterium found operative in the graveyard was that of specialization. Two kinds could be distinguished: arrowheads (etc.), and pottery. The arrowhead-associated specialization cannot be taken into account here; the pot people can only be hesitatingly considered, for there were no special characteristics common to their ware. The status they occupied (2 times moderate, 1 time high) might suggest at first sight an investigation of number of decorated sherds *vs.* hut type (Table 57), when such a correlation of age and type had not been rejected previously (p. 140).

Ever the traditional concern of archaeologists, the chronology of huts (Fig. 17) has been translated into schematized plans of the site, Figs. 46-50. With the idea that huts close together on the chronological component must have stood together, an attempt was made to ascertain which houses were synchronic. Soon it became clear that some groupings of huts showed constancy over time: similar configurations were found to be repetitive. Initially, most of the huts accompanied by decorated ware could be fitted to such a pattern; later the non-ceramic huts were also brought in.

Short-cutting the discussion below, four (or perhaps six) groups of huts appear to be visible. Not all groups in all phases, but four of them have been of longer duration than a single phase – at least in the excavated part of the site (Figs. 46-50, 51). For instance, the *eastern group* may have been in existence for a long time before it moved into the southeastern excavation. However, it has not been possible to assign every single hut to a group: 34

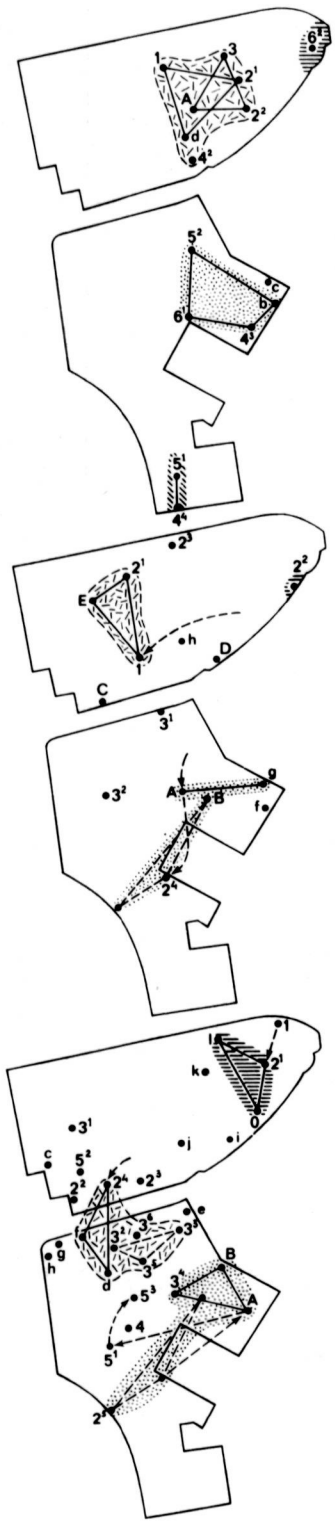


Fig. 46. ELSLOO VILLAGE: Huts in use in the first ceramic phase. Chronological ranking according to factor scores. 1-6, old to young. 'Weight' indicates no. of associated sherds (cf. Fig. 17).

rank	hut	type	weight
1	66	x	C
2^1	65	2	B
2^2	62	1b	C
3	70	x	A
4^1	not entered		(63)
4^2	50	3	A
4^3	19	2	C
4^4	04	x	A
5^1	05	x	A
5^2	32	1b	A
6^1	17	2	A
6^2	75	2	A

huts not datable by decd. pottery

A	61	3	
b	20	2	
c	22	2	phase 1 or 2
d	54	3	

Fig. 47. ELSLOO VILLAGE: Huts in use in second ceramic phase. Chronological ranking according to factor scores 1-3, old to young. 'Weight' indicates no. of associated sherds (cf. Fig. 17).

rank	hut	type	weight
1	55	1a	A
2^1	67	2	B
2^2	64	x	B
2^3	68	1b	B
2^4	10	1b	C
3^1	36	x	C
3^2	28	3	A

huts without decd. pottery:

A	25	1a	
B	26	2	
C	45	x	
D	51	1b	
E	59	2	
f	20	2	
g	22	2	phase 1 or 2
h	54	3	

Fig. 48. ELSLOO VILLAGE: Huts in use in third ceramic phase. Chronological ranking according to factor scores. 1-5: old to young. 'Weight' indicates no. of associated sherds (cf. Fig. 17).

rank	hut	type	weight
1	76	1b	A
2^1	74	1b	A
2^2	44	x	A
2^3	49	2	A
2^4	48	1b	A
2^5	08	x	A
3^1	58	1b	A
3^2	38	3	A
3^3	34	x	A
3^4	24	x	C
3^5	31	3	A
3^6	37	x	A
4	16	2	A
5^1	15	1b	C
5^2	56	2	C
5^3	27	1a	A

huts without decorated pottery:

A	21	1a	
B	33	x	
c	57	2	either phase 3 or phase 4
d	30	x	
e	35	x	
f	39	2	
g	40	2	
h	41	2	phase 3 to 5
i	52	2/1b	
j	53	3	
k	69	2	
l	71	2	
o	63	2	(see text, p. 65)

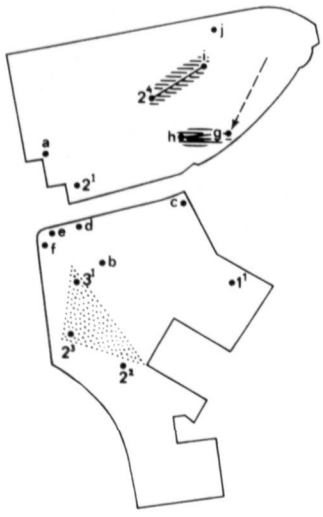


Fig. 49. ELSLOO VILLAGE: Huts in use in fourth ceramic phase. Chronological ranking according to factor scores. 1-3: old to young.
'Weight' indicates no. of associated sherds (cf. Fig. 17).

rank	hut	type	weight
1^1	23	3	C
1^2	84	x	A
2^1	47	x	C
2^2	11	x	A
2^3	14	3	A
2^4	60	2	A
2^5	87	2	B
3^1	29	x	B
3^2	89	1b	A

huts without decorated pottery:			
a	57	2	phase 3 or 4
b	30	x	
c	35	x	
d	39	2	
e	40	2	
f	41	2	phase 3, 4 or 5
g	52	2/1b	
h	53	3	
i	69	2	
j	71	2	
k	78	2	phase 4 or 5
l	90	2	





Fig. 50. ELSLOO VILLAGE: Huts in use in fifth ceramin phase. Chronological ranking according to factor scores. 1-7: old to young.
'Weight' indicates no. of associated sherds (cf. Fig. 17).

Rank	Hut	Type	Weight
1	12	2	A
2	93	x	A
3^1	88	1b	B
3^2	83	x	C
4	92	2	B
5	09	2	C
6	79	2	B
7	85	x	B

huts without decorated pottery:			
A	07?	x	
B	13	1a	
C	42	x	
D	43	x	
E	91	x	
F	94	1a	
g	78	2	
h	90	2	phase 4 or 5
i	30	x	
j	35	x	
k	39	2	
l	40	2	
m	41	2	phase 3, 4, or 5
n	52	2/1b	
o	53	3	
p	69	2	
q	71	2	



(out of 92) cannot be fitted. Thus, the ending of the *northern group* – if such a thing occurred, and if it happened as outlined in Fig. 48 – may have proceeded beyond the triangle of rank 3 in that figure: huts 35, 37 and 49 (marked e, 3^6 and 2^3), perhaps also 40 and 52 (g, 5^2) may or may not have been inhabited by the descendants of this group. Yet, because of the disappearance of the "*Grossbau*" from the group's ranks these latter five huts were not incorporated into the group's trajectory. Also,

huts 57 and 58 (c, 3^1 in Fig. 48) and 40 and 56 (g, 5^2) may possibly belong to a different, unrecognized group. The *northeastern group* has an "ending" similar to that of the northern group (Figs. 48-49). Regarding the *middle group*, in the later part of the third phase it may well be different from that of earlier and later dates; only from its position in the same part of the site has its identification been derived. Hut 16 (phase 3, no. 4) should also be assigned to this middle group, although its whereabouts are abscure.

A *fifth group* may be discernible in the south in phase 1; it may have moved out of observation in the second phase, as all other groups seem to have migrated in counter clockwise trajectories across the site. I am also tempted to propose a *sixth group* in the latest phase of the settlement, for which huts 78 and 79 would stand (g, 6 in Fig. 50).

To arrive at these groups, several considerations applied:

– From Modderman's accounts, a dating, to within a phase in some cases, could be extracted for most of the huts without decorated pottery (those huts that cannot be dated to either the first or the second period of the Dutch LBK have been omitted: N = 10) (Modderman 1970 (I): 6-35).

– Non-ceramic houses were assigned to groups of ceramically accompanied ones on a variety of considerations: apart from phase, stratigraphic observations; constructional details; and distance. Stratigraphic observations: Modderman (1970 (I): 28-35 and (II): Pl. 7-38). Constructional details: P.J.R. Modderman, (pers.comm., 201278). Distance: a choice among alternatives was made on closeness (e.g., hut 59 – phase 2, no. E – has been grouped with huts 55, 67 because it is nearer to hut 55 than to 68; cf. Fig. 47).

– "Synchronousness" and "similar rankings" should not be lightly equated. For example, huts nos. 48 and 49 have been ranked 2^4 and 2^3 in phase 3 (Fig. 48) – that is, *ex aequo* in Chapter III – yet they cannot possibly have stood together (Modderman 1970 (II): Pl. 23). This example is quite clear; similar difficulties may arise, however when dealing with the chronological positions of different hut groups where no stratigraphic controls are available.

When in Fig. 51 synchronism is entered for

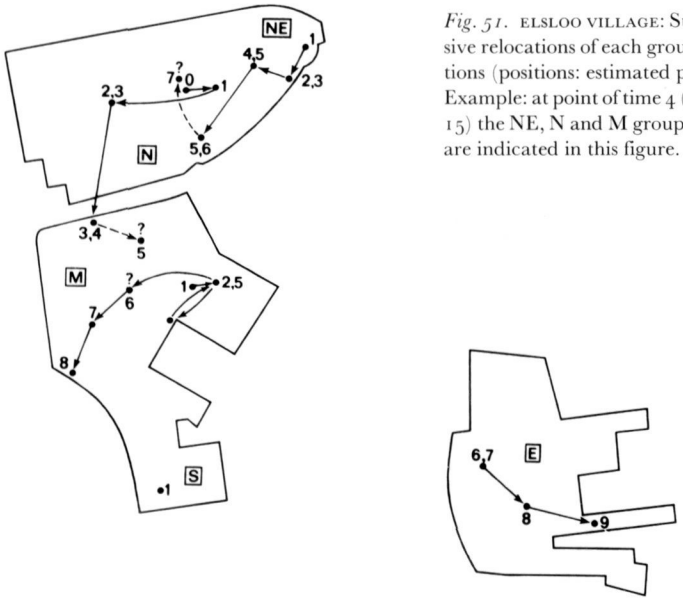


Fig. 51. ELSLOO VILLAGE: Summary of Figs. 46 through 50, showing the successive relocations of each group with time. Numbers indicate synchronic occupations (positions: estimated points of gravity per group). Also cf. Table 15. Example: at point of time 4 (this figure), roughly in the middle of phase 3 (Table 15) the NE, N and M groups existed on the site together; their relative positions are indicated in this figure.

groups, then it is on the assumption that ceramic dates (i.e., rankings of indiviudal huts) provide averages of the period of inhabitation of the huts. A hut ranked t_x will have stood from (t_x − m) to (t_x + n) years B.P. Although m and n are indeterminable by present means in some cases an allowance for this range has been made.

In table 58 the relative chronological positions of the means for every group have been entered. On the bottom scale ten "points" on the chronological scale are indicated at which the synchronisms of Fig. 51 were established, with the allowances mentioned in the previous paragraph.

A number of locational shifts of the groups cannot be dated precisely: the northern group at t_3 and the northeastern group at t_5. As the hut groups will not have moved as groups, but rather hut-by-hut, the lack of precision may be reflecting such shifts.

All in all, 58 huts (20 of which were not accompanied by decorated pottery) plus hut 03 could be assigned to one group or another. 34 huts (13 with and 21 without decorated ware) could not be assigned. They can be derived from Figs. 46-50, and are entered into the right-hand column of Table 62.

What emerges, however, is a fairly constant configuration of the groups. Within these groups the distances between the huts are considerably less than between the groups (Table 59). The northern and eastern groups seem to have been made up of three households each, the middle group of two to four of these units, and the northeastern group of perhaps two or three households (to judge from phases 3 and 4).[4]

Adding the 34 non-assignable dwellings as well (huts nos. 01 to 03 excluded below), on the average one hut should be added to each of the above derived groups. That is, *the excavated part* of the settlement must have comprised six to nine households at the least at any moment. So when Modderman estimates the size of the settlement at two or three hectares in the older period, of which approximately 20,400 square metres have been excavated, and if six to nine huts have stood there simultaneously, then eight to eleven huts should have made up the whole village estimated at $2\frac{1}{2}$ hectares. (With this, the basis of Pavlů's computations is weakened, insofar as it is based upon the Elsloo data: no case can be made for a relatively densely-packed village. Pavlů 1976: 12).

Changing over to the structuralist way of research, we start with the number of groups living in the village of Elsloo. To arrive at that figure, one would have to multiply the number of groups observed by the ratio of estimated over investigated site area, but such a procedure seems a bit risky. However, a minimal number of three groups does not seem too far-fetched: in the first three phases at least three groups are visible, and later at least two (Table 58; Fig. 51). Three is the minimum number of groups with which to operate an asymmetrical exchange system, as hypothesized in the graveyard chapter.

However, this speculation leads to (unsolved) difficulties. If it is to be assumed that throughout the village's existence four groups of three huts each have stood, and if it is also to be assumed that the huts were (re)built ten times, then the total number of huts erected at the site is 120. Modderman's estimate is almost double that number (200 to 250; Modderman 1970(I): 204). Several possible explanations can be thought of: shorter life-span of the huts, more groups on the site in the younger two phases, longer duration of these two phases, etc. For instance, doubling the length of the final two phases (the least unlikely solution) would add another 50 huts. The trouble is, though, that these solutions are merely *ad hoc*, without justification or contradiction in the data.

I do not consider it possible to observe the results of the asymmetrical, lineal exchange system in the village unless all items excavated were brought into play. And even then, only the importing groups might be traceable. This also implies the impossibility of matching (in the *present* study) any or all of

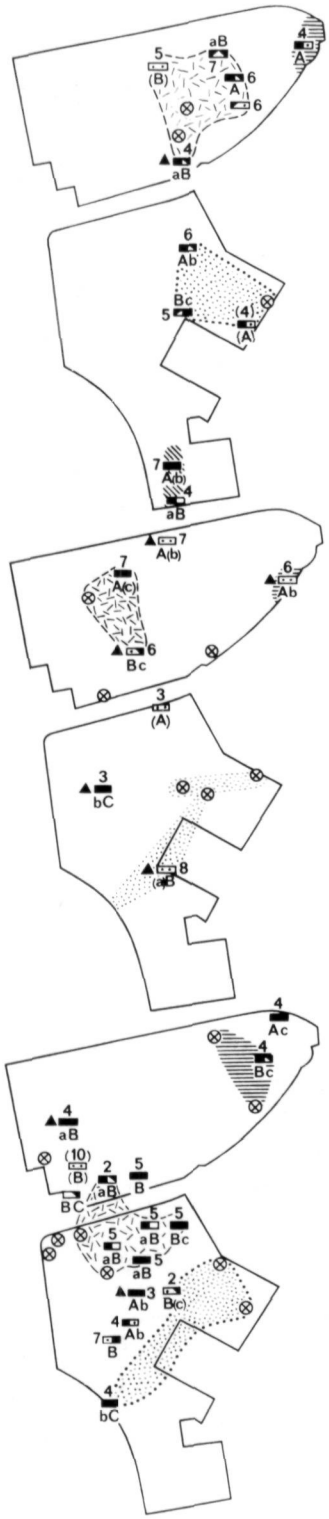


Fig. 52. ELSLOO VILLAGE: Distribution of major VARIABLES of pottery decoration in first ceramic phase (For hut nos., Fig. 46)
□□: MAIN MOTIFS: wave/spiral,
■: present
◤: probably present (via associated attributes)
● : absent
1-9: STRUCTURES: proportion of curvilinearity.
abc: NUMERICITY: a, simplex; b, duplex; c, triplex. CAPITAL LETTER indicates preponderance.
▲: innovators – introducing neck decoration.
⊗: huts with less than 3 decorated sherds.
In parentheses: when less than 10 sherds available.

Fig. 53. ELSLOO VILLAGE: Distribution of major variables of pottery decoration in second ceramic phase (for hut nos. Fig. 47). Legend: see Fig. 52.

Fig. 54. ELSLOO VILLAGE: Distribution of major variables of pottery decoration in third ceramic phase (for hut nos., cf. Fig. 48). Legend: see Fig. 52.
▲: innovators, introducing multidented spatula and stab-and-drag decoration.

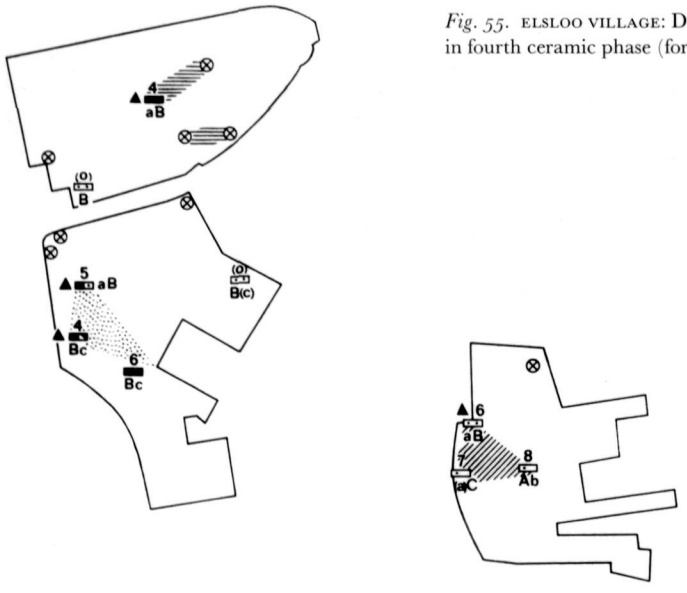


Fig. 55. ELSLOO VILLAGE: Distribution of major variables of pottery decoration in fourth ceramic phase (for hut nos., cf. Fig. 49). Legend: see Fig. 54.

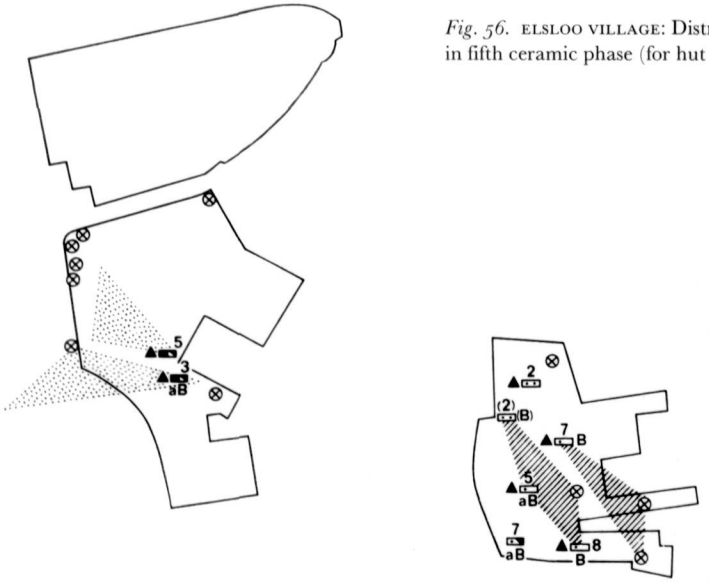


Fig. 56. ELSLOO VILLAGE: Distribution of major variables of pottery decoration in fifth ceramic phase (for hut nos., cf. Fig. 50). Legend: see Fig. 54.

the four graveyard groups to a corresponding group in the village.

While the relations between the groups are difficult to perceive, something more can be said on the topic of group composition – for which unilineal (Behrens, Soudský) and bilineal (graveyard Elsloo) hypotheses have been proposed. When it can be assumed that social groups showed differential preferences for the attributes of ceramic decoration (if structure is anywhere, then it is everywhere) then the geographical distributions of these attributes should provide testing possibilities. To

that end, in Figs. 52 to 56 data have been assembled relating to this subject. In fact, these figures are the graphic representation of the outcome of the principal components analysis; the innovator components, matrilineal, main motif, and numericity components are depicted.

A look at the plans reveals that no case can be made for unilineality – the matrilineal mode proposed (the patrilineal mode has not been hypothesized in the literature) would have resulted in a localization of the decorative preferences, so that the various mixes should have been very much one-sided. As the numerical values of the mixes generally vary between .3 and .7, the unilineal case can be ruled out; consequently, a bilineal or disharmonic regime should be adopted.

Perhaps it will be observed that these proportions relate to dichotomous variables. What if the labelling system did not consist of twin symbols but rather of a larger set? Suppose the marker system had four attributes – curvilinear wave, curvilinear spiral, rectilinear wave, and rectilinear spiral – each for one exogamous group. Then the first couple would be using, say, curvilinear wave. Its descendants, in the case of bilinealty, would be associated with curvilinear spiral in the first generation, with rectilinear wave in the next, and its great-grandchildren with rectilinear spiral. Thus, when the mixes are summed, they should exhibit all possible values between .0 and 1., even if the "true" four-group attribute system were reduced through faulty observation to a two attribute one. Uniliny would have resulted, however, in the constant association of the same single attribute with a lineage. Hence, the mixes would be either close to .0 or to 1., with or without reduction, and one can conclude that the precision of the classification is of no consequence in this matter.

Again, when the assumption of group differences in preference for certain ceramic decorations would be invalid, then a more or less even distribution of the attributes is to be expected. This, however, is not the case either: extreme values of the mixes (that is, preponderance of one characteristic to the near exclusion of all other attributes on the same variable) do not occur – except in cases where less than ten sherds are available. In the case that the huts have been lived in for a shorter period, extreme values should be as likely to occur as more moderate figures. Or otherwise, in the case of a longer period of habitation, when summed the mixes should exhibit a normal curve of frequencies – which they do not (p. 151; Table 60). The assumption of group-bound ceramic preferences for ceramic attributes thus underscored leads to the observation that the rules governing residence are not the same as those governing the distribution of these preferences: non-uniliny or rather biliny, would have been the case.[5]

Without addition of further assumptions it is not possible to decide whether this disharmonic regime was of the virilocal-matrilineal or of the uxorilocal-patrilineal variety. But it is possible, for instance, to adduce the ethnographical generalization that the uxorilineal-patrilineal system has only rarely been observed (Murdock 1949: 59); however, as there is no *strict* necessity for non-occurrence this is a weak argument in favour of the first combination. The demonstration of matrilineal succession of preferences for ceramic decoration in the Elsloo graveyard is a much better point to go by. Besides, it leads to the same outcome as the ethnographic argument: a virilocal residence rule plus matrilineal descent. In other words, the hut groups in the Figs. 46 to 50 were inhabited by males who were *de facto* patrilineally related per group – a relation brought out by father-to-son "inheritance" of residence. In more homely phrases: the son succeeded the father on the farmstead. Apart from this succession, women were not only brought in from elsewhere, they were matrilinealy related ("discriminated", or "differentiated" would better describe it), and the web of kinship integrated the residential segments of LBK society. In this way, the seemingly unstructured distribution of all kinds of elements of

ceramic decoration over LBK sites finds its necessary explanation: the bilineal social structure prevented localization of any attribute by pumping people in an orderly way out of their birthplaces; the sons became associated with another matriline, the sisters went to live with another group.

I shall now turn to the neo-Marxist frame of reference, where the household was posited as the unit of domestic production and consumption. The conjugal couples in the Elsloo graveyard have already been assembled in extended families (above, p. 140), one associated with each hut. However, "extended families" exist in three types (with intermediates), and these have not been explicitly differentiated and referred to in the Elsloo data. Firstly, there is the opposition of large and small extended families, and secondly, among the small variety, a "stem" and a "joint" type are customarily differentiated (Bohannan 1963: 100-105; Murdock 1949: 32-37, and 1967: 47; Wolf 1966: 61-73). A minimal definition of an extended family includes at least two conjugal groups linked either by descent or as siblings (i.e., polygyny not included here; adapted from Bohannan 1963: 101 and Murdock 1949: 23). Also by definition, a large extended family incorporates at least two conjugal families of siblings or cousins in each of at least two successive generations. When the extended family does not attain such an extent, it is called a "stem family" when there are two related conjugal families from different generations and a "joint family" when there are two related couples from the same generation together with a parent of the siblings. Extended families as residential units are defined by the mode of residence: virilocality results in patrilineal relations between the constituent conjugal couples, and uxorilocality in matrilineal relations (Murdock 1949: 37).

Large extended families consist of at least four conjugal families, which equals eight adult persons, plus supposedly a number of children – all in all, at least ten persons, if not more. A small extended family consists of two couples with a number of children plus perhaps an unmarried relative: some six or seven persons perhaps (children counting for half), which is considerably less. Given the floor area in Bandkeramik huts (between 35 square metres and 112 square metres in Dutch Limburg; Modderman 1970(I): 205; modally some 60-70 square metres) and using the estimate of necessary space as ca 10 square metres per individual (Naroll 1962; see p. 139 above) as a rule of thumb, small extended families appear the more likely hut occupants.

"Stem" and "joint" families can be discerned in the archaeological record from the different patterns of rubbish they may be expected to produce. In a virilocal community like Elsloo a joint family will consist of two brothers plus their wives and offspring; the women will be classificatory (if not actual) sisters, who come from the *same* group. A stem family in similar circumstances will consist of father and son – but they will be married to women from *different* backgrounds (given matrilinear, or double, descent). Thus, decorative preferences on earthenware will be homogeneous in the "joint" case, and heterogenous in the "stem" case.

Table 60 summarizes some data relevant to this point (I have selected the variable STRUCTURES because it is best observable and quantifiable. The other variables in the Figs. 52 to 56 exhibit similar patterns; their poorer distinguishability makes them less suitable to quantification, however). It is apparent that heterogeneity has been the case, and therefore the "stem" family must have been the modal type of household.

An extended family of the "stem" type will have consisted of two couples plus children and unmarried siblings of the younger couple; that is four or five adults and three or four children. This number cannot be directly converted into an estimate of the village's population, however: huts will probably have been built to a size related in some way to the expectable *modal* household size, rather than to actual size. The *average* household size is well below this count – on demographic

parallels I would estimate by a factor. .7 (based on demographic statistics for seven nonindustrialized countries, ca. 1960 A.D.; from Table 10-6 in Shryock, Siegel et al. 1976: 172). With this conversion factor added, the population of the Elsloo village must have been in the range of 39 to 69 during the older LBK. As the assumption regarding the relation of hut size to modal household size cannot be substantiated in any way, this population estimate is to be considered a minimum (cf. Modderman's estimate of 54 to 170 people; Modderman 1970(I): 205).

There is another thing that can be derived from Table 60. It has but remote relations with the domestic mode of production, but is, nevertheless, of some archaeological interest: the life-span of the huts. When:

– curvilinearity and rectilinearity are each tied to a matrilineal group (cf. previous chapter);
– the matrigroups were exogamous;
– there were virilocal residence rules;

then, at any *locus* successive generations of women will have used alternately curvilineally and rectilineally decorated pots. That is, summed over space and/or time, the mix will be .5. For individual cases, however, it is the *size* of the sample that is determinant for the mix. If, for instance, two generations are represented in a sample, the mix will be approximately .5 – one woman having left pots marked by one attribute, her daughter-in-law having used the other (because of her origins in a different matri-group). Keeping to this concatenation of alternative preferences per generation and to a sample length of two generations, *it is impossible to frame a sample in which the mix is not .5* (Fig. 57). With a selection of a sample only one generation in length, the mix may attain any value; introduction of a fixed point would result in a two-peaked frequency distribution (one peak for where one attribute prevailed, and another for the alternate attribute).

