

Spil

Overdruk uit :

oudheidkundige mededelingen
uit het Rijksmuseum van Oudheden te Leiden

LVII 1976

LOCAL DEVELOPMENTS IN A BORDERLAND
A SURVEY OF THE NEOLITHIC AT THE LOWER RHINE

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LOCAL DEVELOPMENTS IN A BORDERLAND

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Throughout the Neolithic the Lower Rhine District is essentially situated between three major spheres of cultural development :

- *A central sphere, centred on the Rhine and documented in the Valleys of the German mountaneous zone with a development : Bandkeramik – Rössen – Michelsberg (– Wartberg).*
- *A western sphere in the Paris Basin and adjacent Belgium, where influences from the Rhineland and from the south interacted, with a sequence : (local) Bandkeramik – Cerny – Chasséen – S.O.M. In the centuries around 3000 b.c. we may include the Early Neolithic in the eastern part of the British Isles in this sphere.*
- *A northern sphere, covering the North German Plain and the Danish Isles with the sequence Ertebølle (– Michelsberg) – TRB; the first originating from a lengthy interaction between the indigenous Late Mesolithic and the Rhenish cultures; the second with more (south-) easterly links and intrusive elements.*
- *In the Rhine/Meuse delta and its immediate surroundings, in between these three major spheres smaller, more or less independent units came into existence. But beside distinct local stamps cultural relationships to each of the major spheres may be reflected. The discussion concentrates on the recently discovered domestic assemblages, that document these units.*

CONTENTS

Introduction,	229	The Rhine/Meuse delta,	253
Mesolithic,	233	Swifterbant,	253
Neolithic,	234	Hazendonk-1,	255
Phase A, c 4500-4000 b c ,	234	Bergschenhoek,	259
<i>Linearbandkeramik</i> ,	234	Conclusion,	260
Contacts with Younger Oldesloe,	235	Phase D, 3250-2700 b c ,	260
Limburg Pottery,	238	The southern sequence later Michelsberg	
The end of the <i>Linearbandkeramik</i> ,	239	and Chasséen,	260
Phase B, 4000-3500 b c ,	241	The northern sequence Early TRB,	261
Großgartach, Rossen, Bischheim,	241	The Rhine/Meuse delta,	263
Ertebølle/Ellerbek,	244	Hazendonk-2,	263
Subsistence economy,	246	Hazendonk-3,	267
Phase C, 3300-3250 b c ,	247	Het Vormer, Wijchen,	271
Michelsberg (I-III),	247	Conclusion,	272
Belgian Michelsberg and the flint mines,	249	Phase E, 2700-2450 b c ,	273
Michelsberg in the North,	252	<i>Tiefstich</i> TRB,	273

Rheinland and Limburg,	275	“Classical” Vlaardingen,	283
Seine-Oise-Marne,	278	Vlaardingen-1b,	284
Initial Vlaardingen,	279	Vlaardingen-2a, b,	286
Phase F, 2450-2150 b.c.,	283	Settlement and subsistence economy,	289
TRB and PFB,	283	The start of Phase G, 2150-1700 b.c.,	290

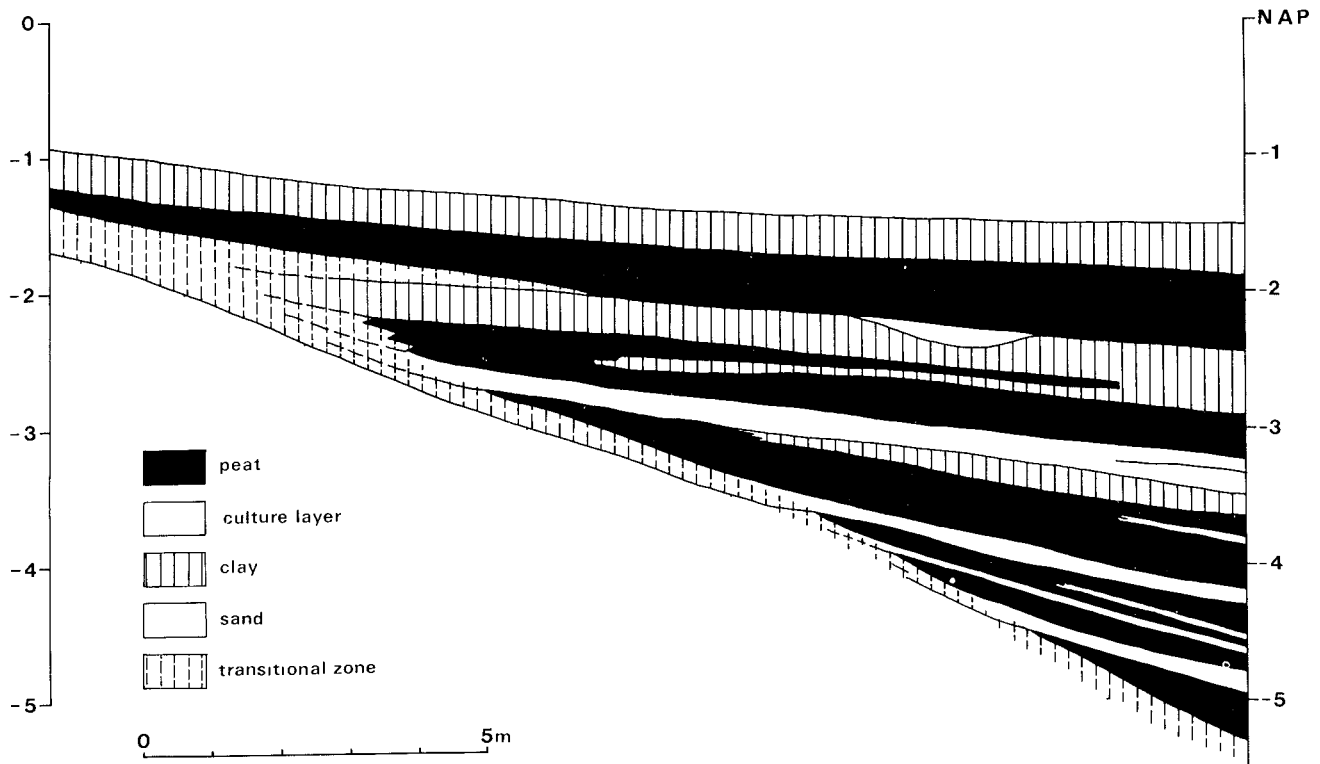



Fig 1 Hazendonk, simplified cross-section through the deposits that cover the donk slope in trench 8 and its extensions. This is the most complete stratigraphy on one point at the site. Missing culture levels (VL 2^{b1&2}) are projected from other sections. Height exaggerated 2x.

INTRODUCTION

The paper presented here, is in fact the second part of my contribution to the 4th Atlantic Colloquium in Ghent. The first part appeared in the Acts of the Colloquium¹. In these Acts a chronological scheme of the Northwest-European Neolithic, based on ¹⁴C-



phase	age	depth	pollen	affinities, remarks
12th cent. A.D.			7	
Late Bell Beaker	1800-1700	-1.90	5	Molenaarsgraaf
Vlaardingen-2b (2)	1900		-	
Vlaardingen-2b (1)	2100	-2.10	-	Late PF & AOO Beakers, Voorschoten 2b
Vlaardingen-1b	2500-2400	-2.55	4	Drouwen C/D, Voorschoten 1
Vlaardingen-1a	2700	(-3.00)	-	
Hazendonk-3	3000	-3.50	3	Het Vormer, Cuyk
		(-3.65)		
Hazendonk-2 (a,b)	3200	-3.80	-	Belgian MK, Grimston-Lyles Hill bowls
Hazendonk-1	3400	-4.35	2	Swifterbant, Boberg 15
Hazendonk-0	c. 3700	-5.10	1	old surface(s) in borings
Mesolithic	c. 4500	c.-8.	-	old surfaces in boring

Fig. 2. Hazendonk, stratigraphic column, similar to the extreme right part of fig. 1, with archaeological comments.

phase: names attributed to the archaeological remains found in the various levels.

age: uncalibrated ¹⁴C-dates in years b.c., based on the five published determinations (Louwe Kooijmans 1974, 140) and interpolations.

depth: depths of "juncture points" of the surfaces where they make contact with the sandy donk-slope, measured in cms below N.A.P. (Dutch O.D.). These values are 50 ± 20 cms above the contemporaneous Mean-Sea-Levels (cf. Louwe Kooijmans 1976a 134f.).

pollen: pollen zone, distinguished in the pollendiagram Hazendonk-I (Louwe Kooijmans 1974, fig. 39).

affinities,

remarks: foreign elements found in the levels, sites with similar pottery, related pottery styles/cultures.

¹ Louwe Kooijmans 1976.

dates, is presented, a division in 8 phases is proposed and maps of six of them are drawn. The text gives a description of some lines of reasoning followed in the construction of maps and scheme.

Here the description of the contents of each phase is given: the "Cultures", the evidence with which they are constructed and their interrelationships. This was planned to be a general survey, an entrance to the rather widely spread literature with an accent on a series of recently discovered find groups.

This survey was started to obtain the necessary background information for the Neolithic assemblages uncovered during the excavation on the Hazendonk near Molenaarsgraaf (province of South Holland), lead by the author in three campaigns (1974-1976). Domestic refuse from at least seven successive occupation phases, dated from 3400 b.c. up till 1800 b.c., was found there in stratification and separated by sterile peat deposits. Because of the wet conditions organic material from five stages was also preserved in some quantities: animal refuse, a number of bone tools and a modest number of wooden objects were found. Large quantities of the refuse layers were sieved in a big sieve with various meshes, with the aid of the water produced by the pumping system. The sieving added many small bones of birds and fish (esp. numerous vertebrae) to the find material. At least the

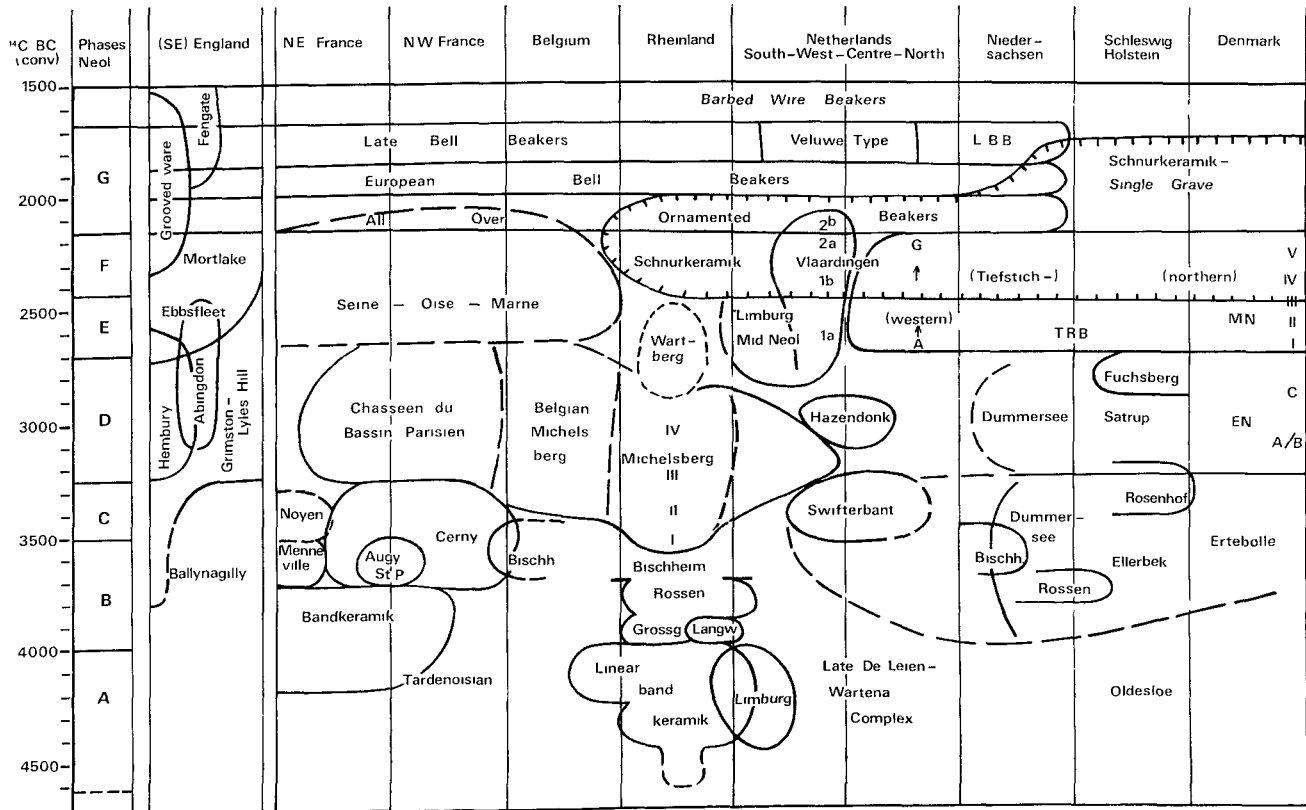


Fig 3 Chrono-geographical scheme of the Neolithic in the Lower Rhine District and its surroundings According to Louwe Kooijmans 1976, with some modifications, necessary after the 1976 Hazendonk-campaign

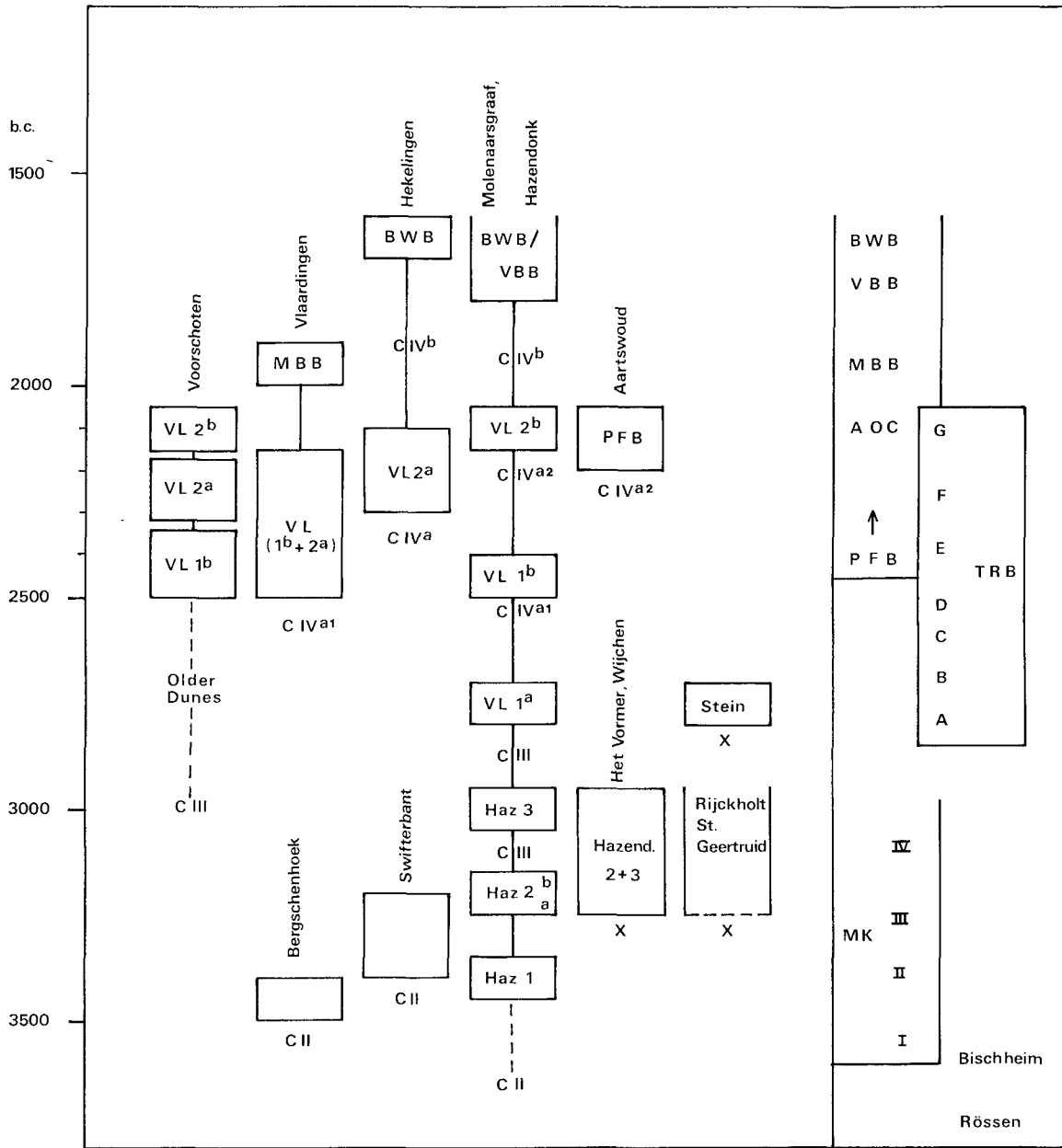


Fig. 4. Graphical representation of the most important Neolithic sites in the Rhine/Meuse delta and their relationships to the sequence of Calais transgression phases (C II-IV^b). The chronological positions of the squares are based on direct ¹⁴C-dates or typological relationships (viz. Aartswoud, Voorschoten). At the right the chronological position of MK and TRB and their phases and of the various beaker types. The scale is in conventional ¹⁴C-dates b.c.



Fig 5 Map of the Netherlands and surroundings with the sites mentioned in this paper Scale 1 2 million Pre-Holocene deposits are dotted, the Holocene sedimentation areas are left blank Brook valleys and peat bogs above sea level are left out of consideration Boundary according to the Geomorphological Map of the Netherlands 1 600 000, sheet III-1 of the Atlas of the Netherlands, The Hague 1963

sheat-fish, sturgeon, pike, perch, roach and eel could be identified during a cursory examination. Hazelnuts, charred apples and charred grain were found. Together with the cereal-pollen grain cultivation on the small dune top is well-established in various phases. But the yield must have been very modest, in view of the lack of space, and can only have had additional significance. It will be possible to get a picture of the material, economic and environmental changes over a period of about 16 centuries. The picture of the Dutch Neolithic has been enriched so considerably by these and other discoveries, that an up-to-date general survey seemed necessary to place the new finds in their appropriate contexts.

A preliminary report on the Hazendonk excavation is planned to appear in the next volume of the *Oudheidkundige Mededelingen*. In this stage of research it was only possible to discuss the pottery of the various phases, the major cultural guide fossil, at any length.

MESOLITHIC

In the Mesolithic the Lower Rhine Basin did not yet exist as a geographical landscape. The region just formed a part of the wide North European Plain, together with the "North Sea Land", that gradually became drowned².

In the Boreal two major Mesolithic "provinces" can be clearly lined out³: the "North-West *Kreis*", north of the Overijssel Vecht and east of the Rhine, and the "Rhine Basin *Kreis*" in Gelderland, Overijssel and S.(W.) of the Rhine. The last is characterized by the presence of Wommersom Quartzite as raw material and the occurrence of surface-retouched microliths, *feuilles de gui*, and various leaf-shaped points; these are all elements missing in the N.W. *Kreis*. Other differences are less conspicuous and mainly of a quantitative character⁴. Of a third group situated in the then drowning "North Sea Land", and perhaps differing from both mentioned above, only the bone industry is accidentally known by some dredged-up implements. They show a close relationship with the Danish Maglemose bone industry. The bone implements from the present Dutch territory and from the Scheldt valley suggest that this was probably a general characteristic of the Boreal Mesolithic in the whole area⁵.

The Atlantic Mesolithic has got more body during the last years by the work of Newell⁶. First named after the site De Leien then "Western Oldesloe" and now "De Leien-Wartena Complex" it differs mainly from the foregoing industries by the very rare occurrence of some new types of points (viz. the "Maglemose lanceolate" and the Svaerdborg point), the small number of backed blades, but mainly by the occurrence of the tranchet axes, all "northern" elements. The appearance of this new flint assemblage can well be explained as the result of the appearance of Mesolithic communities, that were driven away from

² Louwe Kooijmans 1970/71, esp 66-7, with references

³ We will follow here Newell. The older classification by Bohmers (1956) in five pre-Atlantic groups agrees partly with that by Newell

⁴ Newell 1973, esp 406-7, with references to his unpublished Ph D thesis, London

⁵ Louwe Kooijmans 1970/71. The series of barbed-points from Europoort has now grown up to 12 specimens, most of them very small, like no 16a. This gives the total assemblage a miniaturistic and more original appearance

⁶ Newell 1971, 15-6, 1970b

the "North Sea Land", because of the rising sealevel and the quick extension of the sea⁷. In view of the "northern" bone industry of their forerunners, the northern character of these Atlantic flint assemblages needs no surprise. The preference for a wet environment fits also well in this supposition. The distribution map has marked concentrations in the eastern part of Friesland and in Middle Limburg. These might, however, partly be the result of the intensity of the prospectings. Until now no settlements were discovered in the Holocene district.

The De Leien-Wartena Complex is ¹⁴C-dated between 5900 and 4800 b.c., but it is assumed that it lasted many centuries longer and perhaps ended only with the introduction of a (semi-) Neolithic way of life⁸.

The find-places are markedly more extensive than those from the Boreal. This might reflect bigger encampments and/or a more sessile way of life⁹. In addition to these "maintenance camps" smaller "extraction camps" are known. They have a poorer and less uniform artifact assemblage and are considered to be short-lived supporting-points of activities that took place far from the main camps, for instance, during hunting or fishing. If these suppositions are true, this would be a favourable situation for the adaption of one or more Neolithic traits from the fully Neolithic invaders who were about to come.

NEOLITHIC

PHASE A, c. 4500-4000 b.c.

Linearbandkeramik

The *Linearbandkeramik* (LBK) in its north-western extension is very well known by the large scale excavations of Modderman and others and by the gigantic Aldenhovener Platte project¹⁰. A lengthy discussion in this context does not seem very appropriate. We will only mention some elements that are of relevance for this sketch of the occupation history of this region.

The primary phase of the LBK colonization (the "ältesten LBK") does not extend farther than the Lower Main with possibly a relatively late outlier at Meckenheim near Bonn¹¹. We think it is advisable to reserve a separate sub-phase A1 for this initial LBK

⁷ Newell 1973, esp. 407-8, graphs 2, 3.

⁸ Newell 1973, graph 4. In Schleswig Holstein Younger Oldesloe complexes seem to be dated up to 4000-3800 B.C. (Newell 1971, 17).

⁹ Newell 1973, 400-9, graphs 1, 6. The one type measures 1750-2500 m², the other 250-1000 m². Terminology on 408. Extraction camps measure less than 40 m².

¹⁰ In the Netherlands: Bursch 1937, Beckers & Beckers 1940, Modderman 1958a and other articles in the same volume, Waterbolk 1958, Modderman 1970, 1972. In Belgium: Roossens 1962. In Germany: Butler & Haberey 1936, Schietzel 1965, Faruggia et al. 1973, Dohrn-Ihmig 1974, Aldenh. Platte I-V, 1971/75.

¹⁴C-dates: Modderman 1970, 200, Abb. 17, ranging c. 4450-4050, not very consistent with the phasing; further Faruggia et al. 1973, 100.

¹¹ Quitta 1960, Sielmann 1972, esp. 43, Meier Arendt 1972b. Modderman 1970, 195. Two ¹⁴C-dates from Eitzum for this phase in Behrens 1973 with other *Bandkeramik* dates of the Mittelbe-Saale district:

and to bring the main LBK in a next phase A2. First the duration of the *altesten* LBK is unknown. Second, other equally old cultures (esp. Cardial ware) can more easily get a place in the system. Third, the start of the main LBK (the *alteren* LBK, Flomborn group) seems to be a good synchronic event all over the area.

The Lower Rhine District was reached in the following phase and only during the later LBK the eastern part of Belgium and, finally, also the Paris Basin were colonized¹².

In the choice of terrain there is a strong preference for loess-soils, for the presence of water in the direct vicinity and for a flat or gently sloping terrain. An ideal position for the settlement seemed to have been a site with a well-drained soil and in between a good biotope for animal husbandry (valley bottoms) and crop farming (hill slopes). The natural vegetation might have been a guide in this choice. It is a landscape that, in view of the lack of finds, was not attractive to the Mesolithic people, and it seems unreasonable to assume that from the colonization in this stage any serious conflict with an indigenous population could arise¹³.

Since Modderman demonstrated¹⁴ that we only can say no to a hypothetical *Wanderbauerntum*, the LBK safely can be considered as the reflection of settled farmers communities. In this area the bone-spectrum of Muddersheim and the relative abundance of flint arrowheads might indicate a greater hunting activity in comparison to other LBK groups, but animal husbandry stayed prominent¹⁵. Sielmann¹⁶ argued very ingeniously that the increase of bones in refuse pits, where LBK, Rossen and Michelsberg settlements are considered, point to an increasing importance of animal husbandry over that of crop cultivation. So initially crop cultivation will have been relatively important. One may ask, however, whether the different structures of the settlements and the different positions, forms, original uses etc. of the pits might be another possible cause of this phenomenon.

Contacts with Younger Oldesloe

In two different ways, the one more convincing than the other, contacts between the *Bandkeramik* farmers on the loess and the indigenous population on the sand north of it, could be established recently.

Bln 51 - 4360 ± 200 b c

H 1487/985 4530 ± 210 b c

Meckenheim Dohrn-Ihmig 1974, 120

¹² New true *Bandkeramik* sites along the Aisne. Curry Les Chaudardes, Pernant-Cys la Commune, Bailloud 1976, Centre de Recherche etc. 1972/'73

¹³ Modderman 1958b, 1970, 202f, Sielmann 1972, Kuper et al. 1974. Distribution maps esp. Modderman 1970, Tafel 1, Dohrn-Ihmig 1974b, Bild 19, 20

¹⁴ Modderman 1971, 1970, 208f. The critic of Berlekamp (1975) does not seem justified and not undermining Modderman's arguments.

¹⁵ Stampfli in Schuetzel 1965, 115-23. 156 bones of domestic animals (104 cattle) against 64 of wild animals (33 Aurochs, 16 Aurochs (?)) against more than 90% domestic animal bones elsewhere (Clason 1968, Muller 1964). Clason (1972, 149) states that the difference is actually the result of a different Aurochs-Cattle division line. We cannot say anything about the relative importance of animal husbandry and crop farming. About the *Bandkeramik* crops in this area: Willerding 1970, Knorz 1967, 1972, 1974, in Farruggia et al., 1973.

¹⁶ Sielmann 1971

Newell¹⁷ studied the similarities between the latest Mesolithic flint assemblages and the LBK flint industry. It is possible to separate on typological grounds a "Younger Oldesloe" group from the main De Leien-Wartena Complex¹⁸; there are, however, no ¹⁴C-dates available yet to confirm its chronological position. Newell states that the thesis of Bruijn and Bohmers, "that the *Bandkeramik* flint in Western Europe arrived at its prime, because in this region much flint (of very good quality (L.K.)) was directly available", is no longer tenable and cannot be cited as the causative one¹⁹. His study leads him to say that "it can be stated without equivocation that the Limburg industry originated and developed in the Meuse Valley due to functional contact with the local Younger Oldesloe Culture". And "that this contact manifests itself first and most apparently in the *Bandkeramik* flint industry". The economy should have been changed too by these influences: hunting became more important. These "sweeping changes" could not be the result of "some floating contact", but "the range and scope of the cultural re-orientation must indicate a high degree of functional acculturation"²⁰.

