The TRB West Group

Studies in the Chronology and Geography of the Makers of Hunebeds and Tiefstich Pottery

J.A. BAKKER

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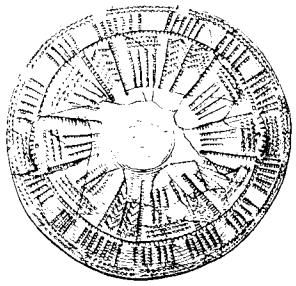

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In Retrospect

When Sidestone Press announced that they wanted to reprint this book, originally published in 1979, and asked me to write a new Introduction, I thought of a recent conversation with my Scandinavian colleague Kristian Kristiansen. He told me that my book, 'a classical work', had been 'obligatory reading' when he studied in Denmark. And he asked me, how I had come to write it as I did. I'll try to explain here how the book was brought about. Most of the publications I mention can be found in the Bibliography (p. 226-238), the others at the end of this section.

In February 1957, I began studying Prehistory at Amsterdam University, a few months after Willem Glasbergen (1923-1979) had been appointed there as a professor in Pre- and Protohistory, as successor of the active and well known excavator Albert Egges van Giffen (1884-1973), whose pupil he had been at Groningen University. My father, Jan Pieter Bakker (1906-1969) was a professor of Physical Geography at Amsterdam University, and had a wide interest in cultural and archaeological subjects. Van Giffen had given him several offprints, and he also possessed Van Giffen's survey of the archaeology of Drenthe (1944d). I knew these admirable studies quite well. During my gymnasium / grammar-school years I became interested in the archaeology of Gooiland, the sandy region around Hilversum and my hometown Bussum. The Amersfoort archaeologist Pieter J.R. Modderman was kind enough to teach me, during summer holidays, the Dutch art of excavating in loess and coversand soils, which he himself had learnt from Van Giffen (Bakker 2008).

Modderman's field-technician and draughtsman was, in 1952, Dick de Boer, who collected fossils. I had found an ammonite in black stone at Hilversum-Lange Heul, Which I now exchanged with De Boer. Leiden born, he had taken part in the plundering of the office of the Rijks-bureau voor Oudheidkundig Bodemonderzoek of F.C. Bursch at Liberation Day, may 1945. The Dutch prehistorian F.C. Bursch (1903-1981) was a convinced member of the NSB, the 'National-Socialist Movement' and his office in the Leiden Museum of Antiquities was full of flags and other NSB paraphernalia. During this pillaging by the public, his colleagues in the museum had wisely sat mum.

De Boer gave me a number of printed illustrations from Bursch's publications and a 1 cm thick pack of 9x12 photographs of TRB pots in the Leiden museum. They were stamped 'Kunkel Marburg' on the back. Eventually it turned out that these photographs were taken by or for Heinz Knöll for his 1939 thesis, which was published twenty years later (Knöll 1959) and that they were printed by the photographer Kunkel, father of the well-known archaeologist O. Kunkel. Much more important was a unique set of photographs of all Dutch hunebeds taken by Charles Gombault, photographer in Leeuwarden, at Bursch's instruction in 1942. They are now in the archives of the Cultural Heritage Agency, Amersfoort (formerly RACM and ROB). De Boer emigrated to the United States and sold his collection.

Initially I did not pay special interest to these documents, but I became interested in the TRB pottery and a possible hunebed at nearby Lage Vuursche (Bakker 1957), for which I studied Van Giffen (1925-1927).

The champion of Dutch TRB research was Ab van Giffen, who published (1925-1927) a standard work with description, plan, photograph and research history of each of the 54 extant Dutch hunebeds in 1918 and reports of his own excavation of five extant and three demolished hunebeds. In his ample description of the mobile finds in these tombs he developed a typochronological three-partition of the TRB pottery (Drouwen, Early Havelte, Late Havelte). Later on he excavated five extant hunebeds and seven sites of former hunebeds (see p. 229-230).

In Amsterdam, Glasbergen gave thorough and appealing lectures on the achievements of Van Giffen and on a study by Lili Kaelas, from Sweden, who had made a study tour

through north-western Germany and the Netherlands in 1953. She had met Glasbergen, who asked her to publish her study of the TRB pottery in these regions in the newly founded periodical *Palaeohistoria* (Kaelas 1955: 'Wann sind die ersten Megalihgräber in Holland entstanden?'). She was the first to question some of Van Giffen's theories about the TRB culture in the Netherlands, which were almost sacrosanct at the time.

In his later life, Van Giffen neglected the Dutch TRB pottery sequence, although he had seen (1927) that it nicely paralleled the pottery sequence developed for Denmark by Sophus Müller (1913, 1915, 1918) and for northern Europe by the Swedish prehistorian Nils Åberg (1916a, 1918, 1936). In the 1940s, Van Giffen (1943c, 1944d) arranged the Dutch TRB chronology according to a succession of grave types: from short rectangular hunebeds without a kerb (peristalith) to long hunebeds with a kidney-shaped kerb, then to a small hunebed with staircase entrance under a barrow, further to a small hunebed without entrance under a barrow, then to stone cists, to individual graves with stone packing under a barrow, to other graves with few stones, to flat graves with some stones, and finally to stone-less flat graves.

Kaelas (1955) applied J.E. Forssander's principle (1936, p. 61): "that the grave types must be dated by the earliest artefacts found in them and not vice versa". The earth graves from Zeyen were thus assigned by her to the earliest TRB period in Drenthe, instead of the latest, as Van Giffen (1943c, 1944d) had. She also noted that collared flasks occurred in the Netherlands until far into what is now called the Middle Neolithic TRB, in contrast to southern Scandinavia, where they seemed to disappear at the beginning of the Middle Neolithic A. I could later confirm this (pp. 56, 72-73). Further she described and illustrated a collared flask from Wychen near Nijmegen, outside the known TRB region.

In the summer of 1957, I took part in Van Giffen's excavation of the still partly extant hunebed G1 of Noordlaren. I became dedicated to the study of the TRB culture for the rest of my life and published the mobile objects from this excavation much later (Bakker 1983).

In 1957, Glasbergen met Carl Johan Becker (1915-2001), the famous Danish investigator of the Danish TRB culture, at the conference 'L'Europe à la fin de l'Âge de la Pierre' in Prague, Brno and Liblice – "Becker, you are a six-footer!" – and they liked or esteemed each other instantly. In a long succession of studies (see p. 227) Becker ordered and described the subsequent stages of the TRB and *Enkeltgrav* (Single Grave) cultures in a systematic, consequent manner and he sent Glasbergen the offprints. Glasbergen lectured about Becker's achievements and lent me his publications. I much admired their methodical approach. The then small library of Glasbergen's Instituut voor Pre- and Protohistorie (IPP) contained the publication of Bagge & Kaelas (1950, 1952) in which Axel Bagge (1950) gave a clear review of the history of Scandinavian TRB research.

In 1959, I hitch-hiked to the National Museet in Copenhagen and brought Becker "the best wishes from professor Glasbergen!". He liked this, showed me some of the Early Neolithic TRB pots from Danish bogs in the museum, and presented me with his *Mosefundne Lerkarfra Yngre Stenalder. Studier over Tragtbaegerkulturen i Danmark* (1947) – which was a good occasion to learn to read some Danish. I also met Therkel Mathiassen, who had investigated the TRB settlement sites of Bundsø and Trelleborg (1939, 1944) and been working on the Danish TRB chronology before Becker (pp. 37-39, fig. 12). This was based on a succession of settlement sites within less than 20 km distance from each other on the narrow island of Langeland, which had been excavated and published by *Købmand* Jens Winther (see figs. 11-12). During this trip I could acquire a few of these monographs (Winther, see p. 237; Berg 1951). The TRB sherds from Bundsø and Trelleborg were still laid out on tables in the National Museum, for Becker's studies (1954a, 1956, 1957).

Glasbergen acquired for the IPP library a large part of Van Giffen's own library, which contained a considerable number of German publications on the TRB culture and *Hünengräber* research. On my trip to Copenhagen, I had also visited the Oldenburg museum, where Johannes Pätzold, curator, had shown me the TRB pottery from the hunebed and other excavations by Karl Michaelsen in the 1930s (Michaelsen 1936, 1937, 1938, 1976) and by himself in the early 1950s (Pätzold 1955, 1957, 1961). Later that

year, Heinz Knöll published a fundamental study on western TRB pottery typochronology (1959), which was an update of his unpublished pre-war dissertation (Knöll 1939). It was hard work to come to grips with this compactly written book. I managed this by mounting Knöll's photographs of the pots in the order of their typological development. This development was described in great detail in the text, but the illustrations were not arranged in that order. Knöll told me "that he had not wished to influence the reader" (which succeeded only too well), but I think that actually he did not want to change the references in his text to re-arranged plates. See p. 16 and chapter 3.

Jürgen Driehaus's book on the Altheim Group (1960), which was a distant TRB relative in southern Germany and Switzerland (fig. 1), stressed the importance of the pioneering work by the Polish archaeologist Konrad Jażdżewski (1932, 1936) and the content of the latter work provided the example for that of his 1960 book. Jażdżewski's first mentioned publication, 'Zusammenfassender Überblick über die Trichterbecherkultur', was published in *Prähistorische Zeitschrift* and readily available. The second work was sent to me about 1961 by the author himself through mediation by my father's colleague, the physical geographer Jan Dylik in Łódź. Jażdżewski told me in 1966 that this copy had damp stains because it was stored in a horse stable during the war. I was much impressed by his work. Gustav Kossinna (1921) had been the first to discern regional groups in the TRB culture, but they were further defined by Jażdżewski (1932; 1936: map 1). My own map (fig. 1, below) is based on his work and later sources. Waldemar Chmielewski's inspiring study of the 'Kuyavian long barrows' (1952) reached me also from Łódź. These sometimes up to more than 220 m long earthen barrows with a triangular base and a narrow, very long tail are found in the whole of Poland (Libera & Tunia 2006) and they may also be expected around Lviv in the Ukraine. These monuments often have kerbs of erratic stones, which are generally less than 1 m tall, so that the tombs can not, in my personal opinion, be called 'megalithic' (as is customary in Poland – see Jankowska 1999). East of the river Oder / Odra they replace the megalithic tombs of the TRB West and North Groups. Contrastingly, they have no megalithic chambers and usually contain less than a dozen individual interments and few grave goods.

In 1964, I accompanied my parents to an INQUA conference in Lublin, Poland, where I met the archaeologist dozent dr. Aleksander Gardawski, who invited me to come and study at the Uniwersitet Marii Curie-Skłodowskiej (UMCS) in Lublin. This could be arranged by a Polish grant in 1966, when I stayed three months in Poland and was enabled to visit most 'Neolithic' colleagues throughout the country by an additional grant of the UMCS. Thus I could take part, for instance, in the excavation of Kuyavian Long-Barrow 8 at Sarnowo by Lidia Gabałówna from Łódź (and discover a new TRB site). This intensive, pleasant and detached contact with so many colleagues who were researching the three groups of the TRB culture with great dedication in 'distant' Poland behind the Iron Curtain, enlarged my 'international' view on the TRB culture widely. Gardawski and Jan Gurba introduced me to a great number of colleagues. Among them was Tadeusz Seidler Wiślański in Poznań, which led to a warm friendship and to the publication by Bakker, Vogel & Wiślański (1969). Since I was going to Poland, professor H. Tjalling Waterbolk, Van Giffen's successor as director of the Groningen Biological-Archaeological Institute (BAI), who closely cooperated with the Groningen C14 laboratory (see Waterbolk 1970, 1971, 1974 and his publications in the periodical *Radiocarbon*), had invited me to bring home as many samples for radiocarbon dating as possible, because hardly any reliable radiocarbon dates were known from Poland at the time. Fourteen samples could be dated in Groningen by John Vogel, and Wiślański and I composed a detailed comment to these and other now available radiocarbon dates from Poland. Because I had seen that the typological interpretations of closed pottery assemblages were tedious and poly-interpretable without illustrations, I presented drawings of the dated artefacts with the site name and radiocarbon age in heavy type in an upper corner – a style of illustration that would now and then be followed in Poland for several years.

Glasbergen had made me one of his assistants at the IPP, in 1959, which gave me ample time to study the relevant literature and the Dutch finds. The IPP copied the Groningen Biological-Archaeological Institute (BAI), which had been founded by Van

Giffen in 1922, in its aims and organisation. Much attention was paid to Prehistory, the Roman period, The Middle Ages and – in combination with the Classical Archaeological Institute – the Near East. Apart from traditional archaeology, Glasbergen had also founded departments for environmental studies: palynology, and of seeds and bones. I am aware that these ecological aspects of the TRB culture are little dealt with in the 1979 book, but they were still in full development and I did not like to give long compilations of the work of others, with which I myself was not too well acquainted (but see Bakker & Groenman-van Waateringe 1988). On the other hand, I added a chapter on the possibility of reconstructing the TRB route patterns (Bakker 1973, p. VII-36-54), which was not included in the 1979 book. As a separate publication (Bakker 1976) it introduced road studies into Dutch archaeology, till then a neglected subject. A small section of 1973, which was cut out of the 1979 book, was a calendar of the discovery of Dutch TRB find-spots between 1845 and 1970 (Bakker 1973, fig. 7.5). To understand the development of thought about an archaeological culture in a country, it is of course necessary to know how the number of finds had increased on which that knowledge was based. Soon afterward such calendars would appear in Scandinavian publications. I would have my own calendar printed only much later (Bakker 1982).

A German grant enabled me to study the TRB culture in western Germany during two weeks in 1968. At the 3rd Atlantic Colloquium in Moesgård, Denmark, 1969, I met Ulrich Fisher (1915-2005), whose articles about Central German TRB groups in *Archaeologia Geographica* and other periodicals had a lasting influence on me, and whose fatherly advice led me to Hans Gummel's book on the history of German archaeological research (1938).

Thus I began to compile a 'History of the study of Western Tiefstich pottery', actually concerning the history of Middle Neolithic TRB research in southern Scandinavia, northern and north-western Germany and the northern Netherlands, between 1613 and 1977 (chapter 2, p. 17-47). During a sea-side holiday, I was extracting Niklasson (1925) and other publications quietly at the reading-table of the 'De Pilaren' inn in Bergen and saw little of the beach.

For my and Marian Addink-Samplonius's (1968) collection of stone TRB battle-axes from the Netherlands, the book about stone battle-axes and axes in north-western Germany by Karl-Heinz Brandt (1967) as well as a number of East German publications provided a useful background and allowed me to compile distribution maps for the TRB West Group as a whole. For the flint flat axes I could rely on the Danish publications and on Brandt 1967 (chapter 5). As a pupil of Jay J. Butler, I enclosed a short study of the metal composition of the copper artefacts of the TRB culture, for which I used a diagram with logarithmic scales as introduced by Waterbolk and Butler (1965), see p. 127-131.

In 1979, at last, my book appeared. It was a thoroughly updated translation of my thesis of 1973. Only part of my site catalogue was included. Four reviews appeared:

- FISCHER, U., *Germania* 60, 1982 (1), p. 238-243.
- KAELAS, L., *Helinium* 22, 1982, p. 304-306.
- PLESLOVÁ- ŠTIKOVÁ, E., *Památky Archeologické* 81, 1980, p. 472-475.
- SHERRATT, A., *Proceedings of the Prehistoric Society* 47, 1981, p. 337-338.

After the publication of this book in 1979, I studied the soil types on which the Dutch hunebeds, TRB flat graves and settlements were located. Following the observations by Jan Wieringa (1954, 1958a, b), it could statistically be demonstrated that dry Late Glacial 'cover sands' without any loam, which later would have acid podsolic soil profiles, were favoured (Bakker 1980 and 1982; Bakker & Groenman-van Waateringe 1988). The boulders needed for hunebed construction were hauled from nearby eroded Saalian ground moraine till areas, which themselves were much too wet to be suitable hunebed locations. These boulders had been brought here by the Ice Age glaciers from Fenno-Scandia. The soil types of the glacial Drenthe Plateau in the north-eastern Netherlands are so differentiated that suitable places for habitation and drinking water are well dispersed. Possibly because the resources of the direct environment were exhausted, the

settlement sites often shifted, as everywhere else in the TRB culture. But our land is so flat that no locations are more attractive than others by their relief; therefore reoccupation of the same site hardly occurred, which is a bonus for the researcher. In drier parts of Drenthe and elsewhere, such as in the Veluwe and the Utrecht-Gooiland Hills in the central Netherlands, the TRB settlements stuck to streams and periglacial dry valleys, in which waterholes were dug.

At Wiślański's request, I investigated the types of megalithic graves of the West Group and tried to date these by the pottery that was found in them. Eventually this study appeared as a book in Ann Arbor, Michigan, thanks to Robert Whallon Jr. and Albertus Voorrips (Bakker 1992).

Meanwhile, Anna L. Brindley, from Ireland, who settled in the Netherlands, scrutinised my pottery typochronology in chapters 3-4 (Brindley 1986). She re-arranged my phases A-G into seven 'horizons'. Horizon 1 is identical to my phase A and Horizons 2-4 re-arrange the (Drouwen) pottery of my phases B-D. Horizons 5-7 are identical to phases E2-G, which were defined by Van Giffen (1927) and J.C. Kat-van Hulten (1947). I accepted and discussed Brindley's typochronology in Bakker 1992, wherein I reproduced (pls. 21-27) her plates of the pottery typical for each horizon. My Early Havelte phase E1 became part of Anna's horizon 4, but she admitted later, in conversation after her study of the flat graves from Mander, that E1 could be considered as a separate, 'late horizon 4' style. See Tables I-II in Bakker 1992 for a comparison of the different dating systems in the TRB West, North and Altmark Groups.