A sample extending over a different number of generations leads to still another type of distribution. Consider a sample of one and a half generations as an example (Fig. 58). Then, the mix will have a minimum and a maximum limit set by the sample/generation rate:

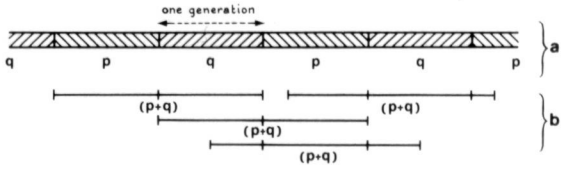


Fig. 57. a: Dichotomous variable, going to its alternate states p or q once per generation
b: Some ways of sampling a two-generation span: sum (p) = sum (q), always, also

$$\text{mix} = \frac{\text{sum (p)}}{\text{sum (p+q)}} = .5$$

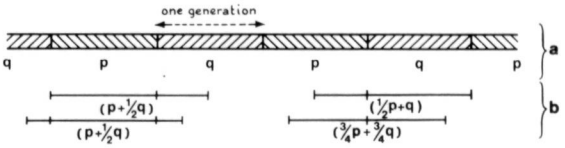


Fig. 58, a: As Fig. 57a.
b: Some ways of sampling a $1\frac{1}{2}$ generation span; sum (p) is always between .5 and 1.0, as sum (q). Therefore:

$$\frac{.5}{1.5} \leq \text{mix} \leq \frac{1}{1.5}$$

(the limit value:) $$\alpha = \frac{|\,(1\text{-sample length})\,|}{\text{sample length}}$$

the upper limit is $(1-\alpha)$. In this case, $\alpha = .33$, and $(1-\alpha) = .67$. The α-values for the different sample lengths are easily computed; Table 61 provides a summary.

Before evidence and model can be brought together, the types of the distributions still have to be considered. Assuming the starting point of the sample to coincide with the construction of the hut, this point may conceivably be tied to the life cycle (which is a bit difficult with a broken number of generations, but until a few lines below, the Pavlú

model of 15-year intervals in construction is still standing). In that case there would be a steep normal curve around one mix-value, plus another one for (1-that value). If, however, huts were built when the old ones were falling down – i.e., a process not linked to the life cycle of individual households but rather to the incidence of dilapidalation – there is no preferred mix-value, and all values within the limits should appear in approximately equal frequencies.

Now turning to Table 60 the α-value at Elsloo is seen to be close to .3, which indicates a sample length of either one and a half or three generations approximately (Table 61). Also, the distribution of the frequencies in Table 60 is less peaked than block-like, which demonstrates an absence of preferred mix-values. Thus the LBK huts at Elsloo have stood for either one and a half or three generations (marriage-death), perhaps some 30 or 40 years, or 60 to 80 years, respectively. Moreover, the building date was not tied to a fixed moment in the individual's life cycle.

A few points should be added. Regarding an eventual tie of the building date to a specific moment in the life cycle, a use of huts over more than one generation makes this hard to imagine, at the very least. Also, extended families of the stem type living in the huts make this an unlikely proposition; to me, it would be very difficult to conceive of a reason why the son would build a hut at a determinate point in his life, when his father had not done so.

There is then no way to choose between the two alternate values for the hut existence except by pointing to the estimated life of the beams. Bakels 1978: 82 presents a table of the life expectancy of native kinds of wood; all are 50 years or less. Elsewhere, on various considerations she estimates the life-span of a hut at ca. 25 years (p. 143). With no extensive repair activities being visible in the excavated huts, it follows that the one and a half generation figure for the life of a LBK hut is to be preferred over the larger number.

Again, this observation does not fit well with Modderman's estimates of 200-250 huts, and 350 to 450 years for the village of Elsloo. With a life-span of 35 years, on the average 15 to 25 huts should have been standing at any moment of the site's occupation. Above (p. 145), four groups of three huts each were "established" – that is, twelve huts, which is clearly less. Again, some "solutions" may be suggested *ad hoc*, such as shortening of the length of a generation, or increasing the number of groups in the latest two phases. For instance, reduction of the length of a generation from ca. 23 to ca. 20 years results in an increase towards 13 to 18 huts at any moment.

It hardly needs to be said that these findings are much at variance with one of the ideas underlying Pavlů's hypothesis of a building cycle of about 15 years: the huts stood considerably longer.

Finally, to conclude this topic, the above has been demonstrated by an analysis of the distribution of the variable STRUCTURES. Other variables might have been used as well, but because they are harder to discern (cf. Ch. I, Section 6), the results would have been less clear-cut. And although I understand neither the transmission mechanism of NUMERICITY nor that of MAIN MOTIFS, extreme mixes do not occur (again, with the exception of small samples); also peaked frequency distributions have not been found.

Returning to the modes of production: just as the huts must have housed the couples visible in the graveyard, so the groups in the cemetery may perhaps be compared to the hut groups – both one step up from the next-to-lowest level of observation. That is, the set of stem families inhabiting the huts belonging to one group (Figs. 46 to 50) should together compose the (local segment of the) lineage; perhaps from this grouping even a lineage mode of production can be derived. Table 62 shows the composition of the groups in terms of hut types per habitation phase. The groups appear to exhibit a regular composition: the better visible and/or the more extensive a group, the clearer a tendency

appears for incorporating *one* type 1b hut (sometimes type 1a); Table 63 sums the data on this topic. The other huts in a group are of the types 2 and 3. In the paragraphs on status (p. 141) I have not been able to explain all the variation in hut types by means of simple ranking only. Indeed, it was written there that "the households held different positions in ahierarchy". The repeated reproduction of the same configuration of hut types seems to indicate that these groups were truly groups with their own functions, rather than *only* of an ephemeral nature (which is a function as well). If the two annexes to the central part embodied by types 2 (one annex) and 1b (two annexes) did serve different purposes, then apparently the formation of the groups was geared to incorporate these purposes or to make available the facilities, etc. In other words, there must have been an economic base for these groups.

Given the existence of such groups, an interpretation involving a lineage organization with its attendant status differentials for the component units does not seem unlikely – especially as such an organization was hypothesized from the graveyard findings. Also, we might speculate that the lineage prominents were living in the larger and more extensive huts. Whether the extras indicated by these more complex (and spatious!) dwellings were at their own disposal alone or also came back to the other households of the lineage can not be decided from the data at hand. From the allocation of valuables in the graveyard one would say that to whatever extent control was exerted by the prominents, it did not pass unnoticed. Together, these points make the existence of a lineage mode of production probable.

There are still two other things to be discussed in this connection. In the first place, in the graveyard chapter the matrilineal accent in the lineage organization was much played up. Here, however, the lineage organization is seen to operate on a virilocal basis – that is, with a *de facto* patrilineal principle. The two findings do not contradict one another at all (see also the following paragraph): a bilineal regime was hypothesized from the graveyard analysis, and has been substantiated in the village (p. 148). It is only here that the patrilineal principle appears to be of more consequence than simple virilocal residence: economic and social factors are involved as well.

The second point may have to do with the matrilineal side of the social formation. There are two huts of type 1a that could be dated through the associated pottery (huts 27 and 55); a third one had less than ten sherds (hut 13). All six, however, could each be assigned to a hut group (this is also the case for huts 21, 25 and 94). Type 1a huts may be an alternative to type 1b, as is suggested by Table 62. When a group possesses a type 1a hut, 1b is absent, and (sometimes) vice versa. From this occurrence in different groups, the associated function cannot have been tied to patriliny. If the interpretation of this hut type as a chiefly one is accepted (an interpretation only hesitatingly made on p. 141) the matrilineal principle governing the distribution of chiefly status hypothesized for the graveyard is not contradicted in the settlement. Differently phrased, the patrilines ("minimal segments") inhabiting the type 1b huts also allocated among themselves the chiefly dignities vested in one of the matrilines.

Of course evidence restricted to one case out of six observations is too meagre to be trusted by itself; however, the suggested "explanation" is in line with both ethnology and better substantiated data from the Elsloo graveyard and village alike; and the two observations do not falsify the propositions (though they could conceivably have done so). Where possible, the statements should be tested elsewhere.

Apart from this, and more *ex hypothetico*, there is another line of evidence pointing to the importance of the matrilineal principle in Elsloo. In the graveyard, the male and the female sexes were observed to be of similar status. If the patrilineal principle had been preponderant, then the sexes

would have differed in average status, with the females in a lower rank; this not being the case, matriliny must have been accorded considerable weight. However, the functional differentiation of the huts per group and the virilocal definition of the lineage inhabiting the hut groups seem to point to an organization of (part of) the economy along patrilineal lines (considering the level above the individual households) rather than on matrilineal lines. And this argues for a patrilineal mode of production, with matriliny fulfilling other, non-procurement functions (also cf. Lévi-Strauss 1969b: 408).

Turning to the third kin-based mode of production, the supralocal one, some of its effects can be perceived in the excavations. For instance, though it must be stated cautiously, the two groups of innovators (first and second phase, and third to fifth phases, respectively; Figs. 52, 53 and 54 to 56) can be linked to this mode. The caution has two grounds: the hidden assumption of innovations being introduced from elsewhere, which cannot be proven; and the nature of the supralocal contacts: was it people who were imported, or ideas only, or perhaps a mixture of the two? However that may be, the habit of decorating the necks of pots was apparently first adopted in the northern group, when other huts in that group and the other two groups continued in the traditional Flomborn way of leaving the necks bare; it should be admitted, though, that the first neck decoration (associated with hut 50) is quite clumsy in appearance (Modderman 1970(II): Pl. 49). Later, in the second phase, the custom spread to the north-eastern group as well, as it did to an unassignable hut (no. 28), and presumably also to the other, hidden/non-excavated groups. If the idea has come from outside, its occurrence testifies to foreign contacts; if the custom originated at Elsloo, its diffusion to other LBK communities points to similar channels. An analogous case can be made for the introduction of the multidented spatula from the end of the third ceramic phase onwards: in the middle group and in an unassignable hut (no. 58) the implement's traces are found first, in subsequent times diffusing throughout the site. Still another instance is furnished by the presence of point decoration, reminiscent of (but certainly not identical with) the Cologne type of decoration (Dohrn-Ihmig 1976b). It occurs in the southern and eastern groups at the same time (fourth and fifth phases; not rendered in Figs. 55 and 56).

Yet, one does not need a principal components analysis to establish the existence of supralocal contacts: it is sufficient to point to the adzes in graveyard and village; also the sherds (presumably originally in the form of pots) belonging to the enigmatic Limburg group (Modderman 1970(I): 141-143; and, latest, Gabriel 1976) must have come from elsewhere. The huts where this imported ware was found did not distinguish themselves in any appreciable way from the ordinary run (huts nos. 50, 74, 75; respectively Fig. 46, no. 4^2; 48, no. 2^1; and 46, no. 6^2); the three huts are associated with sherds mainly rectilineally decorated with the wave motif.

In one instance it is possible to see different processes at work: in the fourth phase the loadings on the "innovator" principal component of *multi-dented spatula* and *stab-and-drag components* are very much opposed (but not so in the fifth phase), apparently indicating an initial disjunction of the two attributes. As elsewhere, the one does not presuppose the other – there is no necessary connection between the modernistic traits.

All these signs of foreign contacts do not establish the existence of an autonomous, supralocal mode of production. They demonstrate only that there must have existed a number of inter-community networks, an important part of which will have had the character of an alliance. The distribution of foreign goods (basic materials, valuables, women) will have been the primary goal. But, if the local lineages were segments of a wider system of lineages and clans (that is, every local lineage is a segment, or element in a super-lineage), this transfer was

simply another aspect of the lineage organization, in no way distinct from its intra-communal manifestion. However, in the village as in the graveyard there is an appreciable increase in indicators of foreign contacts from the earlier towards the later phases. Whether these contacts did bring about social change cannot be established from the data used here. That is to say, apart from this latter point, no case can be made for or against the supralocal mode of production. The fourth mode of production, the loose one, cannot be demonstrated by means of data on pot decoration only. Even for ceramics, no specialist can be determined. The number of sherds per hut, though showing considerable variation, does not seem to allow such a conclusion (cf. Table 57), nor have kiln remnants been found. A study of the distributions of flint artifacts and debris, of adzes, etc., might very well bring out specialized working areas; it would seem possible, then, to check the inference from the cemetery of a non-hereditary transfer of skills.

In the end we remain with two modes of production fairly well demonstrated and two without conclusive evidence. Consequently, nothing much can be added on the topic of dominance of any of the modes. Both the household as an entity and the lineage as a unit persist throughout the village's existence. The dominance of the lineage over the domestic mode can be inferred from the qualitative differences in hut types per lineage; one would like to have it substantiated from a differential concentration of, for example, foreign goods as well.

On the topic of social change the following remains to be said: the factor indicating matriliny turns up in every phase, and the virilocal arrangements of the huts also persist. It is only the unexplained factors of MAIN MOTIFS and of NUMERICITY that show change: they disappear towards the final phase of the village; a matter of changing tastes only, or of wider implications?

Let us now see what can be said about Bandkeramik social structure at a site that is markedly different: Hienheim.

5. *The BK village of Hienheim*

The Bandkeramik village of Hienheim was built on a left-bank terrace of the Danube, about fifteen metres above the valley floor. From the site there is a magnificent view up (to the south) and down (to the northeast) the river, and of the hills on the right bank. The modern relief does not fundamentally differ from the Neolithic one; from the village a steep slope goes down to the river plain. This slope is the site's natural southeastern border. To the south there is a small dry valley; in earlier times it may have carried water in wet periods; the bottom of this gully is the easiest access road from the site to the river valley. About 650 or 700 metres to the north of this cross valley, a wider gully descends to the Danube. Finally, some distance to the west the land rises to a ridge, a remains of a higher terrace. The settlement site is situated in the southeastern corner of the landscape unit thus circumscribed. The site, locally known as "am Weinberg" ("in the Vineyard") lies on the northern outskirts of the modern village of Hienheim.

Neolithic occupation of the site was discovered in 1955 when H. Neubauer, an engineer of the Danube regularization commission, looked from the hills across the river to the freshly ploughed plot. Reconnaissance revealed numerous Bandkeramik sherds and flint debris lying on the field. The first test pit was dug in 1965 (Modderman 1966); further, large-scale excavations were carried out by a team from Leiden University, led by Prof. dr. P.J.R. Modderman during the summers of 1967, 1968, 1970, 1971, 1973 and 1974. An area of over 1.2 hectares has been investigated. The finds from the excavations up to and including 1970 have been published in Modderman 1977; they are from an area of approximately $^3/_4$ hectare in extent; the present study is mainly concerned with data from the excavations up to 1970.

At the village site, the loess covering the terrace is less flat than at the site of Elsloo: height differences of about two metres occur. In Neolithic times the

surface was even more rolling than today. Because of the unevenness of the terrain, erosion has been worse than at Elsloo (Modderman 1966); parts of the Neolithic site have almost disappeared. Many periods from the Middle Paleolithic to the Middle Ages are represented by sometimes considerable amounts of finds from the site; the LBK settlement proper should have covered about 2.2 hectares, and the SSK village (an estimated) 2.7 hectares.

The most densely built part had been investigated by 1970. In all the excavations, 42 huts were uncovered, 25 belonging to the LBK proper, and 17 to the SSK. The dwellings are of different types: in the LBK period: one time type 1b (hut no. 2); twelve times type 2 (nos. 5, 6, 8, 12, 14, 17, 24, 25, 29, 31, 37, 41), and three times type 3 (nos. 1, 35, 43; probably 26, 27 and 51 also); type 2/3, 3 times (nos. 13, 19, 28), three huts from this period are indeterminable (nos. 39, 40, 52). In the SSK period five huts were of type 2 (nos. 3, 4, 15, 22, 42), 10 of type 2/3 (nos. 9, 10, 11, 18, 21, 30, 32, 33, 34, 38) and two of type 3 (nos. 20, 23) (P.J.R. Modderman, pers.comm. 201278). The LBK huts were a bit narrow as LBK huts go: none exceeded six metres in width; the central parts varied between 5 and 19.5 metres in length (at Elsloo, 6 to 16 metres; Modderman 1970(I): 104). There are more things differentiating the Hienheim village from other LBK settlements: there seem to be too few type 1 and type 3 huts; here, contrary to other places, the walls consist sometimes of double rows of posts; the northwestern part has sometimes been subdivided by a transverse wall, etc. Also distinguishing Hienheim from Elsloo is its continuity into the Middle Neolithic (MN, henceforth) (cf. Ch. III).

During the SSK, huts were no longer built with double rows of wall posts, but with single rows instead; the central part of the huts then had a length of 9.3 metres on the average; the huts measured from 5.6 to 7.6 metres in width and between 8.0 to 15.5 in length, with relatively short northwestern sections (1.9 to 2.4 metres; for the LBK huts at this site 1.7 to 11.3 metres). From a research point of view, the SSK huts are considerably more difficult to evaluate than earlier counterparts: in the MN loam/refuse pits were no longer dug parallel to the long walls, but farther afield. To associate such a hut with finds is therefore impossible. The human environment of Neolithic Hienheim must have differed considerably from that of Elsloo, too. The latter village had numerous comparable settlements in its vicinity; Hienheim had no more than three neighbouring villages (if villages they were, and not single field/harvest sheds; cf. Bakels 1978: 141 note) on its loess island within 4 km. Beyond, the woods stretched for 12 km. to the next patch of loess upstream, or 20 km. downstream to the vast, densely occupied Gäuboden (Bakels 1978: 23-26, 52-53; Modderman 1977: 9-11, 121-130).

Across the seven ceramic phases into which the Bandkeramik occupation of Hienheim has been subdivided (Table 53), an unstable and difficult-to-interpret set of factor patterns has been computed (Fig. 59), which is a "verbalization" of Figs. 13-16, and 25:

– "Innovators (1)": At Hienheim, too, innovators have been present, either marked in a positive way, or (artificially) in a negative way (next entry). The introduction and subsequent adoption of the *multi-dented spatula* (one of the points which already emerged from Ch. III) occurred from the third phase onwards. The low incidence of the new tool in the early phases of its introduction will probably explain its association with *fingertip* decoration, which I consider spurious. In the sixth and seventh phases the preponderance of *rectilinear* STRUCTURES, respectively the infrequent occurrence of *curvilinear* STRUCTURES will have caused the reverse: the (out-going) *simple spatula* and the (out-going) *curvilinear* STRUCTURES then load high on the same factors. Therefore, it is probably a spurious association again.

– "Innovators (2)": The factor of the "goat foot tool" is indicated. In the two final phases this

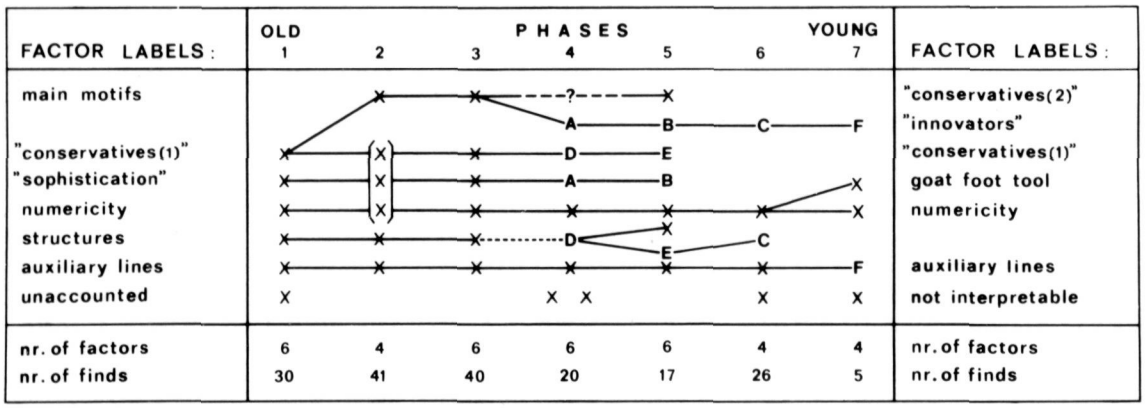


Fig. 59. HIENHEIM: constancy and change in factor patterns.
--?-- connection possible, though not attested.
..... weakly connected.
A to F letters indicate joint occurence on one factor.

instrument is associated with *hatched* COMPONENTS and opposed to *stab-and-drag* and the *multidented spatula* TECHNIQUE. In the sixth phase these loadings still occur on the NUMERICITY factor; more specifically, *duplex* seems associated (but only in that phase).

– "Conservatives (1)": When the LBK occupation of Hienheim began the adoption of (pot)neck decoration was well on its way. Only confusion can be gained by labelling the neck decorators "innovators"; I would rather call the pots decorated in the old way archaic or "conservative". This label, though, is too strong: throughout the Bandkeramik, pots without decoration in the necks keep turning up (cf. e.g., Elsloo). Yet, there is a factor which becomes ever less clearly dominated by this variable, from the first through the fifth phase. As with the previous characteristics, no fixed partner attributes can be found: *simplex* is associated with it in the first phase, and *duplex* in the second; *rectilinearity* in the first, and again in the fourth phase, and so on.

– "Conservatives (2)": As the *wave* MAIN MOTIF in the decoration increases with the transition from LBK to SSK, the pots decorated with *spirals* become an archaic phenomenon. The two main motifs occur in comparable frequencies in the first four phases; it is only afterwards that it makes sense to call one of these conservative. Again, no fixed association with any of the other variables is brought out by the principal components analysis – in most phases where both its attributes are represented, the MAIN MOTIF defines one single factor by itself.

– Structure: As illustrated in Fig. 59 the association pattern of the variable STRUCTURES (at Elsloo, the marker of matrilineal affiliation) is much more complicated than those of the other variables: in the first three phases decoration *without fringes*, and *single-dented spatula* are firmly associated with the *rectilinear* attribute, as are the opposites (simple/multiple spatula spurious?). In the fourth and fifth phases, and weaker so in the sixth, the *multidented spatula* is associated with *rectilinearity* (and simple tool with curvi-). Parallel to these in some phases (1, 3, 4, 5) a factor is found on which *waves* and *non-decorated necks* are associated with *rectilinearity* (as are their opposites: bipolar patterns).

– NUMERICITY is found on an "own" factor in every phase (not separate in phase 2) at Hienheim. In the

first three phases, the *duplex* mode is in constant high association with the *point* COMPONENT in the neck decoration and in the later phases with the same COMPONENT in the belly zone. *Triplex* shows a similar conduct of its loadings on this factor as does *discontinuous neck decoration* in the phase 4, 5 and 6. The *simplex* decoration disappears in the sixth and seventh phases.

– "Sophistication" is a factor which is sometimes associated with other factors. It brings out the opposition of decoration applied with *fingertips or nails* against that applied with the *spatula*. In the first phase an independent feature (with no further associations: a specific factor); in the second phase associated with the first conservative ware; in the third phase independent again (specific); in the fourth and fifth phases its association is with the innovative group of *multident-spatula*-decorated pottery; in the final phases this factor is no longer visible. The opposition of the two wares seems a purely analytical one because of this shift of associations; I shall present no further details.

– The factor of the AUXILIARY LINES is always present; its structure is an opposition of *absence* and *presence* of AUXILIARY LINES. Associated with this bipolarity is the occurrence of *fringes* in a reversed way: when fringe, then no auxiliary lines (and vice versa). In the final phases *continuous* and *homogeneous* neck decoration are at variance with the presence of auxiliary lines.

There are some factors left which could not be accounted for in a structured way. They may have to do with some peculiar decoration in a phase; as they are non-repetitive, there is little to be done with them.

A few things should still be said on the above principal components analysis of the Hienheim pottery, in comparison with that of the Elsloo data:

– In contrast to the Elsloo decoration, the MAIN MOTIFS do not load on different factors; at Hienheim their occurrence is therefore not independent of one another.

– Similarly, at Hienheim NUMERICITY is not spread out over two factors, one opposing *simplex* and *duplex*, and the other opposing *triplex* and the other two attributes, but confined to one factor instead.

– *Curvilinearity* and *rectilinearity* (as long as they are present in the data) show a similar behaviour as at Elsloo: they are bipolar attributes, loading on one single factor.

This completes the generalized description of the Bandkeramik pottery from Hienheim.

A recapitulation of the arguments put forward when interpreting the Elsloo village excavations in the previous section would seem redundant. Thus, unless otherwise stated I assume the same chains of reasoning applicable at Hienheim. And this implies, for instance, that I do not think that any sexual division of labour can be made visible on the Bavarian site, as the same type of data is available as for Elsloo: a publication in which hut plans figure predominantly and a punch card corpus of decorated pottery.

On the subject of ranking, however, a few remarks must be made. The pronounced typological differences between the huts at Elsloo do not figure so conspicuously at Hienheim (Table 64) – not at first sight, that is. From the variation in size of the central parts at Hienheim (Table 65) a similar conclusion can be drawn as for the Dutch site: an extended family rather than a nuclear one will have built and inhabited the huts. Although the variation (and the average, but that is not important here) is larger than in the Dutch LBK living quarters, the range of the lengths of the central parts seems to be similar as the two outlying lengths (5, and 19.5 metres) are clearly extremes: the next-following are different by less than a factor 2 (8.5 and 16 metres resp.).

From a simple typological description the uniformity of the dwellings at Hienheim (as compared with Elsloo) is apparent (Table 64). Especially the virtual absence of type 1 huts (cf. note 2) is conspicuous. However, this may well be a typological artifact: the overall lengths of the huts (and

disregarding the typological distinctions) are similar (Modderman 1977: 123).

Also, instead of possessing those southeastern sections which define the type 1 huts in Holland, some of the northwestern parts of the huts in Hienheim are further differentiated: six of them are divided by an extra (cross) row of posts (huts nos. 2, 8, 17, 24, 29, 31), a feature not uncommon in the "*Grossbauten*" (types 1) in the Dutch Bandkeramik (Modderman 1977: 126). To complicate matters, three of these huts have even had cross *walls* (rather, trenches; huts nos. 2, 8, 31), for which only with some hesitation two approximate parallels (both at Elsloo) can be found. If the type 1/type 2 differentiation in the northwestern Bandkeramik area may be thought of as parallelled at Hiemheim by the divided/undivided northwestern part of the huts, then the separate room in some of these divided northwestern parts is certainly suggestive of the enclosing wall trench of type 1a elsewhere. Note also, that at Hienheim the only hut belonging to the classical type 1, is also of the analogue type 1.

The argument can even be quantitatively supported (Table 66) – though not proved, of course. From the table, the almost identical proportions of the Hienheim "deviants" and the classical subdivision at other places becomes clear. Also, the associated differentials in lengths of the living quarters is visible, though admittedly less so at Hienheim than at Elsloo. If the argument would prove viable, it would account for the greater homogeneity in terms of the classical typology of the Bavarian LBK architecture, as compared with that of the Westerly areas – given comparable social structures. (To distinguish the classical from the analogue-types, the latter will be typographically marked by a "hat".)

When this proposed typological revision is not accepted, even then the variation in the construction of the northwestern parts of the huts tells of a ranking on other principles than age, as the typological variation at Elsloo did: from constructional differences by way of functional differences towards differentiated tasks for the households.

In parentheses: the Hienheim data alone do not constitute a sufficient reason for reconsidering the classical hut typology. Only when other Central European sites also prove to be consistently anomalous in terms of the quantitative distribution of types[6] *and* when there are grounds for considering the social mechanisms behind hut differentiation similar in all LBK areas, then the typology should be amended (cf. Ch. I for a similar case regarding pot decoration).

Just as in Elsloo, the suggested type î analogues at Hienheim are not selected by principal components analyses of the pottery decoration. Similarly, these parallels do not distinguish themselves in numbers of sherds associated (Tables 67 and 68; the type îa high figure refers to hut no. 31, where the association of pits and hut cannot be established beyond doubt: cf. Figs. 60 to 62 and 64; also, Modderman 1977: 38, 39). Also, the other arguments for and against chiefly figures inhabiting the type îa huts discussed in the Elsloo analysis remain applicable at Hienheim: different construction, different function; and perhaps the qualitative rather than quantitative differentiation of types îa and îb might support the argument (again, not proved).

The aspect of specialization cannot be pursued here, for that would require a distributional analysis of all the kinds of cultural debris. And even without a contrasting attribute a potter's specialization will not be visible: the 25 huts without firmly associated sherds do not prove that the other 12 huts with that attribute have been lived in by potters. And the high status accorded to people buried with more than one pot in the Elsloo cemetery cannot be found reflected in the distribution of sherd quantities as compared to hut types in Hienheim (again, Table 68).

On the topic of chronology the small size of the Hienheim site brings its own difficulties. At Elsloo, 54 huts were accompanied by sufficient numbers of sherds to be dated reliably; at Hienheim, this

number is only 12. One of the reasons is that MN huts are no longer surrounded by loam/refuse pits, as were the Early Neolithic dwellings. Another reason is the smaller site/smaller excavation. With ten hectares extent and three hectares excavated, it was possible to ascertain the existence of nearly one hundred huts at Elsloo, and to suppose the existence of 100 or 150 more. At Hienheim there were 2.3 to 2.7 hectares, .7 of them excavated, 37 huts ascertained. Extrapolation from investigated area to all of the site yields the following:

LBK site estimated 2.2 hectares; SSK site estimated 2.7 hectares

LBK huts observed: 19; SSK huts observed: 16

area investigated: .7 hectares (addition of .5 hectares, 5 LBK huts, 1 SSK hut for the excavations after 1970 considerably inflates the estimates resulting from the above data). Averaging the two computations:

LBK huts estimated site total 45-50; id. SSK 40.