However, we think that the base for such a pertinent statement is not sound enough, and we would prefer a more moderate point of view. The similarities of the Younger Oldesloe complexes and the *Bandkeramik* flint are not very conspicuous. In Newell's way of representation 70-40% for the Early LBK and only 55-32% for the later phase²¹. Moreover, the most characteristic Younger Oldesloe types as microlithic points and backed blades are lacking in LBK context. They occur only very scarcely in non-closed association. The tranchet axes from LBK sites are, to say the less of them, very clumsily made and atypical in comparison to the Younger Oldesloe specimens.

In reverse, the *Bandkeramik* has its own type(s) of points and its big blade knives are missing in the Younger Oldesloe. The sickle knives must also be a true LBK element. The development of the LBK flint industry from period I to period II is a technical improvement in favour of the blade technique over flaking, and with more carefully made scrapers. This can be explained without effort by the revival of the technical capacities because of the good quality of the available flint. That the various available types of flint were used in both industries seems a commonplace: what else should one use? The same is true for the similarities in the primary techniques. Gulpen flint might have been won, already in this time, in open quarries²², but probably surface flint will have been available in sufficient quantities. As mentioned above, in the western LBK hunting perhaps was of more importance than in other LBK groups. But we would not call the differences "sweeping". In the other elements of the *Bandkeramik* Culture (pottery, stone industries, houses for instance) no possible Late Mesolithic influences are recognized.

The conclusion must be that contacts with the Younger Oldesloe Culture may have

¹⁷ Newell 1970a, 1971.

¹⁸ Newell 1971, 17.

¹⁹ Newell 1970a, 146.

²⁰ Newell 1970a, 176.

²¹ Newell 1970a, 173.

²² We must take into account that traces of the earliest flint mining will have been largely destroyed during the later activities, certainly when the work took place in open quarries. There is, however, still no proof of so early a mining from the mines themselves.

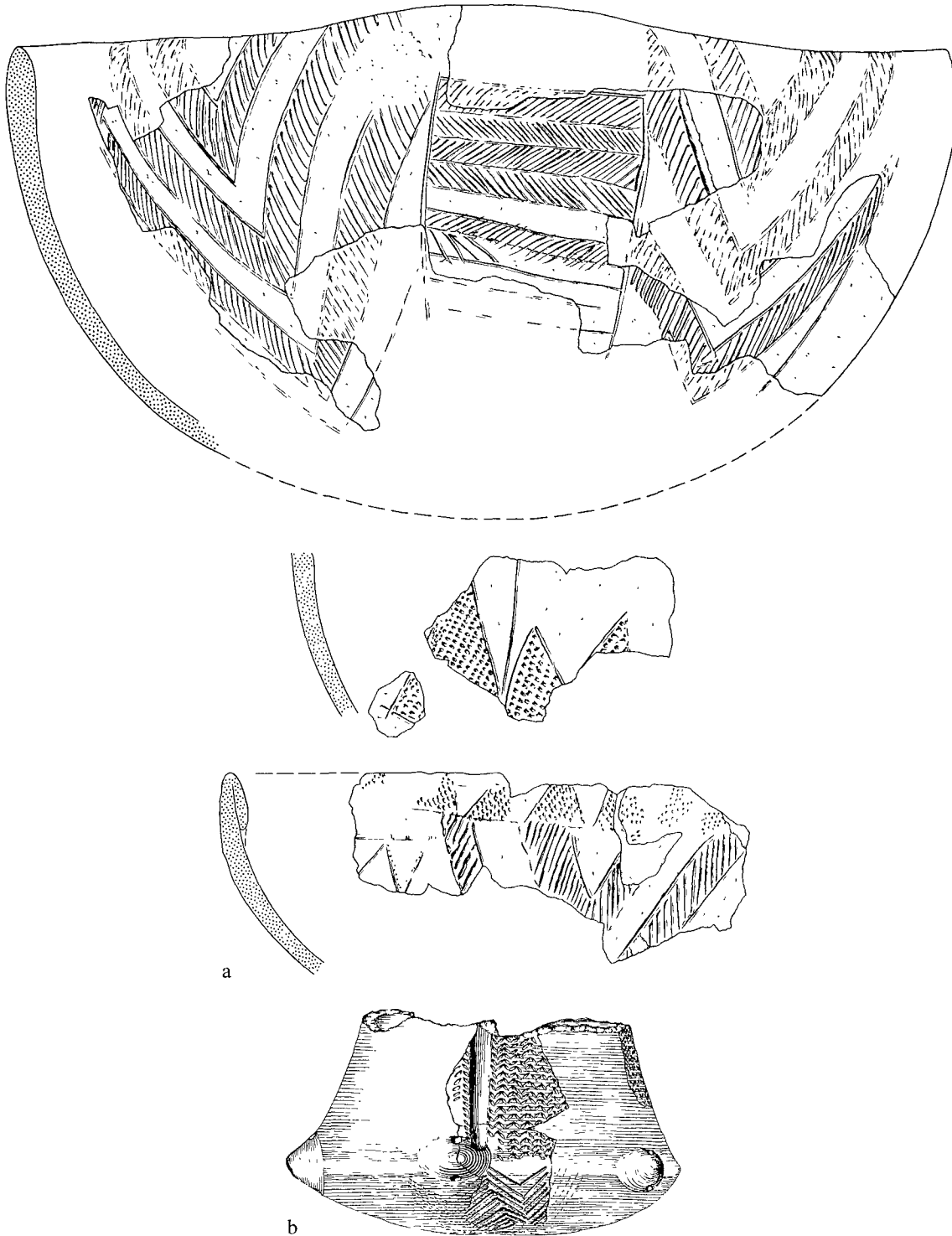
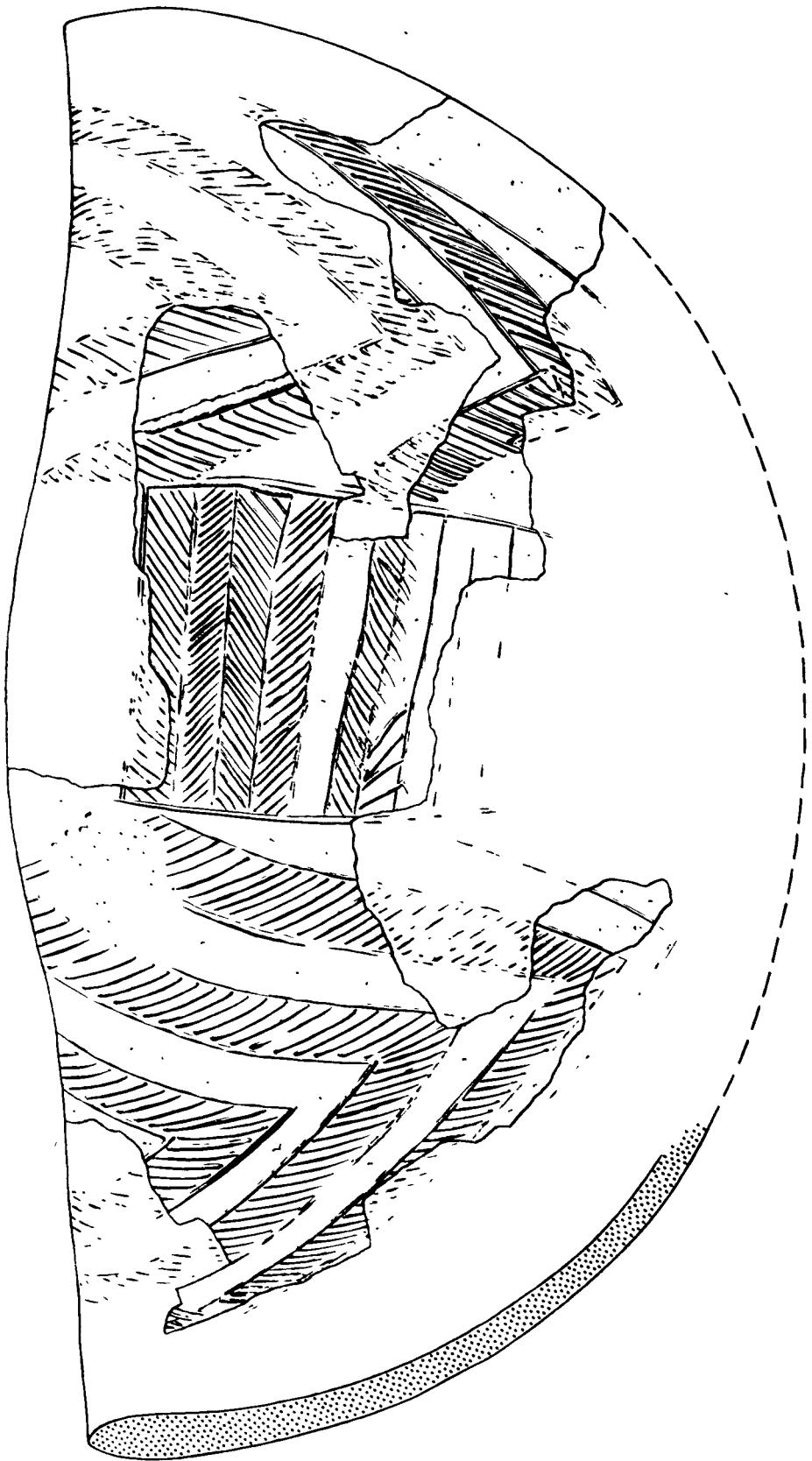


Fig. 6. Limburg Pottery, a) Kesseleyk, after Modderman 1974. b) Stein, after Meier-Arendt 1975, fig. 24, Scale 1:3.



played a role in the flowering of the LBK flint industry, as well as the good quality of the flint, but that these influences were of a character more modest than suggested by Newell and that there is no proof of any "cultural re-orientation" in the *Linearbandkeramik*. That there really existed contacts and that there were influences in the reverse direction is proved by the existence of the Limburg Pottery.

Limburg Pottery

Recently Modderman reconsidered the *Importgruppe I* of Köln-Lindenthal and presented it as a regional group in Limburg and Rheinland under the name of "Limburg Pottery"²³. In technical respect (a.o. by its tempering with organic material) it is different from that of the *Linearbandkeramik*, but its forms and especially its decoration seem to be inspired by it. Limburg pottery occurs as a rare element in most of the large excavated sites, in Köln-Lindenthal only in a relatively late context, but in Limburg in the earliest phases as well²⁴. The independent occurrence of this pottery on a site near Kesseleyk²⁵ (on the Middle Limburg sands) is very important. It proves that it is an element of a separate pottery-using culture in that region. Unfortunately no other material or soil traces were associated with it. It is generally accepted that it represents the first Neolithization of an indigenous Mesolithic group, which hardly can be another than the Younger Oldesloe or a direct successor of it. Until now no proof of the adoption of more Neolithic elements could be established. At any rate the influence of the *Bandkeramik* occupation did not reach far beyond the area of settlement proper. Only a few adzes have been found along the Meuse, the northern-most at Nijmegen²⁶.

²³ Modderman 1970, 141 with references. The published sherds certainly belong to pit-filling assemblages, some of them from the earliest LBK-phases (cf. Meier-Arendt 1972, Modderman 1974, note 24). Additional references: Buttler 1932, Bursch 1937, Meier-Arendt 1969a, 1972c, Stehl in Farruggia et al. 1973, 84, Hinz 1974, 195-7, Taf. 3, 1, Bloemers 1971/72, 13-5. Meier-Arendt (1975, 109-10) gave recently good arguments to attribute the well-known "Hinkelstein-pot" from Stein, pit 56, to the "Limburg pottery". Doing so, the Hinkelstein influences are not documented farther north than the outlying find at Köln-Lindenthal.

²⁴ Modderman (1970, 142) mentions a number of differences between the older and the younger Limburg Pottery. The exclusive occurrence of the older ware in Limburg and the absence in the neighbouring Rheinland suggests a Limburg origin.

²⁵ Modderman 1974a. The wide bowl with the wavy rim has its counterparts in some bowls from Worms-Rheingewann, grave IV, dated around the LBK/Hinkelstein boundary (Meier-Arendt 1969b, Abb. 5, 2-3). This is in slight disagreement with the relatively early dating for typological reasons by Modderman.

²⁶ Hulst 1970, 27. Other adzes are in the collection of the Nat. Mus. of Antiquities, Leiden from Caberg, Montfort, Hout, Tegelen and Venlo. North of the LBK settlements these adzes are thinly spread. Only in the Münster Basin a considerable number of the various types has been found. North of the Teutoburger Wald only three high or rather high adzes are mentioned from the Lunenburger Heide and a number directly north of the Porta Westfalica. But "Plattbolzen" and "Hoge durchlochtete Schuhleistenkeile" are found as far north as the Elbe estuary. Cf. Brandt 1967, Karte 2, 5, 6, Hoof 1970, Karte 13.

The oldest ¹⁴C-dates for Satrup (Schwabedissen 1972, 7, 4100 B.C.) and Hude I-Dummersee (Deichmüller 1969, 36, 4200 B.C.) are very interesting in this context. They suggest that the earliest pottery of northern Europe might already have come into existence under the influence of the Later *Bandkeramik*. The equally early date of Sølager in Denmark (Tauber 1972) is, however, considered not fully reliable and so the earliest Danish ¹⁴C-date is ca. 3800 B.C. at present.

The oldest human influences in the Hazendonk pollen-diagram are the more intriguing in this context. Can there be any relationship with this early phase of neolithization or are we dealing with a freak of nature?

The end of the Linearbandkeramik

During the end of the LBK a regionalization took place. On a European scale this process is very clear: the *Stichbandkeramik* came into existence as did the important Hinkelstein group along the Upper Rhine²⁷. In NW-Europe the differentiation is vague²⁸. It is mainly recognizable in the technique and style of pottery decoration, especially in the fillings of the bands. A Rhine-Meuse Group is characterized by stitch-filling (*Kölner Typ*) a Rhine-Main Group by fine hatching. Comb-impressions (*Plaidter Typ*) are of a later date and occur in both districts. At that time a Meuse-Moselle Group can be distinguished by bands, filled with cross-hatching or herring-bone patterns, *Tremolierstich*-decoration and the *Geringer Gruppe* are the latest elements. Within the Rhine-Meuse Group of the Lower Rhine District the evolution of the pottery decoration has allowed a very fine chronological phasing, worked out in a number of studies by Modderman, Dohrn-Ihmig and Stehli²⁹. For non-specialists it becomes, however, increasingly difficult to grasp the essence.

When it is allowed to generalize the Merzbachtal situation (and we think it is, with the excavators) extensive stretches of the loess were fully exploited, at least during a mature stage of the LBK. The settlements were lying along the valleys in between the lower grazing lands and the higher crop fields³⁰. The continued extension of the LBK into Belgium and on the less favourable sands along the Lower Meuse and Rhine (be it seemingly only incidentally)³¹ and at last into northern France, as far west as Normandy³², might be very well the result of a population increase and a resulting population pressure.

In this end phase earth-works of clearly defensive character with deep V-sectioned ditches and palissades were constructed in the Merzbachtal³³, pointing to a certain measure of unsafety. As far as archaeological data may reveal, we can recognize a crisis-situation. There might have been an internal stress situation (lack of space?) or external conflicts.

²⁷ Meier-Arendt 1969b, 1972a, 124f, 1975

²⁸ Meier-Arendt 1972a, Dohrn-Ihmig 1974a,b The type M (Buttler & Haberey 1936, Taf 43 = Typ Leihgestern) is a very late local development (Dohrn-Ihmig 1974b, 125)

²⁹ Buttler & Haberey 1936, esp 114, Modderman & Waterbolk 1958, Modderman 1970, Stehli in Faruggia et al, 1973, Dohrn-Ihmig 1974b, esp 122

³⁰ Kuper et al 1974, 29 Knorzer (1974, 90 with further ref) states, however, that the fields must have been small and surrounded by wood, an idea based on the agricultural weed communities reflected in the charred seeds from the settlement sites For palynological reasons natural hedges along the forest borders are presumed by Groenman-van Waateringe (1970/71) a situation that could only be possible in a wooded landscape with permanent fields

³¹ Sielmann 1972, 45-6, Newell 1970, 177-9, Bloemers 1971/72, 12-5, Hinz 1974, 195-6

³² Bailoud 1971, 206f, 1976, Verron 1976

³³ Langweiler 3 Ihmig 1971, Aldenh Platte II, 350-70, Langweiler 9 Aldenh Platte III, 244, Langweiler 8 Aldenh Platte IV, 429 Another ditch at Broichweiden Aldenh Platte I, 586-91 General information Kuper et al 1974, 25

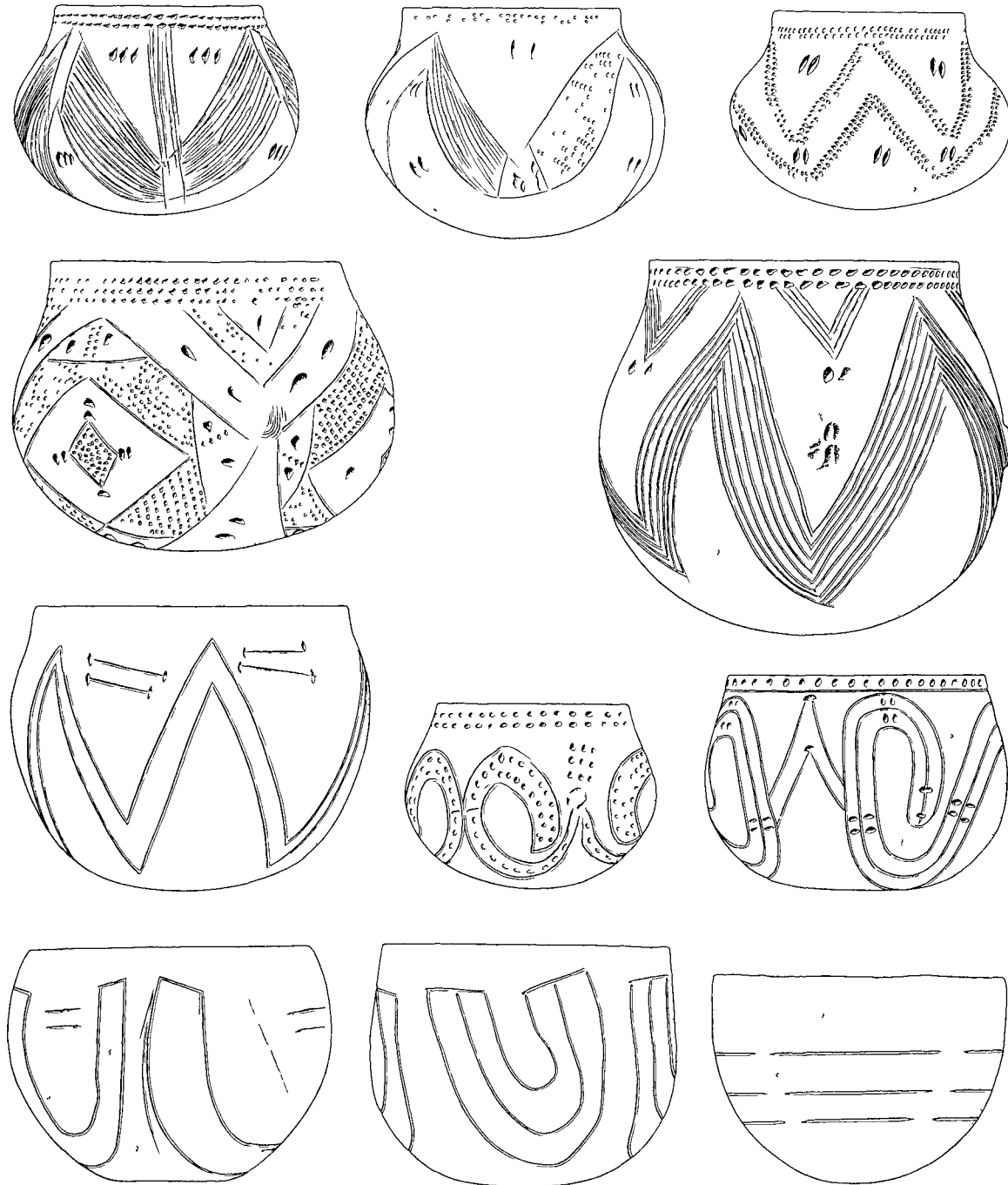


Fig 7 Stylistic changes of the LBK pottery in South Limburg, demonstrated by some vessels from Geleen, Sittard and Elsloo Lower row per I b, upper row per II c/d 2nd and 3rd row intermediate forms and decorations Drawing IPL redrawn after Modderman 1958, 1973, Waterbolk 1958 Scale 1/3 Reproduced with the kind permission of Prof Dr P J R Modderman

For this phenomenon the acculturated Mesolithic people (in view of the new *Bandkeramik* expansion) may be considered, or other *Bandkeramik* groups farther south, which might have been suffering from the same problems. However that may be, shortly afterwards the *Bandkeramik* occupation breaks off abruptly in the Netherlands and Belgium.

PHASE B, 4000-3500 b.c.

Großgartach, Rössen, Bischheim

In the Rheinland the LBK is succeeded by the Rössen Culture, but we need to say more. In the Merzbachtal an Early Rössen earthwork separates both cultures in chronological respect³⁴. An original *Langweiler Typus* goes together there with Großgartach ceramic³⁵, as this developed on the Upper Rhine. This development is clearly demonstrated in the studies of Meier-Arendt and Mauser-Goller among others³⁶. In the region of the Rhine/Meuse LBK group it can hardly be interpreted as an indigenous developed pottery type; it must be considered as intrusive. The *Langweiler Typus* resembles the Limburg pottery to a certain extent, in its bag-shaped forms and its coarse and carelessly executed band-decoration. No other Großgartach remains have been discovered until now, but the Rössen (*sensu strictu*) occupation covers the same area as the *Linearbandkeramik*. The settlements themselves, however, demonstrate no occupational continuity: the old sites were abandoned and new villages were founded, with a number of new characteristics³⁷. First, there are the new trapezoidal houses, of which the evolution from the Late *Bandkeramik* house can be demonstrated elsewhere³⁸. No pits bordered the plank-built walls. The large main buildings are accompanied by smaller oval subsidiary structures. The villages are surrounded by palisades. In another “*Siedlungskammer*” — the town district of Bochum and its surroundings — early Rössen (i.e. Großgartach) occupation with house plans and (partly defensive?) earthworks occur on various places³⁹, but these are never the same as those of the *Linearbandkeramik*, that is also

³⁴ Langweiler 10 (a number of pits) and 12 (earthwork, with U-sectioned ditch and palisade, diameter 80-100 m) Langw 10 · Aldenh Pl I, 625-7, Langw 12 Ihmig et al 1971, Aldenh Pl II, 380-6, Kuper et al 1974, 29-33 In a second site (Langweiler 8) a few Großgartach sherds were found in a Late LBK pit assemblage Stehli 1974

³⁵ That both belong together is confirmed by the peculiar tempering of burnt bone

³⁶ Goller 1972, esp 257, Taf 46, 48, Meier-Arendt 1969b There are no ¹⁴C-dates for the Großgartach phase of the Rössen Culture It must be dated between about 4000 (= end LBK) and 3800 b.c. (begin Rössen s.s.)

³⁷ Inden 1 Kuper & Piepers 1966, Kuper & Luning 1975 Inden 2 Aldenh Pl II, 594-9 Inden 3 Aldenh Pl II, 599-604 Aldenhoven 1 Aldenh Pl II, 561-72

³⁸ Gunther 1973b gives an outline of the Rössen house plans in the Bochum area, their possible evolution and parallels

³⁹ Bochum-Harpen Brandt 1967, 74-6, 88, Abb 6, Taf 22, Gunther 1973a, round earthwork

Bochum-Laer Gunther 1973b, early Rössen square earthwork

Bochum-Kirchharpen-Auf dem Anger Brandt 1967, 90, Taf 38, 17, early Rössen house

Bochum-Werne-Auf dem Gericht Brandt 1967, 89, Taf 37, no soil traces, Rössen s.s.

Bochum-Hiltrop-Hillerberg Nord Brandt & Beck 1954, Brandt 1960, Brandt 1967, 54, 87, Taf 12, 13, 58, the famous long house, Rössen s.s.

Deiringsen-Ruploh Gunther 1973b, 1976, four houses, facies “Neuenheim-Nierstein”, i.e. relatively late Rössen See also Stieren 1934

A number of sites of minor importance

represented with several sites, also with house plans. The break in the occupation is not so conspicuous there as in the Merzbachtal.

After this short-lived "cultural revolution", somewhere between 4000 and 3800 b.c. the relationships with the areas bordering the loess to the north were also changed. It seems that the sands were further colonized and the trade with the inhabitants of the North European plain was intensified. Gradually the neolithization of the North European plain was making progress. The absence of any settlement site, dated to this phase on the entire North German plain makes it impossible to characterize these communities. One can only suppose a kind of early Ertebølle or "proto-Swifterbant" to have existed there⁴⁰.

In the Rössen Culture we find the first true axes, carelessly formed, with oval or rounded rectangular cross-section and made of stone, not flint⁴¹. In the flint assemblage the big triangular, surface retouched arrow-heads and obliquely truncated blades (*asymmetrische Eckschaber*) are "guide fossils". In the Rhine/Meuse Basin the yellowish Aubel flint is generally used. As all elements of the Rössen Culture, it is a distinct new assemblage but clearly rooted in the LBK sources.

In the Netherlands newly discovered settlement terrains with some characteristic flint and a few sherds, document the extension of the Rössen Culture on the Middle Limburg sands⁴². Other sites were already known along the German side of the border⁴³ and as far north as Veen⁴⁴. The careful examination of flint assemblages seems the best system to trace more settlements, in order to delimit the occupied area more sharply⁴⁵.

In the same time the Cerny Culture must have evolved in the Paris Basin from the Late LBK stock⁴⁶. For typological reasons the regional group of Augy St. Pallaye (along

⁴⁰ There is an enormous hiatus in our knowledge by the lack of settlement sites. We do not think that true "colonization" reached very far into the North German Plain and consider the well-known Rössen *becher* from Hamburg-Boberg site 20 (Schindler 1962) as an outlier. Factually it is an isolated find and the single complete vessel amongst non-Rössen domestic refuse: this is a soft, coarsely tempered pottery, with funnel-shaped rims, together with a finer (undecorated) pottery. No polished pointed-butted axes were found (only 3 axe flaxes), but 23 flake axes, what confirms the presumed dating, earlier than Boberg site 15 (Schindler 1962, 252). No bone material was preserved. Only a few teeth(?) and some burnt human(!?) bone. The earliest occupation at Hude I, Dummersee is dated back to this time (Deichmüller 1969). We are, however, very critical to the idea that a piece of wood or charcoal found next to, on or in direct contact with a piece of pottery in the Dummersee situation gives a ¹⁴C-date for this pottery. The degree of association is low: both pieces might have been got together during reworking of the refuse layer in a later occupation phase, since the refuse of the various periods is not separated by sterile deposits.

⁴¹ Goller 1972, 236, in Großgartach association.

⁴² Bloemers 1972.

⁴³ Loewe 1971, 20 mentions 10 Rössen settlement sites on the loamy coversands of the *Hauptterrasse* in the *Grenzwald* at Kaldenkirchen, Bracht and Bruggen (Taf. 2-12, Map 64). Hinz 1969, 210 mentions a "young Rössen" settlement at Blatzheim no. 78 (Taf. 45 no. 20), the only one in the Kreis Berghem. Young Rössen meant at the moment of publication very probably Großgartach. See also the maps of Schwabedissen 1966, Abb. 3, Tackenberg 1954, Taf. 5.