The present work (1979) was written at a time when the radiocarbon dates were still insufficiently recalibrated to permit comparison with solar (or historical) years. The just one hundred then available radiocarbon dates from the North and West Groups were presented in the form of 'conventional C14 dates BC' (pp. 141-147). Only ten C14 dates were then available for the TRB West Group. Meanwhile recalibration of these 100 dates has given older and more vague outcomes – which I cannot discuss here any further. It suffices to say that Jan N. Lanting now dates the TRB West Group between 3350 and 2800 cal. BC, based on radiocarbon dates. See the publication by Lanting & Van der Plicht (2000), in which all TRB dates from the Netherlands and a few from elsewhere are updated and discussed.

In a number of later publications, I studied the history of the research of the hunebeds in the Netherlands (Bakker in prep. is the most recent). Finally, a review of newly discovered TRB pottery finds from the margins of and outside the main TRB territory in the Netherlands is also in preparation (Drenth & Bakker in prep.). Such finds are from Texel, Hazerswoude-Rijndijk, Hellevoetsluis-Ossenhoek, Nijmegen-'t Klumke, Almere and Zuidhorn. Several of these pots were traded to Vlaardingen Culture settlements in the western Netherlands. That culture had clay discs ('baking plates') that were similarly formed and decorated to those of the TRB culture, but it had no stab-and-drag decoration on its quite differently formed, smooth-walled pottery. From the Wieringermeerpolder, north of Amsterdam, two TRB settlement sites are known in Slootdorp-Bouwlust and Slootdorp-Kreukelhof, which were investigated by Willem Jan Hogestijn. And a contemporary dug-out canoe was recently found there in Dijkgatsweide.

In 1979, to the west of the river IJssel no other TRB battle-axes were known than the knob-butted type (figs. 50-54). However, an unfinished, 15.6 cm long Troldebjerg battle-axe made of diabase was found, in 1985, on lot NZ14 in the *gemeente* Zeewolde, in the province of Flevoland, 35 km ESE from Amsterdam (Hogestijn 1991, 110-112). Since 1977, only few other TRB battle-axes were found in the Netherlands (A.E. Lanting 1977, 1978; cf. Beuker, Drenth, A.E. Lanting & Schuddebeurs 1992). Given their relative rarity and the increased mechanisation of ground-work this is what one would expect.

Milan Zapotocký (1990) has strongly criticised my treatment of the 'Dutch knob-butted axes' in chapter 5 (esp. p. 96-110 and map on p. 97) and Rainer Kossian (2000, p. 85-86) repeated these objections briefly. Klavs Ebbesen (1998, 10) considered the 'Dutch' type as a local type which differs from Zapotocký's eastern European Group KIVB. Along with Zapotocký, he assumes that this local type dates from the transition from the

EN to the MNA of the Danish chronology, because of its typological similarities with polygonal battle-axes. This would then be in Drouwen A (Brindley's horizon 1).

Admittedly, a more detailed treatment with illustrations of each item and a critical sorting and a subdivision of the collection, for instance according to Zapotocký's typology, is still a desideratum (I hope to present this together with Erik Drenth in the future). But, as indicated on p. 96-110 below, surface finds 13, 32 and 39 came from the TRB settlement sites of Anlo, Beekhuizerzand and Uddelermeer, with exclusively Early Havelte pottery (E2 / horizon 5) and where Drouwen A pottery or any other Drouwen pottery (horizons 1-4) was completely absent. Moreover, atypical but directly related battle-axe forms were found in flat-grave Ekelberg a (nr. 16, p. 187-188, Fig. B16) and in a flat-grave at Heek-Ammerter Mark in Westphalia (unpublished, pers. com. Walter Finke), which are associated with two Early Havelte (E1/2, i.e. horizons 4-5) bowls and Early Havelte pottery. Early Havelte / horizon 5, respectively. Early Havelte corresponds in time to the MNA III-IV in Denmark; whatever Zapotocký may say, there is no doubt that the named knob-butted battle-axes are centuries later than the EN / MNA transition, which was about contemporary with Drouwen A / Horizon 1!

A small fragment of a knob-butted battle-axe was also found in 'the Huntedorf' (or 'Hunte 1'), the TRB settlement excavated by Hans Reinerth in 1938-1940 (number H1/23, 2068; Kossian 2007). This site was occupied during almost the whole MNA, from Drouwen B up to and including Late Havelte (phases B-G / horizons 2-7). Besides there was pottery of the MNB Single Grave and Bell Beaker cultures (Bakker and Van der Waals 1973). The context of this item cannot date it with any precision.

Knob-butted battle-axe nr. 44 from 'Leenderheide' actually derives from an art dealer in Breda and has no known find-spot (Bakker 2004, 132). But nrs. 43 (Bladel), 45 (Neeritter), 46 (Ittervoort) and 48 (Sainte-Cécile in the Belgian province of Luxemburg) have reliable find-spots, while showing a remarkable distribution of what in essence is a TRB battle-axe type outside TRB territory in the southern Netherlands and south-eastern Belgium. Nr. 43 from Bladel is made of diabase (as well as nr. 44), a rock type that is found in the once ice-covered regions north of the Rhine in TRB land, or in the Nijmegen-Düsseldorf end moraine just south of it. On p. 105-16, I asked: 'Was it here perhaps a matter of complicated exchange systems (cf. chapter 6 of Sahlins 1972), in which the flint zone people – [between Aachen-Valkenburg-Ryckholt-Spiennes and Valenciennes and more to the south] – resold these artefacts elsewhere?'

My method of encircling the find-spots in my distribution maps (pp. 14-15, 91-97) is ideal, in my opinion, to clearly show regional clusters. Glasbergen dubbed it 'Mr Bakker's frog-spawn method' – it was rarely followed by others, however (Szmyt 1996, fig. 47-48).

Finally I refer to two excellent books by Magdalena Midgley (1992, 2008), for further general information about the TRB culture and its megalithic tombs. And to Rainer Kossian's thorough works of 2003 and 2007, which compile and illustrate the contents of *all* non-megalithic graves in Germany and the Netherlands and, secondly, the results of Reinerth's excavations and researches in 1938-40 in the 'Hunte 1' settlement and elsewhere in and around Lake Dümmer, 35 km NNE of Osnabrück, Germany, together with all known house plans of the TRB culture.

A 'Schwerpunktprogramm "Frühe Monumentalität und soziale Differenzierung" [der TBK]' for six years is about to start now. This 'Centre of Gravity Programme "Early Monumentality and Social Differentiation" [of the TRB culture]' was initiated by Johannes Müller, in Kiel, and is sponsored by the DFG. It concerns the whole TRB culture in Germany in most of its aspects and is meant 'to arrive at the same level of research as in Scandinavia and the Netherlands', as was verbally explained.

Therefore we will soon 'know everything', or at least much more than forty years ago, when it was such a great pleasure to reconnoitre and compile the bits and pieces available from and about the TRB culture!

Baarn, April 17, 2009, Jan Albert Bakker

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(in addition to those on p. 226-238)

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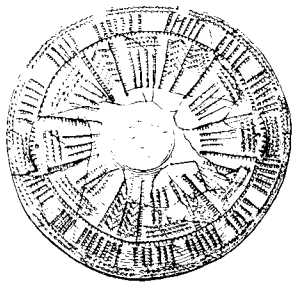
note

This 2nd edition of the 1979 book is a photographic reprint of the text pages of the 1st edition, which are reduced to ca 90 %. (to 0,3) The illustrations of objects, however, are not reduced in scale so that the pots and other artefacts are on scale 1 : 3, as in the 1st edition. J.A. Bakker thanks his old teacher, colleague and friend Jay J. Butler for correcting the English of most of the preceding 'In Retrospect'.

J.A.BAKKER

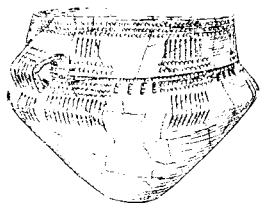


The TRB West Group

Studies in the Chronology and Geography of the Makers of Hunebeds and Tiefstich Pottery

Deze publicatie kwam tot stand met steun van de Nederlandse Organisatie voor Zuiver-Wetenschappelijk Onderzoek (ZWO) en de Stichting Nederlands Museum voor Anthropologie en Praehistorie

Preface



The first version of this book, written between 1968-73, appeared in a very limited number of copies in Dutch, as a D. Sc. thesis. It was defended on 14.11.1973, under the supervision of Prof. Dr. W. Glasbergen, University of Amsterdam.

The present version has been, in places, extensively altered and amplified, although the original framework has not been changed. Chapter 7 is the former section 7.1. The former section 7.2 has been omitted, and 7.3 has been published elsewhere (Bakker 1976).

In principle, important publications which came to my attention before 1978 have been used, but many publications dated 1976, for example, had not yet appeared or were not yet incorporated into our libraries.

I am extremely grateful to all those individuals and institutions, in and outside Netherland, who put their collections at my disposal.

The travel expenses in Netherland, Germany, Denmark, and Belgium were supplied by the IPP. A grant was received from the People's Republic of Poland for a three month study there in 1966, and a 1968 two week study trip through northwest Germany was made possible by the Alexander von Humboldt Stiftung.

Important to the framework of this book have been primarily the publications by A.E. van Giffen (1927), C.J. Becker (1947ff), H. Knöll (1959), K.H. Brandt (1967), R.F. Heizer (1959), D.L. Clarke (1968), and J. Deetz (1967), as well as participation in the Second and Third Atlantic Colloquia (Groningen 1964, Moesgård 1969) and in the conferences of the Arbeits-Gemeinschaft Neolithikum (since 1970).

Prof. Dr. J.D. van der Waals (BAI), Prof. Dr. W. Glasbergen (IPP), Drs. J.F. van Regteren Altena (ROB), P. Kjaerum (Moesgård) and Dr. H. Knöll (Kassel) gave stimulating suggestions during the formative period, or detailed criticism during the realisation of this book. I also thank Prof. C.J. Becker (Copenhagen), Dr. S.E. van der Leeuw (IPP), J.E. Musch (BAI), Dr. H. Behrens (Halle), Prof. Dr. A.P.A. Vink (Amsterdam) and Dr. J. Hoika (Schleswig) for criticism on particulars. Drs. A.E. Lanting (Groningen) has sent me numerous letters (1973-1978) with critical additional remarks; in many places I have gratefully benefitted from these. Drs. J.N. Lanting (BAI) has been exceptionally helpful as to information concerning his own research as well as on materials and documents held by the BAI.

Most of the illustrations have been executed by the IPP drawing department (J.W.N. Vermeulen, S. Hoek, A. Visser, A.M. Numan, T. Mantel, J.P. de Wit, B. Donker, A.J. de Jong), a few as well by the BAI (H. Roelink). The cover was designed by G.M.J. Kosterman (Amsterdam).

The English translation is by Mrs. B.M. van der Meulen-Melrose and Mr. K. van der Meulen (Roden). Dr. J.J. Butler (IPP) and especially Drs. C. van Driel-Murray (IPP) helped with the translation of technical terms. Correction of several notes and later additions in the text, and translation of the preface were done by L.L. Therkorn (Amsterdam). The English manuscript was also read by J.K. Voss, B.A. (Ann Arbor), E.K. Hicks (Amsterdam), and, partly, by Dr. J.J. Butler.
The typing was done by Mrs. M.J.A.N. Kooijman (IPP). Drs. J.F. van Regteren Altena (ROB) and G.M.J. Kosterman (Amsterdam) advised me concerning the lay-out. W.J. Manssen (Harderwijk), Dr. O.R. Ortiz-Troncoso (IPP) and Drs. P. Akkermans (IPP) have very kindly assisted me in the correction of the typescript or proofs.

To all the above I am deeply indebted. Of course, I am responsible for the blemishes that remain.

This publication would not have been possible without a substantial grant for printing and translation costs from the Netherlands' Organization for the Advancement of Pure Research (ZWO). I also gratefully acknowledge the financial support given by the Foundation for Anthropology and Prehistory in the Netherlands.

This study is dedicated to the memory of three unforgettable men:
the physical geographer, Jan Pieter Bakker, my father (21.7.1906-7.4.1969), and the archaeologists, Albert Egges van Giffen (14.3.1884-13.5.1973) and Willem Glasbergen (24.7.1923-1.4.1979).

Amsterdam, 6.4.1979.

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(continued overleaf)

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Illustrations are at a 1:3 scale of reduction unless otherwise indicated or self-evident. The artefacts which came from the same 'sealed find' ('closed find') (flat grave, refuse pit, etc.) have been drawn within a box; 'semi-closed assemblages' (homogeneous refuse from a single settlement, for example) have been bracketed in the corners of the illustration.

CHAPTER 1

Introduction

1.1 SURVEY OF THE CONTENTS OF THE CHAPTERS

'Funnel Beaker culture' or 'TRB culture' (*)[1] is the common denominator name for a number of culturally-related agricultural populations which inhabited north and central Europe between 3300/3600 and 2150 BC.[2] Fig. 1 shows the regional groups which can be distinguished. The boundaries between them must be regarded as rather flexible and as vague transitional zones.
The West Group, which is dealt with in this book, appeared only at a late stage, viz. from c. 2700 to 2150 BC. According to the Danish dating system for the North Group, the West Group coincides with phases I to V of the Middle Neolithic (MN I-V).[3]

Most of the attention of the scholars has, for centuries, been directed to the megalithic graves of the West Group (the *hunebedden* (*)), but this has gradually been transferred to the artefacts which provide the possibility of constructing a detailed typochronology. This is the relative dating apparatus that is practically indispensible for the study of other

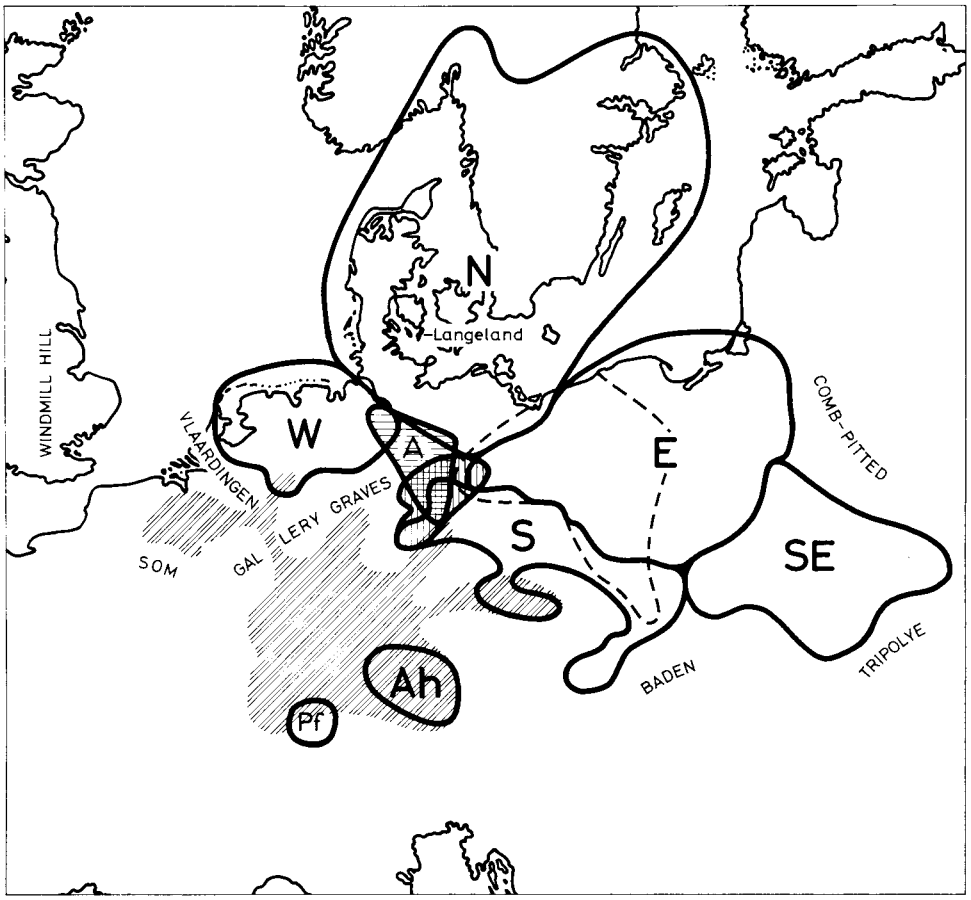


FIG. 1 Map of the regional TRB Groups. Heavy lines indicate the TRB Groups (W = West Group; N = North Group; E = East Group; S = South Group; SE = Southeast Group; Ah = Altheim Group; Pf = Pfyn Group; A and horizontally hatched = Altmark Group; vertically hatched = Walternienburg-Bernburg Group). The broken line indicates the extension of the Luboń ornament. Several of these Groups date from the EN period and did not exist anymore in the MN. Diagonal hatching indicates the extension of the Michelsberg culture. Note the position of Langeland. According to different authors (cf. captions of figs. 12-13 in Bakker, Vogel & Wiślański 1969).