If the site was occupied for 450 years (on the basis of the radiocarbon dates; see Ch. III), and if the lifespan of huts derived at Elsloo was comparable (ca. 30-35 years), then some six (LBK; estimated at 300 years) to ten (SSK, estimated at 150 years) huts must have stood at a time in Hienheim. Of these – on the basis of the relative position and the area of the excavations on the site – it may be supposed that at least three to five have been excavated. That is, we should not expect *groups* of huts to be visible as they were in Elsloo. And with only twelve huts datable an unraveling of the site's building history becomes a difficult affair.

As a first approximation in Figs. 60 to 65 the datable pits ("datable" referring to pits with at least five decorated sherds, allowing computation of their relative chronological positions) are rendered in a similar way as for Elsloo in Figs. 46 to 50 (but note the different scales of drawings and phenomena). Those huts that can be associated with pits or dated on non-ceramic grounds have also been indicated (Modderman 1977: 12-45).

A number of comments should precede interpretation:

– Hut 31 is not that firmly associated with finds as it might appear at first sight. With an average duration of the phases of 65 years, its continuous occupation through $2^1/_2$ phases (even if the phases are half the mean length) calls for too much imagination. Moreover, it is not known what happened beyond the limits of the excavation, which are rather close to this hut and the loam pits. From Modderman's description doubts about the association of the pits involved can be read; constructionally the building is "fairly late LBK", which would favour a phase 3, perhaps phase 4 placement (Modderman 1977: 38-39; and pers. comm. 290978). In the fourth phase, however, no loam pits occur in this vicinity; and the almost perfect alignment of *earlier* loam pits to the building would raise at least some questions.

– Hut 17 figures twice on the plans: phases 3 and 4. This paradox is easily explained: in phase 3 the associated loam pits are dated to its later half, and in phase 4 to the very earliest. The structure will have stood, therefore, across the dividing line of phases 3 and 4.

– A similar point can be made regarding huts nos. 1, 2 and 6 (phase 3): hut 6 is dated right at the beginning of that phase (and, consequently, will have been erected in phase 2). Hut 1 is dated exactly at the end of the phase: it will have stood well into phase 4.

– What emerges then, is that at two or three points of time at least three huts have stood together:

(a) late in phase 2, huts nos. 6, 12, and 35.

(b) in phase 3, huts nos. 2, (perhaps) 31, and 24.

(c) late in phase 3, or at the transition from phase 3 to 4, huts nos. 1, 17, and 24.

There is no evidence at all which would indicate synchronic habitation of buildings very close together.

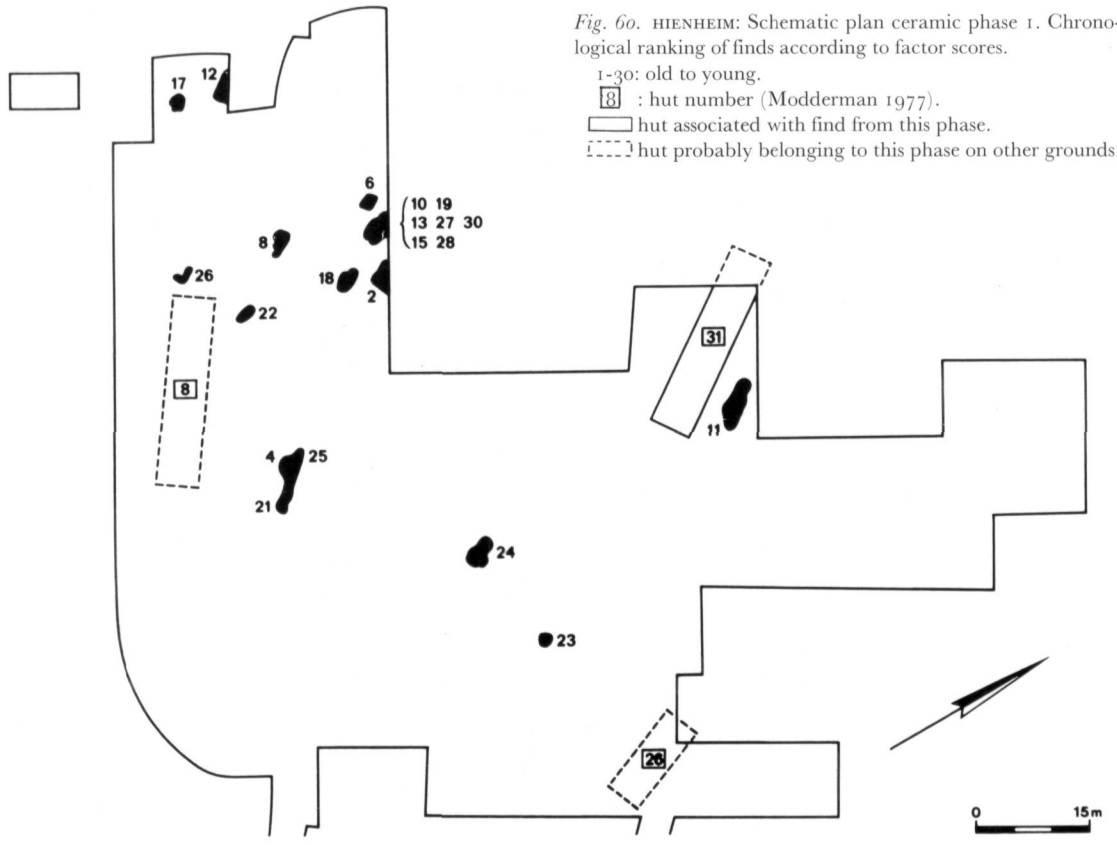


Fig. 60. HIENHEIM: Schematic plan ceramic phase 1. Chronological ranking of finds according to factor scores.
1-30: old to young.
[8] : hut number (Modderman 1977).
hut associated with find from this phase.
hut probably belonging to this phase on other grounds.

– Taking a diachronical point of view, several hut remains which are geographically close together, seem to have been inhabited consecutively:

(a) huts nos. 6 - 2 - 1 - 5 - 3 - 4 constituting a series from late in phase 2 through to phase 6.

(b) huts nos. 12 - 17 - 14 - 15, a series running from phase 2 to phase 5.

(c) huts nos. 26 - 29 - 24, running from, perhaps, phase 1 into phase 3.

(d) a succession of hut 19 by hut no. 31 is not unlikely.

Combination of the above synchronic and diachronic series with the overall plan of the site (Fig. 66) leads to the suspicion that at least four of five "groups" of remains, or building plots may be visible, with every group being the precipitate of continuous building and habitation activities. The plots have been delimited in Fig. 66;[7] their labels are also indicated there. It is quite satisfying that with the exception of the western group all plots contain approximately equal numbers of house remains: 9-12, which are also almost identically distributed over LBK and SSK periods: southwestern 6/2 (1 not accounted); southeastern 4/5 (2); eastern 6/5 (1); western 2/1 (1); northeastern 6/4 (1). As none of these plots has been investigated completely (i.e., up to the site's margins) perhaps a few more huts must be supposed per series. These plots are analogous to Langweiler 9 sectors (Kuper et al. 1977: 319-328), although the dimensions are different: there, a sector measured 12,400 square metres on the average, at Hienheim 3670 square

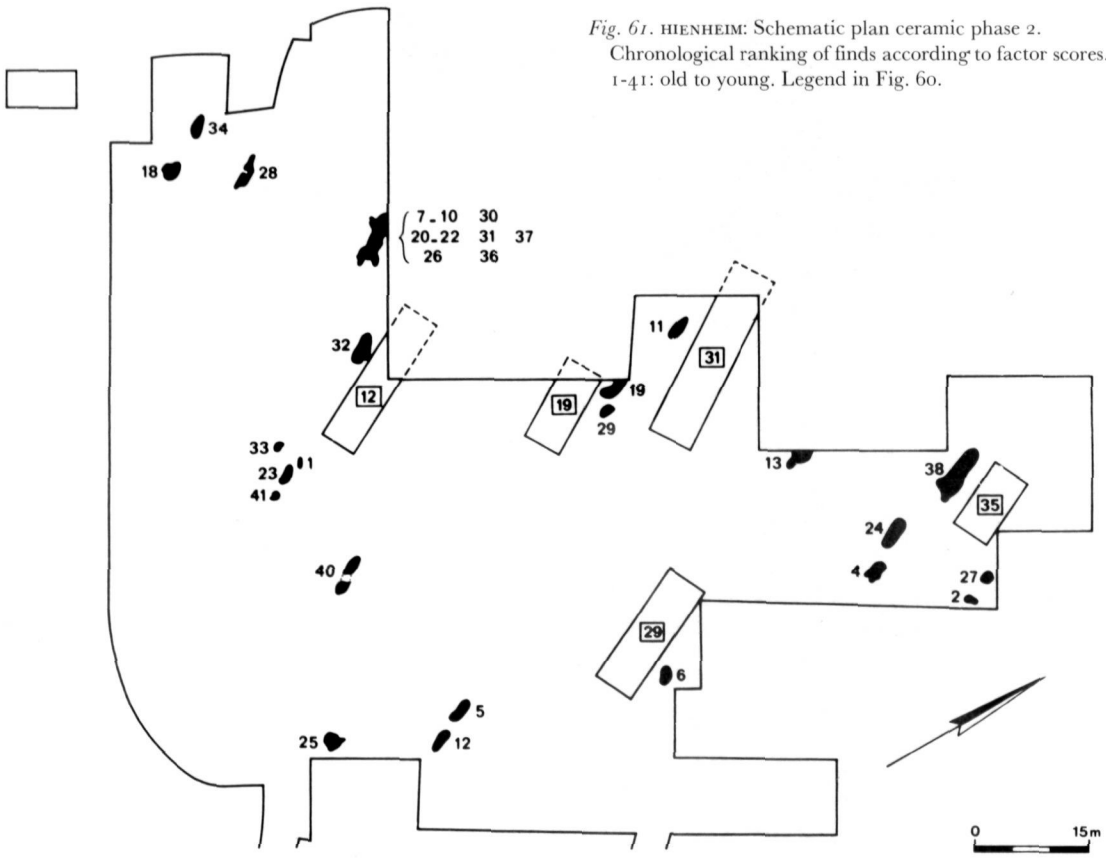


Fig. 61. HIENHEIM: Schematic plan ceramic phase 2. Chronological ranking of finds according to factor scores. 1-41: old to young. Legend in Fig. 60.

metres (6 sectors counted); at LW 9 the distance between the huts was 143 metres, at Hienheim 51 metres (six observations).

From the size of the hut groups at Elsloo (probably three or four huts per group) it follows that no comparable phenomenon can be expected at Hienheim. If anything approaching the lineage group should be sought at Hienheim, it would have to cover the whole site. What is visible in Fig. 66 is the "behaviour" of individual hut builders, who have apparently held to a site and plot demarcation of individual farmsteads for quite a number of generations.

It is even possible to infer the existence of at least one other series of huts to the east of hut no. 34 and to the northeast of no. 28, where there is sufficient space for another plot (now severely eroded); from the occupation of the northwestern plot it almost necessarily follows that in between the latter and the precipice, somebody else's hut has stood. Likewise, the western series should consist of more huts than those recovered.

It will be observed that the above implies that apparently six huts have stood together at Hienheim, which agrees with the LBK estimate but is lower than that for the SSK (p. 159 above). Still, not all plots were built up from the beginning. There is substantial evidence of *use* (digging of pits, wasting of pottery) of the site in the first phase; yet no hut can be unequivocally set to that period. This means that in the first phase a few huts may have stood there, but almost certainly not six of them.

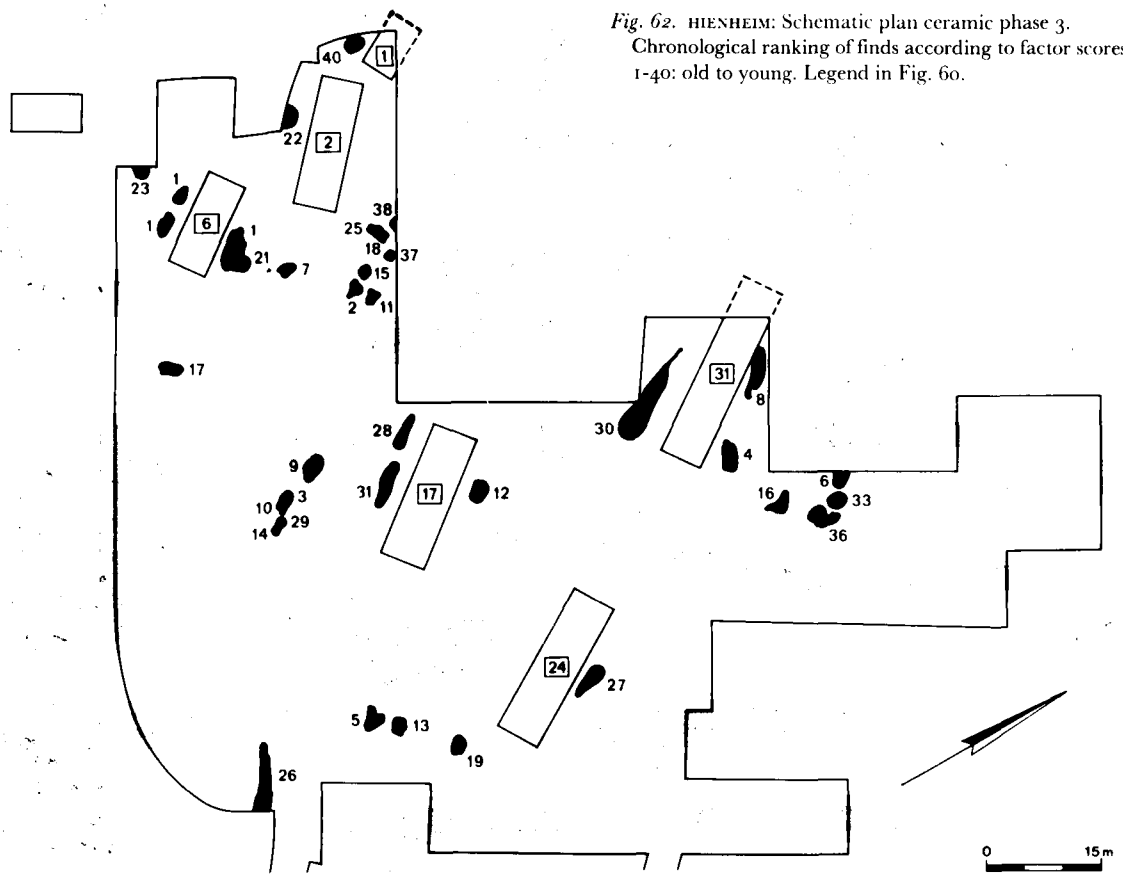


Fig. 62. HIENHEIM: Schematic plan ceramic phase 3. Chronological ranking of finds according to factor scores. 1-40: old to young. Legend in Fig. 60.

Regarding the discrepancy of this six-huts picture and the earlier estimate of ten huts in the SSK, it should be said that the division into plots is very much LBK-centered, although the SSK huts seem to conform neatly to the same pattern. I think this agreement across the Early/Middle Neolithic boundary is a strong argument for continuous occupation of the site (cf. Ch. III). Yet, there should have been more plots and/or huts per plot to account for the difference – the village area was expanded by only 20 percent, whereas the number of huts rose by two-thirds. As the huts are not sharply datable, and also because the excavations at Hienheim have been stopped, these possibilities remain inferential. However, in either case there was a change in the composition of the population by the MN, as more households were set up.

The operation of a ceremonial and connubial exchange system between the households does not seem very likely, if at all possible. The retention of kinship concepts becomes very difficult, as generations never run exactly parallel. For example, normally either the mother's brother's daughter would *not* be of the right age, or she was non-existent – if she had to be the real mother's real brother's real daughter Kin systems will only operate when the notion of classificatory kin is brought into play to fill up the gaps left by demographical

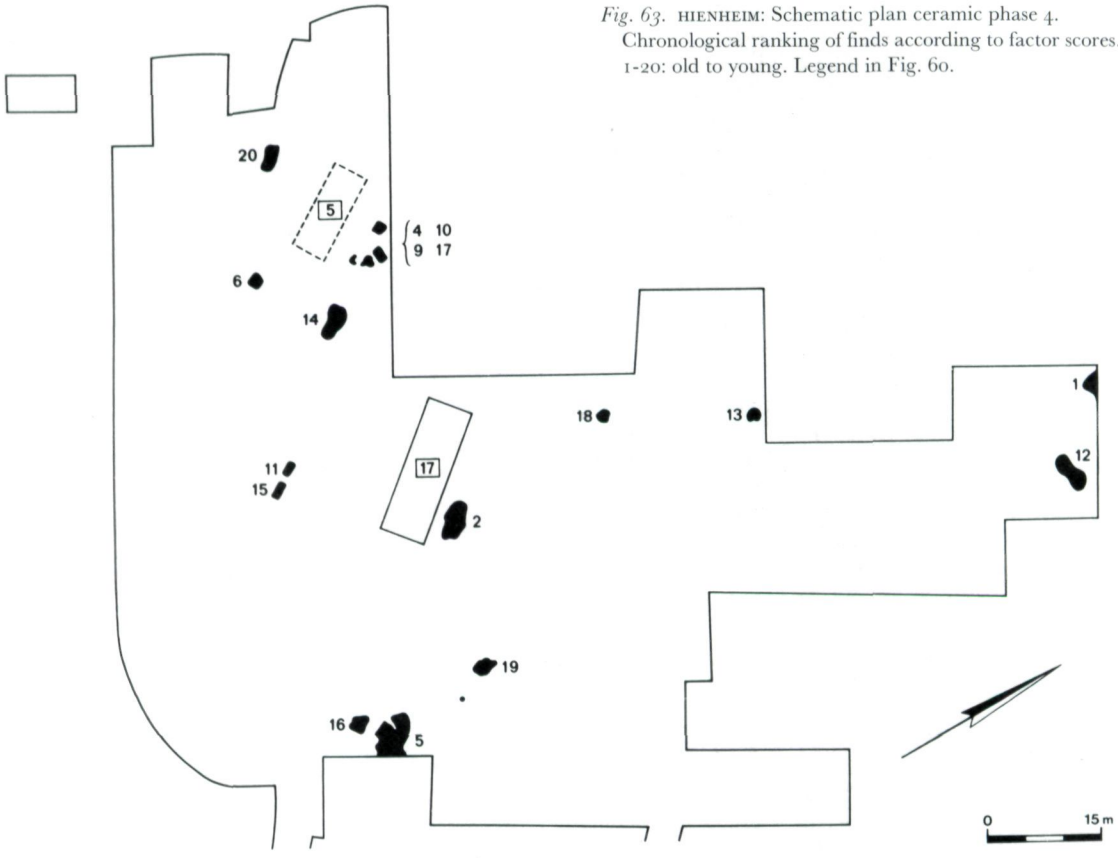


Fig. 63. HIENHEIM: Schematic plan ceramic phase 4. Chronological ranking of finds according to factor scores. 1-20: old to young. Legend in Fig. 60.

fluctuations and thus save the system from these hazards (cf. notes 14, 13 to Chapter IV). We need not even look for such exchanges in a site like this (if other sites in the vicinity were added, this would be different, of course).

Apart from this negative point, the group's composition or recruitment allows more leeway. The bilineal and unilineal options can be approached in a similar way as at Elsloo – that is, through the distributions of ceramic attributes over the site. For Hienheim, however, these have been assembled in a table rather than on plans (Table 69) (in that table, the contents of pit complexes have not been entered; their chronological heterogeneity will mask any pattern ever present in them). The table is, of course, a specification of Fig. 25. From the table, all change appears to have been gradual: old traits just peter out, new ones do not suddenly rise to dominance.

Consider, for example, the introduction of *hatching* and *stab-and-drag* COMPONENTS: qualitatively a peculiar pattern emerges; in the beginning both have a different distribution over the site, to become gradually merged later on (Tables 70 and 71). When the mixes are considered quantitatively, however, they are almost homogeneous from the beginning till the end (Table 69).

More in general this latter table shows an

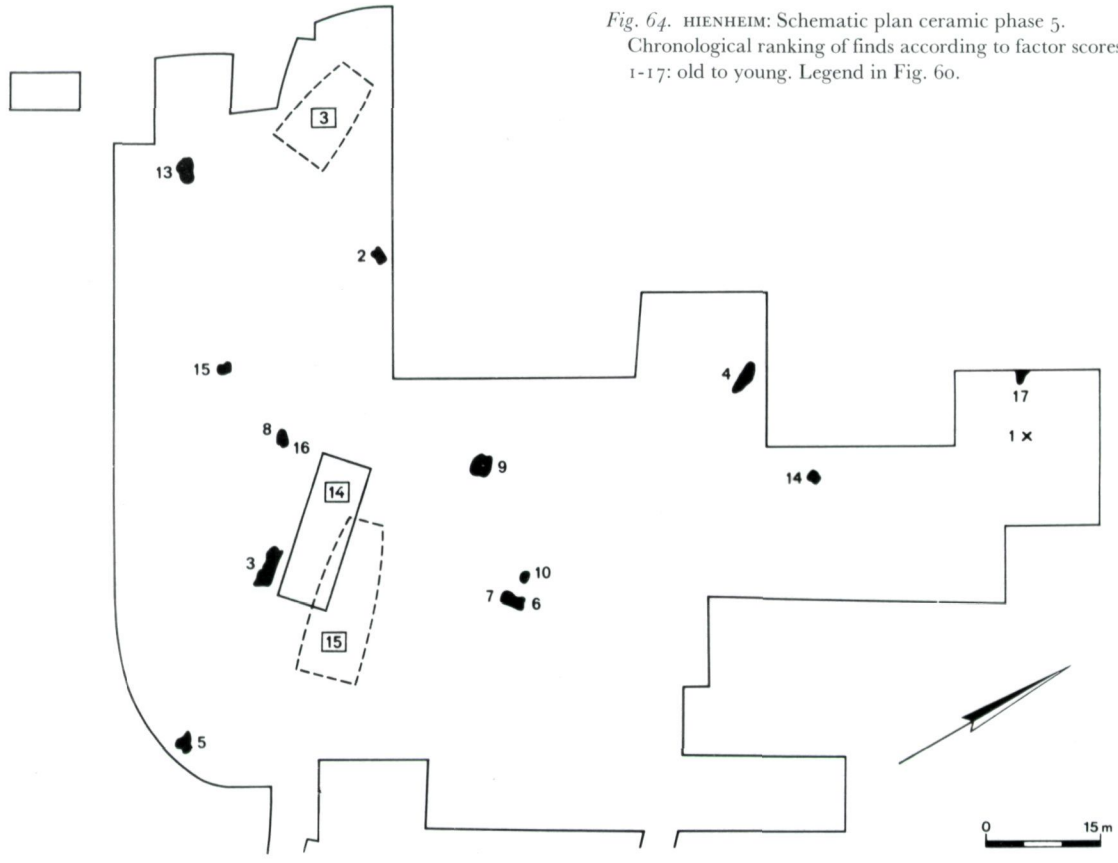


Fig. 64. HIENHEIM: Schematic plan ceramic phase 5. Chronological ranking of finds according to factor scores. 1-17: old to young. Legend in Fig. 60.

important shift. In the phases 1 to 4, spanning the LBK proper, every attribute of every variable seems to be present in every find (with the marked predominance of *curvilinear* STRUCTURES in phases 1 to 3 a major exception). Then, in the transitional fifth phase, an unbalanced distribution becomes apparent for the other mixes, too, which in the sixth phase (the SSK) results in nearly homogeneous mixes on all the variables listed (also cf. Table 72), not even excepting the COMPONENTS. While the distributions in the earlier phases may be explained as evidence for bilineal group recruitment – that is, in line with the findings from the Elsloo village and graveyard – those of the latter phases may stand for a unilineal structure.

A more homogeneous distribution may follow from a number of different types of change. Most drastic would be the breaking up of the exchange chains into small, autonomous cycles of perhaps a symmetrical exchange nature. Chance alone might then well result in homogeneous distributions within these small areas. Across larger regions, however, probability would work in the direction of heterogeneity, especially with a heterogeneous tradition such as the LBK to start from. Such heterogeneity, however, is not the case. Writings on MN pottery from the same general area (Zápotocká 1970), but also from western areas (Meier-Arendt 1975; Stroh 1938) reveal that *no* such diversity is found. Everywhere the *wave* is MAIN MOTIF, and *rectilineally* STRUCTURED decoration.

Less drastic would be a transition from the

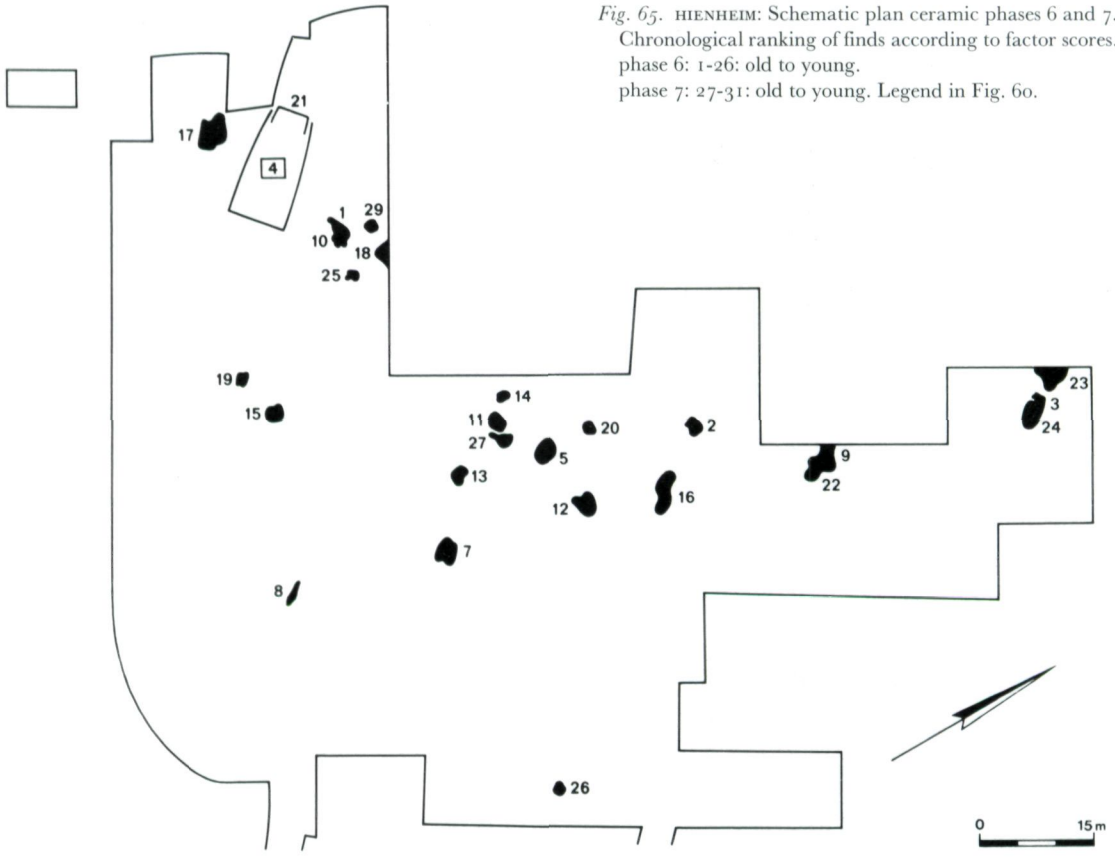


Fig. 65. HIENHEIM: Schematic plan ceramic phases 6 and 7. Chronological ranking of finds according to factor scores.
phase 6: 1-26: old to young.
phase 7: 27-31: old to young. Legend in Fig. 60.

bilineal group definition towards a unilineal one – less drastic, since this change need not interfere with alliances and exchange relations. Suppression of virilocality when the matrilineal tendencies in the bilineal system became more emphasized would (per locality) result in a very homogeneous pot decoration (e.g., Whallon 1968), for in that case the females stay put, and the males are dispersed over the area. Assuming a tie of decorative preferences to the female part of the community as above, apparently no new variety would be brought in.