⁴⁴ Hinz 1974, 197, 199. Recently some sherds of a typical Rössen *Bauchknickgefäß* were found in the neighbourhood of Aalten, pers. comm. Prof. J. D. van der Waals, Groningen.

⁴⁵ Cf. Bloemers 1972, note 13. But on the Dutch loess the absence of perforated *Breitkeile* also points to an absence of Rössen occupation.

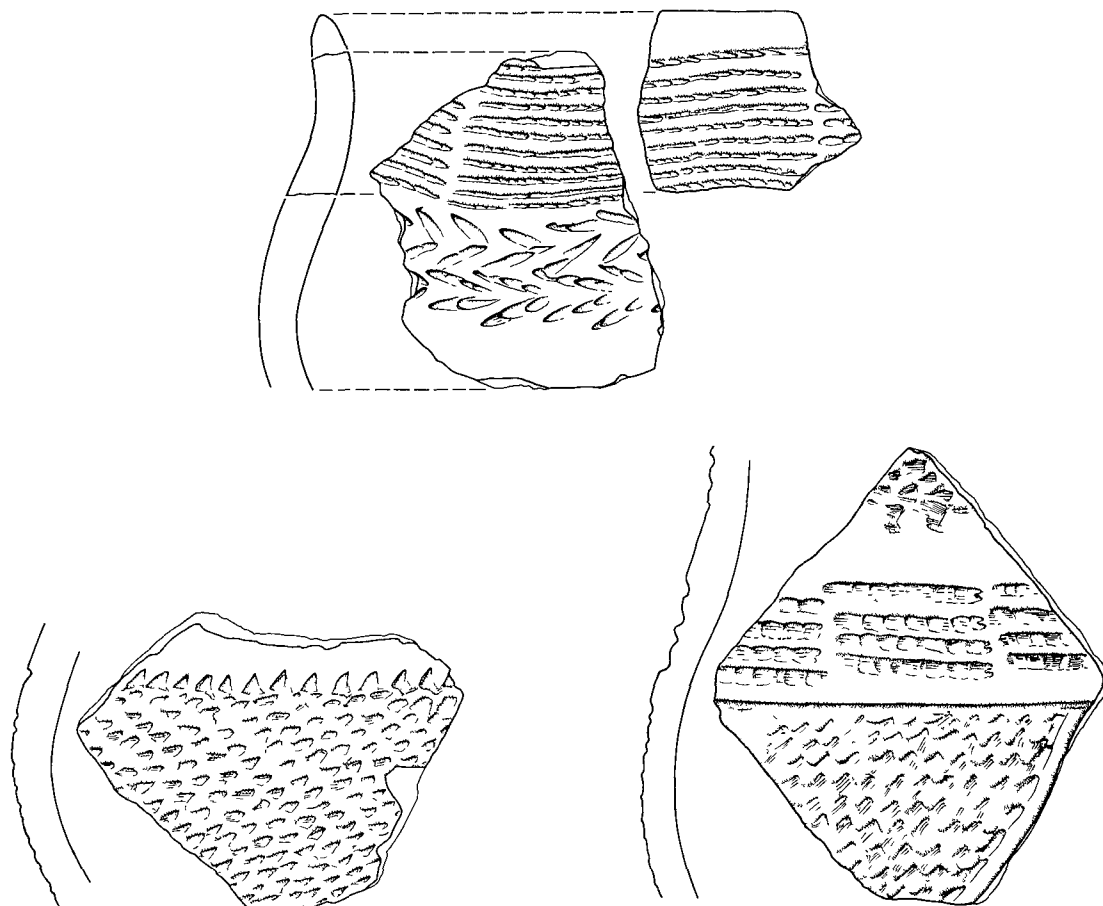


Fig 8. Rössen-sherds found near Neer and St Odilienberg, Limburg Scale 1.1. After Bloemers 1972..

the Yonne) must be placed in this period too⁴⁷. The northern-most Cerny finds were made in Hainaut, Belgium, near the French border. At Givry⁴⁸ and in Artois, clear Bischheim-traits in the decorated pottery prove an extension of Rössen influences to North-West France and the adjacent part of Belgium⁴⁹. More to the south-east the Menneville⁵⁰ assemblage demonstrates clear relationships to another Rössen off-shoot, the Bisschoffingen-Strasbourg

⁴⁶ There is a recent ¹⁴C-date Gif 2139 – 3830 ± 150 b.c. from La Brèche-au-Diable (Edeine 1972) in addition to the four dates given by Bender & Phillips 1972. The youngest of these (Videlles, Gif 720 – 2790 ± 140 b.c.) is regarded with suspicion. It seems considerably too young.

⁴⁷ Bailloud 1964, 127-36, 1971, 220.

⁴⁸ Joris & Moisin 1972, more recent discoveries of Cerny material in the same district at Ellignies-Sainte-Anne, Ormeignies and Blicquy (De Laet 1974, 143f.).

⁴⁹ One Bischheim sherd from Christnach, Luxemburg forms a modest link (Meier-Arendt 1972d).

⁵⁰ Bailloud 1964, 127-36; 1971, 220. See also the related material of Jonquières: Blanchet & Petit 1972, Blanchet 1974.

group. The evidence in northern France⁵¹ is still too widespread to give a coherent picture of the seemingly complex situation, while (with the exception of the Hainaut sites) we have no information at all from Belgium. With the available data there seems to be, however, no reason to assume Cerny influences as far north as the Lower Rhine District. There we have to do, along its southern and eastern borders in the main (if not exclusively), with a sequence to Rössen and Bischheim. Bischheim is characterized by the loss of the rich Rössen decoration and a more restricted variety of pottery forms. The single row of double stabs (*Doppelstich*), the bulbs made by pin pricks (*Lochbuckel*), the small clay lentils (*Tonlinsen*) and the triangles filled with *Furchenstich* are the major characteristics of the decoration. ¹⁴C-dates for Bischheim and Bischheim influences have a range from 3700 to 3250 b.c.⁵². The younger dates give some problems when we consider Bischheim entirely as pre-Michelsberg. A continuation of Bischheim until c. 3400 B.C. outside early Michelsberg might be an explanation of the late dates of Givry and Dümmer. Farther to the east an evolution occurred from Rössen to Gatersleben, that has its distribution east and north of the Harz, and so could not be represented on the map⁵³.

Ertebølle/Ellerbek

The process of neolithization of the North German Plain becomes easier to follow, now the ¹⁴C-dates reduce chronological uncertainties. But to comprehend the things that happened in its western part, we still have to rely heavily upon the data from Schleswig-Holstein and Denmark.

The start of the Ertebølle/Ellerbek culture is about contemporaneous with the appearance of the Rössen Culture to the south of it. The ¹⁴C-dates indicate a start at the beginning of Rössen (Großgartach) and perhaps even slightly earlier. The end is dated at about 34-3300. The early phase is represented by Satrup (4100-3800), the later by Rosenhof (3700-3400)⁵⁴. In combination with the wide spread of *hohe durchlochte Schuhleistenkeile* (probably the relatively early ones)⁵⁵, and of *Rössener Brettkeile* all over the North German Plain and

⁵¹ Bailloud 1971, 219 but Rössen perforated axes occur as isolated finds (13 specimens in his list 1964, 73)

⁵² Luning 1969, esp 14-9 for Bischheim At the end of the Rössen Culture a regionalization took place in SW-Germany, with Bischheim as the most northerly group Until now no finds are known along the Lower Rhine, no finds are made at the Aldenhovener Platte, but at the Dummersee this pottery occurs far to the north There certainly is a big "Forschungslücke"

¹⁴C-dates

Karlich	GrN 6348	- 3735 ± 95 b c	Kulick & Luning 1972
Schwalheim	—	- 3710 ± 40 b c	Kulick & Luning 1972
Givry	GrN 6021	- 3360 ± 60 b c	Joris & Moisin 1972
Dummersee	Hv 1230	- 3260 ± 155 b c	Deichmüller 1969
	Hv 1231	- 3300 ± 240 b c	Deichmüller 1969
	Hv 1793	- 3665 ± 95 b c	Deichmüller 1969
	Hv 816	- 3475 ± 350 b c	Deichmüller 1969

The younger dates offer considerable problems when we consider them as a terminus-post-quem for Michelsberg Is there a late Bischheim tradition outside the early Michelsberg area? See also note 40

⁵³ Louwe Kooijmans 1976, Fig 9

⁵⁴ Satrup Schwabedissen 1957/'58, 1968 Rosenhof Schwabedissen 1972 Danish ¹⁴C-dates Tauber 1972

⁵⁵ Goller 1972, 236, 241, at any rate occurring in Großgartach context From true Rössen the axes seem to be badly known There are typological arguments for a relatively early dating

farther north into southern Denmark ⁵⁶, their occasional association (Satrup, Dümmersee) and the rare (probable) association of Rössen and point-based pottery (Dümmersee, Hamburg-Boberg) ⁵⁷, the introduction of Neolithic elements into this area from the Rössen Culture seems undeniable. The new culture is, however, firmly rooted in the foregoing Late Mesolithic (the Oldesloe Culture in Schleswig-Holstein). A number of indigenous elements changed, new were added. These are mainly of local origin. The few imported elements (perforated stone axes, some pottery) were already mentioned above. As Troels-Smith pointed out there is a marked change between his Bloksbjerg and Dyrholm II stage, which marks the start of the Ertebølle Culture. In Schleswig-Holstein the sequence is known in less detail, but the changes from Oldesloe to Ellerbek are similar, although there are differences in some respects. Certainly some “cultural revolution” took place, but this lasted probably some centuries and no fully Neolithic economy was attained. In Schleswig-Holstein the main diagnostic features, as pointed out by Schwabedissen ⁵⁸, are: another type of flake axe, bigger core axes, the disappearance of microliths and the appearance of a popular new type of artifact: the *Klingengerät mit Schaftzunge und hohler Endretusche*. Further: the change from antler base-adzes to T-shaped axes (also known from Rössen assemblages in Middle Germany and in general use until the end of the Scandinavian Early Neolithic (the Fuchsberg Stufe)), the use of (earlier very rare) partly polished stone axes of *Walzenbeil* type, and the manufacture of coarse, coil-built, point-based pots. Beside this there occurs finer pottery in both phases. Oval *Tonwannen*, finer not coil-built round-based pottery, a modest and simple decoration and, occasionally, lugs are characteristics of the later phase in Schleswig Holstein ⁵⁹.

The occurrence of both types of perforated axes all over the North German Plain, westward as far as the Valley of the Scheldt, points to the occurrence of a similar evolution there as attested for Schleswig-Holstein, but the traces of such communities are restricted to a few sites, all in wet environments, like the Ertebølle/Ellerbek sites. These are Hamburg-Boberg nos. 15 and 20 (no ¹⁴C-dates) ⁶⁰, the settlement “Hüde I” at the Dümmersee (4100?-3200 B.C., first and second (= main) occupation phases) and a number of sites near Swifterbant, in the Dutch IJsselmeer district (one dated 3400-3200 b.c. and so to be discussed in the next section).

The *Hauptphase* (3700-3200 b.c.) of Hüde I is the single site in Lower Saxony ⁶¹. Typical Bischheim elements (*Kugelbecher*, *Lochbuckel*, rim decoration, lugs) are found together with pointed bases representing an Ellerbek-element. But it is not clear what pottery belongs together at the Dümmersee, whether we have to do with a mixture of refuse from various occupations, or of one occupation of long or short duration. Are Bischheim and Ellerbek there contemporaneous or successive and in what sequence? In the Late Atlantic situation these were all fresh-water inland sites. Traces of any coastal inhabitation are irretrievably lost:

⁵⁶ Lomborg 1962 The Danish finds probably come from eastern sources (*Oderstichbandkeramik*) The common source of the amphibolite, of which the axes are made, is now in discussion To see Zobten as the only source might appear to be too restricted

⁵⁷ Cf note 40 Schwabedissen 1966, 420, Deichmüller 1965, 10, Abb 5

⁵⁸ Schwabedissen 1957/'58, 1968

⁵⁹ Schwabedissen 1972

⁶⁰ Boberg 20 note 40, Boberg 15 Schindler 1953/'55, discussed in the next section

⁶¹ Deichmüller 1969 and earlier reports, esp Deichmüller 1963, 80 and 1965, 8 f for the pottery

the sea-level was about 6 m lower than it is now and the coast-lines lay further seaward. It may be one of the explanations of the scarcity of finds in comparison to Denmark and Schleswig-Holstein.

That there are differences between these sites, separated by some hundreds of kms needs no surprise. First, they need not to be exactly contemporaneous. Furthermore, the archaeological *substratum* was not exactly the same, although the flint assemblages (Oldesloe and De Leien-Wartena, Ellerbek and Campignien)⁶² are closely related. The various regions will have had contacts with different groups of the Rössen Culture, and there might have been some natural differentiation due to restricted east-west contacts. Taking all this into account, one is more struck by similarities than by the differences.

Subsistence economy

There still is no general agreement about the economy of the Ellerbek/Ertebølle Complex. Are we dealing with a settled hunter-fisher-gatherer community with pottery as the single Neolithic acquisition or were crop farming and animal husbandry practised too, be it in a moderate extent? Most evidence brought forward to defend the last mentioned supposition is available only in preliminary form and is of a dubious character.

From Satrup ribwort plantain and cereals ("be it in low percentages") are mentioned in the pollen diagrams⁶³. In the pollen diagram *Profil A*, situated next to the settlement, at Rosenhof cereal pollen was found in only one spectrum (out of 6) of the culture layer, with a percentage of only 0.3 percent, which means one or perhaps two grains. This is too weak a foundation to make the people agriculturists. In this case charred seeds must give the ultimate proof of cultivation. Their absence at both sites does not seem meaningless⁶⁴. At the other hand grain impressions on Ellerbek pottery are mentioned by Schwabedissen.

The same is true for the ultimate proof of domestic animals. At Rosenhof no pig, sheep or goat could be identified. The smaller of two types of cattle is more probably a small species of aurochs than domestic cattle. One might ask what weight "some bones of domestic animals" (cattle) from Satrup must be given in this new interpretation⁶⁵.

At the Dummersee no charred grain seeds nor impressions were found. The numerous bones are predominantly of game, with a modest number of domestic animals, that seem to be restricted to the upper (early TRB) layer⁶⁶. Beaver, otter, birds and fish are important at this site.

Troels-Smith⁶⁷ put many arguments in favour of a rural economy for Ertebølle: game,

⁶² The flint industry of Swifterbant does not have such relationships.

⁶³ Schwabedissen 1968, 13.

⁶⁴ Schuttrumpf 1972. Cereal pollen, especially of the more primitive types is moreover, very hard to distinguish from some big types of grass pollen, as those of *Glyceria* and *Bromus* opposed to *Hordeum*. Grain seeds are a much firmer evidence, but the grain might have been acquired by trade. We can, however, hardly assume a long distance trade in grain at that time, what weakens this argument. For cereal impressions: Schwabedissen 1957/58, 17.

⁶⁵ Nobis 1975.

⁶⁶ Deichmüller 1965, 15, 1969, 34.

⁶⁷ Troels Smith 1966, 522-3. It seems that both domestic ox bones and cereal pollen are only found from sediments of the same age, but not directly in closed association. Dr Søren Andersen (pers. comm.) pointed out

birds and fish predominate, but domestic animals only occur in small quantities. Cereal pollen has been established for the Dyrholm II stage, but grain impressions are mentioned to be common only on the A-pottery of the Muldbjerg stage. Nobis⁶⁸, citing Degerbøl, expresses the other camp, denying all evidence for both crop farming and animal husbandry of Ertebølle in Denmark. Most evidence must be attributed to later (early TRB) contamination or get another more critical reinterpretation⁶⁹.

Factually we do not yet know of any sites in the Lower Rhine District dated to this period. The communities that received the perforated stone axes must, however, have been of a very similar character, in view of the development sketched above: a kind of "proto-Swifterbant" (cf. p. 242), or, another possibility especially in the south: successors of the people that used the Limburg pottery. But there is still no Neolithic site north of Middle Limburg older than c. 3400 b.c. If any occupation took place in the Holocene sedimentation area, this will be hard to demonstrate, since the area went through the Calais II transgression phase. Settlements were either destroyed or deeply buried beneath later deposits. Only on the dune tops remains may be within reach, but on the Hazendonk no traces were found, not in the excavation and not in the long series of borings^{69a}.

While the North German Plain was inhabited by these half-Neolithic communities an important change in culture took place in the regions occupied by Rössen and Cerny.

PHASE C, 3500-3250 b.c.

Michelsberg (I-III)

With the appearance of the Michelsberg Culture a new phase is generally started. The question of its origin is not very relevant here⁷⁰. The coincidence in a general sense of the main distribution (along the Rhine) of Rössen, Bischheim and the various Michelsberg phases are a good argument for an autochthonous development with an accelerated cultural change between Bischheim and Early Michelsberg⁷¹. There is a marked change in the pottery:

that the Neolithic economy was gradually introduced in Denmark from the EN-A stage onward and that no animal husbandry or crop farming can be proved for the Ertebølle Culture (i.e. before 3300 b.c.) A recent study on the Danish Early Neolithic is that of Skaarup (1975) on the two houses at Stengade, Langeland. One house (II) with A/B-pottery, the other with characteristic C-pottery, both have TL-dates of resp. about 3800 and 3300 B.C., i.e. about 3100 and 2600 b.c. in the conventional ¹⁴C-chronology. On both sites a farmers economy could be established by means of grain imprints in the pottery and the (very fragmentary, mainly burnt and very scarce) bone refuse. This is in agreement with similar observations on the other Danish Early Neolithic sites. The author criticizes the assumption of (even a modest degree) of farming activities of the Ertebølle Culture.

⁶⁸ Nobis 1975

⁶⁹ The reasons mentioned above make us even more cautious than we were formerly (Louwe Kooijmans 1974) in the interpretation of the lowest zone of the pollen diagram Hazendonk I.

^{69a} During the detailed geological investigations around the Hazendonk, summer 1976, at least one old surface was discovered at a depth of 9-10 m. This means a Late Mesolithic date. Future ¹⁴C and pollen evidence will give more information. No finds can be brought in relation to this level until now.

⁷⁰ For a review of the various theories Luning 1967, 8-10.

⁷¹ Cf. the maps in Schwabedissen 1966, Abb. 3 and 26 (Rössen, Michelsberg), Luning 1967, Beil. 6 (Michelsberg) and 1969, Karte 1 and 2 (Rössen, Bischheim etc.).

MK-I is very rare and occurs only at two sites within the mapped area: Miel near Bonn (Luning 1967, 82) and

decoration disappears (first along the Middle Rhine), flat bases are introduced in the south-east, but remained rare during the entire Michelsberg period N.W. of the Upper Rhine Valley⁷². Pottery forms change, as did the flint industry. The pottery is generally coil-built with narrow coils, firmly kneaded together with oblique joints⁷³. The coils are only rarely visible in the fracture edges. From the beginning (pointed-butted) flint axes seem to have been in use beside the more common axes, made of other stone⁷⁴. The import of dark grey "western" flint into the Rheinland has already started in phase I (Langweiler site 3C) and reaches as far as Frankfort in MK II⁷⁵. If one needs influences to explain these changes: Bailloud observed an intensive influence of Michelsberg on the Chasséen of eastern France. There might have been reverse influences too. Secondly, a cultural reflux may have come from the north⁷⁶.

The undecorated pottery is very resistant to an internal division, either in a chronological or a regional sense, while insufficient closed assemblages with ¹⁴C-dates are available⁷⁷. Scollar placed the regional differentiation in the first place, Lüning⁷⁸ the chronological phasing. For the central *Hauptgruppe* he distinguished five phases (MK I-V), but in view of the regionalization this phasing cannot be applied without further preface in the marginal areas, for instance, the Belgian facies, as De Laet⁷⁹ rightly remarked.

New discoveries have extended the Michelsberg distribution considerably, not only to the north (as we will discuss below), but also to the west, into northern France, demonstrated by the interesting new find-group of Noyen-sur-Seine⁸⁰: beside the characteristic finer Chasséen ware, statuette and vasesupport fragments, the coarse pottery has an original appearance and unmistakable Michelsberg affinities. This is confirmed by the occurrence of ladle fragments. In view of the situation of Noyen-sur-Seine far in the Chasséen area, the position of the assemblage is more likely to be intermediate in chronological than regional sense. The finer ware of Noyen-sur-Seine is very similar in forms to that of the probably slightly earlier Menneville⁸¹ (but *Lochbuckel* are missing!) on the other hand to

Aldenhoven site 3C (Aldenh PI I, 578-82) In view of the relationships in forms a development out of Late Rossen (Bischheim) seems the most logical and simple explanation

⁷² These changes were described by Lüning for S W -Germany (Lüning 1969)

⁷³ Lüning 1967, 12 for some remarks on the construction and fabric

⁷⁴ Flint axe fragments are already present at Miel (Lüning 1967, 74, Taf 5, 31)

⁷⁵ Lüning 1967, 70, 102, Aldenh PI I, 582

⁷⁶ Bailloud 1971, 25-6, 228-30

⁷⁷ It is very difficult to date settlement refuse, when it is fragmentary and of modest amount For ¹⁴C-dates of settlements (Kulick & Lüning 1972, Lüning 1971)

Ehrenstein	MK-III	KN 311	3260 ± 40 b c
		KN 306	3310 ± 40 b c
Karlich	MK-III?	GrN 6345	3015 ± 40 b c
		(apparently too young, contaminated?)	
Bergheim	MK-II/III	KN-I-663	3490 ± 85 b c
		KN-I-664	3540 ± 95 b c

⁷⁸ Scollar 1959, 55-62, 1962, 529-30 esp for the Belgian group, Lüning 1967, esp 80 f

⁷⁹ De Laet 1969, 262, also De Laet 1972

⁸⁰ Mordant 1972a,b There are flake axes among the flint artifacts and the site has an earth-work enclosure with palisade

⁸¹ Cf note 50

the Michelsberg pottery (MK II) of the Mayen earthwork, especially in the relatively abundant *Beckenförmige Schüssel*. Luning named Mayen as the site with the most obvious Chasséen traits in the Michelsberg Culture⁸²! Another important new site is Jonquières⁸³ where a typical Menneville bowl and sherds with Lochbuckel-decoration occur in a northern Chasséen assemblage with some "classical" (i.e. early?) traits. There is a ¹⁴C-date : Gif 2919 3170 ± 130 b.c. This connection between Menneville and Chasséen du Bassin Parisien and the Michelsberg relationships at Noyen-sur-Seine are two new elements that document this phase C in northern France. They do not permit a coherent picture of a seemingly complex situation. The lack of finds in N.E.-France is a serious handicap in this respect.

Belgian Michelsberg and the flint mines

Within Michelsberg a number of unmistakably (south-) eastern elements can be distinguished, as the handled jar, the rough smeared surface, the scratched decoration, the high tulip beakers and the *Knickwandschüssel* with pin-prick decoration, that are entirely missing in the north-west, while the *Schöpfer* (ladles) (Kemmelberg) and *Ösenkranzflaschen* (Furfooz, Thieusies) are very rare. On the other hand wide open bowls, sometimes carinated, and spherical pots with cylinder necks are esp. found in Belgium. The pottery forms have traits in common with the Chasséen of the Paris Basin (there even is an (atypical) vase-support at Zwijndrecht near Antwerp)⁸⁴ and (especially in the carinated "beakers") with the finer ware of the eastern Neolithic in Great-Britain ("Grimston Ware"). Also in its flint assemblage with leaf-shaped arrowheads of various types against the thick triangular specimens in the Michelsberg Culture elsewhere, the Belgian Group is connected with Northern France and Great-Britain⁸⁵. Other links are the flint mining and the antler combs. But we will not deny the Michelsberg affinities. Belgium is firmly linked to Michelsberg, not only by the pottery forms but, for instance, also by the flint trade. We only wanted to stress that it is difficult or even impossible to apply the MK I-V phasing of the Main Group to this northwestern facies. It is certainly not allowed to place all finds in the phase MK III. There are some arguments for a longer duration of Belgian Michelsberg.

First the flint export gives a mining activity during MK I-IV and we do not see a reason for assuming⁸⁶ that the mining was *not* done by the people who used the pottery found on the same terrains and in relation to the mines, the more when this pottery is considered as a separate regional group: in that case the makers of it cannot be considered as travellers from far away. The study by Clason of the bone refuse⁸⁷ and the pollen evidence from

⁸² Luning 1967, 162-6

⁸³ Cf note 50

⁸⁴ Cf Luning 1967, esp 101, regional groups 91-5 The Belgian group has the most in common with the left Middle Rhine assemblages (a.o. Urmitz) Kemmelberg Van Doorselaer et al 1974, Furfooz Luning 1967, no 3, Zwijndrecht id no 8

⁸⁵ Especially some carinated bowls, found in the northern part of Belgium (Lommel, Antwerp, Luning 1967, Taf 2) have a very English appearance The well-known Peterborough sherd from Spiennes (note 205) belongs to a later phase

⁸⁶ For instance De Laet 1972, 206 f

⁸⁷ Clason 1971 There are mainly bones of domestic animals (predominantly cattle) and there is only scarce evidence for hunting

Petit Spiennes⁸⁸ indicate a normal Neolithic agrarian community and the earthwork on Petit Spiennes, excavated by Hubert⁸⁹ is associated with the same type of pottery, which means that there is no question of casual visits.

Second, some of the (tulip) beakers or bowls stand very close to the *Tulpenbecher* Type 1 and 2 that are dated MK I⁹⁰, while other pottery (the jar from Furfooz, the new assemblage from Clypot⁹¹) belongs to MK II.

In the later phases a certain isolation from the Main Group, and Chasséen influences from the south might have given rise to the Belgian group and its original traits. Chasséen influences have recently been demonstrated in the assemblage of the Kemmelberg in Vlaanderen near the French border⁹². True Michelsberg (a ladle for instance) and northerly Chasséen elements (as the double perforated lugs and the big ovoid pot) are found there together in, generally speaking, a Belgian Michelsberg assemblage, ¹⁴C-dated at 3000 b.c. Similar Chasséen influences will have been experienced certainly at the Hainaut sites like Spiennes. The material from this mining centre and that from Boitsfort (= Bosvoorde) dominate the total Belgian Michelsberg. Both (and especially Spiennes) will cover a long period and so might comprise early material as well as later forms. The few ¹⁴C-dates are only of restricted value since they certainly do not cover the total duration.

The backbone of the Belgian Neolithic is formed by the phases of Spiennes, worked out by Verheyleweghen⁹³. The phases I-IV (*Archaique, Evolution, Apogée* and *Décadence*) are based on differences in the composition of the artifact assemblage in flint working and in mining. When we are critical the four phases are, however, in the first instance areas of the Camp à Cayaux, which can be characterized as follows:

- area I : valley slope, open mining, second choice flint
- area II : valley slope, open mining, first quality flint, some deep mining on the corner of the plateau
- area III : plateau, deep mining, first quality flint
- area IV : plateau, deep mining, second choice flint.

In view of this it seems plausible that some of the regional differences are not of chronological, but rather of technical character, viz. the result of the varying quality of the flint. The scrapers (the only artifact available in large enough quantities in all areas to allow statistical work) are very instructive: in phases I and IV the angle of retouch is steeper (75°), they are shorter and have a considerably greater variation in length than in the phases II and III.