aspects of this culture during its long period of existence.
A study of the pottery has turned out to be by far the most fruitful for this purpose. Much of this 'Tiefstich' pottery is decorated with ornamental designs which were impressed into the surface of the pots with a stabbing and dragging movement with a pointed instrument. After the pot was fired, these grooves could be filled with a coloured paste, now mostly disappeared. 'Tiefstich' – a term which is retained here untranslated – literally means 'deeply incised (grooved, cut, . .)'. It is often translated as 'stab-and-drag'. These and other methods of decoration (*) were current in the West Group, as well as in the North Group, the Altmark Group (*), and the Walternienburg Group. Tiefstich pottery has a great variety of shapes, was decorated with loving care, was sensitive to fashion, and, as it was fired at low temperatures, was fragile. The fashion trends caught on over very wide areas and were continually subject to change. Thus, even a few decorated sherds can, theoretically, furnish an accurate dating.
The typochronology concerned, however, was not yet available in an easily manageable form. Although E. Sprockhoff's book (1938) does present a pottery sequence briefly and clearly – particularly by means of omitting discussions with those of different opinions – that sequence is wrong. The two undisputed standard works which describe the lines of development correctly are either inconveniently arranged (Van Giffen 1927) or so detailed (Knöll 1959) that the main argument is difficult to follow. In Chapter 3, I have tried to combine the dating systems of A.E. van Giffen and H. Knöll and to render them more operational. Anyone who thinks that such work goes into too many details would do better to proceed to Chapter 4 where the pottery sequence, divided into phases A-G in Chapter 3, and the distribution maps of the sites concerned are briefly discussed.
The step-by-step development of these problems in scientific research in previous centuries, and particularly in this century, is discussed in Chapter 2. Analogous developments in the North Group and the Walternienburg-Bernburg Group are also dealt with in that chapter.
Chapter 5 discusses the flint and stone artefacts. The stone battle-axes are less useful than pottery for dating purposes because these rare status symbols were evidently less subject to quickly changing fashions and had a longer life. However, their distribution patterns, like those of the ceramics, indicate which intercommunication areas can be distinguished within the areas of the main groups.
The stone and flint axes and chisels were indispensable for the forest clearance for agriculture[4] and also for the building of houses. The trade in these economically indispensable tools shows up in the distribution maps of the flint axes. Technical improvement in the shape of the flint axes from north Jutland and the western Baltic Sea area again provides us with a dating sequence. Other axes, such as those of stone, and the flint axes from Belgium and south Limburg, are of no use to us in this respect because their shape remains consistent. My work on the typochronology of the battle-axes and axes of the West group is based on the studies by N. Åberg (1916a-b; 1918; 1937), C.J. Becker (1957, 1973) and K.-H. Brandt (1967).
Here and there the typochronology of this book is in conflict with current views, or creates new problems. These areas of conflict are discussed in Chapter 6. This chapter includes a discussion of the problems of the TRB 'Copper Horizon' and a synchronisation of the typochronology of the West Group with that of the North Group, with an altered version of Becker's chronology scheme (1954a, 1959) for the South Scandinavian Middle Neolithic, and with the C14 calendar.
In Chapter 7, the megalithic architectural forms in Drente are dated by means of the typochronology developed for the artefacts. A number of ideas concerning the history of the distribution of megalithic grave forms, which were based mainly on a typological series of ground-plans, turned out, on investigation, to be untenable or difficult to prove.

1.2 FACTORS WHICH HAVE HINDERED TYPOCHRONOLOGICAL INVESTIGATION OF THE WESTERN TIEFSTICH POTTERY

U. Fischer (1960) speaks of the great tenacity with which the Western Tiefstich pottery has resisted being classified by typochronology. How can this be explained?
a *The excessively large number of features on the pottery.* While the Western Tiefstich pottery will probably turn out to be *ideal,* because of its great diversity, for seriation purposes by application of modern grouping techniques, this very abundance of features has, until now, hampered the reconstruction of the original sequence; it was more difficult to get an overall picture than, for example, with the undecorated Bronze Age and Iron Age urns of these districts. These urns are distinguishable mainly by profile characteristics. The problems then seem simpler, but the resulting seriation will be less precise.
b Instances of *convergence in profile characteristics* occur in the course of the development of the Tiefstich pottery. This is the case for, for instance, the funnel beakers (section 3.4.1). The profile changes in this pot were used for a long time as the only dating criterion for the Western Tiefstich pottery. The profile line of Early Havelte amphorae wrongly suggested an extremely early dating (the controversy about the 'Seeste Vase': see section 6.5.1).
c *'External' theories* seem to have been a factor in the thinking concerning the sequence of the 'recalcitrant' Tiefstich pottery for a long time. Because too little was known about the material, it was not immediately obvious that a wrong path was being fol-

lowed. Examples are the pseudo-technological explanations, with chronological implications, of the origin of the shapes of the pots (Schuchhardt 1909; Holwerda 1915), a hypothetical sequence of the architectural shape of graves which finally came to dictate the age of the pottery (Van Giffen 1930), and the rigorous pursuit of Müller's ideas about the origin of the *tvaerstik* line (*) in Denmark with relation to the developments in the West (Sprockhoff 1938).

d *There are no stratigraphic sequences* which are useful for the reconstruction of the historical sequence of the ceramics. An exception is the stratigraphy of the chamber fill of hunebed D21 at BRONNEGER (Van Giffen 1927; Knöll 1959, pl. 44), but even this is by no means satisfactory in all respects (see note 2:24).

e *The character of the finds.* Especially west of the Weser, *the chambers of the megalithic graves* contain 'truly bewildering masses' of sherds (Van Giffen) which lie, in a very mixed-up state, on the floor. After years of work, hundreds of the finest ceramics can be composed from them. The numerical record for Netherland is 649 TRB pots from hunebed D53 at HAVELTE; for West Germany it is nearly twice that number from hunebed EMMELN 2. Schlicht succeeded in publishing (1968) the Emmeln material within 14 years after excavation. Thirty years after being excavated, the Havelte material had been prepared for publication by Kat-van Hulten (Van Giffen 1951), but so far it has not been published. On both sides of the border, many other hunebed inventories have not yet been sorted, let alone published.[5]

In the same way as the pellets of an owl give an impression of the prey which was available in its environment, the inventory of a hunebed demonstrates which pottery was considered worthy of being given to the deceased by their relatives (probably living in the vicinity) in the course of centuries. Often the greater part of the local Tiefstich pottery sequence is represented. But inventories of synchronous hunebeds in a small area also reveal among themselves widely differing ratios and gaps for each of the ceramic phases. Local variations in the burial customs may contribute to this; it may or may not, for instance, have been the custom to partially empty the grave before making an addition. As a result of this, the examination of only one or two hunebed inventories may not be sufficient for a quantitative analysis of the types of pottery current in a *Siedlungskammer.* (Jankuhn's term, literally 'settlement-chamber' or '-cell', to indicate moderately large settlement areas delimited by natural boundaries.)

Graves used only once are known in the West Group in fairly large numbers (Knöll 1959 and Appendix B). They comprise 'flat graves' (*), ranging from graves without stones ('earth graves' (*)) to those with a few stones, and to stone-packed graves (*) and, also, stone-cists (*). These graves generally contained one or a few individuals and, in the West Group, were probably never covered by a barrow. Whereas these graves offer a selection of the then available pottery, they have the disadvantage that their pottery is often less carefully executed than that from hunebeds, and therefore somewhat less easily classifiable, and is mostly limited in number. Many of these graves are discovered accidentally by non-experts, with the scientific drawbacks associated with this.

Some of the pots found buried in the sand may not have stood in a grave but may for instance represent *offerings* to some deity. Waterbolk (1958) supposed this for a funnel beaker containing a biberon (*) excavated at AALDEN, but neither the lack of soil traces nor the position of a biberon in a funnel beaker are exceptional in only once-used graves (cf. DIEVER and LANDERSUM in Appendix B). For typochronology this uncertainty makes, however, no difference if a simultaneously buried 'closed find' is concerned.

Offerings of pottery placed next to the entrance of a megalithic chamber upon a flat stone ledge on top of the boulders of the peristalith of the mound, as described for the North Group by Thorvildsen (1946) and Kjaerum (1965; 1967; 1969), seem to be absent in the West territory. However, complete pots buried in and outside the peristalith of megalithic tombs of the West Group may have had a comparable function. If circumstantial evidence indicates that we are dealing with a closed find, the pots may be used for typochronology. In this book several instances will be described of this still somewhat puzzling sort of find.

Offerings of pottery with food on the margin of peat bogs or along peaty rivulets may have been deposited over a very long period at the same spot (Becker 1947). From the West Group territory only four finds have come to my attention (WEERDINGE 1 (fig. 29:1), WEERDINGE 2, EXLO, BARGERCOMPASCUUM, all in the large peat-bog of south-east Drente), but since no more than one pot from each find has been preserved they have little value for typochronology.[6]

Settlement pottery groups usually are rather small collections of typochronologically homogeneous sherds in the West Group, corresponding to one or two of the pottery phases A-G. This is evidently the result of a repeated shifting of the settlements, which is in contrast with the North Group, where several of the settlements which have given their names to the successive phases of the MN turned out to have produced a 'mixed' assemblage because their well-chosen site had been inhabited repeatedly throughout the TRB period (section 2.18). (This contrast may have been caused by the differences between the earlier moraine landscape of the West – of Saale age, but levelled during the Weichsel glaciation – and the later Weichsel moraine landscape of the Baltic which is much more rugged and often makes the choice of settlement sites obvious.) For Danish typochronology the seriation of homogeneous-looking assemblages of sherds from

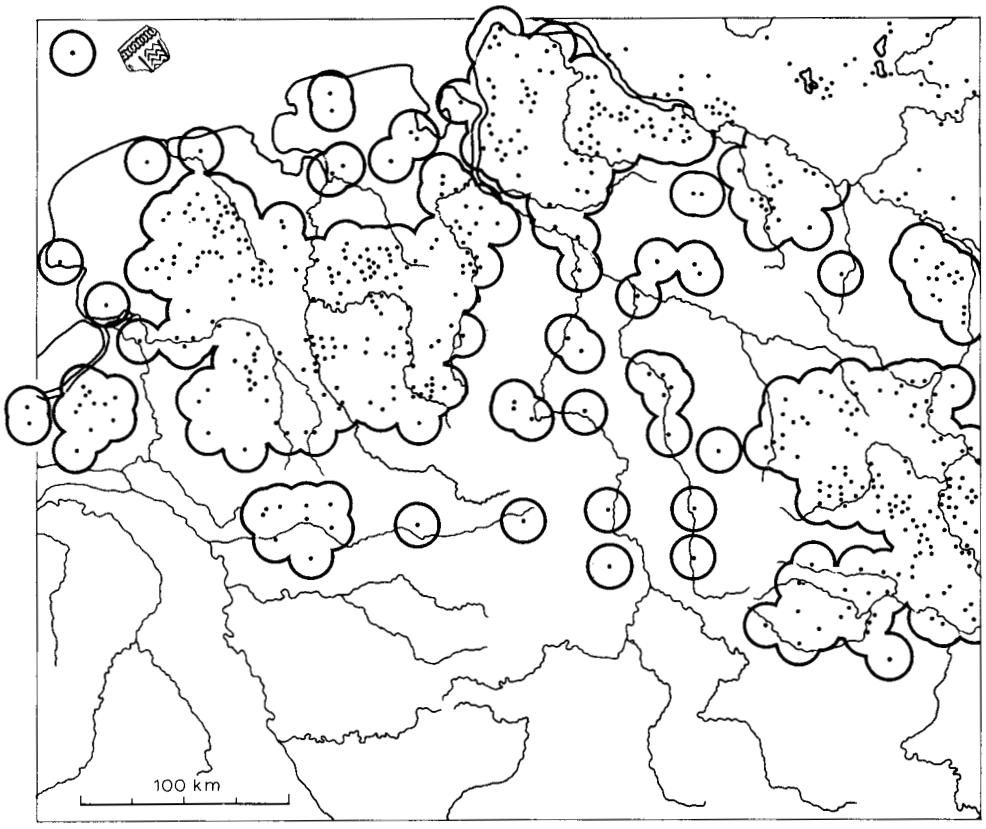


FIG. 2 Find-spots of Tiefstich pottery in Netherland and western Germany (according to Knöll 1959, with additions). Each point indicates a locality under which one or more find-spots were recorded. The two southernmost find-spots on the river Leine and the majority of the points in the closed area in the southeast corner concern the Walternienburg-Bernburg Group.

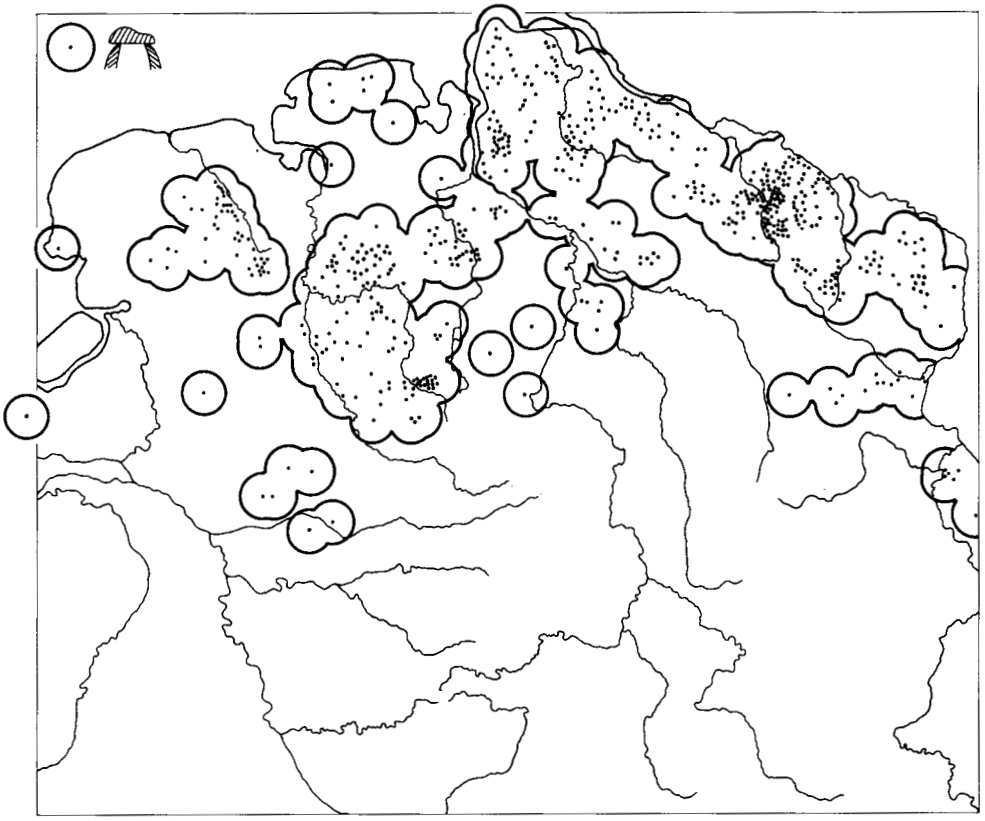


FIG. 3 Distribution of TRB megalithic graves West of the Elbe (after Knöll 1961). Each point indicates a locality under which one or more find-spots were recorded. Probable find-spots are also included. Knöll's data have undergone the following additions or changes: 79a GETELO, Kr. Uelsen; 107a LEER-WESTERHAMMRICH; 110 BURHAFE (?); 112 MARX (?); 538a-b GLIMMEN and ONNEN, gem. Haren; 558a HOOGHALEN, gem. Beilen; 582 MANDER, gem. Tubbergen; 583 FRIESENBERG, gem. Markelo (?); 584 LAGE VUURSCHE, gem. Baarn, prov. Utrecht (?); 111 and 539 have been deleted (538a-b according to Lanting 1975; discoveries Musch); 584 according to De Boone 1971; changes for Ostfriesland according to Gabriel 1966).