The reverse, patri-mode uniliny would arise if matri-descent were dropped in favour of patriliny. Translated to Hienheim, the *de facto* patriliny following from the virilocal residence rule, in the earlier period still crossed, or integrated through a matri-system, became dominant in the later period (for whatever reason favouring the patrilineal option instead of the matrilineal one; for references see Ch. IV). If the marriage preferences, or wider still, the exchange system survived this change – which would be easy enough, because the partner was living in the same locality in the unilineal case as in the bilineal case; only the group names had changed – the females would probably keep bringing in the same preferences, also resulting in a homogeneous outlook of the ceramic decoration. But now, the normal statistical deviations from the stated rules would result in a trickling in of females from other localities as well, presumably bringing other preferences. This latter addition of variety

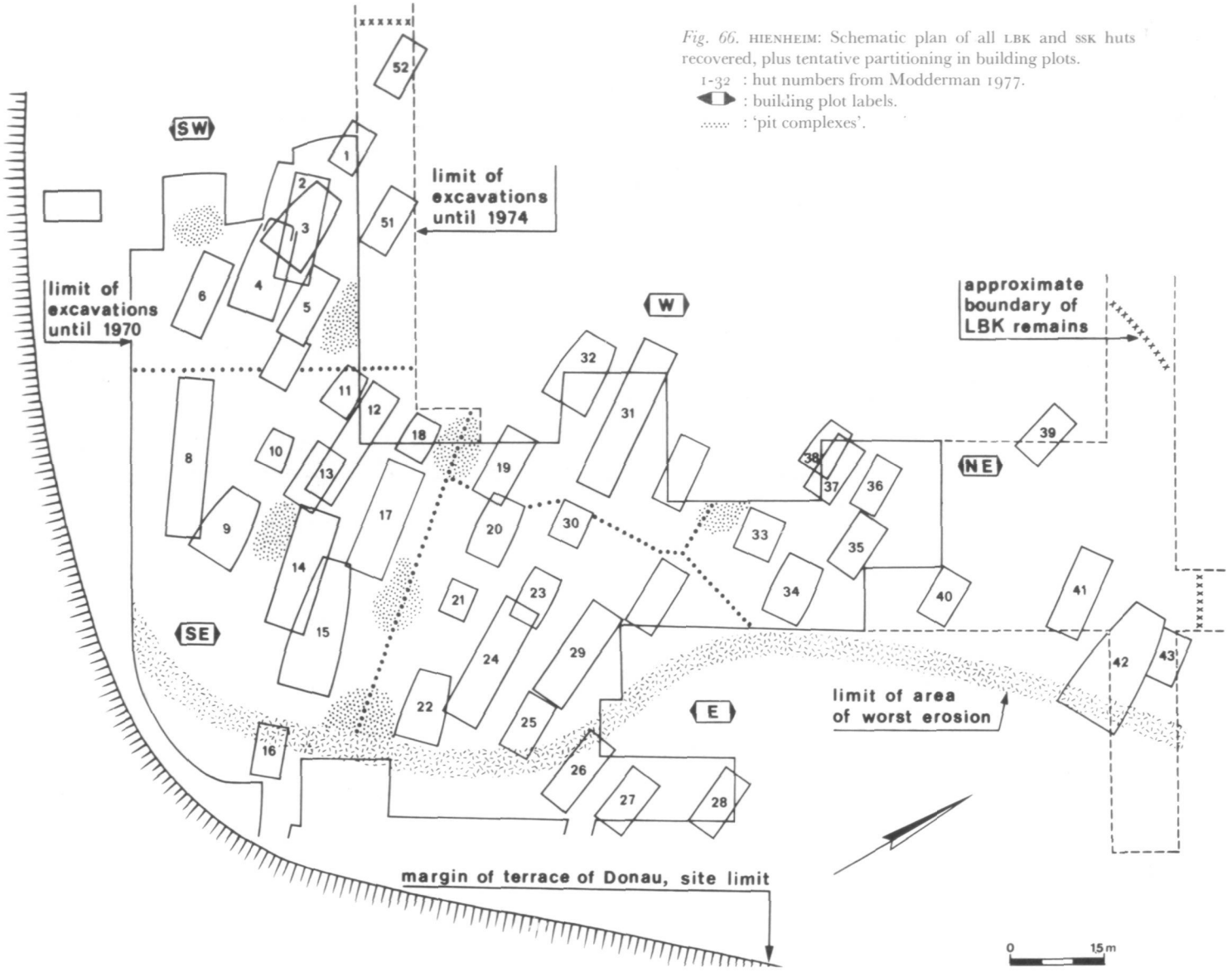


Fig. 66. HIENHEIM: Schematic plan of all LBK and SSK huts recovered, plus tentative partitioning in building plots.
1-32 : hut numbers from Modderman 1977.
◀▬▶ : building plot labels.
..... : 'pit complexes'.

should distinguish the patri- from the matri-mode of uniliny, as in the former the statistical equivocation would only bring in *males* from "non-preferred" localities. From Tables 71 and 72, and especially Table 69 some slight heterogeneity of the mixes is observable, even in the sixth phase (variables TECHNIQUES, STRUCTURES, COMPONENTS; and, perhaps less important, NUMERICITY and AUXILIARY LINES as well). Or, *on the basis of the local data*, virilocal-patrilineal uniliny seems to be fairly well demonstrable. This result hardly comes as a surprise: the transition of patri-descent to matriliny, without intermediary steps, is simply impossible (Murdock 1949: 190).

In this case, however, the general homogeneity of the pot decoration in the MN may be expected to de-emphasize the effects: when there is little variation in the region, there will also be little differentiation visible in the pot decoration at a single site. This, then, underlines the importance of the little variation still visible in the tables just mentioned and strenghtens the patri-unilineal interpretation. From this "hindsight" the biased, one-sided tendencies of the mixes in the LBK period of Hienheim (Table 69) acquire a new meaning. They may testify to a half-hidden unilineal propensity already in that era: more females have been brought in with one set of preferences than with the alternative set. Thus, the exogamy rule which would have resulted in a balance of the two groups (in the aggregate, of course) has not been very strictly adhered to, perhaps an indication of diminished importance accorded to that side of the group definition.

When less value is attributed to the matri-principle in the group composition, this has consequences for the day-to-day affairs as well: females as a class will be accorded less status, and the even footing of the sexes found in the Elsloo graveyard and indirectly attested by the importance of the matrilineal component in the village, will not have occurred similarly in the Bavarian settlement (cf. Pavúk 1972b: 72; in the Nitra LBK necropolis women held less status than men).

In summary, on the basis of the same arguments as given for Elsloo a virilocal-matrilineal system can be found in LBK Hienheim. That we are dealing here with a much smaller social group as well as with smaller units of data than in the Dutch village will be the cause of the sometimes more extreme values of the mixes in individual pits; the one-sided *trend* points to a uni-(patri-)lineal bias already present in this period of the settlement. The probably continuous occupation of the plots on the site indicates a father-to-son inheritance of the farmstead. The women brought in would have come from different social groups. With the onset of the latest LBK phase (no. 4) a shift away from the bilineal pattern towards a unilineal group definition asserts itself; in the sixth ceramic phase of the settlement the matri-duality had probably gone out of use, although the exchange system need not have changed in the meantime.

In the neo-Marxist way of looking at the LBK, at Elsloo the domestic mode of production was found to be organized in stem family households. At Hienheim, the central parts of the huts cover an area of 12.5 metres average length (Table 66) by less than 6 metres width – say, about 70 square metres, a surface area only slightly larger than at Elsloo. The heterogeneous mixes describing the ceramic decoration were used to negate the existence of joint (one-generation, horizontally extended) families in favour of the stem (multiple-generation, or vertically extended) families. Although at Hienheim the mixes for the different variables are partially one-sided they are certainly not homogeneous (Table 69), from which a similar conclusion as that for Elsloo can be drawn: stem families inhabited the huts. Needless to say, for the SSK period with its unassociated and homogeneous pottery decoration, no such conclusion can be drawn here.

Based on comparative figures for the number of inhabitants per hut the Hienheim LBK population must have counted at "any" moment $6 \times 4 = 24$

adults, plus some 25-35 children (cf. p. 149; I assume six huts).

The computation of the life-span of a hut breaks down upon the asymmetry of the mixes at Hienheim (Table 72). For the fourteen pits that can be more or less reasonably associated with a hut, the variable STRUCTURES assumes values centered around .8, and MAIN MOTIFS shows a peak at 1.0. Both distributions are one-peaked, a distribution at variance with the model developed on pp. 150-151. A connection between the building date and the life cycle of the builders should result in a two-peaked distribution, according to that model. Otherwise, if such a correlation were not the case, a block distribution within symmetrical values would be apparent. Finally, construction within a generation cannot account for this distribution either, as the "mirror" values are missing. I will therefore not venture an interpretation of Table 72 on this subject.

At Elsloo, the lineage mode of production could be demonstrated by virtue of a number of these groups: households were found to form compounds which were reproduced over time as such. In Hienheim, only a continuity of the household units can be made plausible (above, the discussion on plots; pp. 159-162). A lineage organization among these households can be suspected only by analogy to the findings in the previous section. Whether or not such an organization existed, status differences between the various households could be demonstrated (p. 158). The various hut types, associated with these status differences are distributed over the "building plots" as indicated by Table 72 (essentially, the huts grouped as "x", indeterminable, belong to the SSK period; judging from the length of the huts, considerable differences have to be assumed for that phase, too). The type î huts are all dated to different points of time (except no. 31, but the difficulties with that building have already been elaborated on p. 159). Their sequence seem to be 8 (phase 1, or 1/2); 29 (phase 2); 2, 24, 17 (respectively early, middle, and late in phase 3). Just as in each of the better observable groups at Elsloo, in Hienheim one household seems to have ranked higher than its contemporaries. From this account, no support for the îa/îb distinction can be found; it cannot be rejected either, as we do not know what is behind the LBK finds from elsewhere on this loess patch. What remains remarkable on this topic is that (as at Elsloo) the two so-called types exclude one another: there was either a type îa hut (2, 8, 31) or a îb one (17, 24, 29).

Regarding the mode of lineage organization, the patrilineal principle must have been at its root. At first, in LBK times, virilocality resulting in patrilineal succession of the households accounts best for the subdivision of the site into "plots"; matriliny will have played its role, too, although from the distribution of the decoration of the pots, it can be derived that this principle was less important. Later in the SSK phases, patriliny/virilocality seems to have been even more dominant, when not to the exclusion of the matri-principle.

The supralocal mode of production can be deduced for Hienheim with rather less hesitation than was the case for Elsloo. The local group must have been too small to be self-sufficient in all respects: with only six households living there endogamy is very unlikely for lack of possible partners; and as soon as "age" is complicated by any restriction following from notions of kinship, the probability of finding an attractive spouse is even more reduced. Considering the changes in hut construction, in format and execution of the pot decoration, in social organization and in tool kit (M.E.Th. de Grooth 1977: 69) – local invention of all these new things can be safely excluded. But, here too, if the village's lineage was merely one branch of a larger unit, then these innovations might have passed down the lineage network straight away instead of with an intermediary network between different lineages or clans, in which case no supralocal mode of production need be assumed.

Finally, the existence of what has been called a loose mode of production could be brought out to a certain degree in the analysis of the Elsloo graveyard. As in the Elsloo village, at Hienheim no traces of specialist potters have been found: there are no kilns. From the table in De Grooth (1977: 70) differential distribution over the site of flint artifacts appears; yet the quantities are too small to infer specialist working areas (M.E.Th. de Grooth, pers. comm. 181278) (the rich inventory of hut 31 indicated in that table should be considered very critically: there are reasons to suspect a non-homogeneous origin; cf. p. 159 above). However, even when specialist working areas could be demonstrated, by themselves they do not make a mode of production, as the productive relations should be known as well. Without a graveyard where these can be made visible/invisible, the inference of a loose mode of production remains speculative.

All in all, the Hienheim data allow us to establish the existence of two modes of production: the domestic one which persisted from the LBK through to the SSK; and another one either of a lineage and/or of a supralocal principle. Some stratification was found among the village's huts, but the smallness of the site indicates an occupation by one lineage only, and so this latter unit is coextensive with the community and will be masked by it. There were interlocal contacts, which in the case of a larger lineage incorporating the local segment may have gone by way of this organization (and then also be part of a lineage mode of production). Or the local community or lineage may have had contacts with other lineages or communities, in which case a different organization existed: the supralocal mode of production. If the differences in hut format and size are indicative of a lineage mode of production, then it also follows that the latter was dominant over the former. It is also clear that during the community's existence, (factors favouring) the patrilineal principle came to dominate (those behind) the matrilineal one which initially had been present as well. Finally, there are no specialist working areas to indicate a loose mode of production; as there is no instrument to probe into the relations either, the existence of a loose mode of production is mere speculation.

6. *Conclusions on Bandkeramik social structure: summary*

Perhaps the major material conslusion of this study is that considerable differences have been found in the social structure from one site to the other – although they are variations to the same theme. And the major formal conclusion can be that although a pilot study may shed light on a host of problems on the one hand, on the other hand such a study cannot be conclusive by itself: there are many differences between the results of Chapter IV (the graveyard pilot study) and those from Section 4 of the present chapter (the study of the settlement next to the graveyard). One hopes, of course, that these differences are real, i.e., they reflect the differences between the "sacred" (the graveyard) and the "profane" (the village); but the possibility cannot be excluded that the differences simply are analytical artifacts.

As differences have been found between the sites of Elsloo and Hienheim, the conclusions drawn from this study cannot be considered definitive nor valid for all Bandkeramik; for the same reason, some statements of other authors are qualified, not falsified – what has been the case in Bavaria may, or may not have been the case in Bohemia.

More specific, regarding the hypotheses derived from the Elsloo graveyard the following can now be said (and I refer to Chapter IV for their contexts):

On the positional paradigm:

A. The social network was *differentiated* according to sex and to some specializations.

Sex: seems plausible from circumstantial

evidence.

Some specializations: untested.

B. The social network was *ranked*, rather than stratified (ranking criteria: age, some specialization).

Age: seems plausible from circumstantial evidence.

Some specializations: untested.

Ranked rather than egalitarian or stratified: a ranking social structure has been found at Hienheim and at Elsloo; at Elsloo some evidence may point to a hereditary chieftaincy (perhaps even to incipient stratification).

On the structuralist approach:

A. The social structure consisted of a number of *residential groups*, integrated by way of *asymmetrical and linear exchange* relations; the groups were defined in a *bilineal* or disharmonic way by virilocal residence and matrilineal descent.

Residential groups: these have been found at the Elsloo village; one such a group may or may not have made up the community at Hienheim.

Asymmetrical and linear exchange: untested, though possible on the number of groups living at Elsloo, and not excluded by a different community make-up at Hienheim.

Disharmonic or bilineal group definition: at both sites demonstrated. At Elsloo, (virilocal) residence and (matrilineal) descent rules equally emphasized throughout the village's occupation. At Hienheim a unilineal tendency found already in the LBK period seems to have materialized in a truly unilineal (patri-mode) group definition by the Middle Neolithic SSK.

On the neo-Marxist viewpoint (only the organizational aspect has been handled):

A. A domestic mode of production was built around a *division of labour* according to sex, united in *conjugal pairs* grouped in *households*.

Division of labour: plausible on circumstantial evidence; demonstrated in the graveyard only.

Conjugal pairs: as division of labour.

Households: as separate units these were found to be continuous organizations for the duration of both villages.

B. A lineage mode of production afforded *differential access* to the group's surplus production grounded on *positions in the matrilineage*.

Differential access: not conclusively proven, but possible.

Matrilineal organization, positions therein: at Elsloo, the patrigroups seem to have been as strong as the matri-organization;at Hienheim the matri-principle was only moderately expressed in the LBK, to disappear in the MN. Positions in the lineage organization: the evidence at both sites can be interpreted as pointing to a hereditary status difference between the households making up the group(s).

C. A supralocal mode of production led to the *import* of people and innovative ideas.

Import: well-established, but not specifiable to nature (people, products or ideas); unclear whether within-lineage or between-lineage/community organizational networks were involved.

D. A loose mode of production applied to *non-hereditary craft specialization*.

Non-hereditary craft specialization: only established in the graveyard.

E. The lineage mode of production *dominated* the other modes.

Dominance of the lineage mode of production: seems fairly well attested at the Elsloo village; at Hienheim from circumstantial evidence only.

Some of the above hypotheses might have been tested in the literature, too; however, as the present research is primarily empirically-directed, that possibility has been left open. From the litarature another set of hypotheses regarding LBK social

structure has been derived in the second section of this chapter (to which the reader is referred for context and reference):

A. Huts have been the dwellings of *extended families* of either a *joint* or a *stem* nature.
   Extended families: did occupy the huts at both sites.
   Joint families: have not been found at Elsloo nor at Hienheim.
   Stem families: both at Elsloo and (LBK-) Hienheim (SSK unknown).

B. Extended families were *matrilineally* defined.
   Matrilineal definition: at both sites a virilocal definition was found.

C. Huts have stood for *15 to 30/40 years*.
   15 to 30/40 years: at Elsloo, one and a half generations (marriage-death).

D. Huts of type 1a have been *men's houses* and/or *dwellings* in which the local chiefly/big man family lived.
   Men's houses: for *a priori* reasons, these huts will have had a special function, which could not be specified.
   Dwellings of the local headman: seems likely on circumstantial evidence from Elsloo.

E. On *relations between the households* no suggestions have been put forward in the literature.
   Kin or economic relations: cf. above at various places.

F. *Status differences* of ranking nature existed *between the households*.
   Status differences: could be tied to the lineage organization at Elsloo; that is, a strain towards hereditary hierarchy or stratification.

G. The village community was headed by *a council* of lineage elders, led by a *primus inter pares (elected)*; or by a *big man*.
   The council of lineage heads: will have existed, on circumstantial evidence, in the village composed of a number of lineages, such as Elsloo.
   A chief-elect: at Elsloo some evidence points to a hereditary chiefly (matri-)line; this is in line with findings from the graveyard.
   A big man: cannot be ruled out; but cf. "elected".

H. Settlements were *economically self-sufficient*.
   Economic self-sufficiency: as part of the labour force was brought in from elsewhere, the self-sufficiency should be slightly qualified: both at Elsloo and at Hienheim a part of the women came from elsewhere.

I. Relations *between the settlements* consisted of some (quantitatively unimportant) *trade, exchange of valuables*.
   Between settlements: rather, between lineages (cf. "exchange").
   Trade: due to absence of non-pot data, not tested.
   Exchange of valuables: as "trade". Women will have been exchanged, as may be derived from the graveyard analysis.

Finally, a few disconnected observations should still be made:

1. Although this study was originally conceived as an analysis of ceramic decoration (of which especially Chapter I is a testimony), no reference at all has been made to earthenware in the present section. General descriptions and conclusions on that topic can be found in Chapter III and in the sections 4 and 5 of the present chapter.

2. From hindsight, the analyses suffer from an important shortcoming: the lack of data on non-ceramic topics. Regarding the huts, this could be improved in a relatively easy way by reference to the relevant publications. For other categories (flint, tools, etc.) this was not possible and has had serious consequences for the description of the social structure at both sites. It seems advisable that in future studies of this kind, from the onset a summary description of the not-directly-involved data should be prepared and entered along with the main body. This applies to every possible principal object of investigation: the other classes of data should not be completely neglected.

3. The markedly different compositions of the communities of Elsloo and Hienheim make comparison difficult. In fact, these differences support Pavlů's (1976) typology of LBK villages: larger and smaller villages and individual farmsteads. The latter have not been discussed here; "smaller villages" might be one-lineage-settlements such as Hienheim; and "larger villages", aggregated lineage communities such as Elsloo. When this typology could be further substantiated, then, e.g., the Langweiler 9 settlement would be better comparable as to type with distant Hienheim than with nearby Elsloo; Langweiler 8 seems to be more like Elsloo; J. Lüning, pers. comm. 151278).

4. Though it is not my specialization, I would yet like to suggest an amendment of the classical typology of LBK architecture (Modderman 1970 (I): 100-120). Such an amendment would drop the threefold division of the house plan in favour of a division based on the complexity of the several parts (cf. p. 158). If this proposition has any grounds, a further differentiation of Middle European huts might be made – which in turn would facilitate site-to-site comparisons of social structure.

NOTES

[1] Several Neolithic ethnographies are available at present. First and foremost, the Sahlins (1968) and (1972) volumes provide general introductions to the subject. Also, Fried (1975) should be mentioned, though a study of a different kind: it is concerned with the delimitation of what is to be considered "tribal", and in this way it touches upon many issues attributed to Neolithic societies. Dalton (1977) deals with the nature of exchange and barter in pre-state societies and should be known to every archaeologist looking beyond one single site. And finally, the volumes in the American Museum Sourcebooks in Anthropology series are readers on almost every conceivable topic in ethnology.

[2] Technically, "filiation" is the recognition of descent through both mother's and father's lines; "complementary filiation" is the recognition of mother-child relationship, or rather, of some rights and duties of the *mother's* lineage *vis-à-vis* a child, in a *patrilineal* society: or of the *father's* lineage in a *matrilineal* society. (Bohannan 1963: 80; Fox 1967: 133.) I think it is Kulczycka-Leciejewiczowa's and also Soudský's intention to indicate simple growth of the number of households pertaining to a lineage.

[3] Type 3 huts consist of an isolated central part only: type 2 huts have an annex with entrenched walls added on the northwestern end of the central parts; type 1b huts can be thought of as type 2 with an extension to the southeastern end of the central part. Type 1a differs from type 1b in one aspect: it has a wall trench all around; all other constructional details are similar. It is remarkable that the northwestern extension is a precondition for the occurrence of the southeastern part. For discussion and illustration of LBK house types see Modderman (1970(I): 100-120), which is mainly concerned with the Dutch LBK. For Hienheim the typology has been expanded and amended: Modderman (1977: 123-129). Also cf. Soudský (1969).

[4] At the Langweiler 9 site, huts were not grouped: four dwellings occupied as many sectors of the area and were apparently rebuilt within their respective sectors. There the average distance between the individual huts was 136 metres and the mean size of the sectors 12,630 square metres (Kuper et al. 1977: 326). At Elsloo, the latter figure must have been smaller, even per group: during the LBK 1 period, two to three hectares were occupied by three or four groups; later (LBK 2), the comparable figures (seven or eight hectares, at least four groups) result in a larger area per group, though still not per individual hut, of course.

[5] Incidentally, from the discussion of the basic assumption on preferences per group, a possible (though unlikely) alternative to group constitution can be ruled out as well: bilaterality (Murdock 1949: 56-58) should distribute attributes according to a normal model also. For in the case of bilaterality, the composition of a household is dictated by exigencies which work counter to possible strains towards lineality. In one marriage, a viri-"lineal" choice will be made, and in the next a uxori-"lineal" one; the structure of bilaterality is non-elementary. Thus, at Elsloo the elementary system has been adopted. Other complex, or non-elementary arrangements (most notably Crow-Omaha types) can be excluded for the same reason.

Finally, the derivation of a bilineal system in the previous chapter was still partially dependent upon the correctness of asymmetrical exchange (of ceremonial gifts). Here, it turns out to be dependent upon the assumption of structured preferences, which seems to be at least as well-founded. Of course, "asymmetry" is but a specification of "structuredness".

[6] For instance, among the 148 huts excavated at Bylany up to 1978, all three types occur in approximately equal proportions: type 1 huts, 14 to 21%; type 2, 5 to 20%, type 3, 14 to 18%; with 67 to 40% indeterminable (P.J.R. Modderman, pers. comm. 201278; cf. Soudský and Pavlů 1972: 317: type 1 huts are most

common in Bylany). At Elsloo type 2 huts preponderate: type 1, 21%; type 2, 30%; type 3, 11%; 38% indeterminable; n = 92 (from Table 64).

[7] There is no definite reason to group hut 8 with the southeastern group rather than with the southwestern group. Yet in the latter case the plots would become narrow strips, and the number of hut remains per plot very unequal (southwestern, 12 huts; southeastern, 8 huts; with the other plots as before). And when the origins of pit complexes should be envisioned as described by Kuper et al. (1977: 74, 331) the complex between hut nos. 9 and 14 (cf. Fig. 66) will not have been a complex (which is a considerable obstacle in the terrain) when hut no. 12 was built; the wide range in time of the finds in this pit complex do not oppose such an interpretation. Perhaps not a good reason, but more in the way of speculation, is a classification based on the size of hut no. 8 being similar to that of no. 12, its alleged southeastern plot successor, but very dissimilar to no. 6, the alternative successor in the southwestern plot.

TABLES

TABLE 1: Efficacy of codebook for the observation of ceramic decoration as measured for the data from Hienheim and Elsloo settlement debris. Counted in noise corrected files (i.e., Hienheim all finds larger than 4 sherds; Elsloo, all finds larger than 2 sherds). Data from Hienheim are younger Early Neolithic + Middle Neolithic; Elsloo, older + younger Early Neolithic.

VARIABLES	HIENHEIM (1)	HIENHEIM (2)	ELSLOO (1)	ELSLOO (2)
GENERAL:				
TECHNIQUES	1.00	1.00	1.00	1.00
NUMERICITY	.90	.34	.91	.43
ZONING	1.00	1.00	.86	1.00
BELLY ZONE:				
STRUCTURES	1.00	1.00	1.00	1.00
IMAGE	not relevant			
BASIC MOTIFS	.80	.28	.54	.20
MOTIFS, DEVELOPED	.38	.06	.10	.04
AUXILIARY LINES	.86	.35	.90	.48
FILLINGS	.92	.89	1.00	.89
ANGLE	.99	.89	.94	.63
LIMITS	.45a	.05a	1.00	1.00
ENDS	.90	.34	.78	.30
SEC. FILLINGS	.54b	.13b	.54b	.15b
COMPONENTS	1.00	n.rel.	1.00	n.rel.
NECK ZONE:				
FILLINGS	1.00	.78	.83	1.00
ANGLE	not entered			
LIMITS	1.00	1.00	.84	.99
COMPONENTS	1.00	n.rel.	.86	n.rel.

Columns 1: proportion of finds in which variable was observed.
Columns 2: proportion of motifs per variable related to the totality of motifs.
a: relates to elaborated limits only.
b: variable with implicit attributes.
n.rel.: not relevant.

	Hienheim	Elsloo
no. of finds	179	151
no. of finds with belly decoration	179	144
no. of finds with decorated necks	93	63
no. of motifs	4646	1984
no. of observable motifs in belly zone	3683	1524
no. of observable neck decorations	733	245
no. of sherds	6138	2345

TABLE 2: Hienheim distributions over time ("PHASE") of finds and sherds, ordered according to the first principal component from a principal components analysis. Respecting this basical sequence, the finds have been regrouped to an even distribution of the sherd quantities ("MODEL I"), a normal distribution of same ("MODEL II"), and twice a normal distribution ("MODEL III").

PHASE	PRINC. COMP. 1				MODEL I				MODEL II				MODEL III				PHASE
	pits		sherds		pits		sherds		pits		sherds		pits		sherds		
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
20	6	4	131	3	14	9	223	5	6	4	131	3					20
19	2	1	21	-	5	3	269	6	4	2	36	1					19
18	2	1	15	-	12	7	234	5	4	2	56	1					18
17	3	2	31	1	20	12	247	5	3	2	185	4					17
16	2	1	144	3	6	4	240	5	9	5	214	4	5	3	49	1	16
15	3	2	106	2	15	9	261	5	17	10	272	6	9	5	174	4	15
14	2	1	52	1	8	5	210	4	13	8	304	6	3	2	185	4	14
13	1	1	10	-	5	3	262	5	21	13	391	8	9	5	214	4	13
12	1	1	8	-	8	5	218	4	10	6	414	9	6	4	125	3	12
11	1	1	6	-	6	4	264	5	12	7	425	9	9	5	81	2	11
10	2	1	59	1	5	3	246	5	8	5	527	11	11	7	219	5	10
9	1	1	39	1	3	2	281	6	7	4	319	7	7	4	217	4	9
8	6	4	125	3	2	1	191	4	8	5	356	7	20	12	404	8	8
7	-	-	-	-	9	5	211	4	9	5	367	8	15	9	549	11	7
6	5	3	46	1	4	2	273	6	6	4	245	5	12	7	556	11	6
5	6	4	101	2	6	4	256	5	6	4	208	4	13	8	739	15	5
4	21	13	424	9	6	4	264	5	6	4	160	3	13	8	512	11	4
3	24	15	710	15	6	4	217	4	3	2	60	1	10	6	370	8	3
2	56	34	2446	50	9	5	243	5	1	1	86	2	9	5	240	5	2
1	20	12	379	8	15	9	243	5	11	7	97	2	13	8	219	5	1

The numbers of pits (or, finds) and the numbers of sherds relate to the same finds.
Total number of pits entered: 164; total number of sherds entered: 4853.
Percentages unadjusted.

TABLE 3: Listing of the 20 finds adjacent to the inferred discontinuity, i.e. comprising parts of the phases 14 and 15 of MODEL II. Numbers indicate percentages of trait-occurrence per variable.