⁸⁸ Hubert 1971a, 51 There was an open place in a wooded landscape Cereals and agriculture weeds are present in the pollen diagram

⁸⁹ Hubert 1971a In one section the ditch crosses a filled-in mine-shaft, at another point a SOM refuse layer was found in the top of the ditch fillings Pottery, very similar to the Michelsberg pottery of the Camp-à-Cayaux was found in the primary levels, together with a representative flint assemblage This area was not excavated before and only known by the section of the railway cutting The Spiennien phases refer to the Camp-à-Cayaux

⁹⁰ Esp Luning 1967, Taf 1, 13, Taf 3, 2, resp Boitsfort and Spiennes

⁹¹ Clypot. De Laet 1974, 193 and own observations

⁹² Van Doorsealer 1971, id et al 1974

⁹³ Verheyleweghen 1963, De Laet 1972, 199-209 for a recent review of all Michelsberg and flint mining evidence

We would prefer to distinct two major phases (I+II and III+IV), the first along the valley slope, the second on the plateau and both with an internal division mainly caused by the quality of the available flint. Moreover, differences in the artifact assemblages of I and II are slight, as are those between III and IV. These might have some chronological value with the evolutionary arguments of Verheyleweghen, but in that case a considerable overlap of I and II, and of III and IV must be assumed. This is in contrast to the marked changes at the transition from II to III. The flint mining along the Trouille is certainly older. There the rich flint must have been discovered. It is directly available and most easy to exploit there. The flint working, based on rough flaking, and the occurrence of tranchet axes in quantities prove the early position. In area III all outstanding features of Spiennes were found: the pottery, most of the bone refuse and all of the human skulls⁹⁴. In this area the production of long blades (only the cores are found) for export purposes took place. We agree with De Laet that the activity in this area (and so phase Spiennien III) must have lasted for a long time⁹⁵. The late dating of the activities in area IV has been based on the assumption that area III was exhausted at a given moment, which seems plausible. It would be one of the first cases of the exhaustion of a raw material in human history!

¹⁴C-dates from the flint mines (Spiennes, Mesvin, St. Geertruid) all lie between 3500 and 3000 b.c.⁹⁶. Spiennes I and the comparable Mesvin are dated relatively early, but there is no direct evidence for earlier mining. Until now this has to be derived entirely from the study of the domestic flint assemblages. In the flint mines the earliest traces of working will have been easily destroyed during the continued exploitation and are, if preserved, hard to discover and to date.

With all this, the knowledge of the Belgian Michelsberg group is still defective. The find density is low, but this will gradually be changed by new discoveries and modern excavations, as those of Hubert at Boitsfort and Spiennes⁹⁷, by van Doorselaer at the Kimmelberg, and by Vermeersch at Thieusies⁹⁸.

⁹⁴ Clason 1971, De Laet 1974, 174 9 "graves" containing 12 skulls, all Spiennien III, one perhaps IV

⁹⁵ De Laet 1972, 204, 208, but we cannot support De Laet in a dating of the end of SOM much later than the first Bell Beakers say about 2000

⁹⁶ Mesvin	Lv 65	3270 ± 170 b c	Lefranc & Moisin 1965
Mesvin	Lv 216	3390 ± 150 b c	Lefranc & Moisin 1965
Mesvin	BM 417	3181 ± 123 b c	Lefranc & Moisin 1965
Spiennes	GrN 4674	3470 ± 75 b c	Vogel & Waterbolk 1967, 132
Rijckholt	GrN 4544	3120 ± 60 b c	Vogel & Waterbolk 1967, 132
Rijckholt	GrN 5549	3050 ± 40 b c	Vogel & Waterbolk 1972, 83, Engelen 1971
Rijckholt	GrN —	3140 ± 40 b c	Vogel & Waterbolk 1972

⁹⁷ Boitsfort Hubert 1971b, Spiennes, pottery Colman 1957, Spiennes, Camp-à-Cayaux Hubert 1969 Cf Bailloud 1971 Pl 126, 2 for a Chasséen counterpart of the Boitsfort pot and Bailloud 1964, fig 21 for that of Spiennes Both are not current Michelsberg types The Spiennes pot resembles most the rare "Einfache Flasche Typ 6" (a o the spherical vessel from Spiennes!) and the "Flaschenformige Bechter Typ 16", of Luning 1967

⁹⁸ At Thieusies-Casteau (Hanaut) (Vermeersch & Walter 1975) a MK complex with an *Ösenkranzflasche Typ 1, 2* (= MK III or II) is dated GrN 7012 3300 ± 45 b c The ¹⁴C-dates of the Kimmelberg assemblage are

Lv 524 3050 ± 120 b c

Lv 525 3070 ± 95 b.c

These later dates are in good agreement with the Chasséen influences in the material

At Chaumont-Gistoux (Brabant) a few sherds, probably Michelsberg, were found below a wall (next to

Michelsberg in the North

In this phase the Lower Rhine District is essentially a borderland between Michelsberg and the western-most extension of Ertebølle-Ellerbek as found at Hude I, Dummersee, and at Swifterbant. Until a few years ago the boundary between both was extremely vague, but recent finds have changed this to some extent and document a northward extension of Michelsberg in the southern part of the Lower Rhine District.

At the Aldenhovener Platte MK I and MK II assemblages document Michelsberg in its earliest phase⁹⁹. Modderman attributed a sherd from Koningsbosch to Michelsberg, but one can also find parallels in the assemblages from the Hessian Gallery graves, what fits better with the other pottery found at the site¹⁰⁰. In view of the ¹⁴C-dates, the mining techniques, the artifacts found, and the occurrence of some human skulls St Geertruid is a counterpart of Spiennes in all respects. With the exception of one flat base (probably S.O.M.) no pottery has been found, however. By the admirable investigations of the "Working Group on Flint Mining" very detailed information on the mining techniques have been obtained. There is every reason to connect the mining centre with Michelsberg, but the ultimate proof must be given by pottery finds and these are still lacking, since no systematic investigations to the settlements sites have been carried out¹⁰¹. In the careful study of the flint assemblages and the numerous axes of the Meuse Valley lies another possibility to extend our knowledge.

The northern-most Michelsberg remains were discovered recently in the neighbourhood of Coesfeld, Westfalia¹⁰². The presence of big pots with roughly smeared surfaces and ladles gives a better correspondence with the Michelsberg along the Rhine than with the Belgian group. The forms suggest a relative late position in Luning's sequence and so a dating in the next phase. But we consider them as a sign that after the northward Rössen expansion the Münster Basin belonged to the central German ("Rhenish") sphere and that finds, filling the blank between the Bischheim of the Dummersee and the Late Michelsberg of Coesfeld must be expected in the future.

Another extension of the Michelsberg area has been attested recently in the north-eastern corner of this culture by the finds at Rosenhof¹⁰³. In a level above a late Ellerbek

a ditch), that for palynological reasons is dated at about the Atlantic-Subboreal transition. The ¹⁴C-date Lv 290 2090 ± 90 b.c. seems, however, not acceptable as a Michelsberg date (Graff & Lenoir 1969, 109)

An impressive new assemblage, found at Clypot (Hamaut) and with MK II characteristics is now in study (De Laet 1974, 193)

⁹⁹ Aldenhoven site 3C Aldenh Pl I, 578-82 (MK I),

Inden 9, Aldenh Pl II, 349, Kuper et al 1974, 36, Aldenh Pl V, 197-201 (MK II),

Aldenhoven 9' Aldenh Pl IV, 252 (MK)

¹⁰⁰ Van Haaren & Modderman 1973, 43, fig 30 The "Robenhausien burial" of Stein (Becker & Becker 1940, 149, pl 47) might belong to this phase in view of the big round flint scrapers. The older excavation at Caberg near Maastricht produced some material that might belong to this phase (Modderman 1958a). Modderman (1958, 97 and Abb 67, 378) published a sherd with "Tonlinzen" decoration from Sittard, that has its counterparts at Theuiesies

¹⁰¹ On St Geertruid Van Giffen 1925, 1953, Engelen 1967, 1971, Felder & Rademakers 1969, Bosch 1976

¹⁰² Wilhelm 1971, to be placed in phase MK IV. Dr Wilhelm kindly informed me that more sites were discovered after his publication

¹⁰³ Schwabedissen 1972, p 7 and pers comm

assemblage (^{14}C -dated 3700-3400 b.c.) an assemblage with certain Michelsberg affinities was dated 3400-3250 B.C. These finds fill up the gap between Ellerbek and Schwabedissen's Satrup phase and are of special interest in view of the problem of the origin and relationships of the earliest TRB in Denmark. Michelsberg relationships, especially of the B-pottery, can now be more easily accepted. At the other hand south-easterly origins seem to be clear for the A-pottery. These will probably lie more in the Polish early TRB (with a very early date at Sarnowo, GrN 5035 3620 \pm 60 b.c.)¹⁰⁴ than in the Baalberg of the Saale district or the related Bohemian material. Baalberg seems to be the direct successor of Gatersleben, but the boundary between both is difficult to date exactly, because of the restricted number of ^{14}C -dates. It must, however, be at any rate before c. 3200 and perhaps even at the beginning of this phase C¹⁰⁵.

To the north of Michelsberg in its early phase the semi-Neolithic communities of Ertebølle/Ellerbek character continued. The main occupation of Hüde I, Dümmersee ended about 3200, which means that the finds (partly?) and the conclusions about this site are also valid for our phase C.

The Rhine/Meuse delta

Two new find groups from the Netherlands display close Michelsberg relationships and have in parts of their pottery surprisingly distinct parallels in the British Early Neolithic carinated bowls. We will discuss them, however, not here but in the next section, since they are dated between 3200 and 3000 b.c. There are other new sites and assemblages, dated slightly earlier and of different character, that fill the blank that formerly was this phase C. These are, first, a group of settlements discovered in the early sixties near Swifterbant in the newly drained polder Eastern Flevoland, situated at a depth of c. 6 m below sea-level on the natural levees of an early phase (Calais II) of the IJssel estuary and on the tops of partly eroded Late Glacial river dunes. Second, three find groups between the lower courses of Rhine and Meuse, all discovered in 1976: two assemblages on the Hazendonk and one at Bergschenhoek, north of Rotterdam.

Swifterbant

The settlements on the natural levees near Swifterbant are dated between 3400 and 3200 b.c. by means of ^{14}C -dates and for geological reasons¹⁰⁶. But on the dune tops it appears to be very difficult to separate the material from various occupations: Mesolithic and Neolithic remains are found on the same sites. The settlements must be taken as representatives of the occupation of a much larger region, comprising the northern part of the Holocene sedimentation area and the adjacent sand-districts. There is slight evidence that similar settlements occurred there along the brooks¹⁰⁷. Of these, the discovery of about

¹⁰⁴ Bakker et al 1969, 7

¹⁰⁵ Behrens 1973, 67, 79

¹⁰⁶ Van der Waals & Waterbolk 1976, Ente 1976, Hacquebord 1976, Brinkhuizen 1976, De Roever 1974, Van der Waals 1972, Van der Waals in *Helinium* 17-1, 1977

¹⁰⁷ De Gaste-Meppel and Heemse-Hardenberg Van der Waals 1972, 167-8 Spoolde id 162, Van der Heide 1962

350 antler implements at Spoolde near Zwolle is most extraordinary for the whole part of Europe under discussion. Although later trial excavations were carried out, there is no good circumstantial evidence. But it is very probable that at least the major part of the implements can be considered as one complex. As such it has very good parallels in the heavy bone industry of the Danish Dyrholm II stage. A big rim sherd, found at the same occasion, becomes now very interesting: it shows a high S-profile, widely spaced finger imprints in V-motifs as decoration and impressions on the rim¹⁰⁸. It is a sherd that would very well fit the pottery of the sites discussed here, especially the “Hazendonk-1” assemblage.

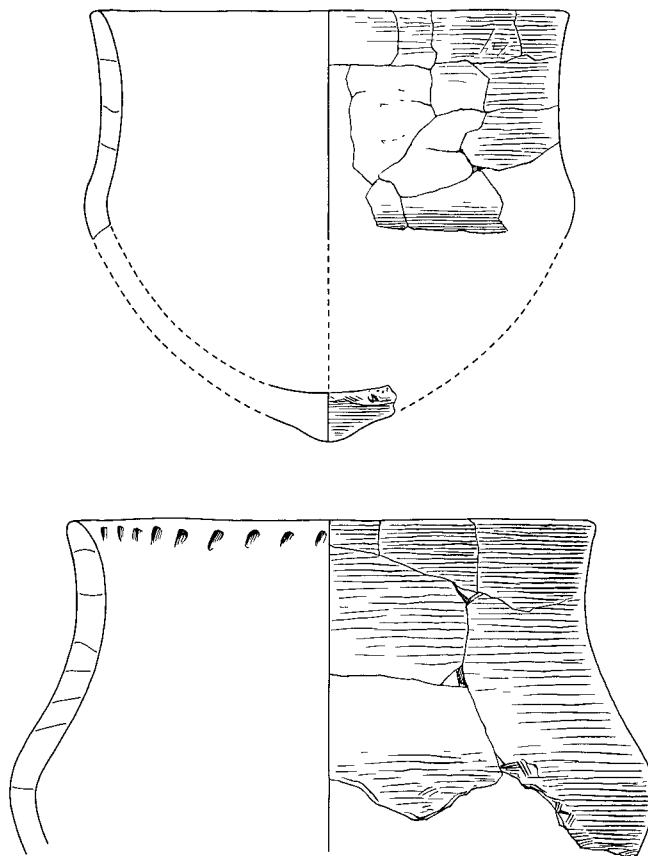


Fig. 9. Swifterbant, site S3, two pots. Scale 1:3. Drawing H. R. Roelink B.A.I., Groningen. Reproduced by the kind permission of Mrs. Pauline de Roever.

At Swifterbant the settlements concentrate around a point where a minor creek had formed a connection with a main branch of the system. It might have been an especially favourable fishing site. The small settlements measure up to 30 m in cross-section. Thanks to the wet conditions during and after the occupation and the subsequent covering with

¹⁰⁸ Van der Heide 1962, 25, Plate 33.

clay the circumstances for excavating are very favourable. So it is not unlikely that the internal structures of the settlements are preserved to some extent and that conclusions can be drawn about the organization of the communities that once lived there. But at the site S3, now carefully excavated by the Biological-Archaeological Institute, Groningen, only a few hearth places and post settings were found. The study of the botanical and zoological material is still in progress, so at this moment no information is available about the food economy at the site. The rich occurrence of fish bones (all fresh water species) and the presence of charred grain¹⁰⁹ suggest that this did not essentially differ from the related sites farther east.

The pottery is coil-built and has pointed or round bases, S-sections with flaring rims and sometimes weak shoulders. Perforations below the rim and lugs are absent. Decoration is not frequent and consists generally of a row of impressions along the inner rim or on the shoulder, executed with simple instruments like reeds, broken twigs or plain spatulas. In rare instances the surface is decorated with nail impressions and some sherds have a rough, smeared surface, like some of the large Michelsberg storage vessels. The differences in pottery technique and style on the three sites investigated until now are only of gradual weight: differences in the ratio of organic and stone tempering, in the decoration and in the details of the coil-construction. The flint industry is rather poor and no flake axes were found. Furthermore there are fragments of two antler T-axes and of a perforated adze with double-conical shaft-hole¹¹⁰. In two terrains a number of graves, with the dead stretched on their backs, were found. The absence of the skull in one of the graves might be accidental, but is interesting in view of the skull burials in the flint mines. More human remains were found among the domestic refuse, which was also the case at the Dümmersee. Swifterbant appears to be essentially a (very) late member of the northern Ertebølle in which typical eastern elements (e.g. *Tonwannen*, flake axes) are missing, like at the Dümmersee. The few sherds with roughened surface are interesting, since they point to a (be it very modest) Michelsberg contact.

Hazendonk-1

Until a few years ago, the single indication of comparable occupation in the Rhine/Meuse estuary was a round base sherd, tempered with organic material, found together with an antler axe (now lost) during the construction of a dry dock at Schiedam¹¹¹. It might very well be the single surviving object of a small settlement, similar to those now known from the Hazendonk and Bergschenhoek. A second indication was a level with human influences (wood clearings and cereal cultivation) in the Hazendonk-pollendiagram I¹¹², ¹⁴C-dated at 3370 ± 40 b.c. During the third and last campaign of the excavation there, summer 1976, two distinct concentrations of domestic refuse, to be brought in connection with this culture level, were found. Because of their age they were labelled in the first

¹⁰⁹ There is also a ¹⁴C-date (GrN 5081 3380 ± 60 B C) for cereal pollen in a pollen diagram from this district Van der Waals 1972, 164 A preliminary report on the palaeobotanical evidence appeared in *Helinium* 17-1, 1977

¹¹⁰ During the 1977 campaign a true *Breitkeil* fragment was found

¹¹¹ Louwe Kooijmans 1974, 18-20, 146

¹¹² Louwe Kooijmans 1974, 138

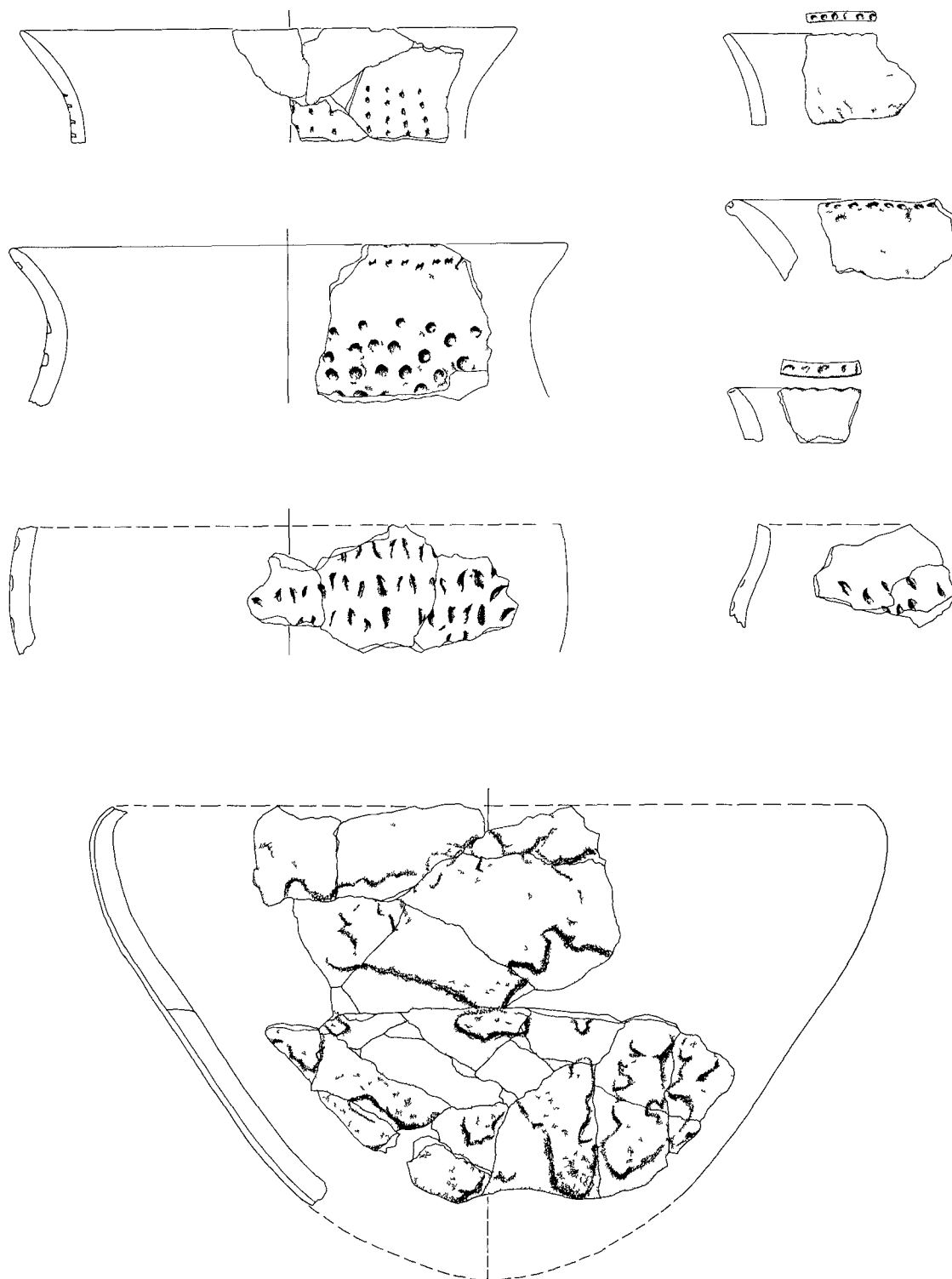


Fig 10 Hazendonk, phase Hazendonk-1, SE (= major) concentration, pottery Scale 1/3 The bulbous lower part of the big vessel shows the construction out of two wide strips and the subsequent cover of a clay with a different tempering This cover is heavily weathered

instance “Swifterbant”, but in view of the rather marked differences with Swifterbant proper now, more neutrally, named “Hazendonk-1”, to avoid future misunderstanding (cf. fig. 1).

The major find concentration was found in a well-defined stratigraphic position below levels with later (Hazendonk-2 and -3) remains. A smaller concentration lies at a distance of 180 m at the other end of the *donk*. It was excavated only relatively high on the slope, but still well below an Early Vlaardingen (2400 b.c.) level. The pottery is tempered with organic material, more specified with rather long pieces of straw and/or grass. Strip-building is rarely visible. It is rather thin (6-8 mm in general) and has a well finished surface. Decoration is not rare and consists of double fingertip-impressions, small squares filled with pin-pricks and impressions of a blunt object. Remarkable is a type of pottery of which the surface is covered with a 1-3 mm thick layer of an untempered or differently tempered clay. The pots had wide flaring rims, often with shallow impressions or incisions, the shoulders were rather sharply curved and the bases most probably were round. No flat or pointed bases were found. The amount of flint is very modest. We only can say that the industry is based on blades (in contrast to the irregular flakes of all later flint industries on the site) and that the single artifacts found are small broken blades with retouche along both edges. This is in good agreement with the flint industry of Swifterbant¹¹³. Some

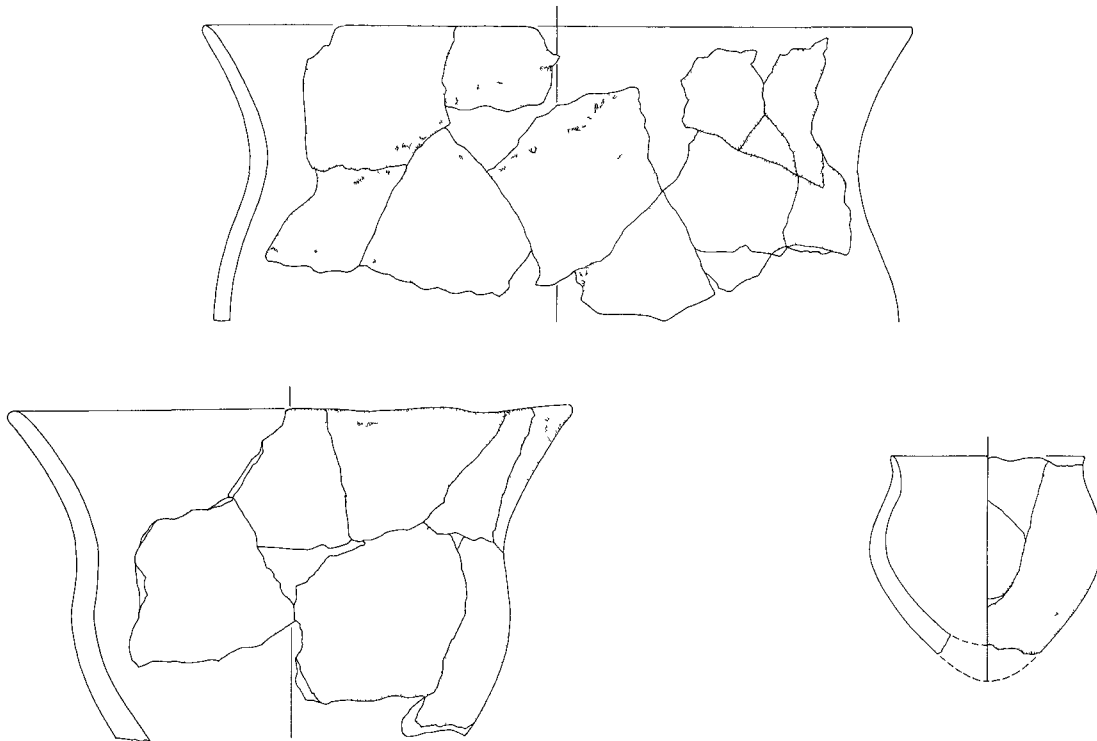


Fig 11 Hazendonk, phase Hazendonk-1, SW (= minor) concentration, pottery Scale 1 3

¹¹³ Van der Waals 1972, 166 blades, not larger than 5 cm with same retouch and *Hochglanz* are the single type of implements

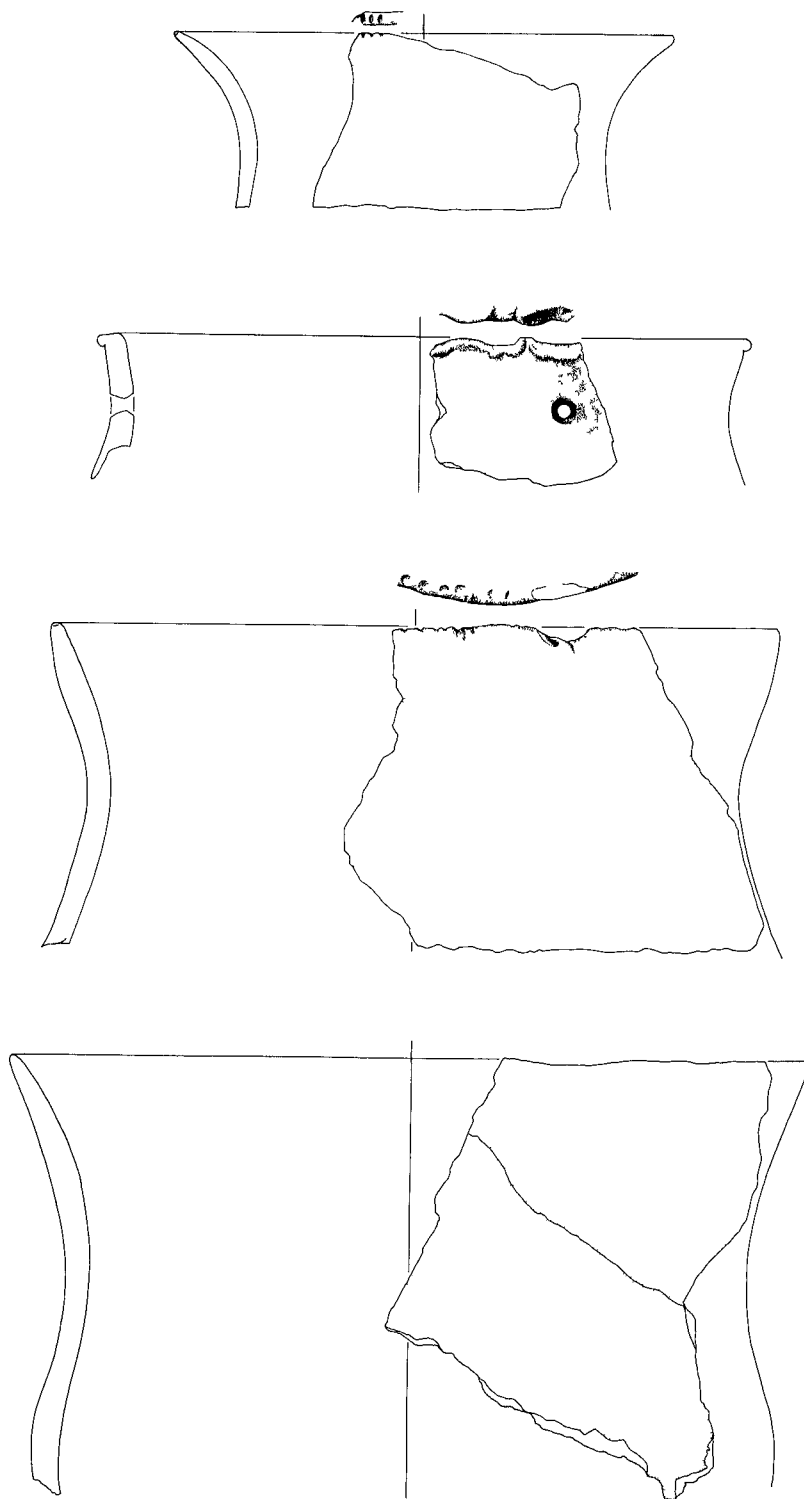


Fig 12 Bergschenhoek, selection of pottery collected at the discovery of the site, May 1976 Scale 1/3

perforated flat pebbles have also their counterparts in Swifterbant. The major concentration comprised further a modest number of animal bones (not yet identified) and large amounts of fish remains and charred chaff with grains of Einkorn and naked Barley and remains of the stems¹¹⁴, occurring in distinct thin layers and concentrations.