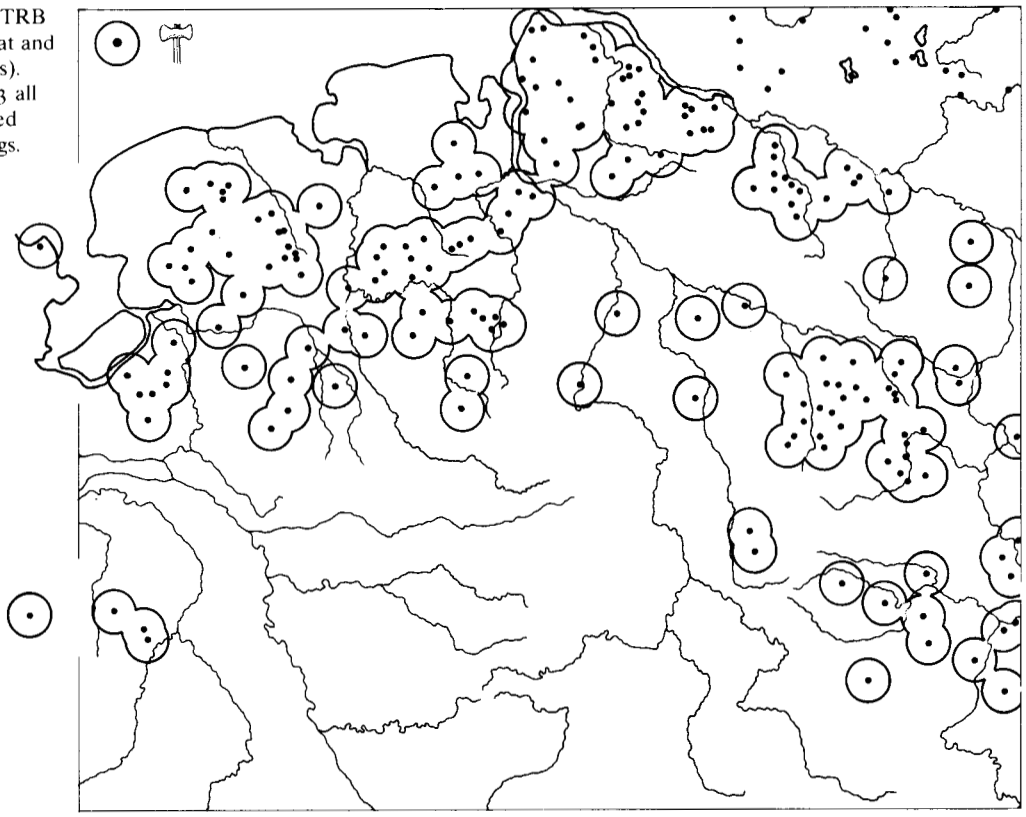


FIG. 4 Find-spots of TRB battle-axes (except Flat and Fan-butted battle-axes). In contrast to figs. 2-3 all find-spots are indicated (according to maps figs. 50-52, 54).

pit fillings provided a way out of this difficulty (Becker 1956; 1957; section 2.18). Such pits were dug for loam (to daub the house walls with) or for storage (?) and were afterwards filled in with refuse; they seem to be rare in the West Group (cf. note 5:33). Wells sometimes offer a better opportunity, as does the one in the dry streambed at ELSPEET (Appendix B7). In the lined wells in the springs of KARLSQUELLE (section 2.17), however, an EGK (*) layer covered a TRB layer and the sherds were badly corroded. Another lined well, probably of Drouwen date was found at ANGELSLO (information J.D. van der Waals).[7]

f *Ground traces unclear.* The TRB West Group supported itself particularly on the plentifully available, boulder-free, glacial or periglacial sandy soils.[8] After TRB times, these soils were podzolised to a greater or lesser extent. The podzols have not accentuated the traces of former TRB pits, as can be the case with soil traces from the Bronze and Iron Age, but, on the contrary, have wiped them out. The deeper TRB pits, extending to below the iron pan of the podzols, have also become almost invisible since the vegetable material in the pits has apparently lost its colour. For this reason, it is rarely possible to exactly establish the contours of a grave pit, or to recognise the pits which must have been dug during the construction of megalithic tombs. If the sands are layered (as, for example, the Older Coversand and the Younger Coversand I) the pits may show up against this layering. Differences in loam content between pit-filling and matrix sometimes reveal differences in humidity. No chemical sprays have yet been developed to make the invisible visible again in such situations. These unfavourable soil conditions can be blamed for the fact that house plans have been so rarely established. If we leave the still unique peat-settlement DÜMMER-NORTH out of consideration here, where even the wooden floors of houses of 3-4 by 4.8-7 metres were preserved (Reinerth 1939; Jacob-Friesen 1959), the only other known house plans are those on the Lüneburg Heath, from WITTENWATER, Kr. Uelzen (Voss 1965) and DOHNSEN, Kr. Celle (Piesker 1937). The houses at Dohnsen measured 4 by 4.90 metres. In Wittenwater, a barrow of the Bronze Age (which may have had a Bell Beaker core) prevented the colours of the post-holes of a house with rounded ends, of 16 by 6 metres, which lay under it, from being completely discoloured by weathering. The artefacts assign this house and the one of Dohnsen to the Altmark Group. Some post-holes have been established in ELSPEET, but without providing house plans (Appendix B7).

Strangely enough, it is iron infiltrations which indicate post-holes inbetween the boulders of megalithic constructions. Three such cases are already known, all established during the investigation of a

megalithic grave which was robbed of its boulders; TINAARLO-D6e (Van Giffen 1944a), NOORD-LAREN-G1 (unpublished) and TANNENHAUSEN (Gabriel 1966).

g *The area of the West Group extends over c. 60,000 km²* (so, twice the surface area of Belgium, less than that of the Irish Republic, and two-thirds that of Portugal). *The ceràmic material is present in great abundance.* Knöll (1959) counted nearly 300 place-names with one or more finds (fig. 2) and (1961) about 500 places with one or more megalithic graves (fig. 3). His data were up-to-date until 1951, the numbers would now be considerably higher. Add to this the masses of sherds to be assembled from nearly every megalithic grave which has been investigated, and one understands the difficulty of knowing all the material thoroughly. Moreover, only a few people at a time have worked with this material, so that all too much pottery in both countries still awaits sorting and publication. Subjects like the objective mapping of possible market areas, trade routes, regional subgroups and their relative population densities, have scarcely been touched since Knöll (1952c).

1.3 AN OUTLINE CORRELATION BETWEEN THE POTTERY SEQUENCE A-G AND THOSE OF KNÖLL AND VAN GIFFEN

In Chapter 3, a detailed explanation will be given of how, on the basis of the work of these two authors, I arrive at the subdivision into the phases A-G. As an introduction, a correlation table for the subdivisions concerned is given here (figs. 5-6). Both Van Giffen (1927) and Knöll (1959) reconstructed pottery sequences for the Western Tiefstich pottery. Neither of these sequences was explicitly meant for its own country, and both of them were partly based on material from the neighbouring country, but, until now, each has been applied almost exclusively in its 'native land'. Wrongly so. Both series run roughly parallel, are equal in length, and are both theoretically acceptable. Since only one of the two internal dividing lines between the *three* stylistic periods of each system is identical, a combination immediately leads to a subdivision into *four* stylistic phases (fig. 5).

VAN GIFFEN 1927	KNÖLL 1959	Combined
Late Havelte	2	LHV
Early Havelte		EHV
Drouwen	1/2	Knöll 1/2
	1	Knöll 1

FIG. 5 Combination of the chronologies by Van Giffen (1927) and Knöll (1959) results in a four-phase division.

In this book the number of stylistic phases distinguished is increased to *seven or eight*, a step which seemed desirable for a better subdivision of the long lifespan of the West Group.[9] The initial idea for this is derived from Knöll (fig. 6). In his Marburg thesis

BAKKER	KNÖLL 1939	KNÖLL 1959	VAN GIFFEN 1927
G Late Havelte	5	2	Late Havelte
F Middle Havelte			
E Early Havelte	4		Early Havelte
D_1^2 Drouwen D_1^2	3	1/2	Drouwen
C Drouwen C			
B Drouwen B	2	1	
A Drouwen A	1		

FIG. 6 Comparison of the chronologies by the present author, by Knöll (1939 and 1959) and Van Giffen (1927).

of 1939, which was not published, Knöll defended a subdivision into *five* phases. In his 1959 book, he combined the old phases 1 and 2 into phase 1. The old phase 3 was renamed phase 1/2, and the old phases 4 and 5 were combined into phase 2. The old lines of division can, with some difficulty, still be recognised in the book. In it, moreover, we find the criteria for a subdivision of the bowls and pails of the new phase 1/2 into an early and a late group. I am trying to extend this line to the shoulder pots, and to cut phase 1/2 in half.

It is less certain if the latest of these halves can again be subdivided into two.

Finally, a Middle Havelte phase, as yet little-known, could be distinguished at the transition from Early to Late Havelte (Bakker & Van der Waals 1973).

The resulting (sub-)sections A-G are shown in fig. 6 in their relation to previous systems.

Since I sometimes give a somewhat different interpretation to my sub-sections, the horizontal lines do not imply complete agreement with the phases of the other three systems. In this connection, I would emphasise that my horizons partly overlap and do not cover an equal period of time and that the style which they represent will not have been current everywhere at exactly the same moment. Sometimes, even, pottery which represents one or more stylistic phases is missing in a certain region, and this clearly indicates the limitations of the system.

Before various points are worked out in Chapters 3 and 4, Chapter 2 deals with the history of the pottery investigation.

CHAPTER 2

History of the study of Western Tiefstich pottery

'The reverse side of this false familiarity is the pedestal onto which the old gentlemen were pushed. When studying Wallenstein, one is inclined to believe that the spirit of the man who appears in such heavy type in the history books has entered one's own brain. What historical fraud!'

Kurt Tucholsky, 'Die Essayisten' (1932)

This chapter deals with the history of the study of Tiefstich pottery; especially that of the West Group, but also – more briefly – of the Tiefstich pottery of the North Group, the Altmark Group and the Walternienburg-Bernburg Group, where the development of the research was analogous, or, rather, often served as an example for the research of the West Group.[1]

The greater part of the chapter (sections 2.2 ff) is devoted to the period after 1908 when the pottery was first studied with the aim of typochronological subdivision of the period of the TRB culture itself. Section 2.1 deals with the study of the pottery in the preceding centuries in northwest Germany and, especially, Netherland. It seemed useful to elaborate somewhat at this point on the rapid development which scientific thinking has undergone concerning the megalithic graves, their builders and their times. The few remarks about stone artefacts will also be reported.

A more stringent selection process was necessary for the period since 1908 because of the increased production of literature. Besides, what strikes the reader in older studies as 'modern' or 'quaint' comes across as self-evident or annoying in modern work. While the demanding work on the TRB pottery sequences progressed only gradually (so that it can be fairly conveniently dealt with per investigator or per single problem), a lively exchange of opinions on related subjects was taking place simultaneously, and such discussions may have given many a student a taste for this work.

In general, these theories will be touched on in this chapter only if they had a direct influence on the direction of the pottery investigation. Two erroneous approaches have been virtually ignored, although, in their time, they were taken seriously in almost every study. One is the derivation of Tiefstich pottery shapes from gourds and wicker-work, an idea fashionable in the 1910's and 1920's (see 1.2c and 2.7). The other is an annoyingly persistent theory that in the pottery of the Early Havelte phase, represented by an amphora from SEESTE, (the 'Seeste Vase'), typological contact is revealed between Tiefstich and Rössen pottery. Indeed there is sometimes a striking similarity, although, according to C14 dating, the latter is centuries earlier. This is a question which was of topical interest from 1900 to 1940 (and since then sporadically until the present day) and it will be dealt with separately in section 6.5.1. The history of the investigation of stone artefacts since 1908 (which can be told in a few words) will be discussed in Chapter 5.

2.1 RESEARCH BEFORE 1908

The growth of the empirical sciences in Europe in the 17th and 18th centuries gave rise to a few written reports concerning excavations in megalithic graves.[2] The earliest of such reports for the West Group are those of excavations in 1613 by Johan van Velen in 'Suirboldts Haus' at BÖRGER and in other megalithic graves on the Hümmling (Gummel 1938, p. 16-17), and in 1685 by Titia Brongersma in hunebed D27 at BORGER in Drente (Van Giffen 1927). Johan Picardt, the first Dutch scholar to write intensively on the hunebeds (1660),[3] came in this respect not yet further than the remark (p. 24) that 'under some of these piles of boulders there are vaults and hollow places which have collapsed because of their great age; as one has often found in other countries, with very rare antiquities hidden in them. I believe these are likely to be found here, too.'

Van Velen and Titia Brongersma found 'remarkably petrified' bones during their investigations. Ludolf Smids, the antiquarian to whom we owe the report of Titia's observations (1694; 1711), had these bones identified by the medicus Christ. Schlegel. The latter declared them to be the remains of normally proportioned people, i.e. not of giants. This was important, because Picardt (1660) had, on the basis of written sources and reports of finds,

quite seriously defended the age-old popular belief that only giants could have built these hunebeds. Hermann C. Conring (1665) had defended the same opinion about the Lübbensteine at HELMSTEDT in Germany. In the 16th century, scholars had advanced this opinion, too, but often with a smile of disbelief. The remarks of Antonius Schonhovius Batavus (1547), which were afterwards quoted so seriously, concerning hunebed "s Duvels Kut' at ROLDE in Drente, could have been meant as a joke,[4] but they are only remotely comparable with the passage in Rabelais's *Pantagruel* (book II, 1532, chapter 5) concerning the construction of the Pierre Levée at POITIERS by the giant Pantagruel. (It is also remarkable that the text accompanying an engraving of this Pierre Levée in part V of *Civitates Orbis Terrarum,* published in c. 1598 by George Braun, does not mention giants, but has the Pictish (!) inhabitants lift the boulder.[5])

Although Smids himself (1711, p. 136) still seems unsure as to whether giants had built the Drente hunebeds (in which normal people were afterwards buried), the significance of Schlegel's identification, which was published by Smids, was not lost on his readers. Jodocus Hermann Nunningh (1713), Johann Heinrich Cohausen (1714) and Johann Georg Keysler (1720, p. 207-230) considered that megalithic constructions such as hunebeds were the work of normal human beings.

This was definitely the end of the giant theory. In the meantime, the discussion had started about the method of construction of the hunebeds (Cohausen is already thinking about levers and rollers) and about which people, of those recorded by ancient writers, had built these monumental tombs.

Pottery was of course encountered during these first excavations. Van Velen's report of 1613 (Gummel 1938, p. 16-17) says only that 'in my hurry, I could find nothing but bits of old pots and bowls'. Smids (1694) in a poem of 1685 or 1686, entitled 'The Swabian Urn', where he suggests that it is Swabians, Danes or Saxons who are buried in the hunebed, advises his dear friend Titia to pay more attention to him, Ludolf, than to the urn:

'Oh, maiden, where wishest thou to go with these sherds?
Lay down and cover bones and bottle
And be for me again a faithful lover!'

He describes the pottery itself (1694, 1711) as 'round pots, very squat and roughly modelled, brown, blue or dark red in colour, some having two, others four handles'.

S. Hofstede, in 1706 (manuscript; Van Giffen 1927, p. 9-12), gives a better description of the pottery which was excavated from hunebed D17 at ROLDE: 'a blue pot of non-porous *(zeer dicht gebakken)* pottery (..) with cracks everywhere. After the rim was washed, it was found to be painted with gilded stripes which glittered from among the blue, giving it a pleasing appearance. Its base has small feet . . .' His description apparently indicated the white filling of the decorative grooves. Furtheron in his description, a collared flask and a biberon can be recognised. The biberon, which was found high in the chamber-filling, on top of a layer of stones which covered the actual layer of sherds, is interpreted as a votive offering, with food or drink, to the spirits of the dead.[6] The sherds and collared flask (containing 'white ash mixed with burnt bones'), which were found below, were interpreted as urns.

The aforementioned Nunningh published (1713[1], 1714[2], 1835[3], pl. III) the first illustrations of Western Tiefstich pottery.[7] The engravings (fig. 7) are not-completely successful attempts to reconstruct pottery fragments excavated by him from the Düvelsteenen at HEIDEN in Münsterland and the Dicke Steenen at MEHRINGEN, near Emsbühren, Kr. Lingen. Yet, the decoration has been sharply observed by the artist: even the *tvaerstik* line (*) can be recognised and many details give the impression that the collection contained, among other things, a D1-type of pail and a great deal of E-pottery. Nunningh's comments on ornamentation and manufacture of the pottery run like this:

'There are . . . on the outer skin . . .[of these pots] . . . unusual figures which have been engraved, deeply or more superficially, viz. circle- or diamondshaped, notched, grooved and dotted. And these occur in a great variety, connected with each other either crossways or by means of straight lines, or by means of diagonal lines, rising and falling. The particular diligence and care of the untrained potters from those days rightly command our admiration; by means of these pretty figures these potters knew how to indicate a certain particular distinction of the status of the cremated person. Among the splendid urns which came out of the hunebeds near Emsbühren there is a very special fragment with very fine ornamentation, which derives particular splendour from a black and gleaming stain . . . I have made inquiries from a competent potter concerning the origin of this stain and the way in which such figures are engraved. He says that the figures were engraved with a special instrument, a little wheel. The black colour, however, was burnt in by the flame itself which was smothered in a sealed oven. For this was the only method for the Ancients to give their pots their protective coating, since the use of salt and lead-ash was still unknown. This is also a proof of the statement [which I made before] that these pots received their hardness and durability . . . exclusively in an oven [and that they had not been dried in the sun].' [8]

I mention in passing that Nunningh correctly interprets a faultlessly-drawn TRB amazon axe (see section 5.6.2.4) as a battle-axe or the handle of a staff (probably meaning a symbol of authority), but that he considers a stone axe (a *Walzenbeil,* also pictured) as a product of lightning. The discussion concerning the origin and the function of stone axes was then still in full swing.