TECHNIQUES				COMPONENTS (BODY)					COMPONENTS (RIM)					MAIN MOTIFS		STRUCTURES		AUX. LINES		RIM DECN.		NO. OF SHERDS	FIND NUMBER	FACTOR SCORE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22			
66	29	01	04	08	24	21	02	45	01	17	56	.	26	96	04	35	65	76	24	19	81	AVERAGES OF PHASE 15		
26	68	.	05	.	48	52	.	.	.	.	100	.	.	x	x	.	100	100	.	.	100	21	0868	-1.005
25	75	.	.	01	99	.	.	.	x	x	x	x	x	100	.	.	100	.	100	x	x	20	1143	- .917
90	10	.	.	13	06	.	.	82	.	33	67	.	.	x	x	33	67	100	.	.	100	7	0546	- .895
78	22	.	.	22	08	13	.	57	x	x	x	x	x	x	x	40	60	42	58	x	x	9	0697	- .710
100	.	.	.	01	03	10	.	86	x	x	x	x	x	100	.	50	50	100	.	x	x	5	0316	- .706
50	33	.	17	02	52	.	.	47	x	x	x	x	x	x	x	33	67	100	.	x	x	5	0418	- .679
83	08	08	.	09	14	.	.	77	x	x	x	x	x	67	33	80	20	42	58	50	50	10	0364	- .461
100	.	.	.	09	32	07	.	53	.	38	62	.	.	x	x	40	60	100	.	33	67	7	0648	- .379
64	29	.	7	10	21	49	.	20	x	x	x	x	x	x	x	69	31	83	17	x	x	13	0232	- .134
100	.	.	.	18	.	82	.	.	x	x	x	x	x	x	x	25	75	100	.	33	67	5	0823	- .121
																						INFERRED DISCONTINUITY		
86	14	.	.	04	79	.	17	.	x	x	x	x	x	100	.	43	57	34	66	x	x	7	0614	+ .027
92	05	03	.	34	24	.	04	38	08	16	.	.	76	100	.	77	23	47	53	31	69	59	0526	+ .030
																						PHASE BOUNDARY		
88	.	13	.	41	23	08	28	.	x	x	x	x	x	.	100	67	33	69	31	x	x	14	0576	+ .049
100	.	.	.	56	44	.	.	.	x	x	x	x	x	.	100	20	80	76	24	x	x	11	0313	+ .077
83	17	.	.	20	51	.	.	28	.	06	17	.	78	100	.	56	44	54	46	25	75	9	0611	+ .097
100	.	.	.	50	50	.	.	.	x	x	x	x	x	x	x	25	75	50	50	x	x	5	0302	+ .130
100	.	.	.	12	88	.	.	.	x	x	x	x	x	100	.	25	75	100	.	x	x	5	0736	+ .155
100	.	.	.	38	32	.	29	.	x	x	x	x	x	100	.	71	29	40	60	67	33	14	0522	+ .239
100	.	.	.	20	48	06	.	26	x	x	x	x	x	x	x	73	27	51	49	67	33	10	0380	+ .262
89	.	11	.	73	16	.	11	.	x	x	x	x	x	x	x	67	33	84	16	x	x	11	0227	+ .263
92	02	06	.	38	47	01	09	05	09	44	05	09	33	65	35	58	42	36	64	42	58	AVERAGES OF PHASE 14		

'.' equals 'zero'
'x' equals 'missing because of lack of data'
N.B. 'No. of sherds' relates to all wall sherds, excluding rim sherds.

LEGEND
1. simple spatula
2. multidented spatula
3. fingers/nails
4. 'goat foot tool'
5. lines
6. points
7. hatchings
8. finger/nail imp.
9. stab-and-drag
10. lines
11. points
12. hatchings
13. finger/nail imp.
14. stab-and-drag
15. waves
16. spirals
17. curvilinearity
18. rectilinearity
19. absence
20. presence
21. absence
22. presence

PHASE	MODEL I	MODEL II	MODEL III
20	11.6	7.1	
19	12.7	15.6	
18	22.4	10.7	
17	30.8	7.8	
16	22.2	22.4	1.2
15	21.9	26.8	11.5
14	15.5	27.8	6.7
13	20.4	22.2	22.2
12	38.5	24.7	19.7
11	19.2	28.6	24.8
10	17.4	16.5	28.6
9	10.9	12.1	23.1
8	10.8	18.1	22.8
7	10.9	15.3	30.6
6	22.2	18.4	17.1
5	25.5	12.8	11.0
4	24.2	14.5	19.2
3	17.3	16.3	18.8
2	13.5	.	16.3
1	23.8	20.3	20.3

TABLE 4: Roots of averaged sums of squares of standard deviations of traits per phase: summed over the 8 traits listed in TABLE 5.

TABLE 5: As TABLE 4, though summed per trait over phases.

TRAIT	MODEL I	MODEL II	MODEL III	N
single dented spatula	14.3	13.4	12.9	164
points in body decoration	15.7	14.8	16.4	164
stab-and-drag in body decn.	11.4	13.1	15.4	164
points in neck decoration	21.2	21.6	21.9	86
stab-and-drag in neck decn.	17.3	16.6	17.6	86
wave motif	26.9	25.2	27.8	131
curvilineair structure	15.8	13.7	13.2	164
presence of auxiliary lines	25.1	25.3	22.8	138

N: number of valid cases per trait in the complete file of 305 coded finds.

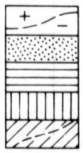
MODEL I	PHASED SEQUENSE FROM CANONICAL ANALYSIS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	Σ
20	2 2	4
19	2 1 2	5
18	1 3 2 1	7
17	1 1 3	5
16	1 2 1 1	5
15	1 1	3
14	1 1 2 1	5
13	1 1 1	3
12	1 1 1	3
11	1 1 1 1 1	5
10	1 2 1	4
9	1 1 1 1 1	5
8	2 1	3
7	1 1 1	3
6	1 1 1 2 1	6
5	1 1 1 1	4
4	1 1 1 1 1 1	6
3	1 1 3 1	6
2	2 1 2 1 1	7
1	1 1 1 1	4
Σ	5 5 5 4 5 5 5 4 4 5 5 5 3 4 4 4 5 5 6 5	93

TABLE 6: Fits of sequences of pits distributed according to MODEL I and the first principal component of a principal components analysis (vertical) and from a canonical analysis of raw data (horizontal) resp. based on 11 and on 43 traits (out of 82).

r (hor.; vert.) = .70.

PHASES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
16	-19	-25	-12	-11	-12	-5	5	-6	1	4	37	58	63	66	67	
15	6	-0	8	10	12	14	30	18	32	39	52	79	95	97		
14	12	8	15	17	21	24	34	27	40	48	56	84	98			
13	21	15	24	26	31	34	45	37	49	53	64	89				
12	18	12	25	23	29	32	47	37	44	45	79					
11	57	48	65	62	62	66	81	69	72	66						
10	78	75	84	83	84	86	84	86	90							
9	92	84	94	94	95	97	96	96								
8	95	92	97	98	99	97	93									
7	90	80	94	92	91	94										
6	96	91	98	97	98											
5	98	96	97	99												
4	99	95	99													
3	98	91														
2	96															
1																

TABLE 7: Between phases correlations for MODEL III, as calculated from 22 traits (7 VARIABLES). Above the diagonal the actual correlation coefficients, below a contour map, shaded as indicated in the bottom.



$r \leq .45$ ('very low')
$.46 \leq r \leq .63$ ('low')
$.64 \leq r \leq .77$ ('moderate')
$.78 \leq r \leq .89$ ('high')
$.90 \leq r$ ('very high')

MACRO PHASE	I	II	III	IV	V	VI
I	+	96	77	53	12	-22
II	96	+	86	69	28	-07
III	84	87	+	66	48	05
IV	62	76	66	+	63	37
V	20	38	48	63	+	66
VI	-12	01	05	37	66	+

TABLE 8: Correlations of macrophases defined from TABLE 7, weighted as to sherd counts.

Above diagonal, MODEL III-A, below, III-B. Definitions as follows:
III-AI : aggregate of phases 1 & 2 of MODEL III.
II : " 3 to 9 " .
III: identical with phase 10 " .
IV : " 11 " .
V : aggregate of phases 12 to 15 " .
VI : identical with phase 16 " .
and
III-BI : aggregate of phases 1 to 6 of MODEL III.
II : " 7 to 9 " .
III-VI: identical with macrophases of III-A.

		INHUM.	CREMN.	
GIFTS	PRESENT	55	29	84
	ABSENT	11	18	29
		66	47	113

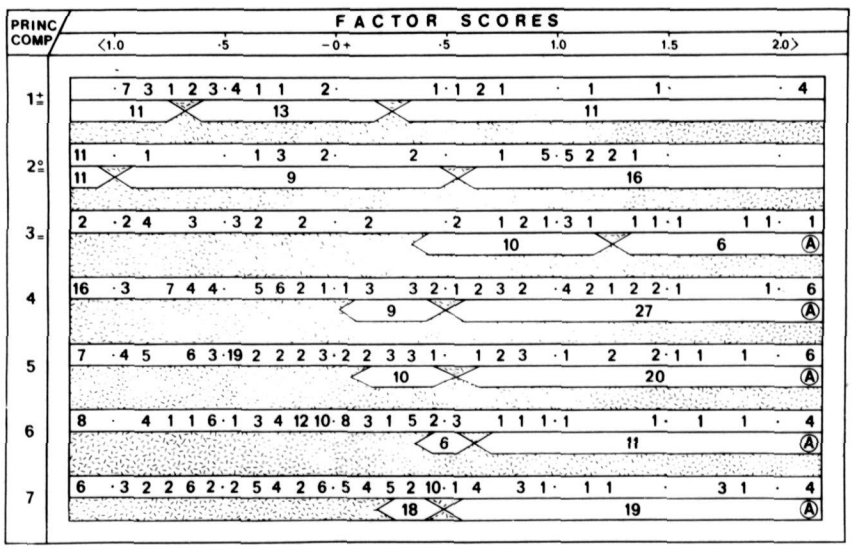
TABLE 9: Grave goods vs. burial rites at Elsloo cemetery.

$\chi^2 = 6.88$ $p = .10$

TABLE 10: Pattern of loadings on the first seven principal components (VARIMAX rotated). Before input, counts were transformed to proportions per variable or category.

PRINCIPAL COMPONENTS			1	2	3	4	5	6	7
RAW COUNTS OF EARTHENWARE		undec. pots	-.18	-.19	-.05	.13	.45	-.03	.42
		undec. sherds	.23	.05	-.64	.40	.07	-.14	-.15
		dec. pots	.13	.11	.62	.14	.06	.14	.07
		dec. sherds	.03	.01	-.20	.10	.66	-.15	.13
DETAILS OF CERAMIC DECORATION	TECHNIQUES	simple spatula	.53	.00	-.03	.09	.03	-.65	-.11
		m.dented spatula	.34	-.02	.25	-.01	-.05	.83	.10
	STRUCTURES	curvilinearity	-.06	-.90	.10	.08	-.02	.06	.07
		rectilinearity	-.01	.94	.08	-.03	.06	-.05	-.04
	FILLINGS OF DECN.	none	.29	.16	-.31	.02	.32	-.24	-.32
		discontinuous	.39	.31	.66	-.07	.25	.33	-.05
		continuous	-.67	.32	-.17	.05	-.28	-.08	.18
	FILLINGS	punctated	-.85	-.20	.13	-.05	.11	-.10	.04
		other types	.68	.37	.22	.06	-.15	.29	-.05
	AUXILIARY LINES	absent	.08	.00	-.06	-.01	-.01	.11	.83
		present	.01	-.02	.69	.28	.07	.10	-.39
	ELEMENTS OF DECORATION	lines	.25	-.10	.78	.26	-.10	-.08	-.06
		points	-.45	.18	.52	-.07	.05	-.13	.20
		stab-and-drag	.06	-.28	.15	.10	.10	.66	-.30
		hatchings	.68	-.15	.30	-.27	-.06	-.01	.30
		red ochre	-.17	-.18	.23	.82	.11	-.01	-.11
		charcoal	-.08	-.06	.11	.12	.25	-.11	.56
FLINT		arrowheads	.00	.03	.29	.28	.51	-.36	.27
	BLADES	blanks	-.08	.08	.12	-.05	.41	.17	.01
		worked	.38	.27	.05	.59	.38	-.15	.17
QUERNS		complete	-.08	-.09	.09	.70	.04	.07	-.05
		fragments	.18	-.05	-.01	.27	-.25	-.34	-.04
ADZES		type I	-.10	.21	-.22	.41	-.02	.46	.35
		type II	.19	.00	.02	.39	.21	-.01	.31
		type III	.04	-.03	.05	-.05	.71	.10	-.02
		types IV-VI	-.04	.03	-.01	.60	-.25	.06	.22

TABLE 11: Distribution of the graves at Elsloo on the first seven principal components; top scales: grouped distributions per .10 intervals of factor scores; bottom scales: grouped distributions for interpretation (cf. text).



= first three components: graves containing decorated ware only.
+ scores computed with relevant variables only, unrotated solution.
o scores computed with relevant variable only.
Ⓐ scores considered most significant (also cf. NOTE 3).

TABLE 12: (VARIMAX) transformation matrix: the cosines between unrotated and rotated principal components.

PRINC. COMP.	1	2	3	4	5	6	7
1	.64	-.14	.58	.11	.09	.47	-.02
2	-.31	-.14	.32	.67	.44	-.24	.29
3	.53	.54	-.47	.34	.22	-.11	.16
4	-.13	.64	.46	.19	-.36	-.19	-.41
5	-.11	.44	.31	-.54	.31	-.00	.56
6	-.22	.12	-.11	.30	-.54	.53	.52
7	-.36	.23	-.16	.04	.49	.63	-.39

PRIMARY PHASES	N. OF GRAVES	FINAL PHASING	N. OF GRAVES
1 (oldest)	11	I	11
2	13	II	13
3	5	III	14
4	2		
5 (youngest)	4		
4/5 (indirect)	3		

TABLE 13: Grouping of the graves at Elsloo into phases.

Primary phases: those suggested by distribution of graves on principal components nos. 1 and 6.

Final phasing: phases as compounded from the original, primary ones; identical with those in fig. 26.

PRINC. COMP.	SEX "MALE"	"FEMALE"	"AMBIGUOUS"
4	-	16	-
5	11	-	-
7	17	-	-
4 + 5	-	-	2
4 + 7	-	-	5
4 + 5 + 7	-	-	4
5 + 7	3	-	-
	21	16	11

TABLE 14: Distribution of graves on the significant parts of the principal components nos. 4, 5 and 7, which are supposedly sex-indicators.

Component no. 4: female.
Component nos. 5, 7: male.

TABLE 15: The distribution of the more frequent categories of grave gifts over the sexes, as determined initially by a principal components analysis.

CATEGORIES OF GRAVEGIFTS	ALLEGED SEX M	F	χ^2	CATEGORY INDICATES)^0
undecorated pots	10	1	3.54	male
undecorated sherds	6	6	1.05	general
decorated pots	10	4	.37	general
decorated sherds	8	2	.38	general
red ochre (lumps)	3	11	10.74	female
charcoal (lumps)	12	5	.31	general
arrowheads	9	3	.61	general
blades	9	4	.16	general
querns	2	10	11.56	female
adzes III	12	-	6.70	male
adzes IV - VI	6	7	1.76	general
N. OF GRAVES	30	17		

)^0 on $\alpha = .05$.

CATEGORIES OF GRAVE GIFTS	SEX M	F	χ^2	P
undecd. pots	11	1	8.33	.004
undecd. sherds	4	5	.11	.75
decorated pots	4	6	.40	.60
decorated sherds	6	5	.09	.8
red ochre (lumps)	2	15	9.94	.002
charcoal (lumps)	5	8	.69	.45
arrowheads	6	2	2.00	.16
blades	6	6	.00	-
querns	0	13	13.00	<.001
adzes III	13	0	13.00	<.001
adzes IV - VI	3	6	1.00	.33
N. OF GRAVES	21	21		

TABLE 16: The distribution of the more frequent categories of grave gifts over the sexes, as from TABLE 15. It is assumed that female graves are indicated by querns or red ochre, and male graves by undecorated pots and adzes of type III.

CATEGORIES OF GRAVE GIFTS	SEX M	F	χ^2	P
undecd. pots	11	1	6.74	.009
undecd. sherds	5	5	.08	.80
decorated pots	6	6	.09	.78
decorated sherds	7	5	.08	.80
red ochre (lumps)	2	15	12.42	<.001
charcoal (lumps)	6	8	.74	.40
arrowheads	10	1	5.93	.02
blades	7	6	.00	-
querns	-	14	16.67	<.001
adzes III	13	-	10.92	.001
adzes IV - VI	6	6	.09	.78
N. OF GRAVES	25	21		

TABLE 17: The distribution of the more frequent categories of grave gifts over the sexes, as in TABLE 16, and graves with arrowheads added to 'male' (also cf. TABLE 47).

NOTE: the arrowhead in grave no. 106 has been omitted (cf. p. 16).

TABLE 18: A listing of the graves at Elsloo according to sex, as from TABLE 17.

MALE GRAVES: (n = 25)	001, 003, 005, 021, 024, 025, 026, 031, 033, 038, 042, 051, 055, 056, 059, 067, 071, 072, 073, 074, 081, 092, 096, 100, 112.
PROBABLY MALE: (n = 13)	012, 013, 017, 020, 048, 063, 068, 085, 088, 094, 102, 107, 108.
FEMALE GRAVES: (n = 21)	011, 014, 016, 019, 022, 047, 050, 062, 064, 066, 083, 089, 093, 098, 099, 105, 106, 109, 110, 111, 113.
PROBABLY FEMALE: (n = 12)	006, 007, 027, 034, 039, 040, 054, 057, 070, 075, 082, 097.

"probable" refers to indirectly determined sex (cf. section v).
N.B.: grave 087 which is unsexable is grouped with "probably female" in the remainder of the text (also cf. p. w-23).
(grave numbers acc. to Modderman 1970 (I): 45-65).

N. OF KINDS	P.C.7	ALL
5	4	9
4	3	5
3	2	11
2	7	27
1	3	25
	19	77

TABLE 19: Number of kinds of grave gifts (cf. TABLE 24) per grave in the graves selected by principal component no. 7 and in all graves.

$\chi^2 = 5.79$ (p = .22: not significant).

	GRAVE GIFTS WITH	WITHOUT	
MALES	25	10×	35
FEMALES	21	12×	33
CHILDREN	31⁰	14×	45
	77	36	113

TABLE 20: Hypothetical distribution of graves at Elsloo over adults and children, if graves marked by general categories of gifts only are assumed to be children's.

⁰ all graves with general gifts only.
× estimated partition in analogy to the Nitra-necropolis (Pavúk 1972b: 74-75).

	GRAVE GIFTS WITH	WITHOUT	
MALES	31	10×	41
FEMALES	33	13×	46
CHILDREN	13×	13×	26
	77	36	113

TABLE 21: Hypothetical distribution of graves at Elsloo over adults and children, if graves indirectly sexed are grouped with directly determined ones.
× estimated partition in analogy to the Nitra-necropolis (Pavúk 1972b: 74-75).

SCORES ON 3RD COMP.	SEX M	F	x	
VERY HIGH	4	1	1	6
HIGH	1(2)	1(2)	2(-)	4
MODERATE	1	2(3)	3(2)	6
	6(7)	4(6)	6(3)	16

TABLE 22: Distribution of graves scoring significantly on principal component no. 3, probably an indicator of "wealth".
(between parentheses): indirectly sexed graves added.

TABLE 23: Distribution of graves ranked according to arbitrarily quantified labour input in grave gifts, and to kinds of grave goods as in TABLE 24 (also cf. TABLE 41).

"POINTS"	"KINDS" 5	4	3	2	1	0	
255-322	1	1	.	.	.	.	2
187-254	2	1	2	.	.	.	5
119-186	1	2	1	2	1	.	7
50-118	.	4	7	10	7	.	28
2-49	.	1	1	8	23	6	39
≤ 1	.	.	.	.	.	32	32
	4	9	11	20	31	38	113

avge. no. of points: 49.75
stand. devn. : 68.09

NO. OF KINDS	SEX M	F	x	
5	.	3(4)	1(.)	4
4	4	5	.	9
3	6	5	.	11
2	9(10)	7(9)	4(1)	20
1	6(12)	1(10)	24(9)	31
0	.(6)	.(1)	38(31)	38
	25(38)	21(34)	67(41)	113

TABLE 24: Frequencies of graves with specified numbers of grouped grave gift categories by sex.

(between parentheses): indirectly sexed graves added.

"kinds" (:grouped grave gift categories): ceramics, flint, querns/whetstones, adzes, red ochre —— entered on an absence-presence basis.

NO. OF ACTIVITIES	SEX M	F	x	
8	.	.	.	.
7	.	.(1)	1(.)	1
6	1	1	.	2
5	2	.	.	2
4	4	6	.	10
3	6	7	.	13
2	7(11)	5(9)	10(2)	22
1	5(10)	2(9)	24(12)	31
0	.(4)	.(1)	32(27)	32
	25(38)	21(34)	67(41)	113

TABLE 25: Ranking of graves from number of activities supposedly represented by grave gifts, by sex.

(between parentheses): indirectly sexed graves added.

TABLE 26: A listing of the graves at Elsloo ranked according to the number of activities represented by the grave gifts (also cf. FIG. 28).

RANKING (N. OF ACT.)	GRAVE NUMBERS)[0]	N
SUPER (6 or 7)	001, 083, 087.	3
HIGH (4, 5)	003, 005, 014, 056, 066, 067, 071, 098, 100, 105, 106, 109.	12
MEDIUM (2, 3)	007, 011, 018, 019, 020, 021, 022, 025, 031, 034, 038, 042, 047, 050, 055, 059, 062, 072, 073, 074, 075, 082, 085, 089, 090, 092, 093, 094, 096, 099, 102, 110, 111, 112, 113.	35
LOW (1)	006, 016, 017, 024, 026, 027, 029, 030, 033, 037, 040, 041, 045, 051, 054, 057, 063, 064, 065, 068, 069, 070, 078, 081, 084, 086, 088, 097, 101, 104, 107.	31
NONE (-)	002, 004, 008, 009, 010, 012, 013, 015, 023, 028, 032, 035, 036, 039, 043, 044, 046, 048, 049, 052, 053, 058, 060, 061, 076, 077, 079, 080, 091, 095, 103, 108.	32

)[0] grave numbers as in Modderman 1970 (I): 45-65.

16	9	9
23	9	9
18	10	8

N = 111

TABLE 27: Number of graves per field of FIG. 30.
(2 outlyer graves omitted)

TABLE 28: The calculation of the pattern of over- and under-representation: example (adzes types IV - VI distrib.).

observed:

2	.	1
2	.	2
1	5	2

−

expected:

2.2	1.2	1.2
3.1	1.2	1.2
2.4	1.4	1.1

=

pattern:

.	-1	.
-1	-1	+1
-1	+4	+1

TABLE 29: Summary of patterns of distribution of grave goods per category; 9-field trial (cf. TABLES 27 and 28 and FIG. 30).

	OBSERVED									PATTERN								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
categories:																		
undecd. pots	2	1	2	3	2	1	1	.	1	.	.	+1	.	+1	.	-1	-1	.
undecd. sherds	6	2	1	4	3	3	1	3	4	+2	.	-1	-2	+1	+1	-3	+1	+2
decorated pots	2	2	2	2	.	4	2	1	2	-1	.	+1	-2	-1	+3	.	.	+1
decorated sherds	6	2	2	1	4	1	1	2	1	+3	.	+1	-3	+2	-1	-2	.	-1
red ochre (lumps)	4	4	1	3	.	2	.	3	1	+1	+2	.	-1	-2	.	-3	+2	.
charcoal (lumps)	1	2	5	4	2	3	4	3	3	-3	.	+3	-2	.	+1	.	+1	+1
arrowheads	4	1	1	2	.	1	2	1	.	+2	.	.	-1	-1	.	.	.	-1
blades	2	3	2	2	1	1	1	2	1	.	+2	+1	-1	.	.	-1	+1	.
querns	2	3	2	1	1	3	.	1	1	.	+2	+1	-2	.	+2	-2	.	.
adzes III	3	.	.	2	3	1	3	.	1	+1	-1	-1	-1	+2	.	+1	-1	.
adzes IV - VI	1	5	2	2	.	2	2	.	1	-1	+4	+1	-1	-1	+1	.	-1	.

field nos.:

7	8	9
4	5	6
1	2	3

↑ N

TABLE 30: Correlation coefficients between trial fields, computed from the patterns of over- and under-representation of grave gift categories, as in TABLE 29.

FIELD NOS.	1								
	-.19	2			$\bar{r}$ = .06				
	-.64	.10	3			field nos. :			
	-1.00	.21	-.34	4					
	.32	-.42	-.03	-.28	5				
	-.56	.10	-.06	-.20	-.29	6			
	-.44	-.15	.13	.27	.00	.13	7		
	.02	.08	.05	-.26	-.41	-.02	-.61	8	
	-.39	-.22	-.14	-.15	-.03	.59	-.17	.31	9

7	8	9
4	5	6
1	2	3

TABLE 31: Two alternative groupings of the 9 trial fields compared.

GROUPING NO.1	44	26	11	7	14	10	4	4	10	7
	23	18	4	3	8	6	5	8	7	9
	ALL		M(min)		M(max)		F(min)		F(max)	
GROUPING NO.2	41	29	14	4	15	9	2	6	9	8
	23	18	4	3	8	6	5	8	7	9

Top row: N-field with W+NW; C with E+NE.
Bottom row: N-field with NE+E; C with W+NW.
The top-grouping is used in the remainder of the text (cf. FIGS. 31, 32).
(min.): directly sexed graves only.
(max.): indirectly sexed graves added.

SECTORS	WITH GIFTS ONLY			ALL GRAVES		
	d	sd	n	d	sd	n
I	3.00	1.01	22	3.12	1.01	26
II	2.48	.94	30	2.44	.89	43
III	2.81	1.30	14	2.82	1.17	23
IV	3.16	1.30	16	3.39	1.40	18

TABLE 32: Mean distances to nearest neighbours in metres in the various sectors.

d : average distance.
sd: standard deviation.
n : number of graves involved.
(for locations of the sectors see FIG. 32).

SECTORS	BETWEEN ZONE LIMITS			ALL GRAVES		
	d	sd	n	d	sd	n
I - II	4.51	2.48	12	7.35	1.86	6
II - III	3.34	2.23	7	5.78	1.97	6
III - IV	10.32	1.83	5	13.80	.30	3
IV - I	4.71	1.85	14	10.38	2.66	5
CENTRE	14.25	.21	2	13.20	3.31	6

TABLE 33: Mean width of zones between sectors in metres.

between zone limits: as drawn in FIG. 32.
between nearest graves: across boundary zones.
d, sd: as TABLE 32.
n: number of observations.

TABLE 34: Summary of patterns of distributions of grave gift categories; final, 4-sector subdivision (cf. TABLE 31 and FIG. 32).

	OBSERVED				PATTERN			
SECTOR NOS.	I	II	III	IV	I	II	III	IV
categories:								
undecd. pots	4	3	3	3	+1	-2	·	+1
undecd. sherds	10	8	6	3	+4	-2	·	-2
decorated pots	6	5	2	4	+2	-2	-2	+1
decorated sherds	6	3	7	4	+1	-5	+3	+1
red ochre (lumps)	3	4	6	5	-1	-3	+2	+2
charcoal (lumps)	8	9	3	7	+2	-2	-3	+3
arrowheads	1	4	5	2	-2	-1	+2	·
blades	3	5	2	5	·	-1	-1	+2
querns	5	1	3	5	+1	-5	·	+2
adzes III	5	5	3	·	+2	·	·	-2
adzes IV - VI	3	3	2	7	·	-3	-1	+4

$\chi^2 = 50.42$
$p = .01$

SECTOR NOS.	I	II	III	IV
I		r=.20	II I	
II	-.08		III IV	
III	-.43	-.32		
IV	-.48	-.48	-.15	

TABLE 35: Correlation coefficients between sectors, computed from the patterns of over- and under-representation of grave goods, as in TABLE 34.

TABLE 36: Obligations following from marital alliances at death: the exchange partner groups which had dealings with the group the deceased was living with (assuming matrilateral cross-cousin preferences).(cf. FIGS. 41 to 44).

		FEMALE DIES	MALE DIES
HARMONIC SYSTEMS	uxorilocal + matrilineal	0,-1	0,+1
	virilocal + patrilineal	0,-1	0,+1
DISHARMONIC SYSTEMS	uxorilocal + patrilineal	0,-1(-1,0,+1)	0,+1(0,+1,+2)
	virilocal + matrilineal	0,-1(0,-1,-2)	0,+1(+1,0,-1)

0: from residential groups
-: from groups down the exchange order
+: from groups up the exchange order
(between parentheses): relations of descent.
relations of consanguinity and affinity.