Hazendonk-1 and Swifterbant S3 certainly have elements in common and (after the identification of bones, seeds and pollen) might be more alike than we are now aware. But there remains the distinct difference in pottery style, a greater difference than that between Swifterbant and the considerably more remote Ertebølle Culture sites. The decorated pottery of Hazendonk-1 has its best counterparts at Hamburg-Boberg site 15, while the pin-pricks, arranged in squares are a rare phenomenon in Danish Late Ertebølle context¹¹⁵.

Bergschenhoek

The other site makes the situation even more complicated. It was discovered on 11 May 1976 during digging works north of Rotterdam, where an artificial lake of 3 m of depth was dug in a polder, in which the surface lies at about 5.5 m below sea-level. At a depth of about -8 m O D some big rim sherds, an antler axe-blade and a fragment of a stone adze were found. A piece of burnt wood gave a ¹⁴C-date 3465 ± 60 b c (GrN 7764). There was a chance for new observations in the beginning of September. Within 10 m of the findspot a small living surface was discovered. No other finds were made than the skeleton of a swan and a broken antler axe, but there are good arguments to combine the observations with the first finds. In a peaty bankzone of a fresh water or slightly brackish lake, small peat islands occurred. On one of them, perhaps floating and not larger than 5 m across, some people stayed at least four times (probably successive years) and each time only for a short while (some days at the most), apparently for fishing. Each time the surface was covered by bundles of reed, to make it firm enough to walk on, and a hearth fire was burnt. Preservation conditions are extremely good. There are abundant fish remains (scales, vertebrae, bones, fin rays), some fruit seeds (apple, plumb(?)) and the remains of a twig-and-rope fish trap¹¹⁶.

The sherds are tempered with pounded pottery ("chamotte") and/or organic material. Joints of broad coils are visible in some cases. The surface is well finished with rough burnishing marks and the interior shows marks of scraping. There is no decoration, but some rims have shallow impressions. Most rims show wide flaring profiles. One sherd of a relatively small vessel is identical in every respect to the Hazendonk-1 ware, the others differ in many technical respects from both the finer Hazendonk-1 and the coarser (thicker, more irregular) Swifterbant ware. It has its best parallels amongst the pottery from the Dummersee, "*Hauptphase*" (3700-3200 b c)¹¹⁷.

¹¹⁴ The macro-botanical remains are studied by Miss C. C. Bakels, Leiden. She kindly provided me with this preliminary information.

¹¹⁵ For instance in the uppermost and middle layers at Ringkloster, ¹⁴C-dated at about 3500-3400 b c (Andersen 1973/74, 62f, 81f). At Rosenhof some sherds were decorated (Schwabedissen 1972, 7). Comparable decoration at the Dummersee. Deichmüller 1965, Abb. 8. Another characteristic of the pottery on these sites is the presence of rim-impressions or -incisions.

¹¹⁶ A complete specimen was found at Vlaardingen (VL culture). F. R. van Iterson-Scholte, Amsterdam, is preparing a publication of this trap. Photograph in Louwe Kooymans 1973.

¹¹⁷ Deichmüller 1965, Abb. 4-a, d, k, but without lugs.

Conclusion

When we try to summarize : it is clear that much new information is available or will be so in the near future. In this phase C semi-agrarian communities existed at any rate in the low fresh water districts and possibly also in other environments, like the brook valleys of the sand regions. The varying dimensions of the sites at Swifterbant and the peculiar situation at Bergschenhoek suggest that maintenance camps and extraction camps can be distinguished, like with the De Leien-Wartena Complex. A major problem is the considerable differences in pottery style, not so much in forms but in the decoration and in technical respect. Does this reflect different sources and contacts, as for instance Michelsberg-influences on the southern sites, that are practically absent at Swifterbant? Or have we to do with rapid changes in pottery style in a relatively short period, or with a complex in which the pottery has a strong local accent and so a rather wide variation between sites¹¹⁸?

PHASE D, 3250-2700 b.c.

The southern sequence : later Michelsberg and Chasséen

Michelsberg, as described above continues into this phase. In view of the available evidence the C/D boundary lies probably somewhere in Lüning's MK III phase. South of Belgian Michelsberg the *Chasséen du Bassin Parisien* came into existence. The conception that this is a late development in comparison to the main distribution of the Chasséen, farther south, is confirmed by the ¹⁴C-dates, that are not earlier than 3200 b.c.¹¹⁹. This means that Belgian Michelsberg pottery with Chasséen relationships cannot be early (MK I or MK II) in Lüning's sequence, and must belong to this phase, as we pointed out in the foregoing section. This is demonstrated in the Kemmelberg assemblage and its ¹⁴C-dates around 3050 B.C.¹²⁰.

In its pottery the northern Chasséen is closely related to the southern facies, with characteristic features as the decorated vase-supports, multi-perforated ridges, tunnel-lugs, shouldered and carinated bowls and the statuettes. The clay disc (with undecorated rims) is a new element, probably derived from the Michelsberg Culture¹²¹. The main characteristic of the *Chasséen du Bassin Parisien* is, however, the autochthonous flint industry of Campignien character, with leafshaped and triangular arrow-heads, pics and some tranchet axes, which is closely related to that of Belgian Michelsberg.

Although there are some late ¹⁴C-dates for Cerny complexes there is no other evidence that this Chasséen group and the Cerny Culture were contemporaneous during some times¹²².

¹¹⁸ That is to say : must these differences be explained in a chronological or socio-cultural sense?

¹¹⁹ Bender & Phillips 1972, Blanchet 1974.

¹²⁰ Van Doorselaer & Walter 1974.

¹²¹ Bailloud 1961, 1971.

¹²² At Montagne de Lumbres (Prevost 1962) and at Videlles both could be separated stratigraphically, while Videlles gave a (very late) ¹⁴C-date at 1790 ± 140 b.c.

The flourishing period of the flint mines (viz. "phase III" of Spiennes and the excavated part of the deep galleries of Rijckholt) is dated in this phase D.

The northern sequence: Early TRB

The scarcity of finds makes it very difficult to follow the cultural sequence in the North German Plain. This is only possible by reference to Schleswig-Holstein and Denmark.

In Denmark the Ertebølle Culture (gradually?) came to an end at about 3300 b.c. or in the century following this moment. It is generally assumed that the EN-A (Store Valby) assemblage, especially the A-funnel-necked beaker, was introduced from "epi-Lengyel" context in Middle Europe. But Troels-Smith¹²³ pleads for an autochthonous development from his Dyrholm II to his Muldbjerg I stage, in which thin-walled pottery (esp. A-beakers) dominates and the thick-walled (Ertebølle) pottery has become scarce. In this phase the first polished flint axes, pointed-butted and with oval section, appear. They might be the "neolithized" (i.e. polished) versions of the now disappeared core axes. With the numerous impressions of various grains in A-beaker sherds we have the impression of a fully Neolithic community. No animal refuse is, however, known from a pure A-context.

The chronological value of the A-B-C division of the Neolithic, especially of the A and B phases, seems to be under discussion. ¹⁴C-evidence suggests that A beakers continue into the later part of the Scandinavian Early Neolithic¹²⁴. In the B-pottery (Havnelev) a number of elements occur that remind of comparable Michelsberg forms: the round-based funnel-necked beakers with wide flaring rims and the *Øskenkrukke* have their counter parts in the MK II tulip beakers and the MK III *Ösenkranzflaschen*. The slight differences in age can be no objection when we take the incertainties of our dating system into account. The EN-A type of clay disc has contemporaneous counterparts in the entire Michelsberg Culture. The discovery of Michelsberg pottery at Rosenhof near Kiel makes Michelsberg relationships (origins) of the B-pottery the more likely. At Havnelev bone refuse revealed that hunting was unimportant and that cattle dominated over sheep/goat and pig¹²⁵.

With the EN-C a dynamic, mainly autochthonous, evolution took place. Regional groups can be distinguished by differences in the richly decorated pottery, that continued the EN-B forms. The dolmens mark the start of a similar evolution in the building of megalithic grave monuments. But it is not relevant to discuss the sequence in Denmark in any length. We are more interested in what happened S.W. of it, and in which measure that can be linked up with this sequence.

In Schleswig-Holstein Schwabedissen¹²⁶ made a distinction between an earlier Satrup phase, characterized by the exclusive occurrence of *Trichterbecher* with *Wackelböden* ("wobble bases") and *Bauchfransen* ("belly fringes" of vertical lines) decoration, and a later Fuchs-

¹²³ Troels-Smith 1966

¹²⁴ Tauber 1972 The development appears to occur unilinear in a general sense but perhaps not so in some finer divisions. Especially the FN-A and B seem to be parallel (contemporaneous) and not successive developments.

¹²⁵ We realize that the idea of connections between TRB-B and Michelsberg is not new, but it is supported now by the new dating evidence. This section was not changed after discussion with Dr Søren Andersen during his visit to Leiden, February 1977. We are aware that more precise information is available now. Cf. also note 67.

¹²⁶ Schwabedissen 1957/'58, 1966, 1968 (Saturp 17-20, Fuchsberg 24)

berg phase. Fuchsberg shares so many characteristics with the Danish EN-C that it can be considered as another regional group within the same dolmen-period complex¹²⁷. The Satrup phase is ¹⁴C-dated about 3000 b.c.¹²⁸. Rare thin-butted flint axes and two fragments of A-type funnel-necked beakers belong to these find groups. Since the earliest thin-butted axes occur in Beckers EN-B, and since in Denmark the Satrup type of *Trichterbecher* is not earlier than EN-C, we must place the Satrup phase not aside the EN-A or -B, but somewhere near the boundary EN-B/C or in the beginning of EN-C. We remark that more than one of the beakers from Satrup have the characteristic EN-C hanging triangles along the rim in their decoration. Any genetical relationship with the Rössen *Kugelbecher* must be excluded for chronological reasons¹²⁹. From the Satrup sites there is no information on the food economy available, but at Fuchsberg, in a similarly wet environment as the earlier (Ellerbek, Satrup) settlements, a fully Neolithic economy could be established: only 15% of the bones belonged to wild animals, and cattle (72% of the total) was most important¹³⁰.

Hamburg-Boberg site 15, is the next stepstone on the way from Denmark to the Rhine/Meuse delta. The finds of this site span at any rate the time from Ellerbek (pointed bases, oval *Tonwannen*) till the EN-C (collared flasks with *Bauchfransen*), with A-(?) and B-beaker sherds in an intermediate position¹³¹. The certain attribution of the numerous fingertip-decorated and undecorated *Trichterrand* pots to any phase of this sequence is not probable, since at the excavated location (relatively high on the covered dune slope), there is no stratification¹³². This pottery has no counterparts elsewhere in the northern Early Neolithic, but the forms resemble the EN-C funnel-necked beakers. We can consider it best as a type of pottery, which had developed at the mouth of the Elbe during the Danish Early Neolithic most probably from an Ertebølle/Ellerbek basis. A related find group is that from Engern-Brinkhof near Minden¹³³. Sherds of *Trichterrand* pots, *Tupfenleisten* (cordons with fingertip impressions), clay discs with fingertip decorated rims and the association with a "flat hammer axe" give a position (as the finds geographically have) in between the Michelsberg Culture and Boberg¹³⁴.

West of the Elbe it is again the Dümmersee that gives the only precise information. In the upper occupation layer, clearly separated from the earlier (Ertebølle-Bischheim) remains, Satrup-type *Trichterbecher* go together with fragments of collared flasks and a beaker of Baalberg-type¹³⁵. This occupation is ¹⁴C-dated between 2950 and 2700, which is in good

¹²⁷ For discussion of the Fuchsberg phase: esp. Schwabedissen 1970.

¹²⁸ Schwabedissen 1968, 17.

¹²⁹ In contrast to Schwabedissen 1966, 421. But at the meeting of the *Arbeitsgemeinschaft Neolithikum* at Würzburg, 6-10-1975, Schwabedissen demonstrated two series of ¹⁴C-dates for both phases, with Satrup c. 3150-2750 b.c. and Fuchsberg c. 2900-2600 b.c. So there appears to be a certain difference in age, but also a distinct overlapping of both.

¹³⁰ Schwabedissen 1968, 24; grain impressions are also mentioned.

¹³¹ Schindler 1953/55, Taf. X-4, 16, XI-13, 15 (are the ears not placed too low?), Taf. X-13, 19, 20 (collared flasks with *Bauchfransen* = FN-C on Taf. XI). Clay discs are remarkably absent.

¹³² This might be the case lower on the slope, as at Shippea Hill (Clark & Godwin 1962) and Hazendonk. The flint of Boberg 15 must be a mixed assemblage.

¹³³ Erdniss 1941, K. H. Brandt 1961, 1967, 24-5.

¹³⁴ Lüning 1967, 62 (: not MK), Bakker 1973, V-28.

¹³⁵ Deichmüller 1969, 31.

agreement with the above suggested correlation Satrup-(Early) EN-C. There are two ways to explain this sequence: an evolution similar to that in Denmark (but perhaps without A-beaker elements) can be assumed for the North German Plain, or a cultural extension from the regions east of the Elbe. In both constructions there is room for the continuation and evolution of communities related to Ertebølle-Boberg-Swifterbant north of the Weser-Wiehen Gebirge and for influences from Michelsberg.

At the Dümmersee some changes in the food economy seem to have taken place in comparison to the foregoing Bischheim-Ellerbek phase. Bones of domestic animals (cattle, pigs) occur in the refuse. No charred grain was found but quern stone fragments and a complete pair of quernstones might be brought in connection with crop cultivation. Their cultural context (layer) is not mentioned¹³⁶.

The few finds in the Netherlands, that were considered to belong to this phase, are now again under discussion. Bakker¹³⁷ argued recently that there is no forcing stratigraphical evidence to assume that the so-called pre-Drouwen grave is older than the *hunebed*, next to which it was found. For typological reasons the age probably is late in the *Tiefstich* TRB, but Bakker does not want to exclude entirely the original dating to the EN-C. The big pot with rim perforations from Neede/Eibergen is not necessarily pre-*Tiefstich* TRB, but can belong to a later TRB phase or the (Early) Vlaardingen Culture as well¹³⁸. The empty place, left by these finds, is now partly filled by the new domestic assemblages of the Hazendonk, Molenaarsgraaf and Het Vormer, Wijchen.

The Rhine/Meuse delta

On the Hazendonk two distinct associations belonging to this phase can be distinguished. The one is labelled "Hazendonk-2" and shows distinct relationships in pottery forms with Belgian Michelsberg and the British Early Neolithic carinated bowls. The second, labelled now "Hazendonk-3" is slightly younger and comprises the Hazendonk pottery as defined earlier plus the associated material. It can safely be correlated to the culture level ¹⁴C-dated at 3000 b.c. in the pollen-diagram I¹³⁹.

Hazendonk-2

The Hazendonk-2 material is restricted to a relatively small concentration (diam. about 10 m) on the covered slope of the north-eastern end of the Hazendonk, sealed off by refuse levels with Early Vlaardingen and Hazendonk-3 material. In the Holocene deposits two thin "culture layers" between the more prominent Hazendonk-1 and Hazendonk-3 refuse layers contained identical pottery in stratification. So the age is certainly between 3400 and 3000 b.c., factually about 3200. Future ¹⁴C-determinations will give more precise dates.

The pottery is very heterogeneous in forms and technology and it might appear that we factually have to do with the remains of more than one occupation, an idea supported

¹³⁶ Deichmuller 1965, 11, 15, 1969, 32

¹³⁷ Bakker 1973, VI-11-16

¹³⁸ Without base and so difficult to date, Bakker 1973, VI-18

¹³⁹ Louwe Kooijmans 1974, 150f, and 138

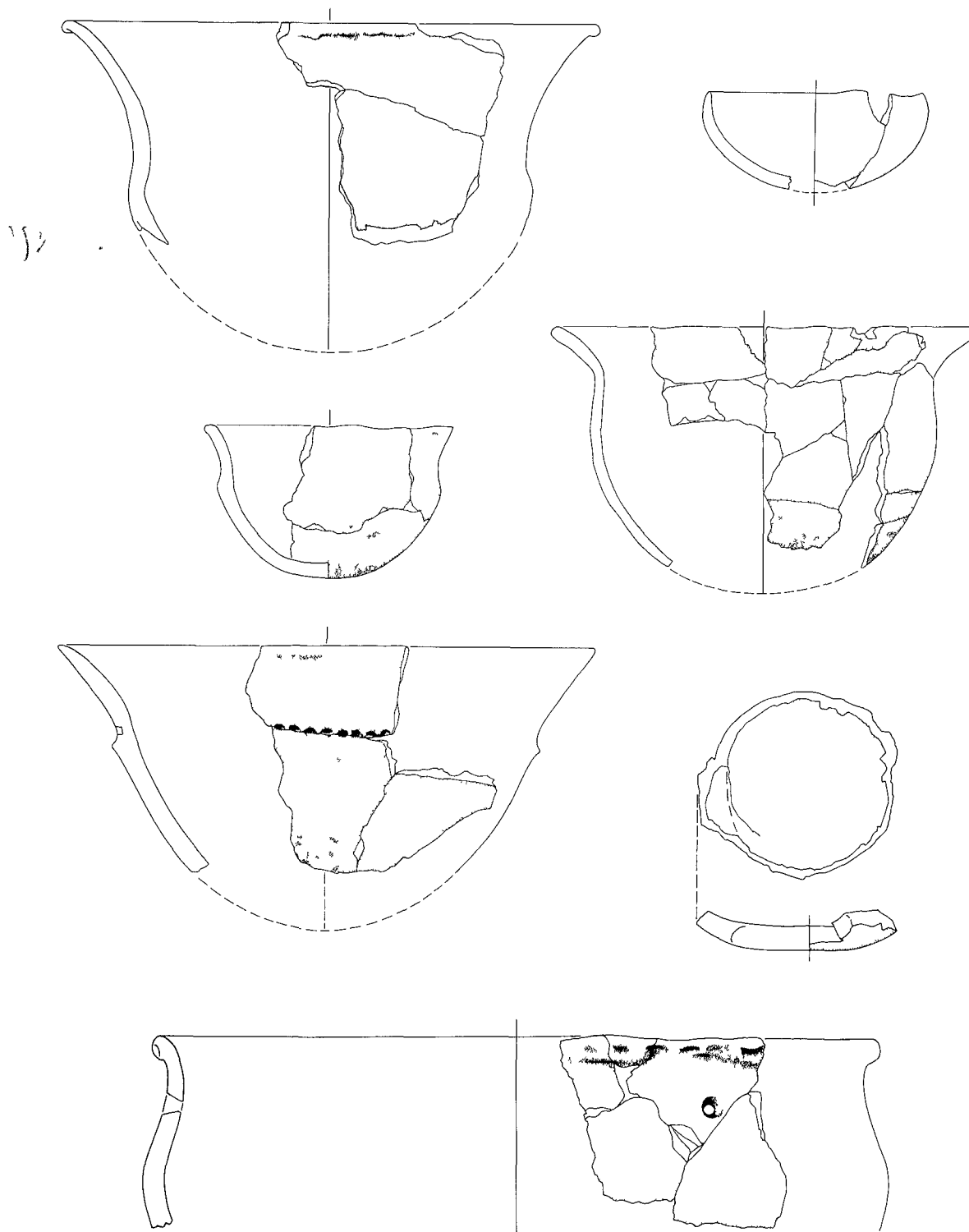


Fig 13 Hazendonk, phase Hazendonk-2, pottery with Michelsberg (tulip beakers) and/or Grimston/Lyles Hill (carinated bowls) affinities Scale 1 3

by the presence of not one but two old surfaces in the peat. There is strip-built pottery (like Hazendonk-3, but less distinct), tempered with shortly cut organic material. Many sherds have a roughened or smeared surface, there are rims with a *Tupfenleiste*, and a peculiar base, that can be described as a round form with a small omphalic depression. A carinated bowl with a row of deep impressions is of the same ware. Another pottery is thin and tempered with broken quartz, badly visible on the irregular smoothed surface. Strip-building is visible only in a few cases. Until now two tulip beakers, a carinated bowl and a little cup could be reconstructed. A third ware is richly tempered with sand and some broken stone and often has a smeared surface. At last we mention a rich temper of crushed granite in a thin black pottery, sometimes demonstrating carinated sections. There are round coil-built bases of different wares. A big triangular arrow-head with superficial retouche and made of grey Belgian or Limburg flint can be connected with this pottery.

We see the coil-(strip-)building with wide coils and simple (horizontal, \cap - or \cup -shaped) joints as an inferior technique to that with narrow coils and oblique joints. In the last case the joints are much firmer by the broad attachment-surfaces and the cracks are independent of the joints. Thus, in respect to the common Michelsberg practice, a deterioration of the potter's technique has taken place.

As a preliminary judgement we are inclined to interpret the material as a locally made pottery in a Michelsberg "pottery style".

At this moment of research it is too early to give more than a general comment on this assemblage. The forms and the various ways of surface treatment demonstrate unmistakably Michelsberg relationships, be it from different directions. The tulip beakers have their best parallels in Belgium, esp. at Boitsfort¹⁴⁰, but the smearing and roughening of the surface are not known from that country, nor is it common in the Rheinland, but it is present at Coesfeld, Westfalia¹⁴¹. The wide and low tulip beakers and the profile of the *Tupfenleiste*-vessel seem to be arguments in favour of an early dating in Luning's sequence (MK II, perhaps MK III) in spite of the absence of other leading types for the phases. Both carinated bowls, the one more distinct than the other, might cause some excitement to our British colleagues. For the big one there are good parallels in forms among the Grimston-bowls from Yorkshire and South-east England, and in some bowls from even more distant places¹⁴². The Hazendonk bowls (together with the material from Het Vormer, Wijchen, see below) support the opinion, based on the presence of wide "carinated tulip beakers" in the Belgian group¹⁴³, that the Michelsberg province north of the Ardennes had

¹⁴⁰ Luning 1969, Taf. 1-3, 8, 11, Spiennes. Taf. 3, 2. Luning's Type 5 or related to this type.

¹⁴¹ Wilhelm 1971.

¹⁴² One can easily find examples of the major characteristics of the big bowl in the British Isles, but not combined on one vessel. For the profile: Jessup 1970, fig. 20 (Cissbury), Piggott 1972, Taf. 54, 1-4 (Easterton, Grimston). Carinations are rare in Broome Heath, Wainwright 1972 (some examples: P. 367, 368, 369). For impressions along the carination: Piggott 1954, fig. 11, 1 (Abingdon), Smith 1965, fig. 27 (Windmill Hill) both in a finer technique. For the remarkable rim form, also present at Het Vormer, see p. 272 and note 161. The best counterparts for the smaller bowl can be found in Ashbee 1970, fig. 38 esp. no. 2, for the little cup: Smith 1965, fig. 15. The Abingdon style means the start of the decorated bowls. ¹⁴C-dates prove its origin at or shortly before 3100, in perfect correspondence with the presumed age of the Hazendonk bowl (c. 3200 b.c.) and the finds at Het Vormer (3000-3200 b.c.). Cf. Smith 1974, 108 and 110 (presence of Abingdon style at Windmill Hill).

¹⁴³ For instance: Piggott 1972, 30, Smith 1974, 106 f.

similar connections with Grimston-Lyles Hill, as Hembury had with the Chasséen of western France. The new finds have widened the frontline of this group and contain closer parallels to the British material. But we do not want to say that Grimston-Lyles Hill is a Belgian Michelsberg extension, nor the reverse. One can only say that the new finds prove contacts between the people at both sides of the southern North Sea about 3200 b.c.

It must be in this sub-phase, about 3200 b.c., that the Neolithic (material assemblage, culture, way of life) was spread all over the British Isles. "Western Neolithic" pottery, earthen (unchambered) long barrows, causewayed camps and flint mines all have ^{14}C -dates that go back to about 3250 b.c., with only a few dates that suggest a slightly earlier start, in the end of phase C¹⁴⁴. This is, however, not the start of the Neolithic on the British Isles. An isolated ^{14}C -date as BM 679 3475 \pm 117 b.c. of Broome Heath cannot be given much weight in this respect¹⁴⁵, but quite the contrary is the case with the long series of interrelated ^{14}C -dates, archaeological and palynological observations at Ballynagilly¹⁴⁶. There is a *landnam* horizon at about 3850 and ^{14}C -dates of nearby occupation by about 3700 b.c. The association of these dates with simple forms of Grimston-Lyles Hill pottery from the same pit fillings seems undeniable. This means that the Belgian Michelsberg pottery can no longer be considered a serious candidate for the ancestorship of the carinated bowls. So the question where the first settlers came from is completely open again. Rössen is cautiously mentioned as a possible source¹⁴⁷, as it seems more by the lack of serious alternatives. There are hardly resemblances in pottery forms, Rössen-decoration is completely missing in Great Britain, there are no Rössen *Breitkeile* as far as I know and the Earliest Neolithic house at Ballynagilly only has modest resemblances to the Rössen trapezoidal houses, for instance in its plank-built walls. There are, moreover, serious geographical objections. The Rössen Culture is a typical inland phenomenon and is nowhere nearer to the coast than 300 km. The first traces of colonization would rather have been expected in the well-investigated south-east of England than at the opposite corner and across the Irish Sea. It has more sense to look south along this sea to Brittany, where are equally old neolithic ^{14}C -dates¹⁴⁸, a country that had megalithic relationships to the same area some centuries later. The bowls of the "Néolithique Primaire"¹⁴⁹ are simple and not shouldered. But we must realize that changes in the material will occur in such a phase of colonization¹⁵⁰ and explain the carinations and

¹⁴⁴ As such in the first place series of interrelated ^{14}C -dates from one site are considered. For example, both ^{14}C -dates of the same Early Neolithic structure at Fengate differ 700 years: GaK 4196 3010 \pm 64 b.c. and GaK 4197 2345 \pm 50 b.c. (Pryor 1972)! It seems uncautious to presume a very long occupation on a few ^{14}C -dates in this case, or when the archaeological material is so homogeneous as at Broome Heath (Wainwright 1972). Survey of ^{14}C -dates in Smith 1974.

¹⁴⁵ Wainwright 1972, esp. 70, 75.