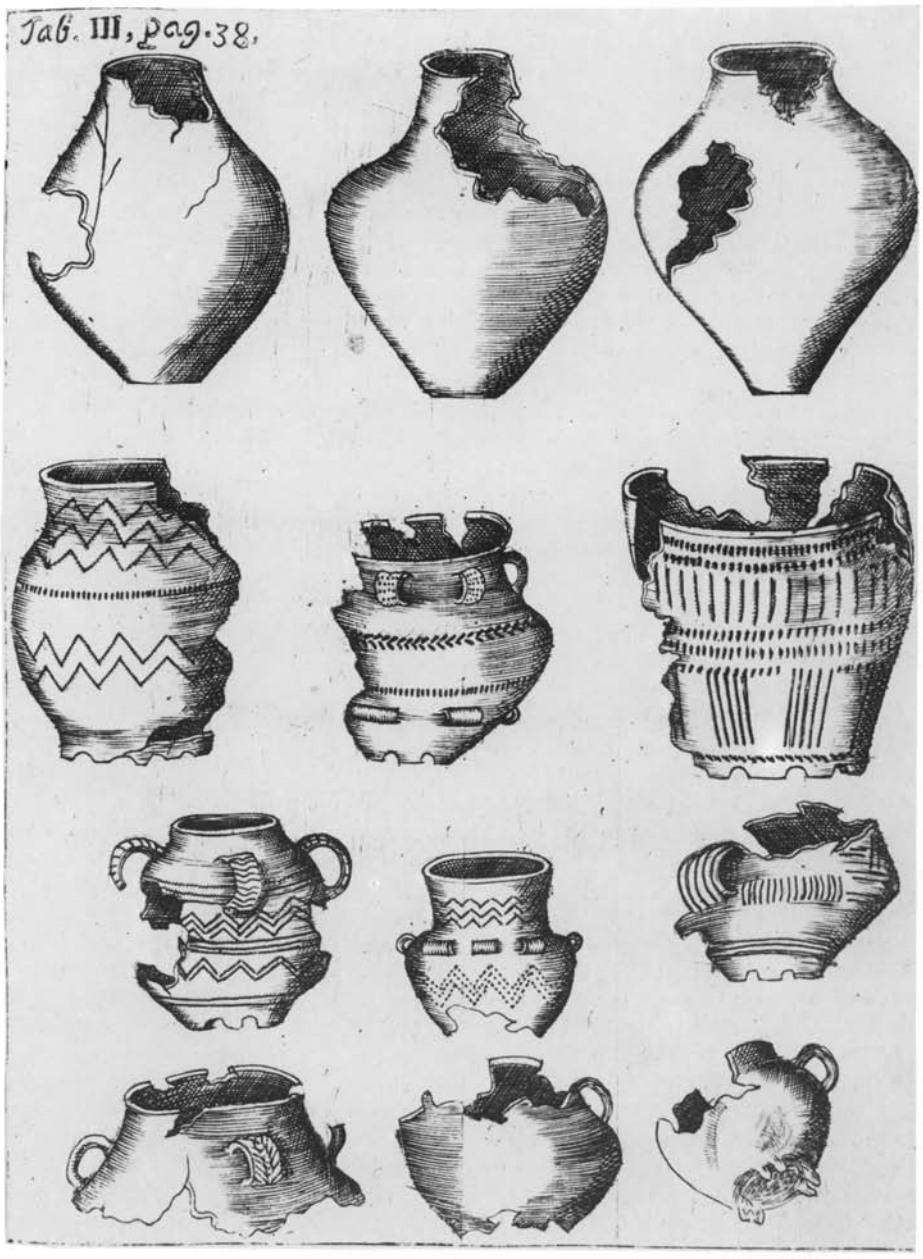


FIG. 7 Plate III from Nunningh (1713; by A. Balckhusen) including drawings of the pottery excavated by him from the hunebeds the Dicke Steene, near MEHRINGEN and the Düwelsteene, near HEIDEN. The ornamental details are well observed but the attempts at reconstruction have been less successful. Apparently, a D1 pail and several examples of E1 and E2 pottery (indented footrings, zigzag, small handles) are concerned, possibly also a zigzag beaker.

In 1726 Zacharius Goeze illustrated a pot which was decorated with the Tiefstich technique, an undecorated collared flask and a stone axe, all originating from the Hünensteinen near DAMME (Gummel 1938, p. 70).

Martin Mushard discusses in his *Paleogentilismus Bremensis* (a manuscript finished in 1755, with notes added until 1764, and published in 1928 by Sprockhoff) in particular the stone axes which can be found in the hunebeds. These, he said, are spear-heads from a time when man already used stone weapons instead of teeth and fists, but preceding the time when bronze weapons were used [cf. Lucretius, *De rerum natura* – B.]. According to Mushard, battle-axes were made of marble, serpentine and a spotted stone, but not of flint. Those seen by him looked too small for use as real weapons. These axes were certainly imitations of Thor's hammer, but, he asked, why are there not more authority symbols such as *fasces* and *secures?* (Chapter III). Concerning the 'various' sherds from the hunebeds (explained as altars, not as burial places), he said that they show that these chambers are not all contemporary with each other, and that some were constructed during a period when iron weapons were already being used (p. 62 and note 89). Mushard does not appear to have noticed Tiefstich decoration, and he did not draw any TRB pot in contrast to his very good illustrations of other archaeological finds.

Jo(h)annes van Lier's *Oudheidkundige Brieven* (Antiquarian Letters) (1760) constitutes the first Dutch monograph on hunebeds. The book is mainly devoted to the structure of and the finds in hunebed

D13 at EEXT. A few of the six pots recovered more or less intact were drawn. They are undecorated. The sherds of the rest of the pottery had not been saved. There is scarcely any description of a collared flask with Tiefstich decoration from hunebed D12 at EEXT. This flask was not notably well drawn (pl. III:5 = Knöll 1959, pl. 32:5). Without having knowledge of Mushard's work, Van Lier used the flint chisels and axes, the stone battle-axes and a barbed-and-tanged flint arrow-head which were found in the burial chamber of D13 as evidence for the existence of a Stone Age in Drente: the period in which the hunebeds were built. The Drente tumuli produced metal finds and dated between the Stone Age and the conversion of the population to Christianity. In his observations about the Stone Age (the term was, however, not coined until 1813-1816, by Vedel Simonsen) he refers to 'Du Hamel' and 'Mr. Cocheret' (p. 129). These are distorted references to the French scholar Mahudel, who (1730) had proved the existence of a Stone Age, and to the excavations in the Gallery Grave at COCHEREL, near Évreux, Normandy, in 1685. The cutting tools found there were exclusively of stone and, for this reason particularly, De Montfaucon (1719) had defended the idea of the existence of a Stone Age (Cartailhac 1889; Daniel 1960). Van Lier now confirmed empirically the correctness of this theory for Drente.[9]
According to Van Lier, the *Flint-Flachbeile* (section 5.3.4) were not sling-stones or products of lightning. He guessed that they had served for spikes of a mace-head (Van Lier 1760, pl. III:7).

At the beginning of the 19th century, a German developed into the major authority on Tiefstich pottery of his period. He was Wilhelm, Count von Münster, who deposited in his collection in Langenlage, near Osnabrück, the fruits of twenty-three years' rummaging (1807-1830) by himself and his relatives in dozens of hunebeds of that region. Contrary to the situation in Drente, everybody could still do that freely there, and hunebeds were destroyed on a large scale for road-building and the export of stones for Netherland's dikes.[10]
Münster's collection was the first really extensive collection of Tiefstich pottery. After 1853, this was to form the nucleus of the collection in the Hanover Museum. It is, however, at least as interesting to know that this officer in the Prussian army drew and described this pottery for a study that was never published (fig. 7a), and that he also did reconstructions from sherds in an exemplary manner. His drawings of 118 pots were reproduced by Gummel (1927), but is it not high time for a complete facsimile publication, including the notes of the Count? In a letter (quoted by Westendorp 1822, p. 22 of the Notes) Münster writes about Tiefstich pottery:
'. . . earthenware vessels of all sorts of shapes. Some were very elegant and looked very much like flat Etruscan [i.e. Greek] vases . . . Designs of various shapes were engraved on them. The material from which these vessels were made is better than that from which the urns of the barrows were made.'

Nicolaus Westendorp's *Treatise written to answer the question: which peoples built the so-called hunebeds? at what time can we suppose that they inhabited these places?* (1815; greatly expanded 1822[2]) is the second Dutch monograph on hunebeds. The book was the winning entry to the prize question stated in the title, propounded by Adriaan Gilles Camper (Petrus Camper's son) and issued by the Hollandsche Maatschappij der Wetenschappen (Holland Academy of Sciences) at Haarlem in 1808.[11]
The competition required a description of the hunebeds in Drente and in the Duchy of Bremen, and a comparison of these monuments with similar ones in Great Britain, Denmark, Norway, Germany, France and Russia. Finally, there was the modern-sounding requirement to compare the 'coffins, urns, weapons, jewels, sacrificial implements, etc. from the hunebeds' with those from 'the burial places of the old Germans, Gauls, Slavs, Huns and other Nordic peoples.'[12]
Westendorp's book is of great importance for a knowledge of the state of archaeological science at that time in northwest Europe. We meet already many of the ways of thinking of the succeeding generation of investigators (Thomsen, Danneil, Nilsson, Lisch, Worsaae) in this historian, working in his remote Groningen parsonage during a period which is less-known now than the following one. In 1758, on the basis of written information, but scarcely on the basis of excavation, A. Y. de Goguet had further developed the theory of the three-period system, with, already built into it, the backwardness of the development in northwest Europe in comparison with the Near East, Egypt and the rest of the Mediterranean area (excerpts in Heizer 1962). This book, which was printed and reprinted in various languages until 1818, is such a familiar source book for Westendorp that he only mentions it in passing in another context. His own research into the relevant literature and into the archaeological collections in Drente and northwest Germany now confirmed completely that the hunebeds were built during a Stone Age.
At the time, Westendorp's absolute datings for the hunebeds seemed unbelievably early, at least in northern archaeological circles (not in French). He considered a date between 2000 and 1500 BC not impossible (1822, p. 293-294); in any case, the hunebeds were much older than the remarks of Ephorus (338 BC), quoted by Strabo (*Geography*, lib. III, 1, 4), concerning megalithic graves in southwest

FIG. 7a Copy of a page of the manuscript (c. 1807-1830) by Count Münster, scale 1:1.2. Descriptions and illustrations of pots from SEESTE (S47:4; S45:8; fig. 32:2&K27:4; S44:7). Courtesy E. Schlicht (Hanover museum).

2./ Die noch unversehrte Vase Fig. 9. Sie ist von einem aschenfarbenen und röthlich spielenden Thon. Die Masse ist fest. Sie ist bunt gezeichnet, hat einen halben Henkel und an der Seite eine Erhöhung wie eine Kirschkerne. Letzterer ist jedoch sehr klein und steht so hoch daß sie schwerlich würklich zum Griff gebraucht worden ist. Das Dessein ist mit Absätzen tief gravirt.

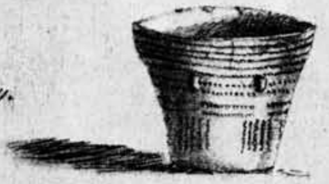
Fig. 9.

3./ Die Fig. 10. gezeichnete Vase welche zwar ganz zerspalten war, und dann zerfiel, nachdem aber zusammen umgeleimet wurde. Sie hat 4. Knöpfe wie No 1., ist von einem grüngelblich gebrannten Thon, sehr bunt gezeichnet. Die zierlich tief gravirte Zeichnung ist mit einer weißen Thonerde ausgefüllt.

Fig. 10.

4./ Die ~~ebenfalls~~ unter Fig. 11. gezeichnete Vase, von derselbigen Beschaffenheit wie die vorige, jedoch ohne die weiße Verzierung

Fig. 11.



5. Die Vase, Fig 12. welche von demselbigen Thon ist und ebenfalls beim Ausgraben zerfiel.

Die auch sehr tief gravirte Zeichnung gleicht ineinander gelegten Ringen . Auch an diesem Gefäße sind 4. Knöpfe, jedoch ohne Löcher.

Fig. 12.

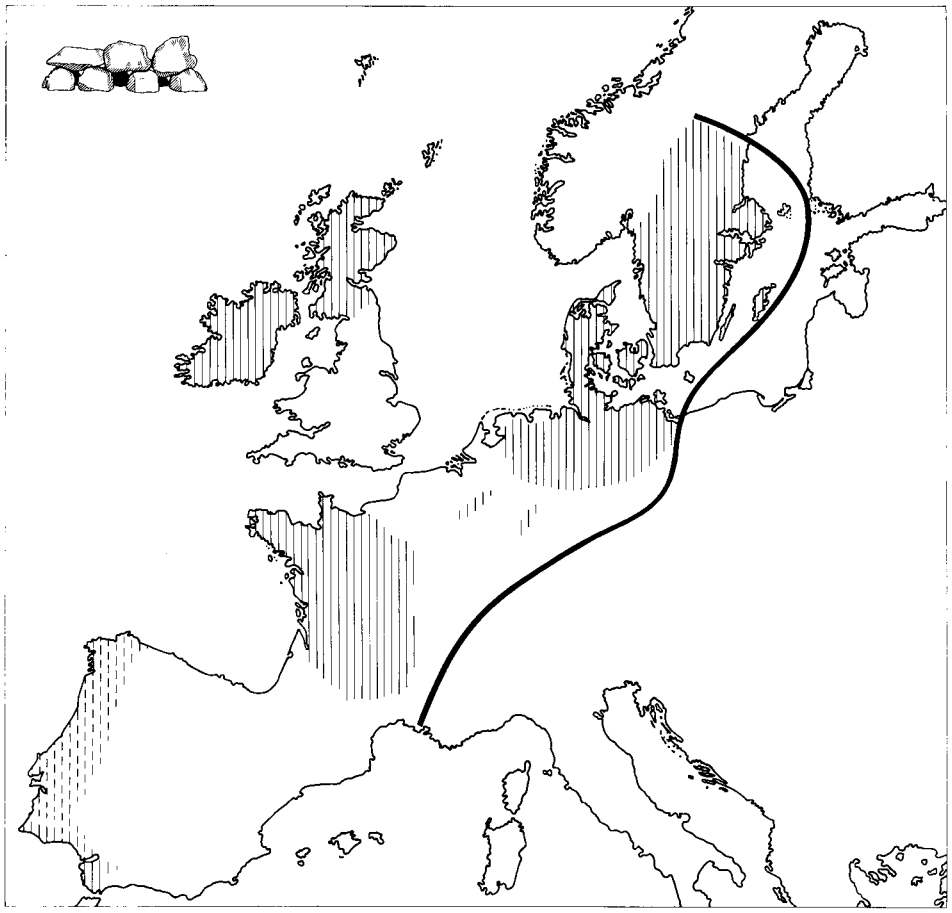


FIG. 8 Westendorp's distribution map of the 'hunebeds' (see text for his definition), only verbally described by him (1822, p. 79):
'A line drawn from [i.e. going along the southern border of] Swedish Lapland into the Gulf of Bothnia, past the mouth of the Oder, Bohemia, Bavaria, Savoy, to the delta of the Rhone in France, excludes, first of all, all the areas lying to the east of it. West of this line these relics of antiquity grip our attention in Sweden, Denmark, Holstein, Pommerania, Mark Brandenburg, Altmark, Lower Saxony, Paderborn, Tecklenburg, Westphalia, Bentheim and Drente, Ireland and Scotland [but not on the Orkneys, p. 131], besides in France, from the Seine to the Garonne: going from the tributaries of the Garonne along those of the Loire, past Nevers and Sens to Meaux on the Seine, we greet on our left the areas which boast these grey monuments. Germania, in the old sense of the word, comprises them within the line going from Nystadt [Finland] along the Oder, Berlin, Dessau, Kassel, Wesel and Kampen. Single hunebeds near Koblenz and Namur seem to indicate a very vague connection between Gaul and Germany' (p. 79, edited somewhat differently than the original, and abbreviated). In the Iberian peninsula, hunebeds occur at Cadiz (p. 41), in Portugal (especially in the Algarve, p. 198-199) and possibly in a few places in Galicia, where they are called *antas* (p. 79). (Westendorp meant by a 'hunebed near KOBLENZ' the Königstuhl, which was an error, as was pointed out by his reviewers Grimm and Reuvens; see Marien 1952 for the Pierre du Diable at NAMUR-JAMBES.)

Top left, the hunebed D6 at TINAARLO (Drente), simplified after Westendorp's plate I.

Portugal, but which were no longer known to have been burial chambers.[13]
To identify the builders of the hunebeds ethnically, Westendorp dealt in detail (as required for the competition) with the typology, the contents and the distribution of the hunebeds. He thinks the hunebeds were built by early Celts from long before Caesar's time, and tries to prove that north Germany and south Scandinavia were also inhabited by Celts.[14]
Although he defines 'hunebed' as any free-standing, long rectangular megalithic burial chamber (including gallery graves, excluding dolmens (*), but with the exception of those occurring in a tumulus), his distribution map, which is described verbally (fig. 8), differs remarkably little from our maps of West European megaliths (e.g. Daniel 1958).[15]
Westendorp's remarks concerning the chronological succession of the types of graves in pre-Christian Drente (1822, p. 184) would be worthy of quotation in works about the development of archaeology. His thoughts concerning the stage of civilisation of the builders of the hunebeds are also fascinating: 'They still only knew stone weapons such as those now in

use in Peru, the Pacific area and North America, and still no metals (every population began with this phase); they were already considerably advanced in pottery; they hunted and fished, but did not farm yet; they were at no higher a stage of civilisation than the Hottentots, but there was more social organisation and religion. But for a well-established authority of the chiefs and priests, such as existed on Otaheite [Tahiti], the building of the hunebeds must be considered to have been impossible. Their way of life was surely no longer as completely nomadic as that of many a North American tribe still is now; some barter trade with other tribes must have taken place, since many of their battle-axes must have been imported from areas which were not too close' (quotation very freely summarised after 1815, p. 286-290 and 1822, p. 99-104. The reference to Tahiti (cf. Renfrew 1973) only in 1815).

We already encounter in Westendorp the opinion that megalithic graves were stone versions of the houses of the living, i.e. the theory which would later be ascribed to Nilsson (1837-1843) (Lubbock 1865, p. 88-90; H. Petersen 1881).