Example: when a female dies in a matri-unilineal system, the groups with which she has had important relations were: own residential group (0 steps away), and group where her brother has gone (1 step down the exchange circuit).

TABLE 37: Distribution of the provenances of the gifts in the graves at Elsloo, as defined by the 'source' or 'importing' group from FIG. 38.

PROVENANCE OF GIFTS:		±2	-1	0	+1
IN MALE	min.	14(14)	12(13)	18(21)	12(14)
GRAVES	max.	22(22)	17(18)	25(28)	18(20)
IN FEMALE	min.	9(11)	5(11)	17(19)	11(19)
GRAVES	max.	18(20)	13(20)	27(30)	18(28)

Exchange sequence along which distances were maesured: I → II → III → IV (→ I); gifts originating to the left are labeled positively (: regular exchange direction), to the right negatively (counter to regular exchange direction).
(between parentheses): indirectly sexed graves added.
Also cf. TABLE 36.

	d_0	sd	d_e	R)+	n
ALL	2.78	1.12	2.91	.96	111)0
M-M	5.62	4.14	6.23	.90	25
F-F	5.97	2.78	6.82	.87	21
F-M	2.55	.50	-	-	10
NON-HOMO-GENEOUS PAIRS:	2.26	.60	6.23	.36	25

TABLE 38: Average distance in metres to nearest neighbours, differentiated to sexes.

d_0: observed average distance to nearest neighbour.
d_e: expected average distance when graves were randomly distributed.
R = d_0 / d_e :nearest neighbour coefficient)+
n = number of graves involved.

)0 two outlying graves omitted.
)+ R-values: R = 0, all points at same place; R = 1.0, random dispersion; R = 2.15, hexagonal pattern.

STRUCTURES OF CERAMIC DECORATION	SEX M	F	x	
RECTILINEAR	4	7(3)	5	16
BOTH	5(1)	-	3	8
CURVILINEAR	2(1)	3(3)	5	10
	11(13)	10(16)	13(5)	34

TABLE 39: Structures of decoration on pots from graves at Elsloo, by sex.

(between parentheses): indirectly sexed graves.
$\chi^2_{M,F}$ = 5.98 (9.36) p = .05(.01).

STRUCTURES	M	F	x	
C or R	6(7)	10(16)	10(3)	26
C and R	5(6)	-	3(2)	8
	11(13)	10(16)	13(5)	34

TABLE 40: Single vs. double marked (by structures of ceramic decoration) graves at Elsloo, by sex.

C: curvilinear decoration;
R: rectilinear decoration.
χ^2 (M,F) = 5.97(9.31) p = .015(.003)
(between parentheses): indirectly sexed graves added.

N. OF FINISHED OBJECTS	SEX M	F	
≧ 5	3	2	5
4	4	3	7
2 or 3	1	6	7
	8	11	19

TABLE 41: Graves with more than modal contents. Differentiated to number of finished objects accompanying the deceased, by sex (specialized assemblages omitted).
(Also cf. TABLES 23, 25 and 42).

TABLE 42: A listing of the graves with more than modal contents.

≧ 5 FINISHED OBJECTS:	male graves	001, 003, 100.
	female graves	014, 087.
4 FINISHED OBJECTS:	male graves	005, 021, 056, 071.
	female graves	083, 105, 106.
2 or 3 FINISHED OBJECTS:	male graves	112.
	female graves	062, 066, 089, 098, 109, 111.

VALUE)^0	SEX M	F	
≧ TREBLE	7	1	8
DOUBLE	5	1	6
	12	2	14

TABLE 43: Specialization of grave gifts, by sex, chiefly figures omitted.

)^0 value: number of items in specialized category divided by number in other categories.

TABLE 44: A listing of the graves with allochthonous or foreign-looking artefacts.

GRAVE NO.	MARKERS ADZE I	MARKERS STAB&DRAG	SEX	STATUS)⁰	REMARKS	AUTO-/ALLO-CHTHONE
066 ‡	+	-	F	4	couple	allo
067	-	+	M	4	couple	allo
073	+	-	M	3		allo
083 ‡	+	+	F	6	specialist	dubious
085	+	-	m	2		allo
087 ‡	+	-	f	7	chiefly	auto
089	-	+	F	2		allo
092	-	+	M	2		allo
096	-	+	M	3		allo
074 ‡	-	+	M	2	2 sherds each only	dubious
101 ‡	-	+	x	1	2 sherds each only	dubious

‡ graves discussed in text.
)⁰ status: number of activities represented by gift set (cf. TABLE 26).

ORIGINS	M	F	x	
ALLOCHTHONOUS	4(5)	2	-	6(7)
DUBIOUS	1	1	1	3

TABLE 45: Summary of TABLE 44 with inferred origins of interred, by sex.

MALE GRAVES	PARTNER GRAVES	SEX	FEMALE GRAVES	PARTNER GRAVES	SEX
003	006	x	011	012	x
005	007	x	014	013	x
021	022	F	016	017	x
026	027	x	019	020	x
033	034	x	022	021	M
038	039	x	047	048	x
042	040	x	050	051	M
051	050	F	062	068	x
055	054	x	064	063?	x
056	057	x	066	067	M
067	066	F	083	085	x
071	070?	x	089	088	x
074	075	x	093	094	x
081	082	x	098	102?	x
096	097	x	099	100	M
100	099	F	105	107?	x
112	113	F	110	108?	x
			111)⁰	112?	M
			113)⁰	112	M

TABLE 46: Listing of paired graves for indirect sex-determination. "PAIRED": graves within average F-M distance plus one standard deviation (cf. TABLE 38).

)⁰ : duogynous couple?
? : distance slightly larger than criterium.

TABLE 47: The distribution of the more frequent categories of grave gifts over the sexes; as TABLE 17, but with indirectly sexed graves added.

CATEGORIES OF GRAVE GIFTS	SEX M	SEX F	χ^2	p	LABEL
undecd. pots	11	1	7.75	.005	male
undecd. sherds	8	12	1.06	.32	gen.
decorated pots	7	9	.39	.60	gen.
decorated sherds	8	8	.08	.80	gen.
red ochre (lumps)	2	15	10.75	.001	female
charcoal (lumps)	11	9	1.00	.33	gen.
arrowheads	10	1	6.18	.02	male
blades	7	7	.01	.90	gen.
querns	-	14	16.12	<.001	female
adzes III	13	-	12.24	<.001	male
adzes IV - VI	7	6	.03	.85	gen.
no. of graves	38	33			

STRUCTURES	MOTIFS waves	spirals	
CURVILINEAR	3	6	9
CURVI + RECTIL.	6	.	6
RECTILINEAR	10	1	11
	19	7	26

TABLE 48: MAIN MOTIFS vs. STRUCTURES of ceramic decoration, per grave.

MOTIFS	M	F	x	
waves	7(7)	5(8)	7(4)	19
spirals	2(3)	2(3)	3(1)	7
	9(10)	7(11)	10(5)	26

TABLE 49: Motifs of ceramic decoration by sex.

(between parentheses): indirectly sexed graves added.

STATUS)⁰	S P E C I A L I Z A T I O N ARROWH.	ADZES	POTTERY	*GRAVES	N
SUPER	(2)	(3)	.	.	(3)
HIGH	5(1)	(1)	3	1	7(1)
MEDIUM	2	.	2	.	4
LOW	.	.	.	1	1
NONE	.	.	.	2	2

TABLE 50: Specialists' positions in lineage mode of production.

(between parentheses): chiefly figures.
)⁰ from TABLE 26.
*GRAVES: graves oriented perpendicular to general NW-SE direction.
N: no. of graves involved.

STATUS)⁰	ALLOCHTHONES	ALL
super	-	3
high	1	12
medium	4	35
low	1	31
none	-	32

TABLE 51: Positions of alleged allochthones in lineage mode of production (see also TABLE 44).

)⁰ from TABLE 26.

ELSLOO			HIENHEIM		
Ch.3	Ch.5	n	Ch.3	Ch.5	n
			7	7	5
6	5	8	6	6	26
5	4	9	5		
4	3	16	4	5	17
3			3		
2	2	7			
			2	4	20
1	1	12		3	40
			1	2	41
				1	30
n of huts		52	n of finds		179

TABLE 52: The phases of chapter 3 compared with those employed in chapter 5, plus the numbers of huts per phase (Elsloo) and the numbers of finds per phase (Hienheim).

vertical axis: chronological sequence approximately proportional to factor scores.

LENGTH, M.	LBK 1	LBK 2
< 7	2	-
7 - 9	11	11
9 - 11	15	22
11 - 13	6	9
13 - 15	2	6
> 15	5	3
n	41	51
avge. length	10.4	10.7

TABLE 53: Length of central parts of huts in metres, all Dutch LBK sites (after Modderman 1970(I): 104).

HUTS	STATUS
type 1a: 7	super : 3
type 1b: 14	high : 12
type 2 : 32	moderate: 35
type 3 : 10	low : 31
	none : 32

TABLE 54: A comparison of the numbers of huts per type at Elsloo during LBK 2, with nos. of graves per status level in the graveyard.

(no. of huts: non-datable and non-classifiable huts added by redistribution according to marginals).

TYPES	LBK 1	LBK 2
1a	13.7 (6)	15.0 (6)
1b	12.1 (12)	11.7 (9)
2 & 3	8.8 (23)	9.8 (36)

TABLE 55: Average lengths of central parts of huts in metres, per type and period, Dutch LBK.

() number of observations.
(from Modderman 1970 (I): 104).

SHERDS	TYPE 1a	ALL OTHER TYPES
PRESENT	3	34
ABSENT	3	17

TABLE 56: A comparison of frequencies of association with decorated sherds; for huts of type 1a, and all other types. Data from Elsloo.

HUTS		N OF SHERDS	
type	n	avge	range
1a	3	38	10-55
1b	11	35.2	6-181
2	16	26.1	4-92
3	7	31.0	3-50

TABLE 57: Numbers of huts per type vs. number of sherds; Elsloo.

TABLE 58: Elsloo village. Micro-phases or grouped use as indicated by chronological ordering of huts with decorated ware. See also FICS. 46-50 and 51.

	CERAMIC PHASES									
	t_0	t_1	t_2	t_3	t_4	t_5	t_6	t_7	t_8	t_9
NE		x	x	x	x		x	?		
N	x x		x		x	x ?				
M		xx	x	x		x ?		x	x	
S		x								
E							x		x	x

TABLE 59: Average distances in metres between (the centres of the) huts per group and per phase, and between the centres of the various groups. Distances were calculated from schematic plans in FICS. 46-51, and relate to huts with decorated sherds only.

GROUPS / PHASES	WITHIN DISTANCES					BETWEEN DISTANCES
	NE	N	M	S	E	
1	-	34(6)	38(12)	20(2)	-	140(12)
2	-	32(3)	41 (5)	-	-	118 (9)
3	36(3)	27(6)	19 (3)	-	-	90 (9)
4	21(4)	-	37 (3)	-	34 (3)	115 (4)
5	-	-	50 (3)	-	42(15)	-

( ): number of observations.

(1)	(2)	(3)
.0	.	3
.1	.	.
.2	2	4
.3	4	5
.4	11	12
.5	9	10
.6	7	8
.7	6	8
.8	2	3
.9	.	.
1.0	.	1

TABLE 60: Frequencies of mixes for the variable STRUCTURES at Elsloo Village.

Col. (1): mix = (no. of curvilinear motifs)/(all motifs).
" (2): no. of huts with more than 10 decorated sherds
" (3): no. of huts with decorated sherds.

TABLE 61: The effects of sample length (top row) on the mix of a dichotomous variable: maximal and minimal proportions of any of the two attributes. (also cf. FIGS. 57 & 58).

SAMPLE LENGTH IN GENERATIONS	≦1	1	1¼	1½	1¾	2	2½	3	3½	4	5	10
LIMIT VALUES OF MIX α	x	0	.2	.33	.43	.5	.6	.67	.7	.75	.8	.9
LIMIT VALUES OF MIX 1-α	x	1	.8	.67	.57	.5	.4	.33	.3	.25	.2	.1

'x : indeterminable'.

TABLE 62: Elsloo Village. Hut types as distributed over group and occupation phases.

PHASES	GROUPS NE	N	M	S	E
1		1b.2.x			
		2.3.x	2.2		
		(3?)	1b.2	x.x	
2		1a.2.x	1b.3		
		1b.2.x			
3	1b	1b.2.x.x	3.x	x	
	1b	1b.2.3.x.x	1a.2		
4	2		2.2	1b.3.x	x
					1b.2
5				**2**	1b.2.x
				2	2.x.x

NO. OF HUTS OBSERVABLE/GROUP:	≧3	2	1
No. of groups with type 1	10	4	1
No. of groups without type 1	3	2	2

TABLE 63: The distribution of type 1a & 1b huts over the observed groups at Elsloo Village (cf. TABLE 62).

HUT TYPES	ELSLOO	HIENHEIM
1a	6	-
1b	13	1
2	28	15
3	10	5
x	35	16
	92	37

TABLE 64: A comparison of the numbers of huts per type at Elsloo and at *Hienheim*.

(from Modderman 1977: 124).

LENGTH (M)	DUTCH LBK	HIENHEIM
< 7	2	1
7 - 9	22	2
9 - 11	37	3
11 - 13	15	3
13 - 15	8	3
> 15	8	4
n. of huts	92	16
avge.length	10.6	12.4

TABLE 65: The lengths of the central parts of the huts; all Dutch LBK sites vs. Hienheim)[0]

Dutch LBK, from TABLE 53.
)[0] Hienheim, estimated from plans in Modderman 1977.

TABLE 66: A comparison of the sizes and numbers of huts per type at Elsloo and at Hienheim.

HUT TYPES	ELSLOO LBK 2			HIENHEIM		
	(1)	(2)	(3)	(1)	(2)	(3)
1a	7	15.0	6	3	14.8	3
1b	14	11.7	9	3	12.8	3
2	32	9.8	36	10	11.7	10
3	10			5		

(for Elsloo: conventional typology; for Hienheim: see text p.).
Col. (1): n. of huts of indicated type.
" (2): mean length in metres of central part.
" (3): n. of huts from which col.(2) has been calculated.

SHERDS	TYPE 1â	ALL OTHER TYPES
PRESENT	2	8
ABSENT	1	10

TABLE 67: Frequencies of association of hut type 1â with at least 5 decorated sherds, and of all other hut types.

HUTS		SHERDS	
type	n	avge.	range
1â	2	188.5	19-358
1b̂	3	48.7	5-82
2̂	3	48.0	25-79
3	2	111.5	72-151

TABLE 68: Hienheim. No. of huts per type vs. no. of sherds. (cf. TABLE 57).

TABLE 69: Hienheim. The mixes of the more important variables of pottery decoration per find (pit complexes omitted).

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
I- 2	528	1.0	.7	..C	.6	1.0			
- 8	728	.3	.9	Ab.	.2	.7			
-11	413	.6	.8	abC	.2	.7			
-12	666	-	1.	-	.0	-			
-17	522	1.	.7	abC	.4	.7			
-18	529	.8	.7	aBc	.4	.7			
-22	550	.3	.9	aBc	.4	.5			
-23	27	.3	.8	Ab.	.6	.6			
-24	275	1.	1.	-	.2	-			
-26	557	.0	1.	aBc	.2	.3			
II- 2	242	-	1.	.B.	.7	-			
4	195	-	1.	A..	.7	-			
5	438	-	1.	-	.8	-			
6	8	1.	1.	AB.	.5	-			
11	401	.5	.9	aBc	.3	.4			
12	319	.0	.9	.Bc	.9	.3			
13	182	.2	.9	Abc	.5	.3			
18	543	.8	.9	aB.	.3	.4			
19	381	.0	.9	aB.	.3	.4			
24	196	.1	.9	Abc	.4	.3			
27	243	-	.8	.B.	.3	-			
28	817	-	.8	-	.7	-			
29	305	.0	1.	aB	.4	.2			
32	507	-	.9	Ab.	1.	.2			
34	542	.4	.8	A..	.4	-			
38	183	.6	.8	ABc	.6	.3			
40	333	1.	.8	.BC	.0	-			

(contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
III- 1	555	.3	.8	ABc	.1	.3	-		
- 4	359	.2	.7	A..	.1	.4	-		
- 7	729	-	.6	Abc	.3	.5	-		
- 8	414	.1	.9	aBc	.2	.2	-		
-17	549	-	.7	-	.1	-	-		
-19	322	1.	1.	Abc	.2	.0	-		
-21	548	.2	.8	.B.	.3	1.	-		
-22	749	1.	.6	A.C	.4	.3	-		
-23	703	1.	.6	.B.	.7	-	-		
-26	721	.4	.8	aBC	.3	.2	+		
-27	68	1.	.7	Ab.	.3	.3	.		
-28	292	1.	.6	aBc	.6	.3	.		
-30	307	.7	.8	aBc	.2	.2	+		
-31	324	1.	.8	.Bc	.2	.2	.		
-40	620	.8	.8	aBc	.5	.4	.		
IV- 1	431	1.	.6	a.C	.7	-	.		-
- 2	166	1.	.6	Ab.	.2	.3	.		-
- 6	743	-	.5	A..	.4	-	.		-
-12	365	.5	.6	Abc	.1	.2	-		-/1
-13	370	1.	.5	.B.	.2	-	.		1/.
-14	526	1.	.7	abC	.3	.3	+		./4
-18	302	-	.2	.B.	.3	-	.		-
-19	313	.0	.2	A..	.2	-	.		-
-20	736	1.	.2	A..	.0	-	.		-
V- 1	364	.7	.8	ABC	.5	.5	+	.	./8
- 3	714	1.	.8	AB.	.2	-	.	.	7/.
- 4	360	-	.6	.B.	.1	.0	.	.	4/.
- 5	648	-	.4	A..	.0	.3	.	.	1/5
-13	546	-	.3	.B.	.0	.0	+	.	./8
-15	551	1.	.2	.BC	.0	-	+	.	2/7
-17	418	-	.3	.B.	.0	-	+	+	./5
VI- 2	398	1.	.3	aB.	.2	.0	+	.	1/9
3	421	1.	.1	aBc	.0	.1	+	+	1/6
5	174	1.	.1	.Bc	.4	.0	+	.	1/7
8	771	1.	.0	.Bc	.0	-	+	.	1/9
12	145	1.	.1	.B.	.2	.0	+	.	1/9
16	10	1.	.0	.Bc	.1	.0	+	.	1/8

(contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(VI)-17	540	1.	.0	.B.	.2	-	+	.	./10
-20	302	1.	.0	.B.	.0	-	+	.	1/9
-21	781	1.	.0	-	.0	-	+	.	1/9
-23	422	1.	.0	aBc	.1	.0	+	+	3/5
-24	362	-	.0	.B.	.0	-	+	.	10/.
-26	108	1.	.0	.Bc	.3	.0	+	.	1/9

Col. (1): rank nos.; refer to FIGS. 60 to 65.
" (2): find nos.
" (3): mix (MAIN MOTIFS); no. of waves proportional to all MAIN MOTIFS in find.
" (4): mix (STRUCTURES); no. of curvilinear motifs proportional to all STRUCTURES.
" (5): mix (NUMERICITY); a=simplex, b=duplex, c=triplex; CAPITAL letter indicates preponderance in find.
" (6): mix (AUX. LINES); no. of motifs with AUX. LINES proportional to all motifs.
" (7): mix (FORMAT); no. of pots without neck decoration proportional to minimal number of pots in find.
" (8): multidented spatula: +, presence in find.
" (9): goat foot tool: +, presence in find.
" (10): proportions of hatches/stab-and-drag COMPONENTS in find.

-: indicates missing data; . or .0, absence.

PHASES	BUILDING PLOTS					N.OF PITS	
	NW	W	SW	SE	E	o	x
4	o	x	.	o	.	2	1
5	o	x	o	ox	.	5	4
6	ox	xo	ox	ox	ox	11	11

TABLE 70: Hienheim: the adoption of hatching and stab-and-drag over space and time.

0: stab-and-drag.
x: hatchings.

PHASES	OCCURRENCE	
	PURE	MIXED
4	3	.
5	5	2
6	2	10

TABLE 71: Hienheim: initial exclusivity of hatching and stab-and-drag COMPONENTS becoming inclusive occurrence per pit.

MIXES / PHASES	MAIN MOTIFS <	.5	>	STRUCTURES <	.5	>
1	4	.	5	.	.	10
2	5	1	4	.	.	17
3	5	.	8	.	.	15
4	1	1	5	3	2	4
5	.	.	3	4	.	3
6	.	.	11	12	.	.

TABLE 72: Hienheim. Summed and grouped distributions of mixes on two variables over time.

main motifs: waves to all MOTIFS.
structures : curvilinear to all STRUCTURES.

MIXES	STRUCT.	M. MOTIFS
.9-1.	4	7
.7-.8	7	2
.4-.6	2	1
.2-.3	-	1
.0-.1	1	2
	14	13

TABLE 73: Hienheim. Summed distributions of the mixes of two variables of ceramic decoration as occurring in hut associated pits.

HUT TYPES	BUILDING PLOTS NW	W	SW	SE	E	
1â	.	1	1	1	.	3
1b̂	.	.	.	1	2	3
2̂	1	.	4	3	2	10
3	1	.	1	1	2	5
x	4	3	.	5	4	16
	6	4	6	11	10	37

TABLE 74: Hienheim. Hut types vs. building plots.

TABLE 75: Hienheim - coefficients of correlation between major dimensions of ceramic decoration.

TECHNIQUES (G)				NUMERICITY (G)			ZONING (G)		COMPONENTS (B)					STRUCTURES	
single dented spatula															
-99	multiple dented spatula														
-44	36	"goat foot tool"													
05	-18	-07	finger/nail												
29	-29	-16	09	simplex											
03	-03	08	-11	-54	duplex										
-06	04	06	12	-26	-46	triplex									
-54	54	34	-08	21	05	01	presence of neck decn.								
54	-54	-34	08	-21	-05	-01	-100	absence of neck decn.							
73	-73	-38	12	25	05	-06	-48	48	lines						
62	-62	-26	05	20	02	09	-43	43	29	points					
-38	36	42	-09	-06	00	-06	33	-33	-42	-39	hatchings				
-78	80	26	15	-28	-04	-01	47	-47	-70	-74	09	stab-and-drag points			
09	-16	-08	56	03	-02	04	-12	12	12	-01	-09	-17	finger/nail imp.		
85	-86	-42	21	21	05	01	-51	51	74	60	-43	-76	15	curvilinearity	
-85	86	42	-21	-21	-05	-01	51	-51	-74	-60	43	76	-15	-100	rectilin.
-38	39	20	-17	-11	-20	18	21	-21	-40	-27	21	39	-09	-48	48
38	-39	-20	17	11	20	-18	-21	21	40	27	-21	-39	09	48	-48
36	-35	-22	03	18	-04	-00	-35	35	27	49	-26	-42	05	44	-44
-36	35	22	-03	-18	04	00	35	-35	-27	-49	26	42	-05	-44	44
03	06	22	02	-13	21	-01	12	-12	-12	-01	05	05	08	00	-00
33	-30	-38	01	13	-15	01	-30	30	42	16	-44	-17	-03	40	-40
-54	51	37	04	-21	-03	12	31	-31	-42	-42	59	30	01	-47	47
40	-40	-25	01	28	-09	-08	-02	02	43	35	-21	-41	02	43	-43
74	-74	-50	16	26	03	-09	-59	59	68	70	-44	-69	16	78	-78
-30	28	42	-18	-12	24	-12	25	-25	-34	-30	68	09	-14	-39	39
-80	81	38	-14	-37	-07	18	48	-48	-68	-69	11	85	-13	-75	75
07	-10	-05	37	17	-14	-00	-08	08	07	10	-08	-10	23	08	-08

(contd.)

TABLE 75 (cont.)

MOTIFS (B)	AUX.LIN. (B)	DIRECTION FILLINGS		COMPONENTS (N)
-40 40	34 -34	-04 28 -27		lines
-27 27	35 -35	-10 41 -51		02 points
21 -21	-21 21	31 -49 33		-23 -46 hatchings
39 -39	-39 39	-07 -23 44		-34 -75 -04 stab-and-drag points
-09 09	08 -08	-06 07 -10		-02 -06 -10 -09 finger/nail impressions

wave
-100 spiral

-15 15 aux. lines
15 -15 -100 no aux. lines

-05 05 | -18 18 indeterminate
-18 18 | 35 -35 -53 parallel
23 -23 | -31 31 -07 -59 others

n = 179 finds (general variables); n = 164 (belly variables); n = 89 (neck variables).

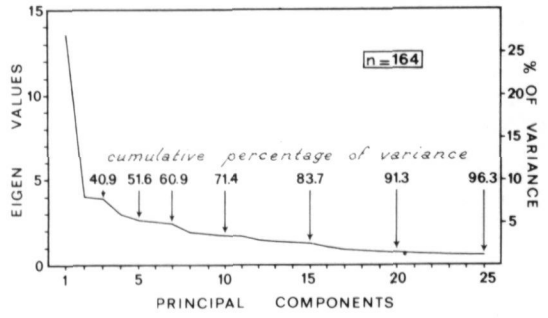


TABLE 76: Hienheim. Eigen-values in principal components analysis of ceramic decoration, analyzed on 52 attributes or 17 variables.

	PC 1	PC 2	PC 3
single-dented spatula	-.896	.023	.099
multi-dented spatula	.896	-.036	-.141
"goat foot tool"	.516	.091	.285
fingers/nails	-.196	-.016	.043
simplex	-.328	.352	-.097
duplex	-.041	-.441	.391
triplex	.069	.089	-.122
presence of neck decn.	.673	-.151	.045
absence of neck decn.	-.673	.151	-.045
lines	-.796	.040	-.010
points	-.720	-.099	.056
hatchings	.487	.118	.488
stab-and-drag points	.820	-.019	-.274
finger/nail impressions	-.180	.058	.034
curvilinearity	-.912	-.024	-.016
rectilinearity	.912	.024	.016
wave	.527	.367	-.126
spiral	-.528	-.367	.126
auxiliary lines	-.504	.089	-.287
no auxiliary lines	.504	-.088	.287
indeterminate	.094	-.118	.458
parallel	-.483	.130	-.566
others	.602	.031	.262
lines	-.398	.028	-.053
points	-.850	-.156	-.072
hatchings	.396	.173	.702
stab-and-drag points	.831	-.009	-.365
finger/nail impressions	-.108	.170	.024

TABLE 77: Hienheim. Matrix of factor loadings (unrotated) for major dimensions of ceramic decoration.

no. of finds: 164.
no. of attributes: 52
or 17 variables

TABLE 78: Hienheim. Size and chronology of find numbers.

(1) find no.
(2) no. of sherds (belly only)
(3) rank phase
(4) rank, within phase
(5) rank, cumulative
(6) remarks

(4) / (5): X possibly unreliable as find belongs to pit complex.

(1)	(2)	(3)	(4)	(5)	(6)
0008	5	2	6	36	
0010	119	6	16	164	0010+0011+0228
0011	-	-	-	-	in 0010
0027	53	1	23	23	
0068	82	3	27	98	C-14: 5910±50
0108	16	6	24	172	C-14: 5780±50
0145	58	6	12	160	
0158	-	-	-	-	in 0275
0162	-	-	-	-	in 0263
0166	28	4	2	113	
0174	40	6	5	153	
0181	44	6	22	170	
0182	36	2	13	43	
0183	151	2	38	68	
0195	7	2	4	34	
0196	24	2	24	54	
0200	36	3	16	87	
0218	-	-	-	-	in 0232
0220	-	-	-	-	in 0245
0221	-	-	-	-	in 0267
0222	7	5	14	145	
0226	-	-	-	-	in 0265
0227A	11	6	9	157	
0227B	11	3	6	77	
0228	-	-	-	-	in 0010
0232	13	5	10	141	0218+0232
0242	5	2	2	32	
0243	9	2	27	57	
0245	26	6	7	155	0220+0245
0247	-	-	-	-	in 0275
0251	-	-	-	-	in 0275
0262	-	-	-	-	in 0275
0263	108	5	9	140	0162+0263+0234
0264	8	6	13	161	
0265	20	3	23	104	0226+0265
0266	-	-	-	-	in 0267
0267	53	3	36	107	0221+0266+0267
0275	18	1	24	24	0158+0247+0251 +0262+0275
0292	16	3	28	99	
0295	16	6	11	159	0295+0296+ +0297+0298
0296	-	-	-	-	in 0295
0297	-	-	-	-	in 0295
0298	-	-	-	-	in 0295
0299	27	6	14	162	
0302A	6	6	20	168	
0302B	5	4	18	129	
0305	15	2	29	59	
0307	97	3	30	101	
0313	11	4	19	130	
0316	5	5	7	138	
0319	78	2	12	42	
0322	11	3	19	90	
0324	31	3	31	102	
0325	182	3	9	80	
0333	5	2	40	70	
0342	5	3	35	106	
0343	21	3	13	84	
0344	40	3	5	76	
0351	10	3	32	103	
0359	30	3	4	75	
0360	22	5	4	135	
0362	8	6	24	172	
0364	10	5	1	132	

(contd.)