¹⁴⁶ ApSimon 1976, 1969. It is hardly possible to deny the association, although it is of Waterbolk's category C. This "Earliest" Neolithic has more simple rims and bowl sections than the Middle Neolithic Lyles Hill ware from the same site. The rippled surface treatment is not present in the Earliest Neolithic material and leaf-shaped arrowheads does not seem to be present before the "Early" phase (ApSimon 1976, 20, fig. 5).

¹⁴⁷ ApSimon 1976, 24; Whittle 1976.

¹⁴⁸ Giot 1971.

¹⁴⁹ L'Helgouach 1966.

¹⁵⁰ Case 1969.

slightly more elaborate rims in this sense as a local development in the first stage of colonization.

We can accept subsequently a gradual spread from the colonization centre(s) around the Irish Sea into England. This expansion (of ideas or people or both) may have reached the North Sea coast of South-east England about 3300 b.c., or perhaps even as early as the oldest ¹⁴C-date of Broome Heath suggests. Apparently there existed at this stage, about 3200 b.c., contacts with the continent. In Wessex Chasséen pottery forms were introduced, but in the east the influences went in the other direction. We can imagine that the descendants of the former colonists (perhaps not being aware of this status!) tried to colonize the continent. Less old-fashioned is the assumption of mutual contacts of the people on both sides of the North Sea. Piggott¹⁵¹ mentioned arguments in favour of this supposition, that are still valid in this new construction: the contemporaneous start of flint mining in similar techniques and with similar implements, the occurrence of the characteristic comb, and I would add leaf-shaped arrow heads in the Belgian Michelsberg province, a very fine example of which has been found on the Hazendonk¹⁵².

Hazendonk-3

The "Hazendonk-3" occupation is characterized by the "Hazendonk pottery", as I defined it some years ago¹⁵³. It has been found in larger or smaller quantities all around the *donk*, that measured in this phase about 8000 m². Within this general distribution distinct concentrations, some meters in cross-section, can be made out. To what measure all finds can be considered as one complex cannot yet be said. Is it the refuse of one central settlement spread in different directions, or do we have to do with more occupation centres with their own debris and when this is the case: to what measure are they contemporaneous? At any rate, the differences between the major concentrations are not prominent but only slight, so I will discuss the material as a whole. The Hazendonk-3 material belongs to a level that slopes from -3.50 m N.A.P. at the contact point of the old surface with the sandy donk slope to a depth of at least -4.40 m farther away, as a result of later compaction. This is the level dated 2985 ± 40 b.c. in the pollen diagram I.

The pottery has all characteristics, mentioned earlier for Hazendonk Pottery: it is built up from small or wider strips (up to 3 or perhaps 5 cm) and tempered generally with coarsely broken quartz and sometimes pounded pottery. The pots have barrel- or bowl-shaped profiles with rounded or flattened bases and inverted rims, that are often turned vertical at the ends. There are various types of lugs, especially highly placed and horizontal in form. More than half of the sherds are decorated with various types of simple imprints of nails, fingertips or simple instruments like feather shafts, broken sticks, round joint-balls of small bones and the like. Incised lines are short or long, deep or superficial, always running parallel and most often in vertical direction. There are no patterns, but the imprints are arranged in fields, covering the entire surface of the pot, with the exception of a zone below the rim.

¹⁵¹ Piggott 1972.

¹⁵² For instance: Kemmelberg (Van Doorselaer & Walter 1974, fig. 8), Inden 9 (Aldenh. Pl. II, 349), Koningsbosch (Van Haaren & Modderman 1973, fig. 12).

¹⁵³ Louwe Kooijmans 1974, 150 f.

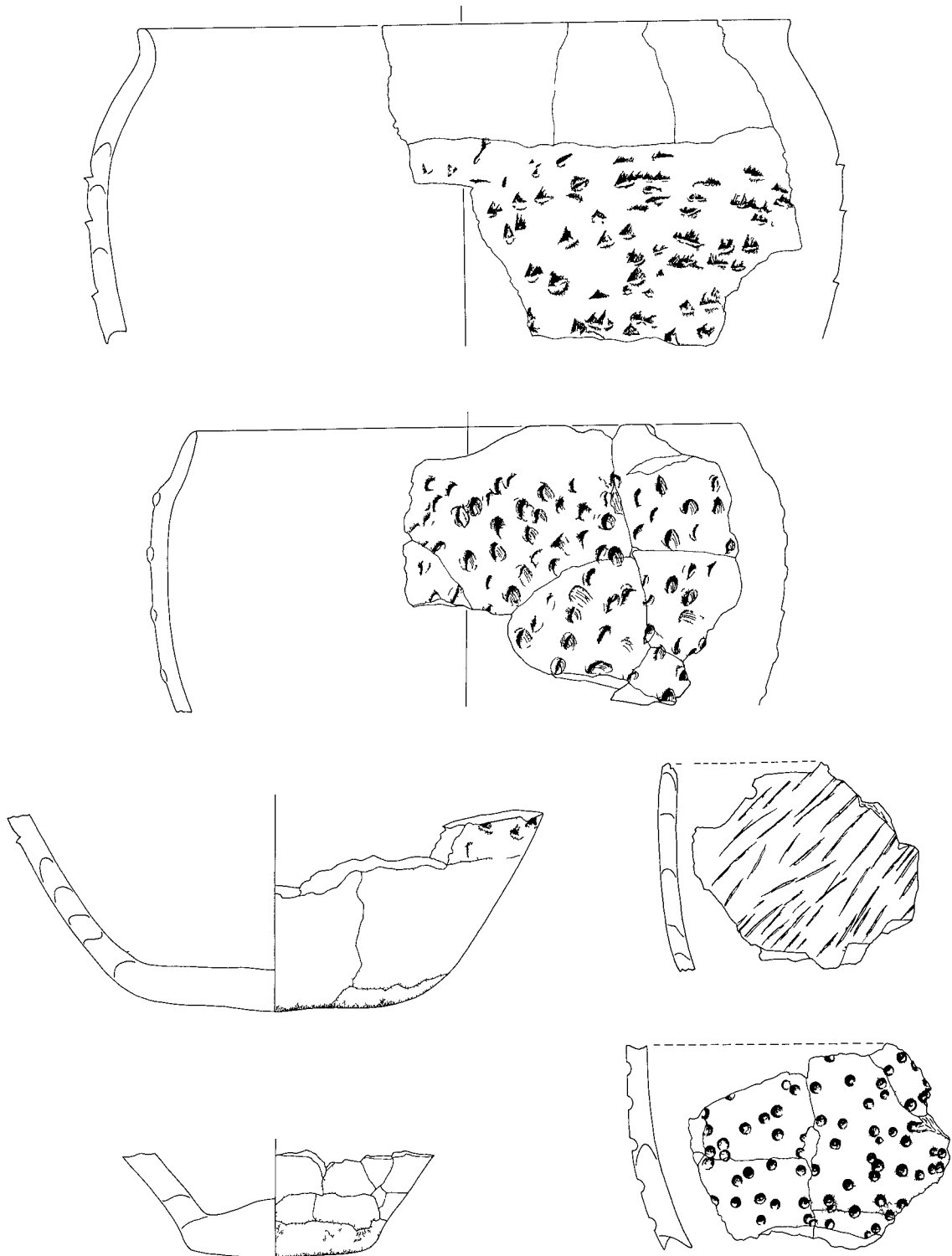


Fig 14 Hazendonk, phase Hazendonk-3, pottery Scale 1 3

Some new techniques of decoration and some new pot forms were added to those already known. Some lumps of potter's clay demonstrate that the pottery was made at the site. Associated with this pottery there are a few fragments of polished flint axes with oval sections, of quartzite grinding stones, and a sandstone arrowshaft smoothener. The flint is very poor in its raw material (exclusively river pebbles) and working technique. Many of the small, irregular flakes were used, but almost no artifacts were found. Some small triangular arrow-heads with superficial retouche come from this level. Conspicuous elements in this assemblage are a few long blades, with retouche along the edges, a long end scraper and a round specimen, that certainly were not made at the site but must have been acquired by trade with the South Limburg or Belgian flint mines. The bone refuse is scarce and not yet identified, but beaver remains are conspicuously frequent and there are some human remains and a complete human skull.

The origin of this Hazendonk-3 assemblage and especially of its outstanding pottery raises many problems. There are hardly points of correspondence with one of the earlier find groups, although the differences in age are not more than a few centuries. In the new situation a more cautious comment must be given, than the author did earlier when he compared the pottery of Swifterbant with this group¹⁵⁴. In tempering, forms, decoration and the absence/presence of various types of lugs there is a great contrast. Even the coil-construction varies considerably among the various complexes, in the way it is executed. The same is true for the various ways in which the surface-roughening (*Schlickrauhung*) is applied in the various phases. We might only suppose a continuity in decoration style from Hazendonk-1 to Hazendonk-3, and then consider the Michelsberg assemblage as an intrusive element. If we assume any genetic relationship within the Rhine/Meuse district, marked changes must have taken place in the pottery tradition. But can we trace some of the new characteristics in other areas?

The coil construction is a general characteristic of Middle Neolithic pottery: it is well-known from Windmill Hill, less distinct for Michelsberg and again characteristic of the later TRB¹⁵⁵. But the joints are never as simple and primitive as with the Hazendonk-3 pottery, but oblique and well fitted together. The flattened-round bases are also an element found in the same widely separated cultures. The bag- and barrel-shaped forms have the best counterparts in the coarse ware of Windmill Hill and the south English EN in general, where we also find a similar variety of lugs, especially the horizontal type, placed not far below the rim¹⁵⁶. Vertical line decoration is common on deep bowls, but in another position and in a more regular execution¹⁵⁷. The *Bauchfransen* of the EN-C *Trichterbecher* (Schwabedissen's *Satrup-becher*) give better parallels, but still the resemblance is not very striking. Although some connections might be real, the main impression is that of a local pottery.

¹⁵⁴ Louwe Kooijmans 1974, 162. These remarks were criticized by Mrs Pauline de Roever, who studies the Swifterbant pottery. She rightly stated that I over-estimated the points of similarity. Even in the single, be it basic, aspect: the coil building, there is a considerable difference in the way of construction.

¹⁵⁵ Smith 1965, 43 f., figs 11, 12, Luning 1967, 12 f., but coiling is rarely visible in MK-pottery. For TRB Van der Waals 1963.

¹⁵⁶ Smith 1965, fig 12.

¹⁵⁷ Id fig 26.



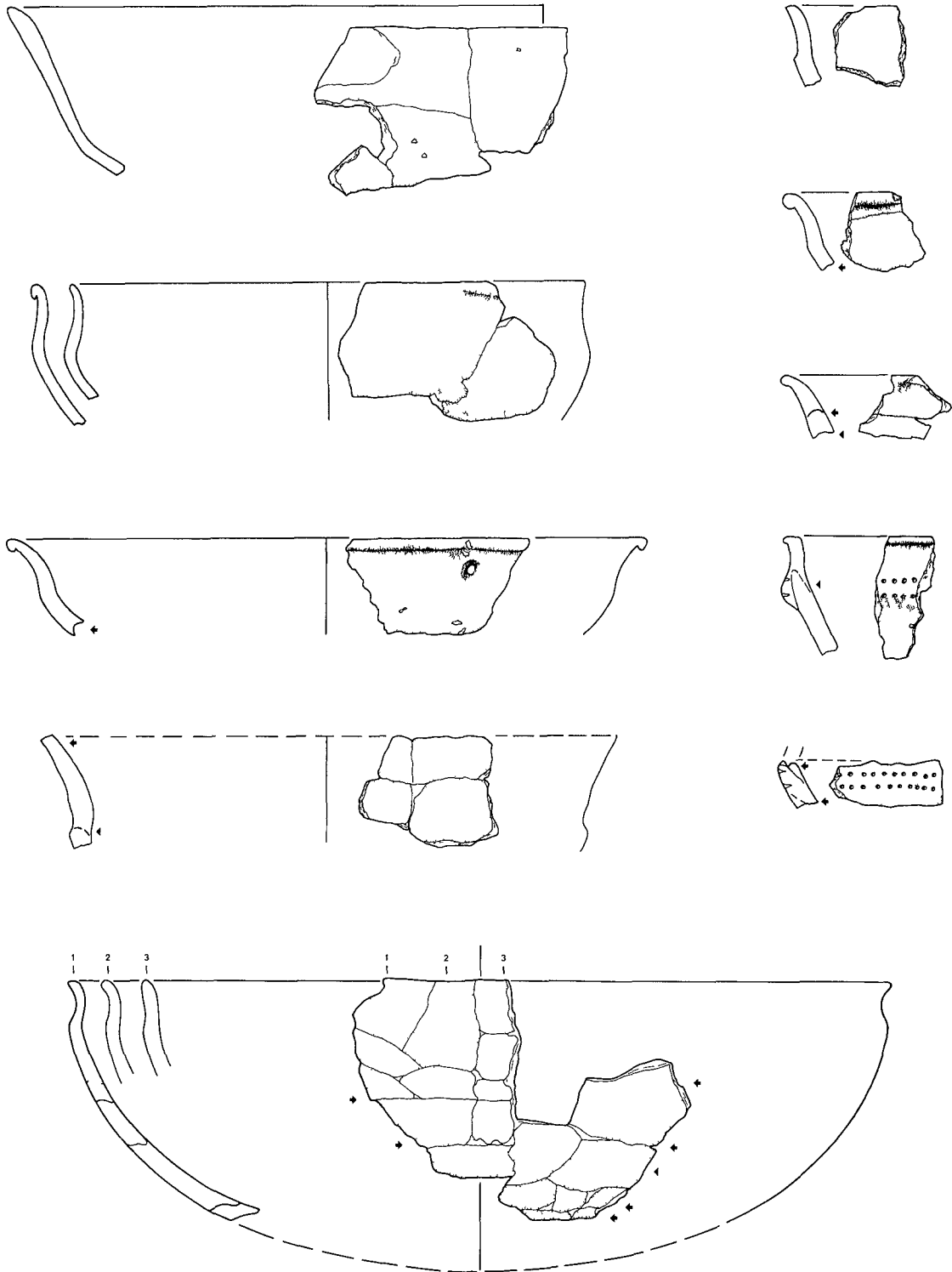


Fig 15 Het Vormer, Wijchen Selection from the pottery of those sherds, that show Michelsberg or Grimston/Lyles Hill characteristics Scale 1 3

style. A definitive judgement must, however, wait for the careful evaluation of all collected information.

Het Vormer, Wijchen

Two more sites with Hazendonk pottery (Hazendonk-3) were discovered in recent years. In 1976 a modest number of decorated, strip-built and quartz-tempered typical "Hazendonk" sherds were found by Mr. Koeling of Cuijk in the new extension of this small town. Apart from some flint implements from the same plan there is no associated material or circumstantial evidence.

Some years earlier, in the autumn of 1971, two more interesting concentrations of this type of pottery together with some flint were saved by members of the Archaeological Work Group of Nijmegen during sand digging works at a wide and low Late Glacial dune named Het Vormer, near Wijchen¹⁵⁸. Both concentrations, one in a filled-in depression, the other from a covered fossil soil on the slope of the dune and below some Bell Beaker sherds, are very similar in composition and will be treated here as a whole. Like at the Hazendonk, both might very well be related to one completely destroyed settlement site on the top of the elevation.

The flint includes two surface-retouched triangular arrowheads, three long retouched blades and the fragment of a flint axe with oval cross-section and flattened sides. These would all fit into the Michelsberg Culture as well as the Koningsbosch assemblage of the "Limburg Middle Neolithic" (Phase E)¹⁵⁹.

The pottery shows a large variety in colour, wall-thickness, surface treatment and tempering and can be divided into three main wares. The main category (70% of the total) consists of decorated and undecorated sherds, that fit in all respects those from Hazendonk-3.

The second group (12%) is a dark (often) black pottery, hard, richly tempered with fine pounded stone and with a sandpaper-like surface. This group has a similar coil-construction as the Hazendonk ware and slightly extended, bevelled or rolled rims. Some show carinated pot-sections, two have a double row of pin-pricks as decoration, one of them with a horizontal lug. One strip-built, wide, carinated bowl could be reconstructed from a sherd. The third group (18%) consists of yellowish brown, moderately tempered and well-finished sherds. Especially the thin-walled part of this ware has some outstanding characteristics: the surface is often burnished, coil-building is not visible and the forms appear to be mainly wide, round-based bowls and dishes with various sections. It seems that we have to do with a Hazendonk-3 assemblage, to which the same elements are added, that are present in the Hazendonk-2 material: pottery with Michelsberg and Grimston affinities. Although we considered the finds in the first instance as one complex, the new information from the Hazendonk makes one more cautious. There are two possibilities: remains from more than one occupation became mixed or the different types of pottery were really used contemporaneously in one community. The first explanation would be more

¹⁵⁸ Janssen 1974, Louwe Kooijmans in prep for a full report

¹⁵⁹ Van Haaren & Modderman 1973, esp 47

in agreement with the Hazendonk evidence, but we cannot exclude Michelsberg contacts at Wijchen at a slightly later moment in advance.

After the comments made above on Hazendonk-2 no extensive discussion is necessary here. It is clear at once that, again, there are no Early-TRB affinities. In workmanship (and the invisibility of coils) the brown burnished bowls correspond well with the fine Michelsberg pottery, while some of the forms have their counterparts in the Belgian group. But the wide dishes seem to be rather original in their forms. A big strip-built pot with a roughly smeared surface, a plain rim and a very smooth S-section was classified as belonging to the Hazendonk Pottery. It has, however, very close counterparts in some *Vorratsgefäße* of the MK III and later phases of the Michelsberg Culture.

The "black sand paper" ware has — in its totality of workmanship, the rolled (or otherwise not plain) rims, frequent carinated profiles and round bases — the best counterparts in the Grimston bowls. The description of "ware B" of Broome Heath particularly fits this black pottery¹⁶⁰. It is remarkable that some of the elements of the brown burnished ware have also been found in the eastern part of England. The typical smoothly thickened rims are present at Fengate¹⁶¹ and the S-profiled bowl has parallels in bowls from Hazard Hill, Giants Hill and Broome Heath¹⁶². The wide carinated bowl has no good counterparts¹⁶³. A marked difference is, however, the absence of the fluted or rippled surface-treatment. The double row of pin-pricks along the carination is a characteristic of Abingdon ware and is also present at Windmill Hill on a number of sherds¹⁶⁴. A similar decoration occurs on the Michelsberg *Knickwandschüssel*, a type restricted to the southern groups and not found north of Mainz¹⁶⁵.

Conclusion

As a conclusion we can state that in the Low Countries during this phase two "cultures" can be distinguished.

First a Michelsberg group with strong Grimston/Lyles Hill affinities, present in isolated finds in North Belgium (Antwerp, Lommel), found at the Hazendonk in stratigraphy and dated c. 3200 b.c. ("Hazendonk-2"), and intermixed with "Hazendonk-3" pottery at Wijchen. Carinated bowls, wide tulip beakers, wide dishes and storage vessels with smeared or roughened surfaces are the major pottery forms.

¹⁶⁰ Wainwright 1972, 23

¹⁶¹ Pryor 1972, 9, esp nos 2, 3, 4, Piggott 1972, Taf 54,3

¹⁶² Newbigin 1973, fig 1-4&6, Piggott 1954, fig 17, 1, Wainwright 1972, P300, 308, 375 and others

¹⁶³ Cf for instance Wainwright 1972, P87, 369

¹⁶⁴ Lit in note 142

¹⁶⁵ Luning 1967, Taf 14, 29 and 55, Taf 33, 24, Taf 75, 8 and 9, Taf 79, 6 and Taf 85, 2 We wonder if there is any relation between these *Knickwandschüssel* and the pin-prick decorated bowls. It can be seen as convergence: the motif is very simple and rather logical in relation to the shape of the vessels. The horizontal lug on one of both Het Vormer sherds fits better to the English than to the Upper-Rhenish examples.

In the discussion of the pottery from Het Vormer during the 4th Atlantic Colloquium in Ghent, especially with Dr ApSimon, the presumed English relationships for both "additional" wares got a firm support. The finer ware of the English Early Neolithic (like that of Broome Heath) has a similar wide range in quality, like that demonstrated in both these wares. The forms of both wares have also better parallels in England than in Belgium.

Second, an apparently small, local culture with the Hazendonk-3 pottery as a leading characteristic, found in domestic assemblages at the Hazendonk, in Wijchen and Cuijk. The pottery is bag- and barrel-shaped, with inverted rims and flattened round bases and is frequently decorated with all kinds of impressions or incisions, with the exception of the upper 5-10 cms.

The description of the associated material of stone, flint and bone and of the subsistence economy must await the find report on the new sites. As to the situation of the settlements it is striking, that they are all situated in or next to the wet, low-lying regions and that, in general sense, the same can be said of many Early Neolithic settlement sites in East England¹⁶⁶. It is remarkable that one of the best known English sites, Peacocks Farm¹⁶⁷, ¹⁴C-dated at about 3000 b.c., lies in a very similar physiographic situation as the Hazendonk. This might make it easier to accept the long distance relationships across the sea proposed in this section.

PHASE E, 2700-2450 b.c.

Tiefstich TRB

After a long "misty" period the occupation of the North German Plain is suddenly richly documented by the *Tiefstich TRB*. Until about 15 years ago it was the oldest Neolithic north of the *Bandkeramik* in the Lower Rhine District and Lower Saxony. But it is not only its occurrence in megalithic monuments that makes the *Tiefstich TRB* so well represented. Flat graves and settlements are known as well in some numbers.

Recently a detailed monograph on the western "group" of the *Tiefstich TRB* was published by Bakker¹⁶⁸ and we will depend mainly on his work. The start can be correlated with the Danish EN-C/MN-Ia boundary. The richly decorated pottery (esp. the shouldered bowls, the dishes and the pails) permits a division into short phases (A-G), parallel to the Danish MN I^a-V sequence¹⁶⁹ and to the East German sequence of (partly overlapping) pottery styles: Salzmünde, Walternienburg, Bernburg, *Kugelamforen* (globular amphorae)¹⁷⁰. Bakker's sequence is a refinement of the older subdivision in the Drouwen, Early and Late Havelte phases¹⁷¹. ¹⁴C-dates are scarce. There is only one early date, which, together with those for Denmark¹⁷², makes a dating of the start at about 2700 b.c. likely. The later half (phases D₂-G, Later Drouwen-Late Havelte) is dated c. 2500-2100 b.c.¹⁷³.

¹⁶⁶ Cf. the map at fig. 10, Louwe Kooijmans 1976.

¹⁶⁷ Clark & Godwin 1962, with further references.

¹⁶⁸ Bakker 1973.

¹⁶⁹ Becker 1961, Bakker 1973, vi-49.

¹⁷⁰ Bakker et al., 1969, fig. 17.

¹⁷¹ Van der Waals 1964, 14f.

¹⁷² Tauber 1972.

¹⁷³ Bakker 1973, vi-51 f.

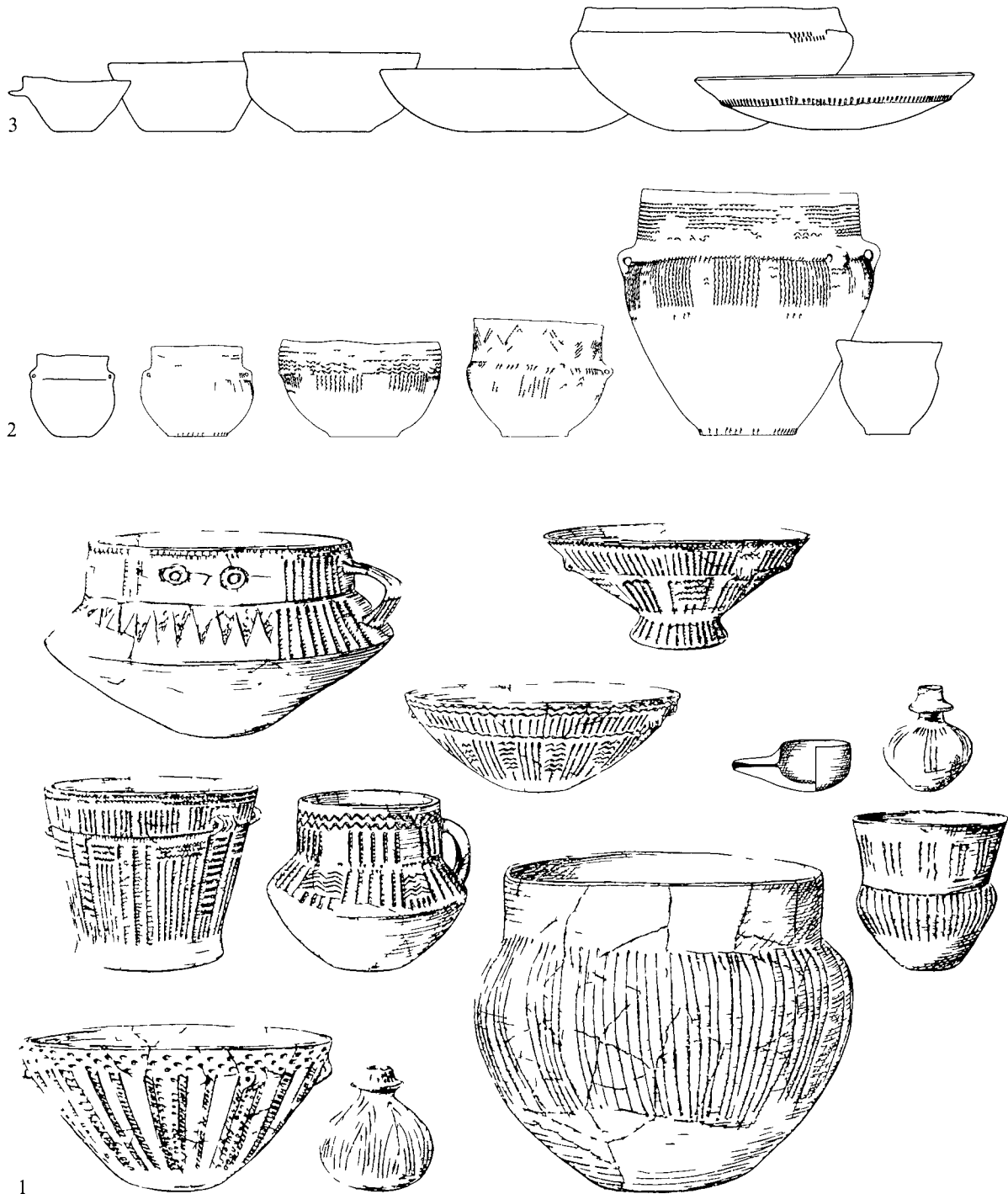


Fig 16 The major phases of the Western branch of the TRB 1 = Drouwen, 2 = Early Havelte, 3 = Late Havelte Bakker (1974) recently refined the classification and distinguished four stages within the Drouwen-phase (A-D) and introduced a "Mid-Havelte-phase" (F) between Early (E) and Late (G) Havelte Different scales Reproduced with the kind permission of Dr J A Bakker

As we pointed out in the preceding paragraph there is no material that can be claimed to be at the basis of this western *Tiefstich* TRB. The dating of the so-called pre-Drouwen grave at Drouwen was queried by Bakker¹⁷⁴ and now a very late position in the TRB sequence seems more likely. The pot from Eibergen might be a pre-Drouwen relic, but we will discuss an alternative, viz a storage vessel of the Vlaardingen-Ia phase¹⁷⁵. The sudden appearance of both the new pottery and the megalithic grave monuments, the strong relationships of both to Denmark and Schleswig-Holstein and the roots both have there in resp. the pottery and dolmens of the preceding (EN-C) phase make a north-eastern origin of the western *Tiefstich* TRB very likely. Perhaps even real colonization took place by new farmer colonists, but as long as the preceding communities are unknown in the northern Netherlands this supposition must have a hypothetical character.