But we must restrict ourselves further to what Westendorp remarks about the artefacts from the hunebeds. Apart from publications, he could base his statements on information about excavations in hunebeds by, and/or collections of, J. and P. Hofstede, C. Pothoff and J.J. Willinge in Drente, and Count Münster, Von Langen (Werlte), Osthoff (Oldenburg), Trënkamp (Strüchtlingen) and Visch (Wilsum) in northwest Germany. 'Not a single piece of copper, let alone iron' had been excavated in and, according to Münster, around the burial chambers; it was purely a matter of pottery and stone weapons and tools. The latter were certainly not *simulacra armorum,* as Thorlacius (1802) had asserted, and some of them must have been imported, as indicated by the type of stone.

Westendorp remarked about the pottery from the hunebeds: 'Although they were baked from sandy loam, these funerary urns are, however, not inferior to the ordinary pots and cooking pans of our time; and they are generally finer and more elaborately decorated than the ones found in the barrows [i.e. mainly Bronze and Iron Age pottery]. It has been thought that they were dried in the wind or the sun, but there is no basis for this assumption. They were, moreover, made in a mould, and not by hand, as the Hottentots do; however, they are unglazed. In order to give them some polish and the required smoothness, a suitable pebble was used' (1822, p. 81-82).

In Copenhagen, C.J. Thomsen learned of the contents of the second edition of this book (1822) through an extensive and good account in an anonymous review in the *Göttingsche gelehrte Anzeigen* (May, 1824, p. 689-711). We know now that the author of this review was the famous philologist and mythologist Wilhelm K. Grimm.[16] Thomsen immediately wrote an excited letter to J.G.G. Büsching in Breslau, to whom he had recently explained his ideas about the three-period system (both letters are quoted by Seger (1930).[17] He found many opinions in Westendorp analogous to his own and he wrote to Büsching so that the latter 'would not think him a plagiarist'. He disagrees with the ideas of Münster and Westendorp concerning the high quality of the pottery. Not only does he reject Westendorp's (utterly unfounded) 'moulds', which Thomsen seems to have thought were invented only after the potter's wheel, but he even denies the greater elegance of the hand-formed pottery from the Danish megalithic graves ('admittedly, once decorated with strokes, and provided with rims . . .') in comparison with later pottery. But he is speaking a slightly different language with the same words – he actually calls everything that is not hard-baked, wheel-turned and glazed 'coarse' if Stone Age ceramics are concerned, and 'medium' if the pre-Christian Bronze and Iron Age are concerned. There was as yet no place in his technological-evolutionary system for a higher aesthetic appreciation of the TRB pottery. But who had at that time seen as much pottery from hunebeds as Münster? A century later the Tiefstich bowl from SKARPSALLING, in Jutland, would be proclaimed as 'the most beautiful of all the pieces of Neolithic pottery in the countries north of the Alps' (Müller 1918, p. 39, fig. 121)!

For some time thereafter, publications concerning the West Group contained little that was remarkable compared with the work of Münster and Westendorp. Westendorp's bold speculations led to a reaction, and reliable reports of excavations were absent for a time.

In Netherland, the early death (1835) of C.J.C. Reuvens, an archaeologist excellent in both theory and practice, first Director of the State Museum of Antiquities in Leiden, which was founded in 1818 by King William I, and the world's first professor in non-classical archaeology, prevented his excavation of a hunebed. His notes[18] show how close he was to doing so.

L.J.F. Janssen, keeper in the same museum from 1835 to 1868, offers us few interesting new ideas (Janssen 1848, 1850, 1853 and 1856). During his excavation in the very derelict hunebed, the Zaalhof at NOORDBARGE, he recovered both TRB pottery, which he rightly compared with Lisch's TRB finds in Mecklenburg, and a piece of iron and bits of tuff stone which he did not think could have been imported here from Andernach (near Koblenz) before the Roman period. Without considering the possibility of a later disturbance, he concluded that this hunebed must have been built in the Roman period, as one of the last megalithic graves.

His excavations at HILVERSUM in 1853 attracted widespread attention. These excavations seemed to involve a Stone Age settlement, i.e., a settlement of hunebed builders, and to be as important as the Kjøkkenmøddinger of Denmark and the Lake Dwellings of Switzerland which were discovered about that time and quickly became internationally

known. Worsaae, Lisch, Von Estorff, Wolf and Wilhelmi complimented Janssen on this find, but did not neglect to add that they did not know of anything which could be compared with the artefacts he discovered. Janssen's publication (1856) of this discovery is extensive and as detailed and abundantly illustrated as one can hope for in a publication of that period. Osteologists, botanists and mineralogists were consulted for the identifications. It was proudly entitled '*Hilversum Antiquities: a contribution to the history of the development of the earliest European peoples*'.
A score of rectangular pits, with stone floors and walls, and which were explained as the hearths of houses, were found on the flank of a hill. Their filling contained peculiar, polished stone tools, some charcoal (including *Pinus silvestris*) and cremated bones of cattle, sheep or goat, but no pottery. Strangly enough, a bone button was lying on the floor of Hearth 1, which was excavated in Janssen's presence, 'completely identical to present-day buttons used by country people', and the filling of Hearth 8 contained a piece of dressed stone (Bentheim sandstone?), but its position was such that it seemed unlikely that it was a recent intrusion. The labourer Westbroek, 'discoverer' and 'excavator' of these small cellars, was apparently unaware of these slips in his fraudulent construction (cf. also Bakker & Ypey 1964, p. 56-58). At a time when loose soil was not yet distinguished from firm soil, and stone artefacts were not sufficiently known, he must have constructed the cellars himself so that he could get more money than he would have obtained by selling his own artefacts separately. Janssen's publication is so accurate that we can find unintentional indications of how the labourer could, through the advice and the questions of interested gentlemen, have arrived at his masterpiece. Janssen also stated that the positions of the hearths could be deduced from depressions on the surface, which he correctly ascribed to subsidence.
The excavator saw in this settlement confirmation of his previously announced assumption (1848) that the last hunebeds were built as late as the Roman period: Stone Age people had still been living in Hilversum at that time.[19]
It is true that Westendorp (1815, 1822) had already irrefutably disproved this idea, but he stood alone in northern Europe in this opinion. In 1825, Thomsen, too, had entirely disagreed with Westendorp in this respect (cf. Seger 1930), and even later he did not go any farther back than a few centuries BC for the end of the Stone Age. Worsaae's dating (1843) of the Stone Age (i.e., the Neolithic) to 1000 BC at least, and the more southerly the earlier, was rather progressive for Denmark. Only when the Kjøkkenmøddinger were discovered (1850) did Worsaae estimate the Danish 'Old Stone Age', to which they were assigned, to c. 3000 BC or earlier, and the subsequent 'Late Stone Age' to c. 2000-1000 BC (1881). In strongly conservative Germany, the hunebeds were still placed around or after the beginning of the Christian era (e.g. Wächter 1841). Little attention was paid to the opinion of P.B. Podczaszyński (1857) that the Stone Age ended in Poland c. 1250 BC, and that of C. Petersen (1857) and G.C.F. Lisch (1863) that this had occurred in north Germany c. 1000 BC (Jażdżewski 1965; Gummel 1938, p. 174).
W. Pleyte, Janssen's successor in Leiden, illustrated the more or less complete TRB pots which were then known in Netherland in his large *Dutch antiquities* (1877-1903). There are no more than fifty, the majority of which are not very representative. Although his reconstruction drawings of fragmentary pots indicate that he had a fairly good idea of this sort of pottery, he was theoretically not much further advanced than Janssen.
The good drawings made of Drente hunebed pottery in 1878, on behalf of the Society of Antiquaries of London, by W.C. Lukis remained unpublished in the archives of that society. Among them is a good reconstruction of a baking plate ('cover') (section 3.4.4) from hunebed D14 at GIETEN.

After the stimuli provided by Thomsen and Worsaae, knowledge concerning the TRB culture developed at a tremendous rate in Scandinavia. In 1881, Henry Petersen published his discovery that the dolmens (*) contained their own kind of pottery which, although related, differed from that of the *gangbygninger* (i.e. *jaettestuer* (*) or passage graves (*)). He dated the dolmens between the latter and the Bronze Age. Shortly after this, Oscar Montelius and Sophus Müller were to place the dolmens and their contents in a Dolmen Period, preceding a Passage Grave Period.
In Germany, these Scandinavian studies were immediately translated and became common knowledge. Here, too, excavation technique and theory were now developing into a modern science, especially once the controversy about the three-period system had come to an end.[20] During the excavations of the Provincial-Roman Limes Committee (which had started in 1899) at Haltern archaeologists soon learned to recognise post-holes and other 'soil traces' in the Münsterland sand podzols (G. Loeschke: 'There is nothing more permanent than a hole'). The existence of post-holes had already accidentally been established in the 1870's and 80's elsewhere in the podzols of the Northwest German Plain (Gummel 1938, p. 224).
Most of the Neolithic cultures, which are especially characterized by their pottery, and their areas of distribution were now distinguished. According to a concise report, O. Tischler, the far-travelled archaeologist from Königsberg, declared (1890) during the discussions after a somewhat absurd lecture: 'Within the whole area of the megalithic graves, different local territories can be defined, every one of which displays an inventory of completely uniformly styled pottery. Such a territory comprises, for example, Hanover, Oldenburg, northern Westphalia and eastern Netherland.'[21] In Germany

this group became known as *Nordwestdeutsche Tiefstichkeramik* (e.g. Knöll 1959), a term which is less popular in Netherland.
Knöll, who went through the 19th century German literature on this topic, stated (1959, p. 3) that the pottery from the megalithic graves is only dealt with in passing there. P. Reinecke's remark in 1900 (Knöll 1959, p. 4) shows, however, that the approaches to the problem were now gradually changing: 'If one investigates the ceramic finds in the megalithic graves thoroughly, one is struck by the variety of basically different types, which show us, even more clearly than the differences in the building styles of the megalithic monuments, that there can be no question of unity in time; but as yet we entirely lack the knowledge that would enable us to group these several types chronologically.'

2.2 J.H. HOLWERDA (1908-1915)

The modern research that was necessary for the chronological classification of the pottery from the megalithic graves of the West Group was initiated by Holwerda, who was, from 1904 to 1939, successively keeper, deputy director and director of the Leiden Museum.[22]
In 1905 he learned the new technique of excavation at the Roman fort of Haltern, Westphalia. He directed his first excavation in Netherland in 1906. In 1907 he formulated his ideas concerning the archaeology of Netherland in *Nederland's vroegste beschaving*. In later studies he did not essentially change his mind. Unfortunately, in this book he continued, as it were, the Mainz tradition after the death of L. Lindenschmit Sr by defending an extremely short chronology, and disputing the applicability of the three-period system, and the typochronological methods of Montelius (1903). One of the most important causes of this chronological myopia, or, at any rate, one of the main defences for it, was the fact that the aforementioned HILVERSUM find (Janssen 1856) was not yet recognised as counterfeit, which implied for Holwerda (1907, 1918, 1925 and – in a less absolute form – 1935) that the backward population there must have existed in Stone Age conditions up to the Middle Ages (the sandstone building fragment was now dated as Gothic or later). The fact that Åberg (1916a, see 2.3) has omitted the Hilversum find from his survey of the Stone Age in Netherland apparently made no contribution to convincing Holwerda that this idea was wrong.

In 1908 Holwerda, quite accidentally, discovered a TRB settlement and flat grave cemetery. At the request of, and subsidised by Queen Wilhelmina, and encouraged by the successful ring fort research of C. Schuchhardt and others in Germany, he started the excavation of the Hunneschans, a medieval ring fort on the UDDELERMEER on the central Veluwe. The TRB site mentioned was under and adjacent to the ramparts, and he examined the greater part of it in 1908, 1910 and 1911. The most important finds of each year were described and illustrated the following year (Holwerda 1909, 1911, 1912). It turns out that Uddelermeer represents a typologically homogeneous Tiefstich pottery group (in later terms, the Early Havelte style group).

In 1912 Holwerda excavated the hunebeds DROUWEN I and II in Drente (D19 and D20 according to Van Giffen 1925). His publications about them (1913a and especially 1913b in *Prähistorische Zeitschrift*) gained a considerable reputation; for the first time people realised what masses of pottery could be expected in western hunebeds. Moreover, there was the extremely fortunate circumstance that, while D19 contained mainly Northwest German Tiefstich pottery (later called the Drouwen (I) style group by Van Giffen (1927)), the bulk of the pottery from D20 consisted of what, in 1927, Van Giffen would call the Late Havelte style group.
Holwerda realised that the inventories of both hunebeds were not equally old (1913a, p. 448). D19 contained much finely ornamented pottery which was directly related to *Nordwestdeutsche Tiefstichkeramik*. D20 contained 'undoubtedly later', sparsely ornamented pottery, which still had some connection with the *Tiefstichkeramik*, but which, on the other hand, could be directly related to the Lausitz (Lusatian) ware (Bronze Age) which was itself probably represented by urns and cremations in D20, as well. Holwerda also based his (correct) chronological order of the inventories on the inferior construction of D20 as compared to that of D19. (In about 1960, however, during his re-excavation of the grave, Van Giffen established that the inferiority of the building was in fact suggested by a difference in the degree of destruction caused in modern times.)
Holwerda's opinion, which was disputed by Van Giffen (1927), that there was a connection between cremations and Late Havelte pottery, became topical again through the discovery of Late Havelte cremation graves at NOORDBARGE and ANGELSLO (sections 2.9, 2.20, 6.8 and Appendix B1).

Thus, each of the three style-groups of Van Giffen's later typological series had been found by Holwerda, but he did not realise this completely, as he did not yet know that Uddelermeer pottery also occurred in Drente. With hindsight, this is understandable, although it now appears that a few typical examples occurred in D19. After Van Giffen had demonstrated (1927) the occurrence of Uddelermeer pottery in Drente, and had arrived at his sequence on the basis of this, Holwerda (1931) preferred to think entirely of regional differentiation without chronological implications, and he did not even refer to his own sequence, (1) D19 and (2) D20, again. This is not too surprising, because Holwerda was an avowed opponent of the typochronological method. But it is a pity, especially considering his excellent work around 1910.

Holwerda's 1913 investigation of the double hunebed within peristalithic long barrow D43, on the Schimmeres near EMMEN, made no further contribution to the reconstruction of the original pottery sequence (Holwerda 1914). This also applies to an article (1915) in which he asserted that certain Tiefstich pottery shapes derived from gourds with a net covering, baskets or wooden vessels.

2.3 N. ÅBERG (1916, 1918)

This fervent adherent of the typochronological method, who supplied the most important stimuli for the investigation of the Neolithic battle-axes and axes in this century (see Chapter 5), visited the Dutch museums in 1915. He dealt with the Tiefstich pottery in his excellent book *Die Steinzeit in den Niederlanden* (1916a). As usual, his observations were stated rather concisely. I quote here some passages which seem to have lost surprisingly little of their current interest. The whole study demonstrates an exceptionally thorough knowledge of the material in the museums and of the results of Dutch research, especially Holwerda's. Without allowing himself to be carried away by Holwerda's theories, Åberg tested these data against the results of research in Scandinavia and elsewhere. In this way, the Dutch finds were placed in their international context, more so than had previously been the case. In this respect, the author was influenced by Kossinna's *Der Ursprung der Urfinnen und Urindogermanen und ihre Ausbreitung nach dem Osten* (1909, 1910) and *Die deutsche Vorgeschichte, eine hervorragend nationale Wissenschaft* (1914²), especially by the former, to judge from the quotations. In addition, he applied Müller's brand-new typochronology of the Danish Tiefstich pottery (1913; see 2.4) in his comparisons of the Dutch and Danish material.

'The connection between England and Netherland appears therefore to have been less developed than between the first-named country and the North. This circumstance, which displays the fact that the interest of the Dutch [Neolithic] culture was directed towards the West to a slight extent only, is surprising in more than one respect. For if the megalithic graves had really come to the North from Britain, as is generally accepted, and if the British double-axes are related to the Nordic ones, as is probable, and if, finally, the abundantly present British amber-beads are partly of Nordic origin, it was to be expected that Netherland was the intermediary area. It is not improbable, to be sure, that there were links between the Nordic culture of Netherland and Britain, but these links can certainly not have been significant.' (p. 28) 'Therefore, although finds . . . [of Müller's 'elegant style', then dated at the transitional period between the Dolmen Period and the Passage Grave Period, now placed at the beginning of the Passage Grave Period, MN Ia] . . . are rare in Netherland, they do give us an indication for establishing the age and the degree of originality of the Dutch megalithic pottery, and they are therefore of great interest.

Most Dutch megalithic pottery belongs to the fully developed Passage Grave Period. We mentioned already the most frequently occurring types of pottery of this period; they are represented in large numbers in the western passage grave near Drouwen. Among the pottery of a later date, purely Nordic types are still to be seen, e.g. the funnel beakers, but also shapes which are mainly found to the south and west of the Elbe. In the course of this development, the area to the south of the Elbe becomes more and more independent of the purely Nordic culture, a fact which also clearly has an effect on the development in Netherland. As we mentioned before, suspension vessels, which are frequent in Denmark [see fig. 14], as well as double-edged stone or amber axes [see section 5.6.2.4], are not found in the graves in Netherland. This, like other circumstances still to be mentioned, is an indication of the changes which must have started to develop in the cultural links with the North. The oldest pottery – above all the collared flasks which are abundant in Netherland and in Oldenburg – indicates a line of communication running more to the north, i.e. nearer the coast. From pottery of a later date, as well as from certain other circumstances, we must, on the other hand, conclude that, here and there, the lines of communication moved in a southerly direction. [A footnote points out that there are similarities between Early Havelte pottery, the amphora from the Globular Amphora culture (*) cist at BÖRTEWITZ, Saxony (cf. 2.8), and Rössen pottery]. The northern impulses were, to a greater extent than before, absorbed and modified by the area south of the Elbe, and this is reflected, as we noted before, in the development in Netherland.' (p. 36-37).