(1)	(2)	(3)	(4)	(5)	(6)
0365	50	4	12	123	
0370	15	4	13	124	
0380	10	3	12	83	
0381	12	2	19	49	
0386	-	-	-	-	in 0396
0387	-	-	-	-	in 0396
0391	-	-	-	-	in 0396
0396	82	6	27	175	0386+0387+0391 +0396+0397
0397	-	-	-	-	in 0396
0398	6	6	2	150	
0401	92	2	11	41	
0413	80	1	11	11	
0414	37	3	8	79	C-14: 6125±35
0418	5	5	17	148	
0421	39	6	3	151	
0422	33	6	23	171	
0431	6	4	1	112	
0438	6	2	5	35	
0446	9	5	6	137	
0476	8	2	25	55	
0477	14	4	16	127	
0489	115	4	5	116	
0504	17	1	6 X	6 X	
0506A	6	6	18 X	166 X	
0506B	29	1	10 X	10 X	
0507	9	2	32	62	
0522	14	1	17	17	
0526	59	4	14	125	
0528	25	1	2	2	
0529	82	1	18	18	
0530A	7	6	25 X	173 X	
0530B	83	4	9 X	120 X	
0531	5	2	36 X	66 X	
0532	10	6	1 X	149 X	
0533	8	6	10 X	158 X	
0534	6	3	2 X	73 X	
0540	5	6	17	165	
0542	5	2	34	64	
0543	40	2	18	48	
0545	-	-	-	-	in 0555
0546	7	5	13	144	
0547	-	-	-	-	in 0555
0548	30	3	21	92	
0549	14	3	17	88	
0550	56	1	22	22	
0551	6	5	15	146	
0555	27	3	1	72	0545+0547+0555
0557	5	1	26	26	
0576	14	3	25 X	96 X	
0586	36	3	18 X	89 X	
0587	15	2	26 X	56 X	
0592	9	3	38 X	109 X	
0593A	6	6	29 X	177 X	
0593B	44	2	31 X	61 X	
0594	18	3	37 X	108 X	
0595	13	2	10 X	40 X	
0596	17	4	4 X	115 X	
0597	27	1	13 X	13 X	
0598	22	2	21 X	51 X	
0599	33	1	15 X	15 X	
0600	15	3	15 X	86 X	
0601	7	2	8 X	38 X	
0602	14	2	30 X	60 X	
0603	31	2	22 X	52 X	
0606	8	2	17 X	47 X	
0608	63	1	19 X	19 X	
0609	7	1	27 X	27 X	
0610	18	1	28 X	28 X	
0611	9	5	2 X	133 X	
0613	10	2	7 X	37 X	
0614	7	4	17 X	128 X	
0615	9	4	10 X	121 X	
0616	7	1	30 X	30 X	
0617	53	2	9 X	39 X	
0618	17	3	11 X	82 X	
0619	15	2	20 X	50 X	

(contd.)

(1)	(2)	(3)	(4)	(5)	(6)
0620	72	3	40	111	C-14: 6000
0648	7	5	5	136	
0666	5	1	12	12	
0697	9	5	8 X	139 X	
0698	6	2	23 X	53 X	
0701	74	1	21 X	21 X	
0703	15	3	23	94	
0714	5	5	3	134	
0720	6	3	14 X	85 X	
0721	125	3	26	97	
0728	30	1	8	8	
0729	10	3	7	78	
0736	5	4	20	131	
0743	5	4	6	117	
0749	19	3	22	93	C-14: 6155±45
0758	53	3	29 X	100 X	
0759	13	4	15 X	126 X	
0760	10	2	41 X	71 X	
0761	9	1	25 X	25 X	
0762	32	1	4 X	4 X	
0763	15	3	10 X	81 X	
0764	17	2	1 X	31 X	
0765	24	4	11 X	122 X	
0767	15	2	33 X	63 X	
0771	9	6	8	156	
0781	5	6	21	169	
0794	6	5	16 X	147 X	
0797	5	6	15 X	163 X	
0807	8	6	19 X	167 X	
0817	13	2	28	58	
0821	36	3	3 X	74 X	
0823	5	5	11 X	142 X	
0866	6	3	34	105	
0868	21	6	6	154	0868+0870+ +0874+0875
0870	-	-	-	-	in 0868
0874	-	-	-	-	in 0868
0875	-	-	-	-	in 0868
0876	-	-	-	-	in 1000
0880	-	-	-	-	in 1000
0881	-	-	-	-	in 1000
0887	-	-	-	-	in 1000
0888	-	-	-	-	in 1000
0889	-	-	-	-	in 1000
0895	-	-	-	-	in 1000
0911	40	4	3	114	
0919	155	2	14	44	0919+0921+ +0952+0964
0921	-	-	-	-	in 0919
0937	-	-	-	-	in 1000
0943	-	-	-	-	in 1000
0947	-	-	-	-	in 1000
0952	-	-	-	-	in 0919
0969	-	-	-	-	in 0919
0976	-	-	-	-	in 1000
1000	74	6	28	176	0876+0880+0881+ +0887+0888+0889 +0895+0937+0943 +0947+0976/1011
1011	-	-	-	-	in 1000
1044	77	4	8	119	1044+1045+1046
1045	-	-	-	-	in 1044
1046	-	-	-	-	in 1044
1082	-	-	-	-	in 1101
1083	-	-	-	-	in 1101
1085	-	-	-	-	in 1101
1089	109	1	16	16	
1099	-	-	-	-	in 1101
1101	99	1	20	20	1082+1083+1085+ +1099+1101+1134
1115	76	6	4	152	C-14: 5905±45
1116	13	6	30	178	
1134	-	-	-	-	in 1101
1140	27	3	20	91	
1143A	20	5	12	143	
1143B	86	1	29	29	
1152	-	-	-	-	in 1188
1187	-	-	-	-	in 1188
1188	25	6	31	179	1152+1187+1188

(contd.)

(1)	(2)	(3)	(4)		(5)		(6)
1387	91	2	17	X	47	X	
1392	24	3	39	X	110	X	
1393	5	2	35	X	65	X	
1395	14	2	16	X	46	X	
1396	78	3	24	X	95	X	
1397	83	1	5	X	5	X	C-14: 6220±45
1398	16	1	14	X	14	X	
1399	9	1	1	X	1	X	
1400	26	1	7	X	7	X	
1401	33	1	3	X	3	X	
1402	28	1	9		9		
1403	23	2	39		69		
1404	5	2	3		33		
1405	9	2	15		45		
1407	-	-	-		-		in 1420
1420	11	4	7	X	118	X	1407+1420

conversion of absolute numbers to 10-logarithms.

A logarithm consists of two numbers: the first one (here to be entered in the first column) describing the general magnitutde, and the other (here to be entered in the 2nd and 3rd columns) the precision. Thus:

counts between	1	and	9	(incl.)	enter 0	in the first column.
"	10		99	"	1	"
"	100		999	"	2	"
"	1000		9999	"	3	"
et cetera.						

Similarly, the precision is indicated by:

counts of 1,	10,	100,	1000	enter 00	in 2nd and 3rd column.
	12,	120,	1200	08	"
	14,	140,	1400	15	"
	16,	160,	1600	20	"
	18,	180,	1800	26	"
2,	20,	200,	2000	30	"
	23,	230,	2300	36	"
	27,	270,	2700	43	"
3,	30,	300,	3000	48	"
	35,	350,	3500	54	"
4,	40,	400,	4000	60	"
5,	50,	500,	5000	70	"
6,	60,	600,	6000	78	"
7,	70,	700,	7000	84	"
8,	80,	800,	8000	90	"
9	90,	900,	9000	95	"
10	100,	1000,	10000	00	"

If the counts fall in between table values, the number to be entered can be found through interpolation.

CODEBOOK FOR THE ELSLOO CEMETERY

GROUP	VARIABLE	attrib. no.	REMARKS AND DESCRIPTION	col.nos.
general	grave no.	01	grave number (ref.Modderman 1970(1))	01-02-03
	position	02	S/N, from plan	04-05-06
		03	W/E, from plan	07-08-09
	type of intermittent	04	empty grave-like pit: 0 only gifts in gravepit: 1 corporal remains, no gifts: 2 corp. remains with gifts: 3 cremation, no gifts: 4 cremation with gifts: 5 calcined bone, no gifts: 6 calcined bone, with gifts: 7	10
	orientation	05	azimuth of head: S=00;SW=01;W=02; NW=03;N=04;NE=05;E=06;SE=07. When no remains are visible for axis of pit: add 50. inapplicable, indeterminable = 99	11-12
	posture of the corpse	06	on the back: 0; left: 1; right: 2; inapplicable: 9; unknown: blank	13
ceramics general	nature	07	undecorated pots: number	14
		08	undecorated sherds: number	15
		09	decorated pots: number	16
		10	decorated sherds: number	17-18
decor. ware)	techniques	11	unidented spatula, no. of motifs	19
		12	multidented spatula, "	20
	components (belly)	13	10-log (lines); if absent: 99	21-22
		14	10-log (points) "	23-24
		15	10-log (stab-and-drag) "	25-26
		16	10-log (hatchings) "	27-28
	components (neck)	17	10-log (lines) "	29-30
		18	10-log (points) "	31-32

CODEBOOK FOR THE ELSLOO CEMETERY

		19	10-log (stab-and-drag); if absent: 99	33-34
		20	10-log (hatchings) "	35-36
	structures	21	curvilinearity, no. of motifs in belly zone	37
		22	rectilinearity "	38
	motifs	23	wave motif "	39
		24	spiral motif "	40
	fillings	25	empty bands "	41
		26	discontinuously filled bands "	42
		27	continuously filled bands "	43
	direction of fill.	28	indeterminate, no. of motifs in belly zone	44
		29	parallel to axis "	45
		30	oblique to axis "	46
		31	perpendicular "	47
	delim. of motif bands	32	no limits to bands "	48
		33	simple limits "	49
		34	fringes "	50
	secondary motifs	35	"Zwickelfiguren" "	51
		36	other types (not if attr. 40-42), no. of motifs	52
	motif ends	37	none (rotated, translated motifs)	53
		38	unelaborated, no. of motifs in belly zone	54
		39	elaborated "	55
	auxiliary lines	40	cadres "	56
		41	symmetry axes "	57
		42	no aux. lines "	58
	numericity	43	simplex decoration "	59
		44	duplex "	60
		45	triplex "	61
		46	quadruplex "	62
red ochre	hematite	47	lumps, number	63
		48	traces, number	64
	bog-ore	49	traces, number	65

CODEBOOK FOR THE ELSLOO CEMETERY

flint	arrow heads	50	retouch on one side only, no. of points	66
		51	retouch on both sides „	67
	scrapers	52	all types, number	68
	blades	53	blanks, number	69
		54	utilized blades, number	70
	other	55	nuclei	71
		56	debris	72
querns	querns	57	querns and quern fragments,no. of pieces	73
		58	whet stone and fragments „	74
		59	lumps of abrasive stone, unworked „	75
adzes	adzes	60	adzes type I, no. of pieces in grave	76
		61	adzes type II, „	77
		62	adzes type III, „	78
		63	adzes type, IV, V, VI „	79
charcoal	charcoal	64	charcoal not found: 0 present close to interment: 1 present in gravepit fillings: 2	80

N.B. (1): When a 'GROUP' does not occur in a grave, do leave blanks.
N.B. (2): What is described as occurring in the "grave pit filling" should not be entered.
)° refer to Chapter 1.

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LIST OF FIGURES

1: Paradigmatic vs. taxonomic classification 5
2: Breakage and Modderman's classification. 8
3: Bottom decoration on LBK pot from Hienheim 15
4: NUMERICITY demonstrated on a pot from Hienheim. 16
5: The development of LBK motifs as an algebraic group 18
6: Reduction of the zigzag MAIN MOTIF to a simple slant 19
7: Frequencies of decorated sherds per pit at Hienheim 30
8: Model of continuity and discontinuity, one variable 43
9: Continuity and discontinuity, one variable, quantified 43
10: Model of continuity and discontinuity, three variables. 44
11: Continuity and discontinuity, three variables, quantified 45
12: Factor plot of 11 traits on the first two components, Hienheim 50
13: Hienheim: change in ceramic decoration with time, MODEL I 52
14: Hienheim: change in ceramic decoration with time, MODEL II 53
15: Hienheim: change in ceramic decoration with time, MODEL III 56
16: Hienheim: summary of MODEL III, condensed to six macro-phases 59
17: Elsloo: principal components' chronology compared with Modderman's 63
18: Elsloo: change in ceramic decoration with time, huts spread evenly 66
19: Elsloo: change in ceramic decoration with time, huts clustered 67
20: Elsloo: change in ceramic decoration with time, finds spread evenly 68
21: Elsloo: change in ceramic decoration with time, finds clustered 69
22: Hienheim: distribution of sherds and finds according to factor scores 75
23: Hienheim: as Fig. 13, though with larger number of finds 76
24: Hienheim: plot of the residuals in a multiple regression analysis. 77
25: Hienheim: change in ceramic decoration with time, macro-phases. 77
26: Elsloo graveyard: chronology of graves 85
27: Elsloo graveyard: distribution of the sexes. 90
28: Elsloo graveyard: distribution of rank 94
29: Elsloo graveyard: grouping of graves according to Pavúk 97
30: Elsloo graveyard: arbitrary division into 9 fields. 98
31: Elsloo graveyard: from 9 fields to 4 sectors 99
32: Elsloo graveyard: the four exchanging groups 100
33: General model of a four group exchange system. 101
34: Model of complex exchange relations in a four group system. 101
35: Model of asymmetrical and linear exchange in a four group system 101
36: Model of asymmetrical and alternating exchange, four groups 101
37: Model of symmetrical exchange: only two groups take part 101
38: Elsloo graveyard: frequencies of grave gifts per sector 103
39: Elsloo graveyard: exchange relations 104
40: Transition matrices of exchange, Elsloo cemetery 104
41: Model of cross-cousin marriage, unilineal and matrilateral 105
42: Model of cross-cousin marriage, unilineal and patrilateral 105
43: Model of cross-cousin marriage, bilineal and uxorilocal 105
44: Model of cross-cousin marriage, bilineal and virilocal 105
45: Elsloo: constancy and change in factor patterns with time 138
46: Elsloo: huts in use in first ceramic phase 142

47: Elsloo: huts in use in second ceramic phase 142
48: Elsloo: huts in use in third ceramic phase 142
49: Elsloo: huts in use in fourth ceramic phase 143
50: Elsloo: huts in use in fifth ceramic phase 143
51: Elsloo: geographical relocation of hut groups with time 144
52: Elsloo: distribution of mixes of major variables in phase 1. 146
53: Elsloo: distribution of mixes of major variables in phase 2. 146
54: Elsloo: distribution of mixes of major variables in phase 3. 146
55: Elsloo: distribution of mixes of major variables in phase 4. 147
56: Elsloo: distribution of mixes of major variables in phase 5. 147
57: Two generation samples of a dichotomous variable. 150
58: One and a half generation samples of a dichotomous variable 150
59: Hienheim: constancy and change in factor patterns with time 156
60: Hienheim: plan of finds from first ceramic phase 160
61: Hienheim: plan of finds from second ceramic phase 161
62: Hienheim: plan of finds from third ceramic phase 162
63: Hienheim: plan of finds from fourth ceramic phase. 163
64: Hienheim: plan of finds from fifth ceramic phase 164
65: Hienheim: plan of finds from sixth ceramic phase 165
66: Hienheim: building plots 166

LIST OF TABLES

(pages 175-215)

1: Efficacy of the proposed codebook.
2: Distributions over time of finds and of sherds, Hienheim.
3: Listing of the finds around the inferred discontinuity.
4: Hienheim: average standard deviations of traits per phase.
5: Hienheim: average standard deviations summed over phases.
6: Hienheim: sequences from principal components and canonical analyses.
7: Hienheim: between phases correlations MODEL III.
8: Hienheim: correlations between phases, weighted.
9: Elsloo graveyard: gravegoods vs. burial rites.
10: Elsloo graveyard: patterns of loadings on 7 principal components.
11: Elsloo graveyard: factor scores of graves on 7 principal components.
12: Elsloo graveyard: VARIMAX transformation matrix.
13: Elsloo graveyard: grouping the graves into phases.
14: Elsloo graveyard: sexes and the principal components.
15: Elsloo graveyard: gravegifts vs. sex, first draw.
16: Elsloo graveyard: gravegifts vs. sex, second draw.
17: Elsloo graveyard: gravegifts vs. sex, third draw.
18: Elsloo graveyard: listing of the graves by sex.
19: Elsloo graveyard: no. of kinds of gravegifts and principal component no. 7.
20: Elsloo graveyard: hypothetical distribution of graves adults/children.
21: Elsloo graveyard: hypothetical distribution of graves adults/children.
22: Elsloo graveyard: principal component no. 3 and "wealth".
23: Elsloo graveyard: ranking according to labour input.
24: Elsloo graveyard: no. of gravegift categories by sex.
25: Elsloo graveyard: ranking according to no. of activities.
26: Elsloo graveyard: listing of the graves by rank.
27: Elsloo graveyard: no. of graves per field.
28: Example of the calculation of a pattern.
29: Elsloo graveyard: summary of patterns for nine fields subdivision.
30: Elsloo graveyard: correlations between the nine trial fields.
31: Elsloo graveyard: two alternative re-groupings.
32: Elsloo graveyard: mean distances to nearest neighbour graves.
33: Elsloo graveyard: mean width of zones between sectors.
34: Elsloo graveyard: summary of patterns for four sector subdivision.
35: Elsloo graveyard: correlations between the 4 sectors.
36: Summary of obligations following from marital alliances, at death.
37: Elsloo graveyard: relative provenance of gravegifts.
38: Elsloo graveyard: sexes and nearest neighbours.
39: Elsloo graveyard: STRUCTURES of pottery decoration by sex.
40: Elsloo graveyard: single vs. double marked graves by sex.
41: Elsloo graveyard: no. of graves with more than modal contents.
42: Elsloo graveyard: listing of graves with more than modal contents.
43: Elsloo graveyard: specialization of gravegifts by sex.
44: Elsloo graveyard: a listing of the graves with allochthonous elements.
45: Elsloo graveyard: summary of table 44.
46: Elsloo graveyard: listing of paired graves.

47: Elsloo graveyard: gravegifts vs. sex, fourth draw.
48: Elsloo graveyard: MAIN MOTIFS VS. STRUCTURES.
49: Elsloo graveyard: MAIN MOTIFS by sex.
50: Elsloo graveyard: specialists' positions in the lineage mode of production.
51: Elsloo graveyard: allochthones' positions in lineage mode of production.
52: The phases from Chapter 3 compared with those from Chapter 5.
53: Lengths of central parts of Dutch LBK huts.
54: Hut types at Elsloo vs. status at the graveyard.
55: Lengths of central parts per hut type, Dutch LBK.
56: Hut types and association with decorated sherds at Elsloo.
57: Nos. of huts per type vs. nos. of sherds at Elsloo.
58: Elsloo: micro-phases.
59: Elsloo: within hut group distances.
60: Elsloo: frequencies of mixes of variable STRUCTURES.
61: Effects of sample length on mix of dichotomous variable.
62: Elsloo: hut types per group and phase.
63: Elsloo: distribution of hut types 1a and 1b over groups of huts.
64: Hut types at Hienheim and Elsloo compared.
65: Lengths of central parts of huts, Dutch LBK vs. Hienheim.
66: Sizes and nos. of huts per type at Elsloo and Hienheim.
67: Hienheim: type Îa huts vs. decorated sherds associations.
68: Hienheim: nos. of huts per type vs. nos. of decorated sherds.
69: Hienheim: mixes of major variables per find.
70: Hienheim: the adoption of hatching and stab-and-drag.
71: Hienheim: hatching and stab-and-drag by phase.
72: Hienheim: mixes of MAIN MOTIFS and STRUCTURES over time.
73: Hienheim: mixes as occurring in hut associated pits.
74: Hienheim: hut types vs. building plots.
75: Hienheim: correlations between major dimensions of decoration.
76: Hienheim: Eigen-values of principal components.
77: Hienheim: factor loadings for major dimensions of ceramic decoration.
78: Hienheim: chronology and size of finds.

AUTHOR INDEX

Adams, R.McC. 46
Adams, W.Y. 37
Aldenderfer, M.S. 7
Ammerman, A.J. 126
Appel, G.N. 38
Audouze, F. 46

Bakels, C.C. 25N4, 84, 114, 119N14, 126, 129, 131, 132, 133, 137, 151, 155
Begler, E.B. 82
Behrens, H. 27, 127, 128, 132, 133, 147
Bell, A.W. 17
Berger, A.H. 108
Berger, L.R. 50, 71, 72N2
Berlekamp, H. 126
Bertels, K. 27, 39, 55, 117N2
Binford, L.R. 1, 33, 34, 36, 38, 39, 49, 80, 90, 91, 92, 121, 124, 131
Binford, S.R. 36
Birdsell, J.B. 82
Blashfield, R.K. 7
Bloch, M. 82, 110, 111
Blok, A. 6, 7, 26
Bocheński, I.M. 3
Bohannan, P. 149, 172N2
Borillo, M. 8
Budden, F.J. 17
Burguière, A. 140
Buschan, G. 126
Butschkow, H. 1, 13, 29, 41
Buttler, W. 1, 10, 11, 12, 13, 132
Butzer, K.W. 126

Cahen, D. 27
Cancian, F. 86
Carneiro, R.L. 123
Cavalli-Sforza, L.L. 126
Chaney, R.R. 6
Charbonnier, C. 1
Childe, V.G. 1, 13, 125, 126, 127, 132
Christenson, A.L. 7
Claessen, H.J.M. 3, 38, 81, 86, 87
Clark, J.G.D. 37, 40N6, 125, 127
Clark, R.M. 73N6
Clarke, D.L. 1, 6, 7, 25N2, 26, 33, 34, 36, 37, 38, 39, 43, 48, 49, 59, 60, 119N12, 121, 123, 125, 126, 127, 133

Coe, M.D. 121, 125, 126
Cohen, M.N. 73N5
Cohen, R. 95
Conklin, H.C. 126

Dahrendorf, R. 86, 113
Dalton, G. 123, 172N1
Danilova, L.V. 108, 109
David, N. 121
DeGarmo, Gl.D. 123, 124, 125
De Groot, A.D. 33, 55
De Grooth, M.E.Th. 168, 169
Dehn, W. 41
De Jonge, H. 51
De Josselin de Jong, P.E.: 79, 83, 104, 107, 123
Dekin, A.A. 118N6
De Leeuw, J. 58
Destexhe-Jamotte, J. 2, 9, 13
Dixon, W.J. 30
Dohrn-Ihmig, M. 2, 9, 10, 12, 13, 91, 119N12, 153
Doran, J.E. 7, 29, 30, 47, 48, 49
Drennan, R.D. 29, 30, 57, 70
Dumont, L. 79, 83, 124
Dunnell, R. 2-7, 12, 25N2, 28

Earle, T.K. 122
Engelbrecht, W. 122, 125
Engels, F. 39, 108, 128
Ericson, J.E. 122
Evans, R.K. 1
Evans-Pritchard, E.E. 96

Farruggia, J.P. 40N3
Firth, R. 110
Flannery, K.V. 121, 125, 126
Foucault, M. 40N6
Fox, R. 96, 119N10, 123, 172N2
Fried, M.H. 82, 86, 111, 112, 116N1, 119N12, 172N1
Friedman, J. 109, 116, 122, 126

Gabriel, I. 114, 119N12, 153
Gerbrands, A.A. 25N3
Gledhill, J 83
Godelier, M. 1, 3, 83, 96, 108, 109, 110, 111
Goldmann, K. 47
Goller, K. 10, 41, 46, 71

Goubert, P. 140
Graham, I. 46
Guillaumin, J. 79

Haberey, W. 2, 10, 11, 13
Haekel, J. 132
Haggett, P. 122
Harman, H.H. 48, 49, 117N3
Harris, M. 36, 38, 40N6, 81, 86, 109
Häusler, A. 87, 89, 90, 91, 92
Hawkes, J. 34
Hawkes, T. 79
Hays, W.L. 26, 28, 30, 31, 34, 35
Hempel, C.G. 32, 33, 34, 35, 36, 37, 38
Hill, J.N. 1, 38
Hodson, F. 7, 29, 30, 47, 48, 49, 70, 81, 92
Hoffmann, E. 2, 8, 9, 10, 12, 13
Hogarth, A.C. 37, 38
Hole, F. 36, 122

Keesing, F.M. 96
Kendall, D.G. 47
Klejn, L.S. 34, 40N6, 127, 128, 133
Kloos, P. 81, 86, 87, 141
König, R. 1
Kroeber, A.R. 119N12
Kuenen, D.J. 39, 43
Kuhn, Th.S. 34, 36, 37, 38, 40N6, 81
Kulczycka-Leciejewiczowa, A. 130, 172N2
Kuper, R. 8, 114, 117N4, 130, 132, 139, 160, 172N4, 173N7

Laming-Emperaire, A. 82
Lanting, J.N. 34, 38
Lauer, P.K. 93
Leach, E.R. 82, 104, 119N9
Leacock, E. 95
LeBar, F.M. 121
LeBlanc, S. 47
Legros, D. 110, 111
Leroi-Gourhan, A. 36, 82
Lévi-Strauss, C. 1, 3, 25N3, 36, 37, 39, 42, 79, 80, 82, 83, 99, 100, 104, 107, 112, 118N6, 119N9, 119N13, 122, 126, 136-137, 141, 153
Linke, W. 126, 131
Lischka, J.J. 48
Longacre, W.A. 122, 124, 125
Louwe Kooijmans, L.P. 33
Lüning, J. 1, 42, 43, 46, 70, 72N2, 114, 128, 130, 132, 172

Maier, R.A. 14, 41, 71
Malinowski, B. 36
Marx, K. 39, 109
Massey, F.J. 30
Mauser-Goller, K. see Goller, K.
McEvedy, C. 27
McIntosh, R.J. 27
Meier-Arendt, W. 2, 9, 12, 13, 41, 61, 71, 72, 164
Meillassoux, C 109
Milisauskas, S. 58, 131, 132, 133
Modderman, P.J.R. 2, 8, 9, 10, 11, 12, 13, 27, 35, 47, 58, 61, 62, 81, 84, 86, 87, 89, 90, 92, 114, 116N2, 118N5, 119N12, 119N14, 120, 126, 129, 130, 131, 132, 133, 134, 137, 138, 140, 144, 145, 149, 150, 153, 154, 155, 158, 159, 172, 172N3, 172N6; T.53, T.55, T.64, T.65
Montelius, O. 27, 28, 29, 40N2
Moore, F.W. 121
Morgan, C.G. 32, 34
Morgan, L.H. 116N1, 128
Moroney, M.J. 51
Moyer, D. 107
Murdock, G.P. 119N10, 121, 123, 129, 148, 149, 167, 172N5

Nandris, J. 127
Naroll, R. 129, 149
Nauta, D. 55
Needham, R. 3, 6, 26
Neustupný, E. 40N6, 58
Newell, R.R. 118N6
Nie, N.H. 35, 48, 135
Nooter, G. 111

O'Laughlin, B. 84, 109
Onvlee, L. 36
Osterhaus, U. 89, 91
Ottaway, B. 122, 123

Pavlů, I. 28, 129, 130, 131, 132, 133, 134, 145, 150-151, 172, 172N6
Pavúk, J. 81, 89, 90, 91, 94, 96, 131, 167
Petrova-Averkieva, Yu. 109
Phillips, P. 122, 129
Piggott, S. 125, 127, 132, 133
Plog, F.T. 37, 38, 57, 72N2, 73N5, 124
Plog, S. 1
Popper, K.R.: 26, 32, 33, 34, 35, 36, 37, 40N5, 55, 83

Quitta, H. 13, 20

Radcliffe-Brown, A.R. 81, 82, 107
Randsborg, K. 81, 124
Rapp, R. 110
Rappaport, R.A. 141
Read, D.W. 7
Redlich, C. 96
Reinecke, K. 89, 131, 132, 133
Renfrew, C. 37, 123, 126
Rogers, E.M. 43
Romein, J. 40N6
Romney, A.K. 48
Rowlands, M.J. 83
Runciman, W.G. 86

Sahlins, M.D. 36, 82, 86, 87, 93, 110, 112, 113, 117N2, 122, 123, 124, 125, 128, 172N1