Already in Bakker's phase A there occurs material in the extreme western point (Laren) of its extent. There is, subsequently, a southward expansion into the Munster Basin and in the next phase (F) the German Hills are reached¹⁷⁶.

Bakker rightly criticized the chronological value of two important pottery types: the funnel-necked beaker with *Bauchfransen* decoration and *Wackelboden*, and the collared flask. The first is not restricted to the northern EN-C, but continues to be in use in the entire Drouwen-phase¹⁷⁷. Collared flasks remained in use till the end of the TRB¹⁷⁸.

The information about settlement and food economy of the western TRB is extremely poor. Apart from the insufficiently published *Huntedorf*¹⁷⁹ there is no house plan nearer than that of Wittenwater, Kr. Uelzen¹⁸⁰. The absence of post-traces in the settlement terrains, even when they should have been preserved like at Anlo¹⁸¹, makes one think of structures, built on the surface like block-buildings and/or the use of sods. With respect to the economy we can only mention the pollen spectra from fossil soils below barrows that indicate grain cultivation¹⁸². No charred grain has been found yet¹⁸³ and bone refuse is always completely decayed on the acid sands where the TRB settlements are situated, but in view of the Danish analogy animal husbandry can be assumed.

Rheinland and Limburg

In the Rhine district we observe the reverse situation of the North German Plain: we enter a period from which finds are notoriously lacking. The end of Michelsberg is not

¹⁷⁴ Van Giffen & Glasbergen 1957, Bakker 1973, vi-51

¹⁷⁵ See p. 181-2

¹⁷⁶ Cf. Bakker 1973, maps in figs. 4-10-14

¹⁷⁷ Bakker 1973, III-20, as opposed to Schwabedissen 1966, the conclusion must be that the "Satrup-becher" as a prevalent type in an assemblage only occurs in the Nordic EN-C, but that the type subsequently did not completely disappear and incidentally may be found in later findgroups. In that case its occurrence is not necessarily an argument for an early start or an admixture of older material.

¹⁷⁸ Bakker & Van der Waals 1973

¹⁷⁹ Rennerth 1939, Bakker & Van der Waals 1973, note 42

¹⁸⁰ Voss 1965

¹⁸¹ Waterbolk 1960, Palisade trenches with distinct traces of the posts were clearly visible!

¹⁸² Van Zeist 1967

¹⁸³ Van Zeist 1968

dated. Lüning¹⁸⁴ distinguished a MK V along the Neckar that (in view of the MK II and III dates) must be placed somewhere after 3000 b.c., perhaps even in the beginning of his phase E. Further north along the Rhine, MK IV assemblages are the youngest. The successor is only represented in Hessen, in the find groups of the Hessian Gallery graves and the related settlements, together known as Wartberg Culture¹⁸⁵. Chasséen relationships or even roots have been suggested by Schwabedissen¹⁸⁶, but it seems that (in a later phase?) Wartberg

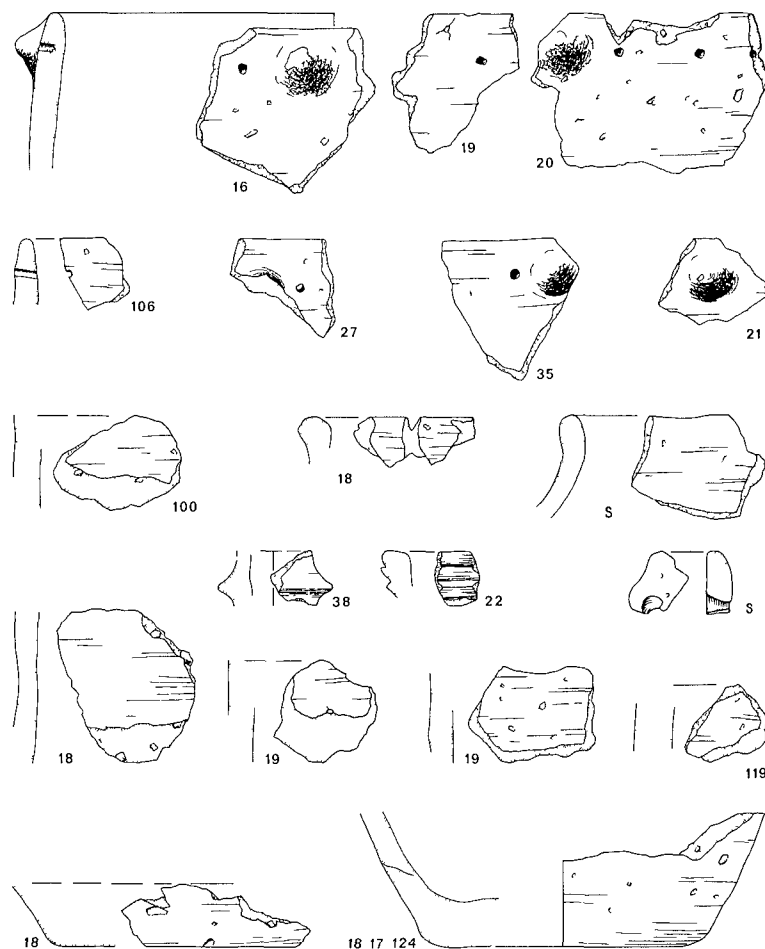


Fig 17 Koningsbosch, "Limburg Middle Neolithic", pottery Scale 1/3 After Van Haaren & Modderman 1973, fig 29

¹⁸⁴ Lüning 1967, 90, 11, Taf 100 MK V occurs in Bohemia, outside my map of phase E (Louwe Kooijmans 1976, fig 11) and farther south especially along the Bodensee

¹⁸⁵ Schrickel 1969, Kruger & Schrickel 1964, Schwelnuess 1970, 1971

¹⁸⁶ Schwabedissen 1966, 433 f, see also Kruger & Schrickel 1964, 45 They state that Chasséen influences are apparent in the older findgroups and Bernburg influences in the younger So a life-span at least synchronous with the Scandinavian EN-C till MN-III must be accepted, what is the best that can be said in the absence of ¹⁴C-dates It means an origin in (the second part of) my phase E and a continuation till the end of this phase F

combines elements from various sides with certain original traits. Flat-based, S-profiled pots are related to those of Seine-Oise-Marne, collared flasks might be northern elements, the inverted rims with perforations and knob-lugs are original. It is remarkable that no obvious roots in the local Michelsberg are traceable. Wartberg might be representative for a much larger area, west and northwest of the present distribution. Related finds (a.o. a collared flask fragment) were found in a *Steinkiste* at Schankweiler, Kr. Bitburg near Trier¹⁸⁷ and on two Dutch sites. These are the well-known burial vault of Stein¹⁸⁸, with the big S-shaped pot, the collared flask with star-shaped collar and bone arrow-heads that have their parallels in S.O.M. context. The other is the modest assemblage of Koningsbosch¹⁸⁹, characterized by inverted rims with perforations and knob-lugs and by a fragment of a collared flask. Similar pottery was found elsewhere along the Meuse: collared flask fragments at Neer¹⁹⁰, a few rimsherds with perforations and knob-lugs among other Neolithic material at Kesseleyk¹⁹¹, two rimsherds with knob-lugs in the Leudal¹⁹² and a rim with perforations and heavy knob at Siebengewald near Nijmegen¹⁹³. We could observe in some cases (Koningsbosch, Kesseleyk) that the pottery has an oblique flaky structure and that it was built-up of coils with oblique joints, like TRB and at least part of the Wartberg pottery.

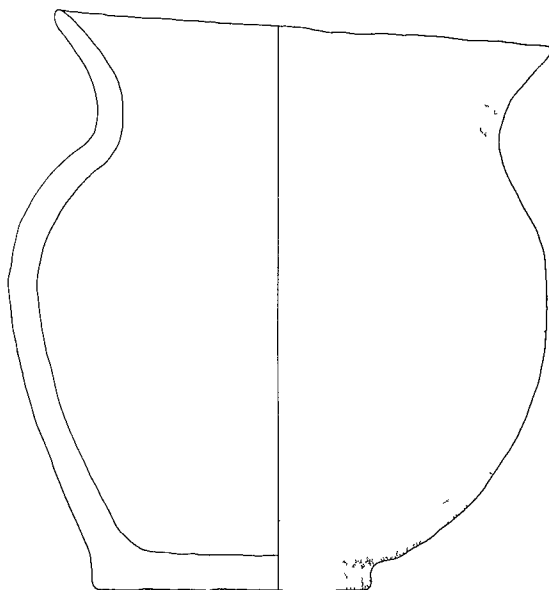


Fig 18 Stein, pot from the burial vault Scale 1:3 Drawing after the original, demonstrating the deformation of the pot during the drying-process, before it was fired Cf the idealized drawing in Modderman 1964

¹⁸⁷ Schindler 1967

¹⁸⁸ Modderman 1964

¹⁸⁹ Van Haaren & Modderman 1973

¹⁹⁰ Bloemers 1971/72, 20, 1973, 15

¹⁹¹ Unpublished, own observations Preliminary notes Modderman 1968, 1969, see also 1974 The excavation did not yield more Limburg Pottery, like that found during the discovery, but sherds of a number of other neolithic groups and some mesolithic flint

¹⁹² Harsema 1973

¹⁹³ Pers. inf. Mr W. N. Tuyn, Nijmegen and own observations

There is one ^{14}C -date (Grn 4831 2830 \pm 60 b.c.) of Stein¹⁹⁴. Modderman provisionally labelled the finds "Middle Neolithic of Limburg"¹⁹⁵. A conspicuous type of flint was exploited; it occurs exclusively at the Lousberg near Aachen. Axes of Lousberg flint are found along the Meuse with outliers in the north on the Veluwe¹⁹⁶. The spread to the east is not yet mapped, but the flint does not seem to be of more than regional importance in comparison with that of Spiennes and Rijckholt. A quartz-tempered flat pot base is the single indication that flint mining continued at St. Geertruid¹⁹⁷, which is very plausible in view of the situation at Spiennes. This "Limburg Middle Neolithic" is one member of a series of related cultural units in the former area of *Michelsberg-Chasséen du Bassin Parisien*. But most of this area is a blank which, however, can be filled with associated non-ceramic groups, according to Schwabedissen¹⁹⁸: "Hessian" gallery graves and the menhirs. The last are, however, badly or not dated in this area. New discoveries in the Rheinland might gradually fill up this blank of about four or five centuries between the end of Michelsberg and the start of the *Schnurkeramik*. The present absence of find places might be caused by the absence of pits in the settlements¹⁹⁹ and so by the absence of pottery, associated with flint assemblages of this phase.

Seine-Oise-Marne

We will not discuss the succession of Chasséen and Seine-Oise-Marne at any length. The modest number of sharp and well-associated ^{14}C -dates, the rare stratigraphical observations and the undifferentiated pottery are serious handicaps²⁰⁰. Late Chasséen elements might survive into this phase perhaps even as late as 2600 b.c., but the ^{14}C -dates of Les Roches near Videlles, belonging to S.O.M. pottery in stratigraphic position above a few Chasséen sherds, prove the presence of S.O.M. at about 2550 b.c. The ^{14}C -date of Stein suggest, if we accept the S.O.M. connections, a slightly earlier start²⁰¹. We think this is allowed, since Modderman demonstrated that Stein as a whole forms an integral part of the cultural remains found in Northern France, Belgium and Western Germany. The collared flasks of Brittany²⁰² are especially instructive in this respect. The south-western connections of Stein (and the Limburg Middle Neolithic) must have run via the Belgian branch of S.O.M., the "Meuse Neolithic"²⁰³. Important is the occurrence of S.O.M. pottery in the

¹⁹⁴ Modderman 1964, 14 mentions that a sample of guaranteed purity could not be collected because of possible contamination with *Bandkeramik* material. But the radiocarbon sample consisted of fragments of one large piece of charcoal, from a low position in the monument (Van Haaren & Modderman 1973, 47). This being the case one can only assume a difference between the age of the wood (a thick trunk?) and the age of the pottery of one or two centuries.

¹⁹⁵ Van Haaren & Modderman 1973, 48.

¹⁹⁶ Modderman 1974.

¹⁹⁷ Van Giffen 1925, 498 & Pl. 4.VII.35.

¹⁹⁸ Schwabedissen 1966, 448 f.

¹⁹⁹ Van Haaren & Modderman 1974, 46.

²⁰⁰ Bailloud 1964, 218, 219; Bender & Phillips 1972.

²⁰¹ Cf. note 194.

²⁰² L'Helgouch 1972.

²⁰³ Marien 1966.

upper parts of the ditchfillings of the earthwork at Petit Spiennes²⁰⁴, indicating a continuation of the mining activities into this phase. The single Peterborough sherd found elsewhere at Spiennes²⁰⁵, but in a similar stratigraphical position is a rare document of the continuation of some contacts with the British Isles, better documented in the foregoing phase.

Initial Vlaardingen

In the empty space between the northern TRB-sphere and the southern resp. western Wartberg and S.O.M.-sphere and coinciding for the greater part with the Rhine/Meuse delta district a number of assemblages with more or less common traits are brought together as the Vlaardingen Culture²⁰⁶. The first site (Zandwerven) was discovered in 1927. Sub-

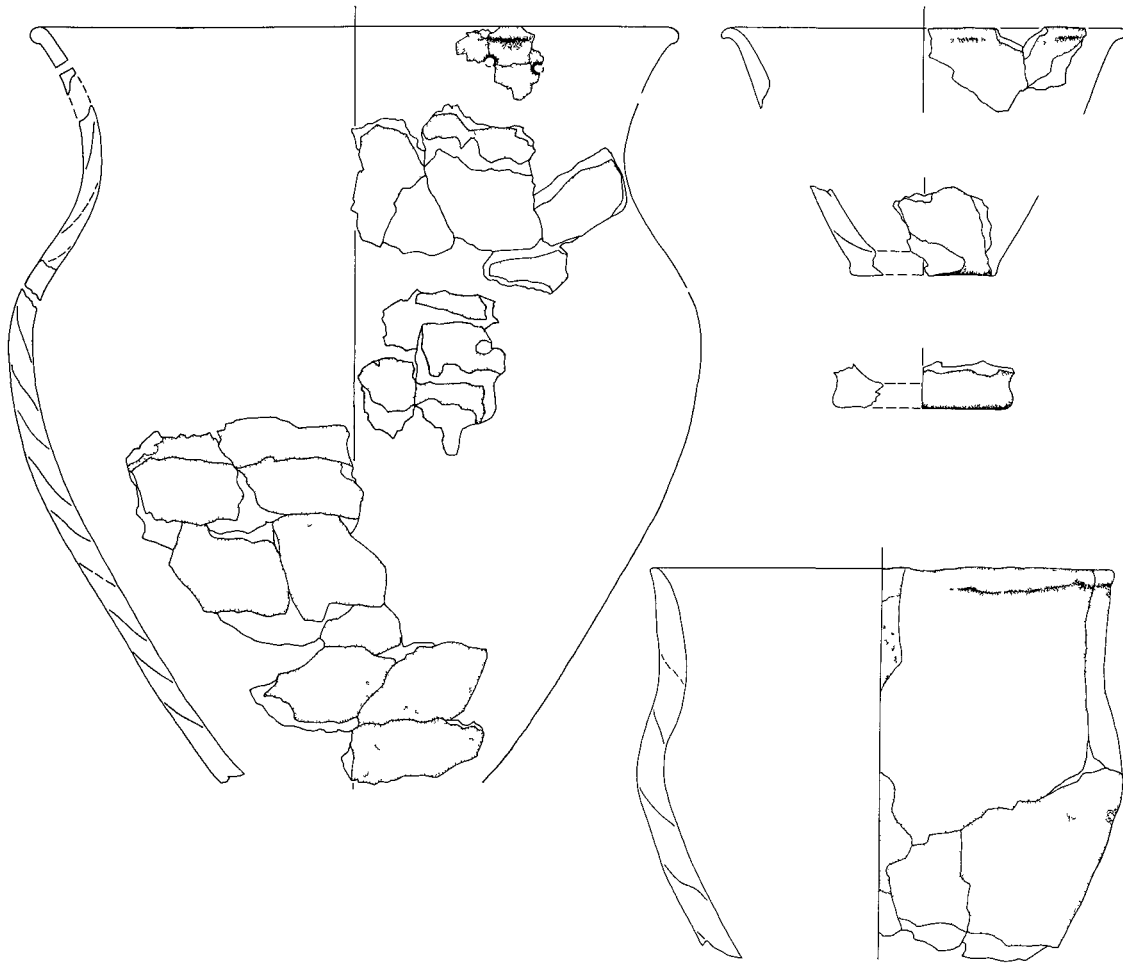


Fig 19 Hazendonk, phase Vlaardingen-1a, pottery Scale 1:3

²⁰⁴ Hubert 1971, esp 50, 57, Pl XXXI

²⁰⁵ Verheyleweghen 1964

²⁰⁶ Altona et al 1962/'63

sequently more sites were found on the coastal barriers and in the estuarine environment at the mouth of the Meuse. In the last years the distribution map got an extension into the river area and on the sands²⁰⁷.

The Vlaardingen Culture is well-dated by a series of ¹⁴C-dates that give a life-span of 2500 till 2100 b.c.²⁰⁸, which means a start at the end of this phase. We must, however, take into account that the coastal districts went through the transgression phase Calais IV^a at about 2500 b.c. and that the absence of cultural remains of the centuries between Hazendonk-3 and Vlaardingen can be explained in that way. The oldest coastal barriers were, moreover, in a state of formation at that time and the natural levee deposits, if preserved, lie rather deep. Thus, the oldest Vlaardingen remains known possibly did not represent the initial phase.

For this phase, the Hazendonk also provides valuable new information. The remains of two pots have been found in a peaty clay layer, about half-way the very distinct Hazendonk-3 (3000 b.c.) and "Early Vlaardingen" (2400 b.c.) refuse layers and in primary situation, in two distinct concentrations. One pot has been reconstructed from a number of heavily wheathered sherds. It has a gentle S-shaped profile, rim perforations and a tempering of some broken quartz and pounded pottery. The surface is well-finished. In the same sherd-concentration fragments of flat bases were present. The other pot (half the upper part) has no rim perforations and a less marked profile. Both clearly demonstrate oblique coil-joints and differ mainly in this respect from the 2400 b.c. Vlaardingen ware. Other differences are the slightly different profiles and the lack of rim perforations in the second vessel and in a separate rim sherd. But I think it can raise no objections to conceive these vessels as the forerunners of the pottery of the Vlaardingen Culture as defined earlier²⁰⁸ and to consider them factually as representatives of a very early (the earliest?) phase of this culture, a phase that is not documented on the sites, known until now. So we baptized this material Vlaardingen-1a and that from the higher level -1b, in this way extending the scheme of Voorschoten²⁰⁹.

There are two more pots, attributed to the early phase of the VL-culture in which the strips or coils are clearly visible. These are, first, a pot from Waardhuizen, Almkerk²¹⁰, with a profile rather different from those of the pottery from the lowest level of Voorschoten. The pot is not dated. Second, a pot found in 1974 on the Hazendonk outside the extensive VL-1b occupation area in an isolated situation, but in a stratigraphic position that offers a date between 2700 and 2400 b.c.²¹¹. Its particular profile with sharp belly bend and gently curved neck is not present among the rich VL-1b material elsewhere on the site, an argument to assume a slightly different (higher) age.

The material, mentioned above as more or less strong candidates for the Vlaardingen-1a phase, has not much in common with the preceding Hazendonk-3 pottery: many charac-

²⁰⁷ Louwe Kooijmans 1974, 20f. and 87f.

²⁰⁸ Ibid. 21, Table 2.

²⁰⁹ Glasbergen et al. 1968, 27.

²¹⁰ Louwe Kooijmans 1974, 24. All finds in disturbed position; also Later Vlaardingen and sherds of various beaker types present on the site.

²¹¹ I attributed this pot earlier to the VL-1b phase, but the new evidence shows that one must be more careful.

teristics are changed. The only “continuity” to be seen is in the construction: the coil-building is improved. So for its relations — and at the same time for the roots of the VL-Culture — a search must be made outside the Rhine/Meuse delta: on the neighbouring sands. The *Tiefstich* TRB (Drouwen A and later) does not offer many possibilities: the angular shapes and rich decoration, the major characteristics, are lacking. More similarities can be found in the Limburg Middle Neolithic. It is worth mentioning that the S-profile is documented among the finds of Kesseleyk²¹². It seems, however, that this material is too scarce to make firm statements. Future finds may confirm my idea that the Vlaardingen Culture (at least in this early phase) is merely the western-most member of the group mentioned above (p. 277) to which the “Limburg Middle Neolithic” belongs, a southern counterpart of the *Tiefstich* TRB north of the Rhine and dated now to “exactly” the same period of 2700-2100 b.c.

How far did this cultural sphere extend to the north? At least not farther than the Dümmersee, because the later assemblage of “Satrup”-character, found there, blocks the way. In the intermediate area, there is one interesting, baseless pot found in 1934 between Neede and Eibergen²¹³ often mentioned, but never illustrated. The pot has a row of rim

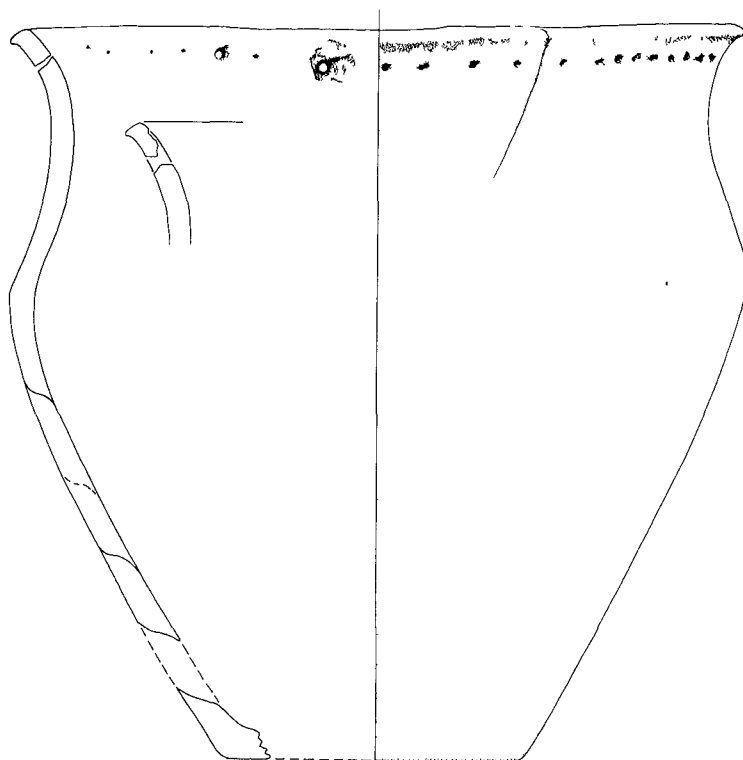


Fig 20 Hazendonk, phase Vlaardingen-1 (a or b), coil-built pot Scale 1 3

²¹² Cf note 191

²¹³ The exact information on the find circumstances was only discovered recently by Mr A. D. Verlinde,

perforations (some not completely piercing the wall) and is clearly built up of coils with oblique joints, visible on some cracks; the pot is moderately gritted with coarse and some fine broken quartz, the surface is well-finished (smooth) but still rather uneven. The pot was considered²¹⁴ probably to be an early TRB (pre-Drouwen) storage vessel. The shape indeed resembles some EN-C pot forms and especially the *Satrup-becher*, but the tempering and the uneven surface are very unlike TRB pottery and rim perforations are very scarce and do not occur in this rather rough form in TRB pottery, as far as I know. The lack of any decoration (*Bauchfransen*) seems also to be an important difference. Technical and stylistical arguments are more in favour of an attribution to our new 1a-phase of the Vlaardingen Culture²¹⁵.

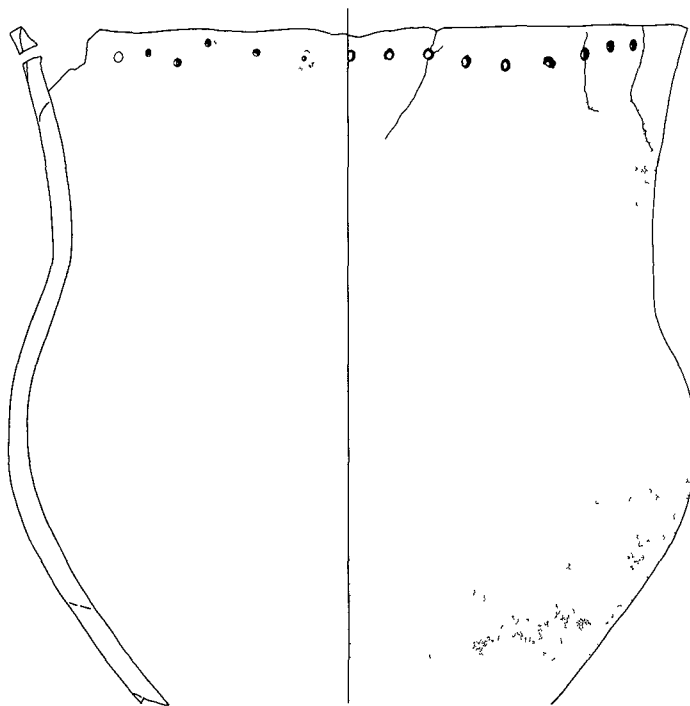


Fig. 21. Neede/Eibergen, undated pot, possibly Vlaardingen-1a. Scale 1:3.

Amersfoort, who kindly informed me on this subject. The pot was found in upside down position during the construction of a cellar floor. This explains the missing base!

²¹⁴ Bakker 1973, vi-18; Lüüdik-Kaelas 1955, 73.

²¹⁵ But for instance at Sølager (Skaarup 1976) similar perforations do occur. Further must be considered another possibility: the inverted position is a characteristic of the Pot Beakers from the Veluwe Bell Beaker/Barbed Wire Beaker phase. The S-profiled type has, moreover, frequently rim perforations, but undecorated specimens are not known from this country, although elsewhere undecorated (and then mostly undated) *Riesenbecher* occur. Although the fabric and wall-thickness would fit in this supposition, this is not the case with other characteristics: the uneven surface, the strip-building and the irregular shape. We think the last word is not yet said about this pot. See *Analecta Praehistorica Leidensia* 9, 1976, fig. 9 for rim perforations among Early-Havelte TRB-pottery from Beekhuizer Zand.

It is not possible to build ideas of cultural relationships on a few pots and sherds. In this phase these are at any rate not clear-cut or straight-lined. To demonstrate this: the second pot mentioned from the Hazendonk resembles some EN-C forms as the *Øskenbaegre* (lugged beakers) and the (Satrup-type) Funnel Beakers.

PHASE F, 2450-2150 b.c.