Subsequently, the author contended that the influence of the northern culture on the West, which was strongly developed at the beginning of the Passage Grave Period, became progressively weaker, until it was almost non-existent by the beginning of the Bronze Age. Not until towards the end of the Bronze Age does the northern influence again increase, and then, according to the finds, more in Oldenburg, situated farther to the east, than in Netherland.

It is outside the scope of this book to determine if this last idea is generally correct or not, but we note that Åberg does not mention the similarities between the Late Havelte pottery in D20 at Drouwen and the most recent TRB pottery in Müller's typochronology for Denmark. Van Giffen was to be the first to point this out, but this idea was to catch on in the international literature only after Becker (1954a, b) had written a descriptive summary of this pottery of the North Group under the term 'Store Valby pottery'. In my opinion, the passages which have been quoted in full are still entirely correct. I reach almost the same results in this book.

In 1918, Åberg dealt briefly, and within a more general framework, with the Dutch material in his study of the North European Neolithic. In a few words he outlined the course of the development of the Walternienburg-Bernburg pottery, which shall be discussed in section 2.6.

2.4 S. MÜLLER, G. ROSENBERG AND C.A. NORDMAN (1913-1918)

Sophus Müller's well-known publications appeared in 1913 and 1918. In these he worked out, in much detail, the sequence of the Danish and Schleswig-Holstein passage grave Tiefstich pottery. Müller's descriptions of his style phases were summarised by Bagge (1950). The latter author states that in 1918 a six-period subdivision of the Passage Grave Period (i.e. the Middle Neolithic, according to Becker 1947) had in fact been established (one of Müller's seven phases is contemporary with two others). Müller paid particular attention to the ornamentation pattern and the technique of ornamentation. In this he was assisted by G. Rosenberg and C.A. Nordman.
A detailed chronological framework of the Middle Neolithic was thus available for the North Group, ten years before the appearance (1927) of Van Giffen's chronological subdivision of the pottery of the West Group, and forty years before that of Knöll (1959).

2.5 THE REGIONAL SUBDIVISIONS OF G. KOSSINNA AND K. JAŻDŻEWSKI

Basing himself on Tischler's above-mentioned observations, G. Kossinna worked out in more detail the subdivision of the TRB culture into geographical main groups (1910, 1921). Whereas Kossinna gives maps of the find spots, K. Jażdżewski delineates the rough limits of the areas of these main groups (1932, with important changes 1936).
Kossinna assumed that the North Group originated from the Danish Ertebølle culture and that the gradual decrease in northern characteristics within the TRB culture towards the East and the West implied that a gradual expansion had occurred from the North to the West and the East. The South Group would then have developed from the East Group. Jażdżewski was also of this opinion. (The theory of the origin of the TRB culture in Denmark was strongly disputed by others, including Müller (1913), who insisted that the megalith builders came from the Iberian megalith area, but I shall not pursue this subject here.)
There was, however, also an awareness of contrary movements, even if they were explained differently. An example is the angular style which, according to Jażdżewski (1932, p. 36), originated in the area of the Altmark pottery (*) and bordering on the area of the Walternienburg pottery which is pre-eminently characterised by this 'angularity' (see fig. 1 for the areas of both groups). The pottery of the North and West Groups was said to have been influenced from this centre. In 1936 Jażdżewski went a step further. Because no collared flasks or funnel beakers were known at that time from the Altmark pottery area, he decided that he was not dealing with a true TRB group, but with a separate 'Elbe-Weser culture', whose angular tureens must have been adopted all over by the West and North Group of the TRB culture. This theory gained little support. Jażdżewski's group-subdivision, divested of its genetic content, is still used (section 1.1 and fig. 1).

2.6 P.L.B. KUPKA'S AND N.H. NIKLASSON'S STUDIES OF THE WALTERNIENBURG-BERNBURG GROUP

According to Fischer (1956), the Walternienburg-Bernburg Group is a regional Tiefstich sub-group of the TRB culture. It developed from the Altmark pottery (*) among others which was closely related to the Western Tiefstich pottery. P.L.B. Kupka, the investigator of the prehistory of the Altmark, called this Altmark pottery 'Langgrabkeramik', later 'Langdolmenkeramik' (Kupka 1924, p. 364 ff.; 1927, p. 128-132; 1928, p. 238-242; 1938, p. 1-12). In the Walternienburg-Bernburg pottery, which he called 'Mitteldeutsche Ganggrabkeramik' (Central German Passage Grave pottery), Kupka distinguished the style-phases I-IV, which gradually succeeded each other. He described them very briefly in the Stendal *Beiträge IV(9)*, dated 1915-1924, p. 437-440. This passage was written, according to his own later report (1927, p. 134), in 1915. But when this study was finally printed (in the spring of 1924), there was another manuscript ready for the press which was also devoted to the same Walternienburg-Bernburg culture.
This was the thesis of the Swede, N.H. Niklasson, who worked in Halle from 1915 to 1929. This monograph was published at the end of 1925. Almost exactly the same phase-subdivision as that of Kupka was presented here independently (Niklasson 1925, p. vii): five phases, the first two of which coincide with Kupka I, the following with II, III and IV. Since this study was more extensively documented and richly illustrated, and became generally known because it was published in the *Jahresschrift Halle*, in contrast to the obscure Stendal *Beiträge*, Kupka's achievement remained largely unknown.
The above seems to indicate that the time was ripe for the development of this typochronological system. Kossinna (1914[2]), and perhaps others also, had worked with the typology of the Walternienburg-Bernburg Group at an earlier date. Åberg (1918) had described the whole sequence step by step in his own succinct style; there had been a preliminary study by Niklasson, and W. Bremer (who died in 1926) described the sequence from the same point

of view before Niklasson's book had appeared (Ebert's *Reallexikon,* entries on Bernburger Typus (1928) and Walternienburger Typus (1928)).
Niklasson's book was the result of a maturing process that had begun earlier. The relatively early date of this beginning may have been due to the fact that, at an early stage, an abundance of complete pottery had been excavated in an area where research into the Neolithic was of a high standard and where more than one person knew this material well. It was, moreover, fortunate that the assemblages which were recovered contained almost exclusively pottery of two consecutive style phases of the system which was developed later (Niklasson 1925, p. 113). Kupka was later to remark that this was 'the best possible proof of the correctness of the insights gained through purely typological methods' (1928, p. 237).
Niklasson's book in particular seems to have served Langenheim (1935), Dehnke (1940) and Knöll (1959) as a model for tackling typochronologically a Tiefstich pottery group which is rich in its variety of shapes and strongly subject to change. He conscientiously applied the typological method to the pottery as it was described by Montelius (1903). He drew up separate development series for each pot-shape. These 'vertical lines' are then cut up and grouped into 'horizontal' stages, on the basis of available assemblages and stylistic similarities. This appeals to me as a Dutchman because the assemblages recovered in our country have, from the very beginning, invited a process of subdividing them into 'horizontal' stages, and only afterwards of tracing the lines of typological development of separate pot-shapes, or even omitting this step.
Niklasson established the sequence Wa I, Wa II, Be I, Be II and Be III – on the basis of the developments of the *Henkeltasse* (tureen (*)) in particular – and this, he hoped, would form a chronological backbone for the Central German Neolithic cultures. His table (1925, p. 113), in which two successive phases normally overlap, shows that he did not consider this sequence so dogmatically as was thought later (section 2.18). The remark quoted above from Kupka (1928) reveals in any case a realisation of the gradual nature of the developments.
Niklasson's observations about related cultures, which like the whole book, are extremely readable, included the West Group too. The material from the Altmark and Central Germany, then insufficiently known – these were bowls and pails but no shoulder-pots, funnel beakers, collared flasks, biberons (*) – led him to a speculative theory. This apparently occurred to him because of the fact that Holwerda (1913a, b) happened to have reproduced the bowls and the rest of the pottery from hunebed D19 at DROUWEN on two separate photographs. Niklasson reproduced these photographs again and postulated that the Western Tiefstich pottery had only bowls at first, and that during that phase the Altmark must have been colonised. When, later, the West Group derived the additional pottery shapes from the North Group, the Altmark was not influenced.

2.7 F. ADAMA VAN SCHELTEMA (1920, 1923) AND H. GUMMEL (1927)

Adama van Scheltema, a Dutchman who worked first in Netherland and later in Germany, included a discussion of the Northern and Western Tiefstich pottery in his philosophical studies of art (1920, 1923). Here he tried to establish generally applicable rules which had governed the growth of the north European prehistoric art styles. He analysed and formulated the principles which might have determined the shape and ornamentation in the successive stages of Müller's pottery sequence, and identified these in the West as well. He thus indicated the probable line of development more thoroughly than Åberg. He avoided skating on thin ice, leaving the Late Havelte pottery from DROUWEN-D20 out of consideration. He, too, used the 'Seeste Vase' as proof of TRB-Rössen contacts.
A very important point is that Adama van Scheltema convincingly disposes of Schuchhardt's (1909) and Holwerda's (1915) pseudo-technological explanations of the origin of certain Tiefstich pottery shapes. F. Boas, who for the rest regarded Adama van Scheltema sceptically, also rejected these and other similar armchair speculations on general ethnological grounds (1927, p. 7, 151). Henceforth, it was in any case no longer necessary to take them as a basis for typological sequences.
Gummel (1927, p. 102-104) applied the principles of Niklasson and Scheltema in his typochronological subdivision of the 118 pieces of Tiefstich pottery which had been drawn by Count Münster a century before (section 2.1). Since this pottery from the vicinity of OSNABRÜCK consisted mainly of phases C – D – E, the earliest pottery was not dealt with in Gummel's report. This is the reason why he placed the earliest types present (ibid., plates 26:21) after later types (plates 26:10-13) – but shortly afterwards Kupka (1928, p. 218) showed exactly how it should be done. In accordance with Niklasson's theory (section 2.6), Gummel assumed an opening phase with bowls, but without shoulder-pots. His material did not, in fact, lend itself to the determination of an opinion on this point.
Gummel's way of describing the typological developments served as an example for Knöll's description (which corrected Gummel's) and Knöll's terminology is also partly derived from Gummel.

2.8 A.E. VAN GIFFEN (1918-1927)

The seven fruitful years of Holwerda's research on the Dutch hunebed pottery were followed, since 1918, by Van Giffen's activities, which would lead in ten years to his *De hunebedden in Nederland* (I, 1925; II, 1927).[23]

During the years when he was keeper of the Leiden museum (1912-1917) Van Giffen had not occupied himself with the hunebeds and their contents. He must, however, have absorbed a good deal of information from the work of his colleague, Holwerda. When the latter investigated the two hunebeds in DROUWEN in 1912, Van Giffen excavated the BUINEN trackway in the raised bog, five kilometres further on (Van Giffen 1913). The analysis of Holwerda's finds took place in the Leiden museum in front of his eyes.

Van Giffen left for Groningen in 1917, and from there he began his investigation of hunebeds in 1918, the digging being done in the course of that year by twenty-five interned Belgians (who had fled to neutral Netherland during the World War). Two of them, Arnold van Dinter, manager of a brewery, and Jules Verdonckt, did the measurements and drawings.

Six hunebeds were investigated during that year, the ruined hunebed O1 at DE EEZE near Steenwijk, D53 at HAVELTE, D40 at EMMEN, D30 at EXLO and D21 and D22 at BRONNEGER. In 1918 and 1919, this team also collected material for a report for the government concerning the state of conservation of the hunebeds in Drente and Groningen. This report was to form the nucleus of Part I of *De hunebedden in Nederland* (1925) in which a detailed description, a photograph, an accurate plan and a brief analysis of the preceding descriptions of the state of conservation were given for each of the 54 hunebeds. An English edition of this work appeared in 1927. This became a model for similar books in other countries. But the same high level has rarely been achieved.

When his Belgian helpers departed, Van Giffen excavated the ruined hunebed D35a at VALTHE in 1920, the ruined hunebed F1 at RIJS in 1922, the small, ruined hunebeds D13a at EEXT and D54a at SPIER in 1923 and the ruined hunebed D37a at WEERDINGE in 1925. In that same year he also discovered the small flat grave cemetery under Tumulus II at ZEIJEN, which we shall deal with in the following section. His interpretation of the flat graves in Hoge Lo, near NOORDBARGE, which were investigated in 1920, will also be discussed there.

In 1927 Van Giffen published the results of the hunebed investigations in Part II of *De hunebedden*, where they are preceded by a thorough description of the older research up to and including that of Holwerda.

Van Giffen also presented here his useful classification of the shapes of the pottery and his typochronological classification. Concerning the latter, he continued on the path entered tentatively by Holwerda. Van Giffen called the pottery from hunebed D19 at DROUWEN (I), which is similar to the older 'Nordwestdeutsche Tiefstichkeramik', the *East Drente-Drouwen I style group*. In the southwest Drente hunebed D53 at HAVELTE, Van Giffen found mainly the *West Drente-Havelte style group*. Theoretically, this could be split into two, separately occurring groups: the *Early Havelte(-Veluwe) style group* which Holwerda had already found at UDDELERMEER and elsewhere on the Veluwe, and the *Late Havelte(-Spier-Drouwen II) style group* which was predominant in the hunebeds D54a at SPIER and D20 at DROUWEN (II).

Different types of argument play a part in his discussions on these pottery styles. Holwerda had shown that the Late Havelte (Drouwen II) pottery probably was later than the Drouwen I pottery, because the former displayed typologically degenerative characteristics (hardly any decoration) and seemed to have similarities with Lausitz pottery. Van Giffen thought that this latter comparison was improbable, but he could point to similarities with Montelius II Bronze Age pottery from Schleswig-Holstein as well as to pottery from BUNSOH, in the same area, 'from the last Megalith and Stone Cist Period'. (Becker (1954a, n. 51) was, in fact, later to assign the Bunsoh pottery to MN V.) The carved cordons of this pottery were also compared with those of the Bernburg group. The Drouwen pottery (I shall omit the other confusing adjectives furtheron) strongly resembled the pottery of Müller's earlier phases of the Passage Grave Period of the North Group.

Van Giffen had established a stratigraphical sequence in the filling of the chamber of hunebed D21 at BRONNEGER of which the significance was stressed by H. Knöll (1959, see his pl. 44). On the flooring of the chamber, under a side stone (or prop) which, according to the excavator, had fallen into the chamber before the disposition of pottery in the hunebed had come to an end, early types of Drouwen pottery were found. Although the situation elsewhere in the chamber-filling did not allow for distinguishing a clear stratigraphical sequence, later types of TRB pottery appeared to occur, mainly, in the upper levels. Van Giffen drew attention to an Early Havelte amphora (K44:52; 12:13). This is of the E2 (Uddel) facies; Van Giffen did not consider the E1 facies as belonging to Early Havelte (examples of E1 in D21 are K44:39 and 40 – see section 6.6). In these upper levels, Single Grave beakers (*) also occurred, and Van Giffen considered them as contemporary with the later TRB ware of the same levels.[24]

The mutually exclusive occurrence of Early and Late Havelte at several sites sufficiently demonstrated that they were not contemporary. Situations like the one described of D21 at BRONNEGER, where Late Havelte was absent, but where a gradual transition from later Drouwen to Early Havelte was suggested by the pottery, showed what the original sequence had been. The presence of a large quantity of pottery of both style groups and of transitional forms in hunebed D53 at HAVELTE made clear, furthermore, that there was a direct genetic relation. Van Giffen drew elaborate typological comparisons with the styles of the pottery found abroad – Åberg (1916a, 1918) and Ebert's *Reallexikon* showed him the way, but he seems to report

nearly all the appropriate literature. Here I would like to single out particularly his remarks on the Early Havelte shape. He compared the Early Havelte amphora with those of the Globular Amphora culture (KAK, *) from BÖRTEWITZ, Saxony, and elsewhere, and with those of the Řivnáč culture. He also pointed to EYERSHEIMER MÜHLE, Schönfeld and – something that was then chronologically still quite conceivable – to Rössen. There is indeed a particularly striking similarity with the large amphora from Börtewitz and with several other 'Kuyavian amphorae' of the Globular Amphora culture (see section 6.7). In this context, Van Giffen also called Havelte the 'West Drente-Veluwe-Börtewitz style group'.