Salisbury, R.F. 102, 141
Salmon, M.H. 32, 33, 34, 40N5, 55
Sangmeister, E. 41, 132
Schietzel, K. 13
Schiffer, M.B. 1, 3, 92
Schnapp, A. 34
Schneider, H.K. 109, 110
Selltiz, C. 4, 35, 47, 118N6
Service, E.R. 81, 82, 111, 116N1, 121, 122, 124, 125, 126, 127, 128
Shennan, S. 87, 124
Shepard, A.O. 10, 14-20
Shepard, R.N. 70
Sherratt, A.G. 125, 126, 127, 132, 133
Sielman, B. 131
Sieveking, G. de G. 122
Siskind, J. 82
Skalník, P. 38
Slofstra, J. 32
Sneath, P.H.A. 6, 7, 26, 47, 60
Snodgrass, A.M. 38
Sokal, R.R. 6, 7, 26, 47, 60
Soudský, B. 2, 10, 11, 126, 129, 130, 131, 132, 147, 172N2, 172N3, 172N6
Spaulding, A. 2
Spriggs, M. 110
Stehli, P. 2, 8, 10, 11, 12, 13, 17, 19, 20
Strahm, C. 122, 123
Stroh, A. 10, 13, 71, 164

Tabaczyński, S. 127, 128, 132
Tainter, J.A. 124
Tăutu, P. 47
Terray, E. 87, 110, 114
Tjok Joe, M. 58
Torbrügge, W. 71
Tuck, J.A. 125

Uenze, H.P. 71

Van Baal, J. 104
Van de Geer, J.P. 35, 48
Van der Leeuw, S.E. 32, 36
Van der Waals, D. 34, 38, 42, 71, 72N2
Van de Velde, P. 25N1, 25N7, 25N8, 44, 79
Van Gennep, A. 80, 95, 121, 124
Van Wouden, F.A.E. 5, 83
Verwers, G.J. 33

Waterbolk, H.T. 9, 10, 11, 12, 13, 34
Whallon, R. 122, 125, 165
Wielenga, G. 51
Wilkinson, E.M. 47
Williams, B.J. 121
Wittgenstein, L. 6, 7, 42
Wolf, E.R. 109, 140, 149

Yengoyan, A. 119N14

Zápotocká, M. 10, 12, 13, 17, 41, 42, 71, 164
Zimmermann, A. 117N4, 119N8
Zuidberg, L. 140

SUBJECT INDEX

A syn. B: 'B' entered at own locus, yet only with reference to 'A'.
A incl. B: 'A' includes 'B', whereas at locus 'B' reference to 'A' is made only.
A; *see also* B: at entry 'B' a related subject is found.

def = definition
N = note
T = table

Adaptation 37, 122
– pre-adaptation 126–127
Adoptive period 43def–46, 54–55, 57, 134–135, Figs. 8–11 (43-45)
Adzes of LBK provenience 85, 86, 87, 88, 93, 94, 95, 102, 113, 114, 118N8, 136, 153, 154; T.10, T.15–17, T.43, T.46
– markers of chronology 85–86, 93, 114, 116
– markers of masculinity 87–89, 91; T.15–17, T.47
– markers of men's societies 131
Agriculture, Primitive; see also Community Society 81, 110-111
– LBK: 125, 127-128, 132, 133
– shifting cultivation, swiddening: 126, 127
– short term fallowing: 131-132
Alliance, Systems of; see also Marriage Rules, Social Structure, and Exchange: 6, 111, 123, 128, 132, 162-163, 168, 172N5
– unilineal: 104def, 105, 107, 148, 164-167, 170
– – matrilateral: 104–105, 115, 122–123, 127, 130, 133, 139, 148–149, 150–151, 152–153, 156, 164–165, 170, 171; Figs.41(105), 52–56(146–147)
– – patrilateral: 104–105, 122, 148, 165–167, 168, 170, 171; Fig.42(105)
– bilineal: 104def, 106–107, 115, 119N10, 119N13, 133, 147–149, 152–153, 163–167, 172N5
– – uxorilocal-patrilineal: 106; Fig.43(105)
– – virilocal-matrilineal: 5–6, 106, 107, 111–112, 133, 148–149, 152–153, 165, 170; Fig.44(105)
– models: 104–106; Figs.41–44(105)
Anthropology, syn. Ethnology: 25N3, 38
– unit of analysis: 28
– related to archaeological research: 27–29, 81, 82, 87, 95, 121, 122, 125–126, 172N1
– laws in 35–36, 80
Archaeology 4, 13, 26, 29, 31, 32-38, 40N5, 45, 46, 59, 72N2, 81, 82, 110, 172N1
– and material validity 36–39, 82
– and laws 33, 35–36, 38
– recent paradigm shift 26, 37–39, 40N6, 40N7
– 'new' archaeology 32–40
– neo-marxist 108–111
– processual 26, 39
– structural 26, 39, 83, 121–122
– systemic 26, 39
– related to social research: 28, 81, 120, 124–134, 136, 172N1
Arrowheads 93, 94, 95, 98, 102, 113, 115, 117N4, 118N8, 123, 134
– markers of male graves: 87, 88–89, 91; T.15–17, T.47
– in female graves: 89, 117N4
Attribute, syn. Trait 3–4def, 7–8, 10, 11, 12, 20, 25N2, 26, 28–29, 31, 42–45, 47, 49, 50–51, 54–55, 57, 70, 73N5, 135; T.5
– 'markers' (of chronology, of kinship, etc.) 13, 32
– counting and coding 20, 21–24, 26
– expressed as percentage of variable 20, 26, 31–32, 42, 48
– weighting of 31–32, 48
– key traits 33–34
– adoptive period 43
– correlations between 46, 47–48

Bandkeramik (sensu lato); see also Social Structure, Pottery Decoration, Grossgartach, Hinkelstein, LBK, Münchshofen, Planig-Friedberg Group, Roessen, SSK, Stroke Ware Culture: 1, 12, 13def, 34–35, 39, 40N3, 44–45, 46, 111–114, 120–124
– a ceramic concept 13, 44–45
– regional variation 9, 12
– chronological variation 9, 41, 70–72, 72N1
– decorated pottery 13–20, 20–24, 25N3, 27, 70–72
– literature on social structure 120, 124–134, 170–171
– social structure 79, 120, 124–134, 136, 169–171
Bavarian Roessen, see SSK.
Bayerisches Rössen,see SSK.
Big men 87def, 95, 131, 132–133, 141, 171

Ceremonial, see Ideology.
Change, Socio-cultural; see also Continuity: 1, 43–45, 55–57, 65, 109, 134, 154, 163–164; T.69–73
– continuity and discontinuity 42–45, 55–57, 163
– 'large jump' 51def, 57
– rate of 50, 57, 163
– Elsloo vs. Hienheim 65, 163–164
Chief 87def, 95, 113, 127, 128, 132, 133, 137, 141, 152, 158, 170, 171
Chiefdoms 124
Chronocentrism and Ethnocentrism in archaeology 36–39, 93, 121, 124

Chronology; see also Dating Methods 62, 70, 85, 114; T.4–5
– relations with time 42, 46, 49, 50, 75–77, 134, 141–145
– through variation and typologies 11, 47, 48, 49–50
– 'marker' attributes 13, 32, 48–50, 57, 62
– the 'phase' concept 26, 50, 51–55, 57, 70, 72N2, 77–78, 85, 120, 130, 132, 134; T.4, T.8, T.52, T.58; Fig. 51(144)
– and distribution of finds 46, 47, 50, 51–55, 57–70, 74–77, 85, 158; T.52, T.69, T.77; Figs. 46–50 (142–143), Figs. 52–56 (146–147), Figs. 60–65 (160–165)
– and MVA 49–50, 62, 70, 73N8, 75–77, 85–86, 88, 134–135; T.76
Clan 3def, 5, 6, 119N13, 127, 128, 153–154, 168
Classification: 1, 2–7, 26, 46, 82, 85
– requirements 4, 8–9, 11–12, 31, 158
– partitioning 3–5, 8–9
– relation to theory 3, 7–8, 13
– relation to models 1, 33–34, 44
– relation to problem 3–4, 13, 14, 33–34, 44, 47, 148
– relation to empirical data 1, 13, 14, 20–24, 26, 158
– Bandkeramik pottery decoration 1, 13–20, 20–24, 85, 112; Fig. 5(18)
– – traditional 1, 7–13, 112; Fig. 2(8)
– – – a base for a paradigmatic classification 7, 13
– extensional, enumerative 3def, 7, 19
– intensional 3def, 7–8, 18–19
– efficiency 24–25, 112, 148; T.1
– non-classifiability 4, 10
– taxonomic 4–6def, 9, 11, 33–34; Fig. 1(5)
– paradigmatic 4–6def, 8, 10–11, 13; Fig. 1(5)
– polythetic and monothetic 6–7, 26
Community Society incl. egalitarian and segmentary society; see also: Primitive Agriculture, Hunters and Gatherers, Segmentation 81, 83, 86–87def, 90, 96, 108, 109, 116N1def, 121, 122, 123, 125, 127–128, 140–141, 172N1
– social differentiation 86, 87, 90, 95, 96, 121–122
– and household group 129–130, 139–141
Complementary Opposition see Segmentation and Complementary Opposition.
Confidence Intervals; see also Statistical Methods 51–55, 57, 59–60, 65, 74
Continuity; see also Discontinuity 1, 37, 41, 42def–45, 46, 47, 50, 70–71, 72N2, 126, 130, 161, 167; T.3
– models 42–45, 47, 50, 55–57, 59–60, 62, 65, 73N5; Figs. 8–11(43–45)
– and tradition 72N1
– of LBK village settlements 130
– 'pseudo continuity' 43def–45, 54, 70
Correlations 47–48, 117N3
– Q-type vs. R-type 47–48, 60
– of attributes 46, 47; T.75
– of dimensions 46

Dating methods; see also Chronology, Radiocarbon, Stratigraphy, 46–47, 73N8
– indirect 116
– TL (= thermoluminescence) 46, 47, 58
– statistical methods 46, 57–58, 73N8, 74
– compared 47–48
Decoration, Pottery 1, 40N3, 44, 93, 102, 171
– variation 1, 28, 44, 134
– geographical variation 1, 13, 161–167
– social variation 13, 122–123, 137, 148, 162–167
– diachronic variation 1, 10–12, 13, 29–30, 42, 45, 49–55, 138–139, 155–157
– statistical analyses 13–20, 28–30; Figs. 12–25(50–77); T.75–76
– observability T.1
– and research problem 28, 42, 50, 70–72, 120, 137, 171
– Bandkeramik 1, 8–13, 13–20, 25N6, 26, 40N3, 83, 137
– – slip covering 40N4
– – LBK 70–72, 138–140, 155–157; Figs. 3–5 (15–18)
– – SSK 70–72def, 155–157; Figs. 5–6(18–19)
– and hut types 141, 158–159; T.56–57, T.67–68
Demography 109, 123, 126, 131, 140, 162–163
– growth model 39, 126
– sex ratio in Elsloo graveyard 87–90, 111, 115
– age distribution in Elsloo graveyard 90–92
– and social structure 82, 109, 123, 126, 149–150, 162–163
Descent; see also Kinship Systems, Social Structure 5, 96, 104, 110, 149, 169–170
– unilineal, matri 5, 104, 133, 139, 148, 152, 169–170; Fig. 45(138), Figs. 52–56(146–147)
– unilineal, patri 5, 104, 168, 169–170, 172N2
– bilateral 119N9, 172N5
– LBK 102, 107, 115, 127–128, 130, 132, 139, 147–149, 156, 170–171, 172N5
Diffusion 37–38, 126–127
Dimension syn. Variable 3–4def, 14, 25N2, 42–44, 47–48, 65, 134
– and classification 3–4, 10–11, 13, 28
– and attributes 3–4, 13–20, 28, 31–32, 57, 148–149
– independence of 46, 57
Discontinuity; see also Continuity 41, 42–45def, 46, 50, 70, 71, 72N2, 74–78; Figs. 13–16(52–59), Figs. 23–25(76–77); T.3
– models of 42–45, 47, 51, 55–57, 59–60, 65, 73N5
– 'large jump' 51def, 72N2
Division of Labour 82, 86, 127–128, 132
– and sex 86, 87–90, 111, 114–115, 127–128, 132, 133, 139, 157, 170; T.15–17, T.43, T.47

Economy; see also Division of Labour, Infrastructure 82, 92–93, 108–111, 113, 122, 125, 127, 152, 171
– site territories 131–132
– LBK surplus production 110, 113, 126, 127, 131, 133
Egalitarian Societies see Community Society
Emic, see Etic and Emic
Erosion of sites 27, 34, 137, 155, 161
Ethnocentrism, see Chronocentrism and Ethnocentrism
Etic and Emic studies of social structures 6, 38def, 40N6, 79–80, 86, 93, 110
Evolution 72N2, 108, 116N1
– general 73N5, 122, 125–126
– specific 72N2

Exchange, see also Alliance Systems, Kinship Systems, Social Structure 96, 99–102, 107–108, 111, 122, 125, 127–128, 163–167, 170, 171, 172N1
– and trade 32, 111, 171
– 'closed' systems 102
– models 99–102; Figs. 33–37(101), Fig. 40(104)
– complex 99def, 118N8, 119N9, 136–137, 172N5; Fig. 34(101)
– asymmetrical and linear 99–100def, 103–104, 107, 108, 118N8, 126, 133, 136–137, 145, 170, 171, 172N5; Fig. 35(101)
– asymmetrical and alternating 100–102def, 118N8; Fig. 36(101)
– symmetrical 102def, 118N8, 164; Fig. 37(101)
– LBK 102–104, 107, 119N9, 125, 133, 145, 148–149, 163–167, 170, 171
Exogamy, see also Exchange, Kinship Systems 5–6, 96, 112, 126, 127, 148
– models 150; Figs 57–58(150); T.61
– exogamous units in LBK 126, 127, 148, 150, 165–167, 168
Extended Families 125, 129–130, 132, 140, 149def–150, 167, 171

Factors of Production 38, 108–110
Factor Scores see PCA
Filiation 172N2def
Finds, syn. Refuse Pits 26–29def, 31–32, 39N1, 40N4, 44, 45, 51–55; T.69, T.77
– relation to research problem 13, 26–29, 39N1, 44–45, 155
– 'closedness' 27–28, 29–30, 39N2, 45
– and 'noise' 29–30, 39N2, 40N4, 59–60
– and representativity 45, 59–60, 72N4
– chronological distribution 46, 50–55, 74–78; T.2, T.77; Fig. 17(63), Fig 22(75), Fig. 24(77), Fig. 26(85)
– relation to huts 13, 27, 45, 61, 141
– function 45
– period of use 46
– size 29–30, 31, 45, 136
Flint of Bandkeramik provenience; see also Arrowheads 85, 87, 93–94, 102, 118N8, 169; T.10
– blades, markers of male graves 87, 133–134; T.15–17, T.47
Frequency Distributions, see also Statistical Analyses 26, 28–30, 31–32
– decorated and undecorated ware on a site 28–29, 40N3, 147–149, 150–151, 168–169; Figs. 52–58(146–150)
– purposely dumped waste 29–30, 51–55
– accidentally dumped waste 29–30
– finds over time 50–55, 59–60, 75–77; T.2
– finds over space 153
– – gravegifts 96–103; Figs. 33–38(101–103), Fig 40(104)
– attributes over time 42–45, 55–57, 73N5; Figs 8–11(43–45)

'Goat foot tool' (German: Geisfüsslein) 10, 14def, 20, 32, 71; T.69, T.75–76
Graveyard Studies 80, 87, 90–91, 121, 123, 124, 136–137, 169–170
– LBK 89–92, 94, 96, 117N4, 131
Grossgartach Culture 10, 13, 41, 72
Group, Algebraic 17, 25N3, 25N6; Fig. 5(18)
Group, Social, see Household Group

Hinkelstein 12, 41, 61, 114
– chronology 119N2
Historical Materialism, see Marxism
Household Group 27, 110, 125, 127–128, 132, 149–150, 167, 171
– diachronic continuity 130, 170
– in relation to Bandkeramik finds 27, 149–150
– relations between 125, 127–128, 132, 151–152, 171
– size 129, 139–140, 149–150, 157–158
– – conversion factors 129–130, 149–150
Hunters and Gatherers 81, 110, 119N14
Hut Groups 141–145; Figs. 46–50(142–143)
Huts; see also Household Groups, Typologies (Houses) 27, 134–135, 136, 149, 171, 172
– as units of analysis 27–29, 61–62, 81
– life time 133, 150–151, 168, 171
– SSK 28, 155, 159

Ideology incl. Ceremonial, Ritual 86–87, 108–110, 121, 123, 132–133
– and the kin system 86, 112
– archaeological observability 86–87, 110, 112, 131
Infrastructure; see also Social Formation 82, 108–109, 133
– and superstructure 108–109, 125–126
– modes of production 108def–109
– factors of production 82
– relations of production 82, 86, 96, 108–111
– of Bandkeramik social formations 127–128, 154
Innovation 43, 72N2, 135, 153, 155–156; T.69–71
Invasion 38

Kin Groups see Kinship Systems
Kinship Systems; see also Alliance Systems, Descent, Social Structure 81–82, 86–87, 96def, 99–102, 121, 123, 125, 132, 162–165, 168
– change 162–167
– functions 86–87, 96, 109, 116N1, 122–123, 148–149, 153
– segments 81, 86, 110, 122, 129, 148–149, 151, 170, 172N2
– marriage classes 107, 115, 119N13, 119N14
– Crow-Omaha type 119N9, 172N5
– LBK 102–104, 106–107, 115, 133, 152–153, 162–167, 168–169, 169–171

LBK (= Linear Band Keramik Cultures); see also Bandkeramik 28, 41, 44–46, 61, 124–134
– social structure 102–104, 106–108, 115, 124–134, 137–154, 154–169, 169–171
– lineages 128, 132, 151–153, 154, 159, 161
– settlement types 130, 145, 160–161, 168, 172, 172N4
– expansion 73N5, 126–127
– ending in Holland 114, 116, 119N12
– ending in Bavaria 1, 41, 70–72, 74–78
Limburg Group, Limburg Ware 153

Lineages, see Kinship Systems-segments, and Modes of Production

Marriage Rules; see also Alliance Systems
– cross-cousin marriages 103–104
– – matrilateral 103–104, Figs. 41–44(105)
– in LBK 103–104, 112
Marxism syn. Historical Materialism 83–84, 108–111, 125, 127–128, 134, 170
Matriliny, see Descent
Men's Clubs 131, 132–133
Mesolithic 73N5, 126–127
– in Bavaria 73N5
Methodology 2, 32–39, 61, 72N2, 120, 134–137, 169, 171–172
Mix 3def, 30–32, 42def, 47, 59–60, 73N7; Fig. 9(43), Fig. 11(45), Figs. 57–58(150); T.61
– evolution of 51, 57, 65, 72N4, 73N7, 148, 150, 163–164; Fig. 9(43), Fig. 11(45)
Modes of Production; see also Social Formation 83–84def, 108–111, 128, 133–134, 149–150, 153–154, 168, 169
– dominance 108–109, 116, 128, 133–134, 154, 169, 170
Models 1, 34, 36, 39, 42–45, 47, 55def
– and theory 36
– and explanation 55
– operationalization and empiry 44, 136–137
– validation 61–62, 71
– 'participants'' vs. 'observer's' 79def–80, 86
– 'mechanical' vs. 'statistical' 79def–80, 107, 108, 136
– of (dis)continuity 42–45, 46, 55–58, 60, 71, 73N5
– of exogamy 150; Figs. 57–58 (150); T. 61
– of chronological distribution of finds 50, 57, 73N8
– of population change 39, 73N5
Moieties; see also Kinship Systems 112, 115
– in the LBK 103, 107, 115, 133
Muenchshoefen (Münchshöfen) 13
Multiple Regression Analysis; see also Statistical Analyses 73N8, 77–78, 134; Fig. 24(77)
Multivariate Analyses ('MVA'); see also PCA, Multiple Regression Analysis 47–48
– canonical analysis 58; T.6
'*Music Notes*' (German 'Notenköpfe') 17def, 22
– differentiated from AUXILIARY LINES 17
MVA, see Multivariate Analyses

Neolithic 82, 86, 90, 110–111, 116N1, 121–122
– European Early 41, 49, 61, 119N12, 119N14, 127, 128, 130
– European Middle 41, 49, 164
– ethnographic textbooks on – social structure 116N1
Neolithization 73N5, 123, 126–127
Noise in data, Statistical 27, 28–30def, 39N2, 48, 59–60, 167
– statistical definition 28–30, 117N4
– treatment in literature 28–30
– Hienheim 30, 40N4, 167; Fig. 7(30)
– Elsloo 62
– Elsloo Graveyard 117N4
'*Notenköpfe*', see 'Music Notes'

Operationalization
– continuity 44–45, 130
– sexes 87–90, 111, 115, 119N11; Fig. 27(90); T.46
– ranking 92–95, 112, 131, 139–141
– household types 140, 149–150
– kinship 99–102, 104–106, 112, 122–123, 136, 147–148, 163–168, 172N5
– modes of production 111–114
– social change 134–135

Patriliny, see Descent
Patrilocality, see Virilocality
PCA (= Principal Components Analysis); see also Statistical Analyses 47, 48–50, 57, 60, 87–89, 114, 117N3
– selection of variables 47, 48–50, 62, 74, 134–135
– definition of components 48–49
– selection criteria for components 48–49, 135, T.76
– independence of components 49, 135
– identification of components 48–49, 135–136
– general, specific, bipolar components 49, 87, 112, 117N3def
– noise in 48, 135
– factor loadings 48–49def, 135; T.10, T.77
– factor scores 49, 72N3def, 117N3, 134
– rotation 73N8, 135
– compared with canonical analysis 58; T.6
– compared with multiple regression analysis 73N8; Fig. 24(77)
Peasantry 110–111
Phase, Chronological, see Chronology
Pilot study
– chronology 48–50, 62, 70
– social structure 80, 133, 169
Planig-Friedberg Group 17
Population Size
– in Community Society 82
– Cook's Principle 73N5
– in Bandkeramik society 129
– – and site territory 131–132
– estimated from Elsloo Graveyard 92, 119N14, 129
– estimated from Elsloo Village 119N14, 129, 140, 145, 149–150
– estimated from Hienheim Village 159, 162–163, 167–168
Positional Paradigm, see Status
Pottery, Undecorated 28, 40N3, 87, 92–93, 94, 118N8
– a marker of male graves 88, 89, 91; T.15–17, T.47
– in female graves 89
Principal Components Analysis, see PCA

Querns of Bandkeramik provenience 85, 88, 93–94, 102, 118N8
– markers of feminity 88–89; T.15–17, T.47

Radiocarbon dating; see also Dating Methods
– Hienheim 46, 58, 74, 75, 134; Fig. 16(59), Fig. 25(77); T.78
– – a test for chronological sequencing 58, 75
– Elsloo 134
Ranking; see also Status 81, 86def, 92–96, 121, 127, 132, 139–141, 157–158

– and wealth 81, 92–95, 112–113, 116, 121, 127, 129, 131, 132
– in LBK society 92–96, 112–113, 116, 139–141, 157–158, 170; T.22–26, T.41–42
– of settlements 82, 127, 128, 155
Ranking Society 82, 86–87def, 94, 112, 116N1, 122
Red Ochre 85, 93–94, 95, 102, 118N8
– a marker of femininity 88–89, 95; T.15–17, T.47
– in male graves 89
Refuse pits, see Finds
Relational Paradigm 81–82, 122, 124
– and positional paradigm 81–82
– and structuralist paradigm 82–83
Relevance 2–3, 33, 35, 47
– and validity 25, 47
– of classification 3, 4–5
Reliability 24–25def, 35, 45–46, 47, 48, 49–50, 57–58, 108
Representativity 28, 34–35, 45, 136
– and sample size 26, 28, 72N4
– and sample distributions 28, 59–60
Residence Rules; see also Kinship Systems 104, 106, 125, 148–149, 165–168, 170
– uxorilocal 122, 165–168
– virilocal 5, 114, 116, 133, 148–149, 150, 152–153, 165–168, 170–171
– bilocal 126
– neolocal 119N9
– and extended families 149–150, 171
Ritual, see Ideology
Roessen (Rössen) Culture 10, 13, 71
Roessen, Bavarian (Bayerisches Rössen), see SSK

šarka Phase, see Stroke Ware Culture
SBK, see Stroke Ware Culture
Segmental Society, see Community Society
Segmentation and Complementary Opposition 124def
– filiation 130, 172N2def
– fissioning 126def, 131
Seriation, see Dating Methods
Settlement Analysis, Between 82, 122, 124, 125–127, 131, 133, 153–154, 165–167, 168–169, 170, 171–172
– Within 82, 122–124, 127–128, 130, 141–145, 149–150, 151, 157–162, 165–167, 168, 170, 172N4; T.58, T.59, T.63; Fig. 51(144), Fig. 66(166)
Settlement Relocation, see 'Wanderbauern'
Similarity and Dissimilarity as measures of variation 26, 28, 46–47, 50
'*Smoothing*' of distributions 50–51def, 55, 73N6
– formula 51
Social Formation; see also Infrastructure, Superstructure, Modes of Production, Social Structure 82, 83–84def, 108–111, 127–128, 133
– relations of Infra- and Superstructures 3–4, 83–84, 108, 133
– dominance of Mode of Production 108–109
Social Structure; see also Alliance Systems, Descent, Kinship Systems, Social Formation 80–84, 116N2, 120–124, 136, 172N5
– perceptability in the archaeological record 80, 134, 136
Specialization; see also Division of Labour 83, 127, 141, 170
– in neolithic technology 82, 111
– heredity of 113, 154
– in Elsloo Graveyard 95, 111, 113, 115, 133–134; T.43, T.50
– in Elsloo Village 141, 154
– in Hienheim 158, 169
SSK (= Stich-Strich Komplex; formerly Bavarian Roessen) 1, 10, 12, 41, 70–72, 73N5, 74–78, 155
– social structure 160–169, 169–172
– ceramics 70–72def, 167–168
– relations with LBK 1, 41, 46, 70–72, 74–76, 161–162
– relations with SBK 12, 71
– diachronical variation 10, 41, 46, 72N1, 73N9, 165–168
– Munzinger Type 41
– Unterislinger Type 10, 41, 71, 73N9
– Oberlauterbach Type 10, 41, 71, 73N9
Statistical Analyses; see also; Confidence Intervals, Frequency Distributions, Multiple Regression Analysis, Noise, PCA, and Representativity 29–30, 34–35, 46–47, 150
– requirements for 31–32, 34–35
– units of 26–29, 46
– sampling level 28, 30, 34–35
– and data base 13, 26, 29–30, 31–32, 34–35, 135, 150
– missing data 15, 20, 26, 72N3, 135
– nearest neighbours 111, 114–115, 119N11, 145; T.38
Status; see also Ranking, Specialization 79, 86–96
– 'positional' paradigm 79, 81, 86–87, 133, 169–170
– and relational paradigm 81–82, 121
– network 82, 86, 124
– hierarchy 81, 112, 121, 124, 131, 158
– 'emic' & 'etic' 86
– differentiation 81, 86def, 121, 133, 169–170
–, – sex 81, 87, 91, 94, 121, 131, 133, 139, 152–153, 169–170
– archaelogical observability 80–81, 92–95, 125
Stratification 86def, 124, 125–126, 127, 131
– LBK 94, 133–134, 139–141, 158, 170, 171
Stratified Societies 83, 86def, 116N1, 122, 124, 125–126
Stratigraphy; see also Dating Methods 46–47
– Hienheim 46–47, 58–61, 74
Stroke Ware Culture, syn. SBK 9, 12, 41, 71
– relations with SSK 41, 71
Structuralism; see also Models, Social Structure 82, 96
– paradigm 81–83, 119N9, 133
– in archaeology 82
Superstructure, see Ideology, Social Formation
Systems Theory 37–38, 39–40, 125

Taxonomy, see Classification
Taxonomy, Numerical 7
Theory 2–3, 28, 32–38, 80, 127
– laws 33–36, 83
Trait, see Attribute
Typologies of Decorated Ware, see Classification Bandkeramik traditional

Typologies of Bandkeramik *houses* 9, 157–159, 168, 172, 172N3 def, 172N6; T.54–57, T.62, T.74
– functional 129–130, 132, 139–141, 151, 171; T.62
– type 1 130–138, 140–141, 151, 152, 155, 157–159, 168, 171, 172N3def; T.54–57, T.62–63

Uxorilocality, (syn. matrilocality) see Residence Rules

Validity 25def, 32–39, 45, 47, 48, 55–57, 70, 75
Variable, see Dimension
Virilocality, (syn. patrilocality) see Residence Rules

'*Wanderbauern*' (= migrant, or normadic agriculturalists) 96, 126, 130, 131, 132