TRB and PFB

The start of the Battle Axe Culture²¹⁶ marks the beginning of phase F. The co-existence of distinct BAC-assemblages and a Late TRB-assemblage in the Northern Netherlands is now well-established²¹⁷. In view of the ¹⁴C-evidence it is very likely that the earliest Protruding Foot Beakers (PFB) were present in Bakker's TRB phase E (early Havelte). In Drenthe the early PFB finds are situated mainly (not all) outside the main TRB concentration, while the later material is more evenly distributed. There are, however, no closed associations in which elements of both go together, with the exception of flat grave 14 at Angelsloo. The association there seems to be accidental, but proves the occurrence on the site of Middle/Late Havelte and cord-ornamented PFB pottery contemporary or before this (Late Havelte, Bakker's TRB phase G) grave, with a ¹⁴C-date GrN 5070 2150 ± 30 b.c.²¹⁸. Bakker and Van der Waals suggest as an explanation of the cultural relationships in this phase, that probably small bands, with a different (more successful) agricultural system, settled in the TRB district, where they were attracted by the existing TRB clearings, like that at Anlo²¹⁹. The TRB lost its identity in an acculturation process of some centuries and was replaced by a (developed) form of the Protruding Foot Beaker Culture. This moment can be dated at about 2150 b.c., the start of the All Over Ornamented (resp. Corded) Beakers.

"Classical" Vlaardingen

A very similar situation existed in the coastal district. After the initial VL-1a phase Vlaardingen- and Protruding Foot Beaker settlements must have occurred side by side. No "pure" early PFB settlements are, however, known from the delta district (nor excavated in the other parts of this country), but there are some finds in the name-giving site of the

²¹⁶ Used here as a collective for the various facies: the Danish *Enkeltgrav*, German *Schurkeramik*, Dutch/Belgian *Standvoetbeker*, present in the area under discussion. For ¹⁴C-dates see Lanting & Van der Waals 1973.

²¹⁷ Cf. Bakker et al. 1969, 230; Lanting et al. 1973. According to the ¹⁴C-dates the BAC certainly was present in Bakker's so-called Mid Havelte Phase (phase F, Bakker 1973). At Anlo (Waterbolk 1960, esp. 89) Early Havelte TRB and Early BAC are very closely connected. The Early BAC people were probably attracted by an open space in the wood, cleared by Early Havelte people. Both (TRB refuse pit and BAC grave) have ¹⁴C-dates that lie very close together.

GrN 1855 2470 ± 75 b.c. (PFB-1^a grave)

GrN 1824 2460 ± 55 b.c. (TRB pit)

²¹⁸ Angelsloo, grave 14, Bakker & Van der Waals 1973

²¹⁹ Waterbolk 1960

Vlaardingen Culture, viz. fragments of an A-type battle axe and of a BAC-amphora²²⁰. But such contacts seem to have been very incidental since no early PFB remains were found on the other Vlaardingen sites.

In the later part of the VL-culture (i.e. during this phase F), a distinct evolution can be made out, documented in the stratigraphies of Voorschoten and the Hazendonk.

Vlaardingen-1b

At Voorschoten²²¹ a gradual change in pottery style could be traced in the contents of three major refuse layers, separated by wind-blown sand, that filled a depression.

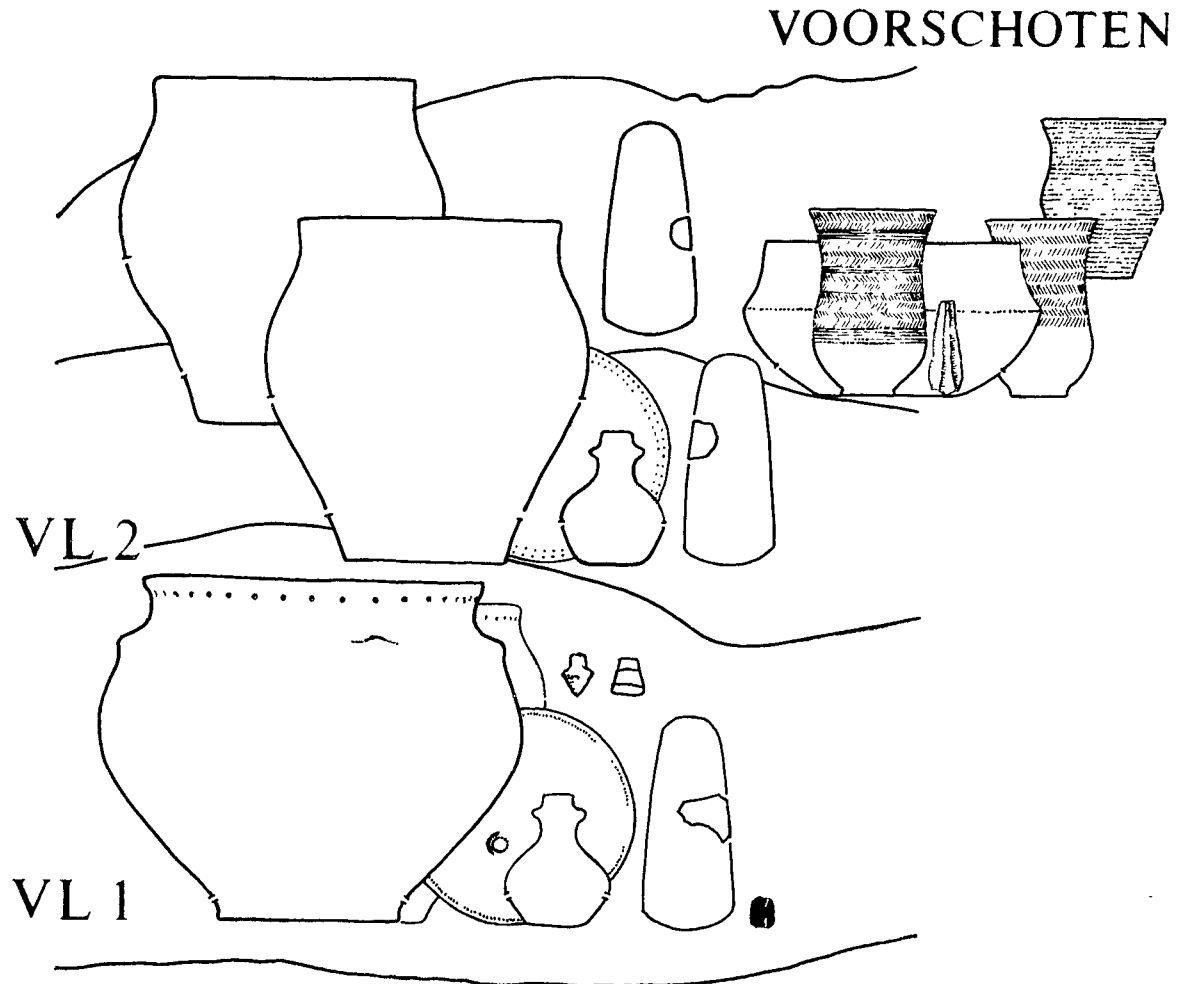


Fig. 22. Voorschoten, schematic representation of the stratigraphy of the humic filling of a depression in the Older Dundes-landscape. After Glasbergen et al. 1967, fig. 21.

²²⁰ Altena et al. 1962/'63: 1962, 226; 1965. ¹⁴C-dates of Vlaardingen go back to c. 2450 b.c. Late PFB remains are absent at the site.

²²¹ Glasbergen et al. 1968.

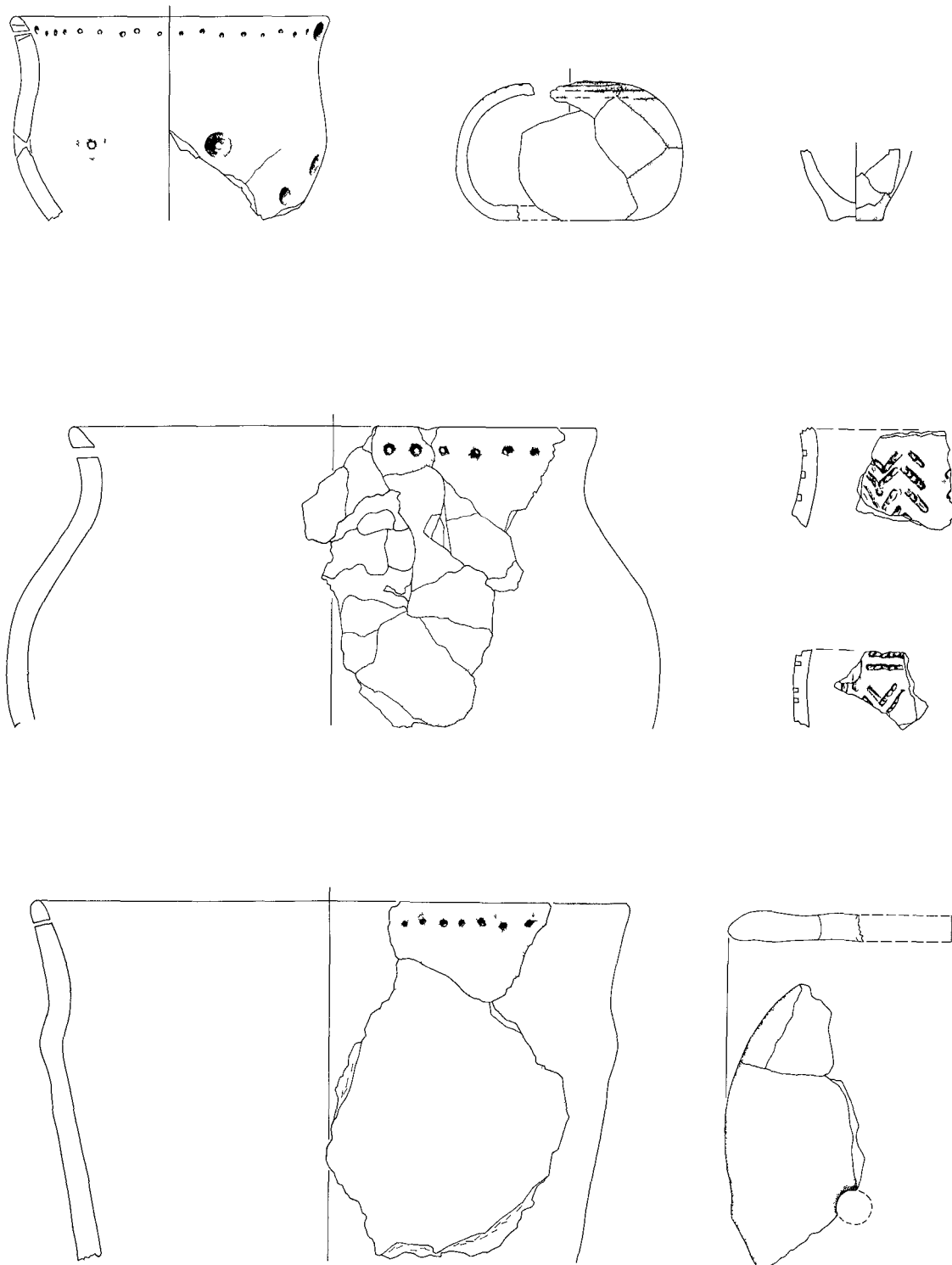


Fig 23 Hazendonk, phase Vlaardingen-1b, pottery NB the body of a collared flask and both sherds with *Tiefstich*-decoration Scale 1/3

The lowest levels (VL-1) contained fragments of pots with bulging profiles with in- or everted rims, rim perforations or -pits (65%), pointed knob lugs, slightly protruding foots and a tempering of broken quartz. Collared flasks and clay discs are present but no PFB-sherds were found, which is a significant difference with the upper layers. There is (almost) no decoration. The layers have ^{14}C -dates around 2100 b.c., to my opinion some centuries later than one would expect²²². Fragments of flint axes with oval section (a form found predominantly south of the Rhine and Meuse) and two small transverse arrowheads belong to this phase. This larger assemblage demonstrates some more connections to the south than both VL-1a pots of the Hazendonk. Added are now: inverted rims with perforations, knob lugs, the undecorated collared flask, flint axe type and the type of arrow head, that resembles more those of Stein and Koningsbosch than the longer ones found in a TRB-context²²³. But the collared flask as such is found in all TRB-phases in a great variety of shape. Certainly the clay disc is an element derived from that side, and since its evolution in the following centuries (excentric holes, decoration) is similar to that in the TRB settlements, a continuous, be it modest contact with the TRB on the central sand district (Veluwe, Utrecht hills) must be assumed.

The pottery from the VL-1b refuse layer on the Hazendonk can roughly be equalled with the lowest level of Voorschoten. There are, however, distinct differences in some respects: there is more tempering with pounded pottery, a higher percentage (more than 80%) of the rim sherds with perforations, no knob-lugs and only one clay disc fragment and one fragmentary collared flask in spite of the huge material. The pots have mainly bag-shaped forms with weak shoulders, but gentle S-profiles are present too. Very remarkable are two sherds, decorated with chevrons in a rough *Tiefstich* decoration. Both sherds (and the collared flask as well) are certainly of a local, at any rate non-TRB, fabric with a quartz and/or sand tempering. We consider them as local products, in which TRB forms and decoration are copied²²⁴. The chevrons are not very characteristic for a TRB phase. Bakker illustrates the single row of chevrons in his phases Drouwen C1, D1 and (less D2). Double chevrons occur in phases B and C. So it is not possible to give a sharp correlation of this layer and a TRB phase at this moment. There are two ^{14}C -dates referring to this phase: GrN 6213 2530 \pm 40 b.c. and GrN 5175 2340 \pm 40 b.c.²²⁵, that lie rather far apart, but make a date between 2500 and 2400 b.c. the most likely. Both decorated sherds are another demonstration of TRB-contacts. The occurrence of (early) Vlaardingen sherds near Kootwijk on the Veluwe²²⁶ is also instructive in this respect.

Vlaardingen-2a,b

The next stage is documented at Voorschoten, but lacking on the Hazendonk. That site was not inhabited for some centuries and the natural vegetation had completely recovered

²²² Based on the marked typological changes in the successive stages and the ^{14}C -dates of other sites. The lowest layer most probably is older or contemporaneous with the start of Vlaardingen and the early phase of the PFB Culture.

²²³ Cf. for instance Waterbolk 1960.

²²⁴ These observations were confirmed by Dr. J. A. Bakker.

²²⁵ Louwe Kooijmans 1974, 140.

²²⁶ Own observation with the kind permission of the excavator, Mr. H. H. van Regteren Altena, Amsterdam.

before the next (VL-2b) occupation took place. In the middle phase (VL-2a) of Voorschoten the pottery has got weaker, beaker-like profiles, the tempering has changed via sand to pounded pottery ("grog"), rim perforations and lugs have disappeared, protruding foots and clay disc fragments became scarce. We can imagine, but it cannot be proved, that these changes reflect beaker-influences. But it is only in the last stage (VL-2b) that PFB sherds appear beside this evolved VL-pottery sherds of evolved PF beakers, decorated with herringbone patterns. The ^{14}C -date of 2030 ± 60 (GrN 4909) for this layer is rather (but not extremely) late for this type of beakers. Some AOC-beaker sherds occurred in the sand covering this refuse.

The refuse of the Late Vlaardingen occupation on the Hazendonk occur in three distinct concentrations at the base of a clay deposit or the filling of shallow gullies. The major concentration is about 4 m wide and has been excavated over a length of 13 m, probably about $\frac{2}{3}$ of its total extent. About 15 000 finds were mapped, mainly bones and sturgeon bone plates, but enough pottery was present to give a good characteristic. The pots are even more beaker-like than those of Voorschoten, but similarly undecorated. AOC-beaker sherds were found in two concentrations, fragments of a late PF beaker in the third. ^{14}C -dates are forthcoming. Later beaker sherds (European and Veluwe Bell Beaker) are not associated and document continued occupation of the site. All other Vlaardingen sites produced either a mixed or compound assemblage (Vlaardingen, Almkerk), finds of a restricted period (Hekelingen VL-2a, Zandwerven VL-2b, Leidschendam VL-2a,b)²²⁷, or a too modest material to make an attribution to a certain phase.

It can be said in general, that, apart from the chronological differences, a marked inter-site difference in pottery style can be observed, very different from the situation in the TRB- and beaker cultures. This makes it, first, easier to link related but not identical find groups from the sand districts to this "Vlaardingen Culture", second, this can be interpreted as reflecting different ways in which the pottery was distributed, for instance by specialist-potters²²⁸ as opposed to home-made ware in each settlement. In this stage of research we cannot do more than just point to these facts.

No early Protruding Foot Beaker settlements are (yet) known within the area covered by Vlaardingen, but in Westfriesland at least one settlement is considered by its excavator to be "pure PF beaker", be it of a slightly later stage. This is the settlement near Aartswoud, in excavation since 1972 by the Institute for Pre- and Protohistory of Amsterdam. The pottery is characterized by various PFB-decorative motifs, especially the zig-zag patterns. A date of about 2200 b.c. seems the most likely at the moment, but it is not improbable that an earlier phase is represented elsewhere on a not yet excavated part of the extensive settlement-terrain²²⁹. Typical Vlaardingen characteristics (e.g. rim-perforations, pointed lugs, collared flasks, clay discs) are entirely absent²³⁰, but this does not seem an argument to call the

²²⁷ Altena et al. 1962/63 (Vlaardingen, Zandwerven), Modderman 1953 (Hekelingen), Glasbergen et al. 1968 (Leidschendam), Louwe Kooijmans 1974, 23f (Almkerk).

²²⁸ Cf. Schlicht 1971.

²²⁹ Van Iterson Scholte in Woltering 1976, 239-41. A second site of the same age was discovered recently (1975) near Kolhorn, 7 km northwest of Aartswoud, in a very similar geographical position on salt marsh deposits of the Calais IV-A2 sedimentation phase and near the contemporaneous tidal flats. Peat formation on these deposits started c. 2200 b.c. (Woltering 1976, 235-6).

²³⁰ Pers. inf. Prof. Dr. W. Glasbergen.

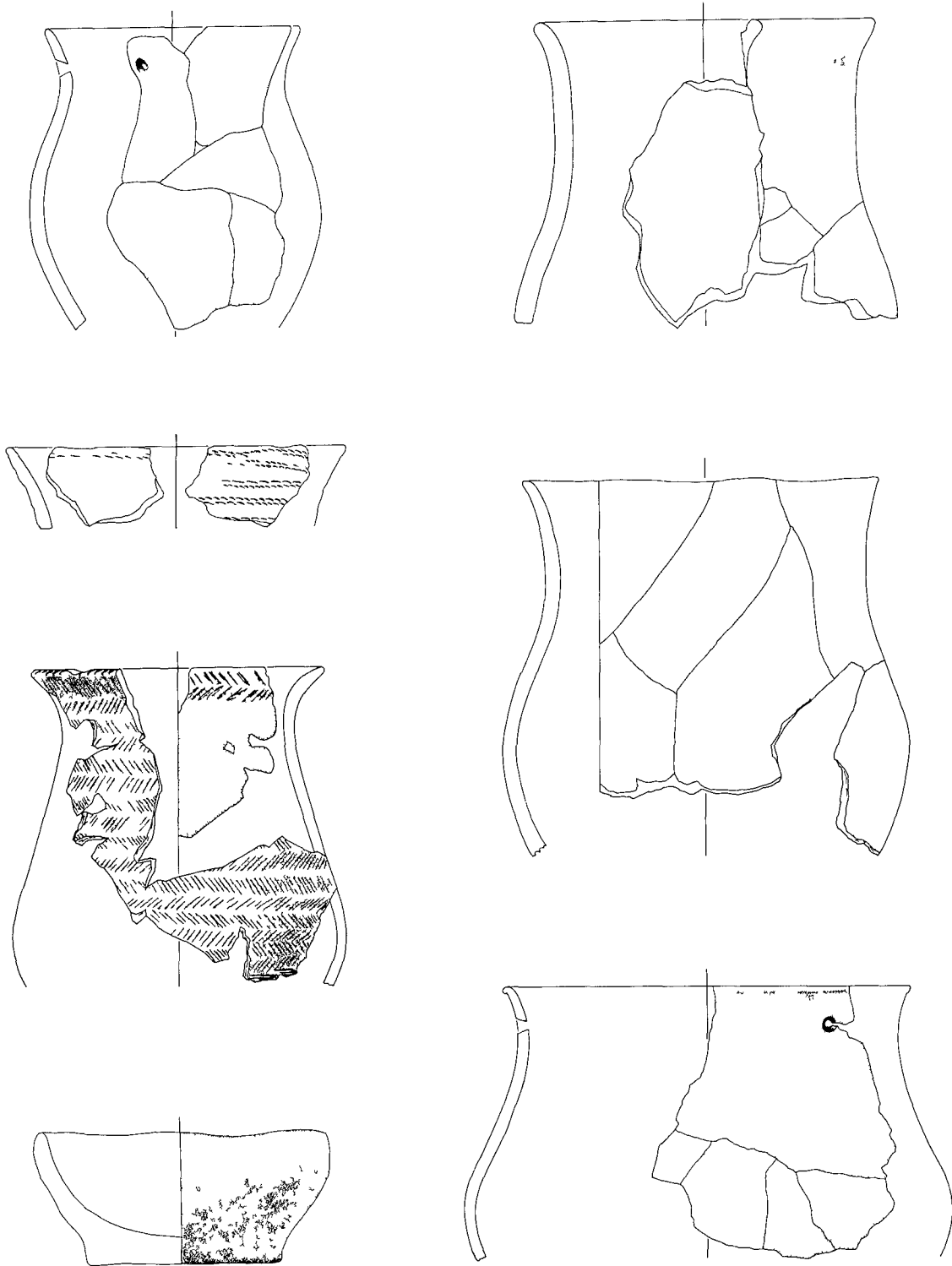


Fig 24 Hazendonk, phase Vlaardingen-2b, pottery N B sherds of a 2IIb(= All-over-cord) and a 1d (late PFB) beaker Scale 1 3

site “pure beaker”, since the same is the case in the VL-2b phase at the Hazendonk and Voorschoten. The three sites differ, however, in the percentage of decorated pottery: Aartswoud 20%, Voorschoten 8%²³¹, Hazendonk less than 1%, all low in comparison to later beaker assemblages 30-60%²³². At Voorschoten a small group “undecorated beaker pottery” could be separated from the VL-pottery, probably because of its wall-thickness and fabric. At the Hazendonk there is a gradual transition from thick-walled to finer pottery without a clear dividing line or a separate “undecorated beaker” group. At Aartswoud all pottery is considered as “beaker ware”.

Taking everything together we think that the situation is similar to that in Drenthe, with Vlaardingen here in the rôle of the TRB on the sands. After a period of peaceful coexistence of two pottery traditions in the same district with very incidental contacts of the older Vlaardingen communities with the new beaker communities²³³, a phase of assimilation can be distinguished: the phase VL-2b, 2200-2100 b.c. The degree of assimilation is reflected in the percentage of decorated sherds and the change to more beaker-like forms of the undecorated pottery. This factor needs, however, not to be of an absolute chronological value. The Vlaardingen-beaker ratio might have varied from site to site at a certain moment during this phase. But at last the “Vlaardingen-tradition” got completely lost and is replaced by the “beaker-style”. It needs no argumentation that we see this as a cultural change without any extinction of a group of people.

Settlement and subsistence economy

Because of the very favourable conditions for the preservation of organic material in the delta-district much information is available about the settlements and the subsistence economy of this phase²³⁴.

At Vlaardingen and Haamstede plans of small rectangular houses, not larger than 5 × 10 m, were found. At some sites (Vlaardingen, Hazendonk, Aartswoud) one must assume an occupation over a long period in view of the extension of the site, the amount of refuse, the thickness of the culture layer and the typological variations. At Vlaardingen permanent occupation is very likely in view of the age-determinations of the lower jaws of the hunted red deer²³⁵. We expect a conclusion from similar material from the VL-2b phase of the Hazendonk: permanent occupation over some years or decades or repeated occupation in an especially favourable season.

The food economy varied widely between the various sites and appears to be linked closely and adapted to the environmental possibilities. In the estuarine district hunting (red deer, wild boar, beaver) and fishing (esp. sturgeon) were of more importance than animal husbandry and it seems that this was also the case in the peat district at the Hazendonk. But on both sites domestic animals were kept and grain was grown in spite of the lack of resp. well-drained soil and space. But on the wide and sandy coastal barriers hunting was

²³¹ Glasbergen et al. 1967: 31.

²³² Louwe Kooijmans 1974: 293.

²³³ In which we still like to see at least for a part new people arriving from elsewhere.

²³⁴ Cf. Clason 1967; Louwe Kooijmans 1974: esp. 330.

²³⁵ Altena et al. 1962/63: 1963: 47.

unimportant and cattle breeding the main activity. In yet another situation, the Westfrisian salt marshes, one took profit of (or even was attracted by) the shell-fish, available in great quantities in the nearby tidal creeks: at Zandwerven and especially at Aartswoud thick layers of broken mussel shells were intercalated between resp. dune sand or peaty sediments. But apart from these bones of cattle, pig, sheep/goat, dog, roe deer, beaver, sturgeon and others reveal animal husbandry, hunting and fishing²³⁶.

THE START OF PHASE G, 2150-1700 b.c.

The occupation of the Rhineland is again documented with the start of the *Schnurkeramik*, after a findless period of some centuries. It is remarkable that until now only very few domestic assemblages have been published. One is that of Mayen-An der Sauperg²³⁷, where the fillings of some sunken huts were discovered between 1923 and 1935. Sherds of Protruding Foot Beakers with cord- and herringbone-decoration are associated there with somewhat rougher undecorated pottery, mainly with S-sections, that seems to have much in common with the developed Vlaardingen ware²³⁸. We must not be astonished when similar findgroups will reveal a much wider extension of Vlaardingen than is now known or accepted.

In this initial phase the beaker tradition did not reach Belgium or France, but in a second wave a further spread took place into the British Isles and throughout France as far as northern Spain. We might expect that similar processes as described for TRB and Vlaardingen took place where the new pottery was introduced and that for instance S.O.M. and Peterborough ended in a similar way. In Scandinavia TRB disappeared at about the same time, after the Store Valby phase, but the beaker-continuation remained there outside the AOO-BB tradition and took a separate line of development. Bakker and Van der Waals²³⁹ presented a detailed correlation of the various phases of the *Enkeltgravskultur* and those of the Dutch sequence.

The end of TRB, Vlaardingen and S.O.M., all firmly rooted in the Neolithic, seems to be a good end to this discussion. With the start of the Bell Beakers many new problems arise that fall outside the scope of this review. They are discussed elsewhere, especially by Lanting and Van der Waals²⁴⁰.

ACKNOWLEDGEMENTS

The author wishes to thank Dr. J. A. Bakker, Mr. J. H. F. Bloemers, Mrs. Pauline de Roever and Prof. Dr. P. J. R. Modderman, for the figures they placed at his disposal, John N. J. Caspers for making most of the drawings and Mrs. L. J. Witkam-van der Hoek for doing the typing work.

²³⁶ Cf. note 230.

²³⁷ Wagner 1938.

²³⁸ I owe these observations to Mr. J. F. van Regteren Altena, who studied the finds of this site and related complexes in the Landesmuseum at Bonn.

²³⁹ Bakker & Van der Waals 1973.

²⁴⁰ Lanting et al. 1973, Lanting & Van der Waals 1974.

ABBREVIATIONS

AOC	All-Over Cord
BAC	Battle Axe Culture
b c	Before Christ, in conventional (uncalibrated) ¹⁴ C-years
BWB	Barbed Wire Beaker
C I IV	Calais I-IV
EBB	European (= Maritime) Bell Beaker
Haz	Hazendonk
LBK	<i>Linea bandkeramik</i>
MK	Michelsberg Culture
N A P	Normaal Amsterdams Peil (= Dutch Datum Level)
PFB	Protruding Foot Beaker
ROB	Rijksdienst voor het Oudheidkundig Bodemonderzoek (State Service for Archaeological Investigations)
TRB	<i>Trichterbecher</i> (Funnel-necked Beaker)
S O M	Seine-Oise Marne
VBB	Veluwe Bell Beaker
VL	Vlaardingen

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