Van Giffen attached great importance to what I shall call the 'geographical' and the 'grave-typological aspect' of the Dutch TRB pottery.
It seemed that the Drouwen style group was the predominant one on the east Drente Hondsrug and the 'Havelte style group' in west Drente and on the Veluwe. This idea can no longer be maintained in this form. Drouwen extends to LAREN near Hilversum and appears in ELSPEET and other places on the Veluwe; Late Havelte appears in the whole of Drente, but not (yet?) on the Veluwe. The type-site for Late Havelte, hunebed D20 at DROUWEN, is in east central Drente! Early Havelte is not restricted to the west of Drente, but is also amply represented in the north (D6e-f at TINAARLO; settlement of ANLO) and even in D20 at Drouwen.
Still, there is a real difference in nuance between southeast Drente and northwest Drente (section 6.6). And this may not be restricted to within the Early Havelte horizon.
Van Giffen, however, did not yet know all this in detail, and, at some places in his book, there is a *monologue intérieur* on the chronological significance of the three pottery groups, since these did not overlap completely on the maps (1927, p. 452). His many-sided, sometimes even contradictory conclusions, have been explained by others in two ways. Holwerda – essentially averse to typochronology – was to cite exclusively the regional differences (1931). Later, when the chronologies began to get continually longer, the typochronological aspect was exclusively emphasized. This was done by Katvan Hulten (1947), whose own research must have clearly shown her that Van Giffen's distinction between east Drente and west Drente was untenable, and by me (1962) and Van der Waals (1964a).
Another competitor to pottery typology was that of grave architecture. Analogous to the grave architecture typology of Montelius and Müller (1897), Van Giffen toyed with the idea that the very large hunebeds with a peristalith (like D53 at HAVELTE) had gradually developed from the small ones with two cap stones but without peristalith or passage, and that they were succeeded by more and more rudimentary shapes like stone cists and flat graves. His interest in pottery typology was stimulated in no small degree by the desire to test this idea. Yet, in 1927 (p. 454-455), he had to conclude that 'preciously little had become evident' from this test, although he could point to 'a certain relation' between peristalithic hunebeds and Havelte pottery, and between Drouwen pottery and the more simple hunebeds without a peristalith.[25] There were, however, several exceptions to both relations.
Shortly after this, the central idea in his thinking was to be that of the degeneration from hunebed to flat grave (section 2.9). In Chapter 7 the typology of megalithic architecture will be checked once more against the pottery typology; even with the present, more detailed, pottery typochronology, the subsequent architectural stages cannot be bound to separate pottery stages. The developments in hunebed architecture had taken place quickly, and earlier types continued to be built simultaneously with later ones.

While U. Fischer (1960) concluded from Knöll's Chapter B, 'The present state of research', that 'A.E. van Giffen was the only investigator to arrive at solidly founded opinions [on the sequence of Western Tiefstich pottery], which were based on his excavations in the province of Drente' it is somewhat surprising that before the publications of Knöll (1959) and Schlicht (1968), scarcely any attention was paid to Van Giffen's work abroad, especially in West Germany. Sprockhoff (1938) completely ignored it. Dehnke (1940) called Van Giffen's study 'already out-of-date', which was indeed partly true concerning the internal typochronology of the Drouwen style, which was the most relevant for Dehnke's finds in eastern Hanover. Becker (1954a) was not familiar with the Late Havelte pottery style which is so closely related to his Valby style.
The reason for this lack of attention is, undoubtedly, largely the second part (1927) of *De hunebedden* itself. This 580-page tome was written in Dutch, in a rather verbose style which would certainly cause difficulties for any foreigner who tried to read it. Van Giffen chose to deal very thoroughly with the hunebed investigations, describing them per province in the chronological order of their investigation.
Each of these sections could have been published separately as an article in a journal (and some were, e.g. Van Giffen 1924), but, as is often the case when an author's work is published in a number of widely scattered places, we can see his ideas developing slowly, or oscillating between contradictory conclusions. For an inveterate researcher like Van Giffen, a problem is rarely conclusively solved, he keeps coming back to it later in his other work, often ignoring his latest printed conclusion. In this way, the work, which was the result of many years of excavation and study, became (and remained) a source book of ideas. However, since the order of the pages is not the same as the order of writing, and since the author was unable to give the book a final revision (editing and systematizing it), the reader

gets confused in the contradictory pronouncements. Later authors often chose just one of the contradictory conclusions from the book. We have already seen an instance where both contradictory statements were theoretically correct, although on different wave-lenghts.
If Van Giffen had published a summary of his ideas about the pottery styles in the West in a well-organised, illustrated article, in an international language, they would presumably have immediately attracted the attention they deserve, and which they are only now gradually receiving.
Yet another reason can perhaps be suggested for the initial limited success of the book. At that time it seemed that the Late Havelte style was not present in West Germany. Moreover, the Early Havelte style often occurred there in a form which could only with difficulty be recognised as such by people who had not seen the Dutch material themselves. In addition, the rival influence of the theory concerning the origin of the Seeste Vase, a typical Early Havelte amphora, was very strong here (section 6.5.1).

2.9 VAN GIFFEN (1927-1943)

During the following years, Van Giffen did not work his pottery sequence out any further; the most he did was to enfeeble it. For the time being, no publications appeared on the contents of those hunebeds which were occasionally investigated after 1927. In fact, Van Giffen was really far more interested in uncovering ground traces and burial chambers – which he did extremely capably – than in recovering finds and analysing them typologically. The artefact was for him the means of dating the structures which were discovered, not the aim of the excavation, as is sometimes the case with more history- or art-orientated colleagues. Considering the tremendous energy and haste which made Van Giffen a trail-blazer in almost every field of Dutch archaelogy, it is not in the least surprising that 'the truly bewildering masses of finds' from the hunebeds were felt as a heavy encumbrance. There was also the circumstance that, until 1940, there was never a capable pottery draughtsman at his disposal, or an assistant who could relieve him of this work.
His well-known *Die Bauart der Einzelgräber* (1930), which was devoted to the astonishing results of his barrow and urnfield research, also contains a discussion of two barrows containing Tiefstich pottery graves: Tumulus II at ZEIJEN and the 'Stone cist barrow' at DIEVER. These are still the most expertly investigated barrows with TRB graves west of the Elbe. I shall discuss them extensively in Appendix B. The book deals first and foremost with the stratigraphical situation and grave typology. The finds described seemed to be links in a degenerating chain, from hunebed, via stone cist to individual earth grave. The Tiefstich pottery from the Diever cist was not expressly dated, but the (Drouwen) pottery from the graves in Zeijen was assigned by Van Giffen to the transition from Drouwen to Early Havelte. This would appear to be confirmed by a sherd from a Drouwen funnel beaker which was wrongly interpreted as a piece of an Early Havelte amphora.
The publication (1934) of the results of a 1920 excavation of the Hoge Lo at NOORDBARGE, where buried cremated remains appeared next to what was unmistakably Late Havelte pottery (ibid., fig. 2, sub 20, 21, possibly also 35), raised difficulties in interpretation, since it had been contended in *De hunebedden II* (1927) that Holwerda was mistaken in drawing a certain connection between this sort of pottery and cremations. The situation in Noordbarge conflicted therefore with Van Giffen's conviction. All he writes about it is this: '. . . in addition to some sherds, a few bowl-shaped, undecorated urns appeared. Although the latter pointed to a distant affinity with late hunebed pottery, I was unable to place them accurately in the established archaeological system. This still holds true' (1934, p. 90).
Among the reasons for the 1933 excavation campaign at BALLO were finds of TRB refuse. However, the results were bitterly disappointing in this respect: 'Nevertheless, the (. . .) investigation, as usual, has not fulfilled the high expectations (. . .) because the previously collected types of arrowheads and other silices, as well as the sherds from hunebed- and similar pottery, had raised hopes of richer finds than were actually encountered' (Van Giffen 1935). Van Giffen had hoped to find TRB ground traces comparable with those of the UDDELERMEER. The publication dealt rather sketchily with the sherds. Since it has now become clear that TRB settlements in our country do not normally reveal ground traces, but that the inconspicuous refuse of a settlement can be very useful for the chronological classification, we can take a different view of Van Giffen's finds at BALLO.
The brief publications in the *Nieuwe Drentsche Volksalmanak* (1937a-b) concerning the flat graves in SLEEN and EKELBERG which contained much pottery, did not lead to a further pottery study either.

In *Opgravingen in Drente* (1943c, 1944d), the hunebed pottery was only dealt with perfunctorily. Van Giffen allowed the dating to be determined completely by the grave typology. Of the 1927 sequence of Dutch TRB graves (short rectangular hunebeds without a peristalith → long hunebeds with a kidney-shaped peristalith → stone cists → flat graves), he now amplified the end: small hunebed with staircase entrance, EEXT-D13 → small hunebed without an entrance, EMMEN-D41 → stone cist EEXT-D13a → stone cist DIEVER → main grave with stone packing at ZEIJEN → the other graves, with only a few stones, at ZEIJEN → flat graves with some stones at EKELBERG → stone-less flat graves at SLEEN. Van Giffen did not mention that this

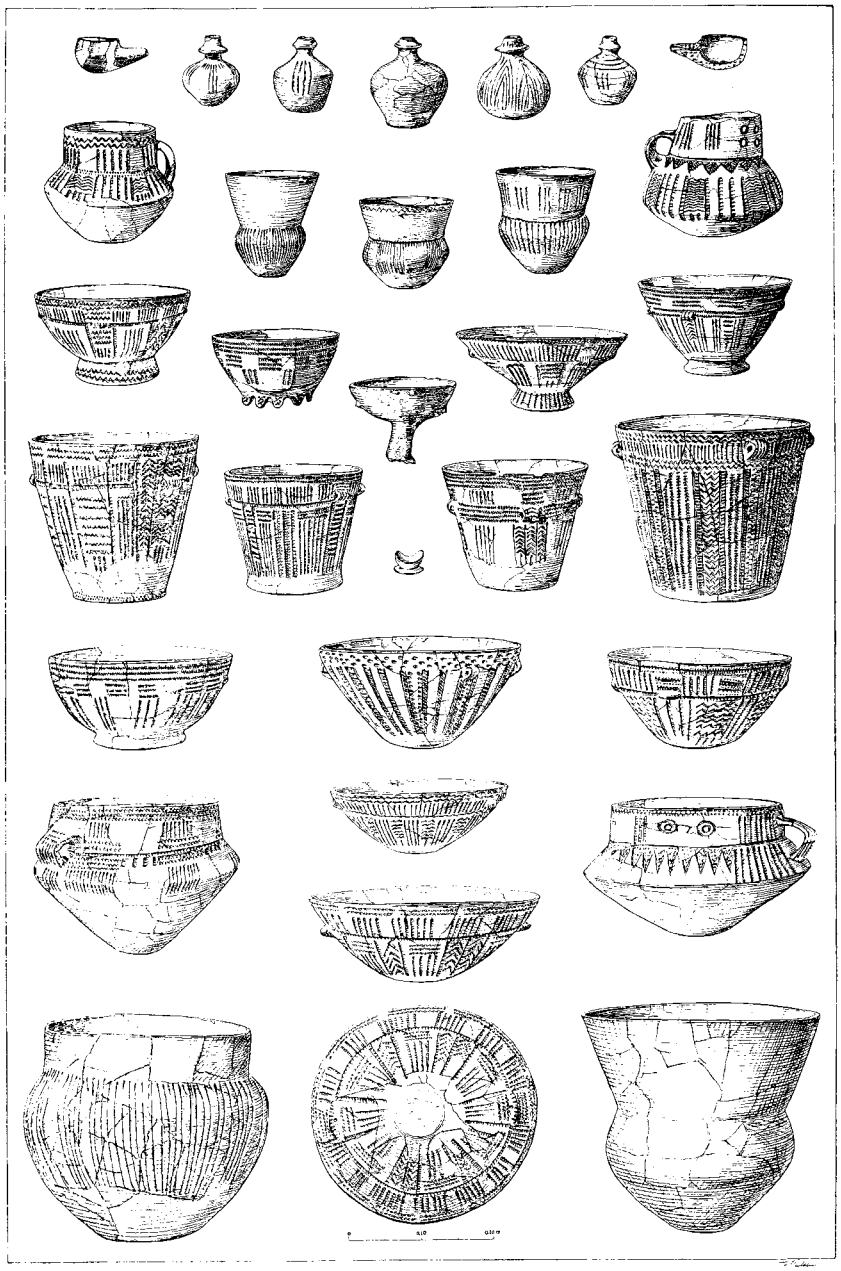


FIG. 9 'Tiefstich pottery from Drente hunebeds, the majority in the Drouwen-I-style' (Kat-van Hulten 1947, plate 34 = Van Giffen 1943c, 1944d, fig. 11).

grave typology conflicted with the pottery typology.[25]
A great deal of attention was also paid to this sequence in *De voorgeschiedenis van Nederland* (1941) by A.W. Byvanck.

2.10 J.C. KAT-VAN HULTEN'S CO-OPERATION WITH VAN GIFFEN (1940-C. 1950)

After the arrival of Miss Tini van Hulten's (later Mrs. J.C. Kat) at Van Giffen's institute in 1940, publication of the inventories of the hunebeds was resumed.[26] Up until c. 1950 she worked on the reconstruction, in drawings, of prehistoric pottery from hunebeds and urnfields. Now Van Giffen published (with drawings and detailed descriptions by Van Hulten) the results of his much earlier investigations of the hunebeds D13-EEXT (Van Giffen 1943a), D28-BUINEN (Van Giffen 1943b), D6e/f-TINAARLO (Van Giffen 1944a), D13a, b and c at EEXT (Van Giffen 1944b, c), D42a-WAPSE (Van Giffen 1946). In these publications it is regrettable that Van Hulten's good, half-scale drawings were always reproduced at such a small scale (sometimes even c. 1:9 or 1:14). In principle, the shape of the pot was reconstructed in these drawings, even in the case of small fragments. Unfortunately, Van Hul-

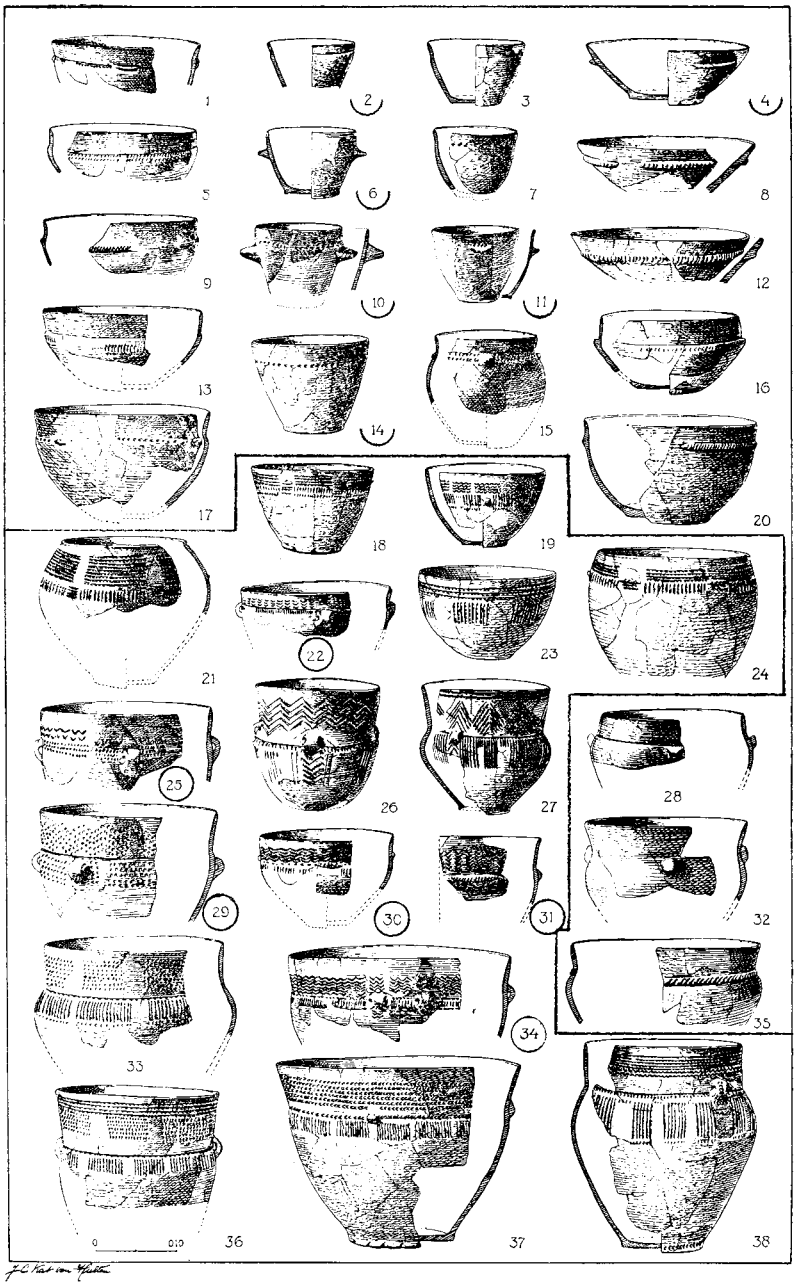


FIG. 10 'Tiefstich pottery from Drente hunebeds, mostly in the Havelte style' (Kat-van Hulten, 1947, plate 35).
The following has now been added to the figure: a line separates Early Havelte (E), at the bottom, from Late Havelte (G). The numbers assigned explicitly to Late Havelte by Kat-van Hulten have been underlined. The numbers which, in her opinion, form a typological transition from E to G, have been circled. I now include most of the latter in Mid-Havelte, F.

ten's catalogue of the numerous pottery finds from hunebed D53 at HAVELTE, which was investigated in 1918, remained unpublished. Only a list of the types of pots identified was published (Van Giffen 1951).
In these studies a typochronologically transitional phase between the Early Havelte amphoras and certain Late Havelte shapes was proposed (fig. 10). This transition corresponds with my phase F, Middle Havelte.
The publication of a special collection of essays to celebrate the 25th anniversary of Van Giffen's Groningen Institute was the happy occasion for the appearance of an article (in Dutch) by Mrs. Kat-van Hulten, 'The hunebed pottery and its styles' (1947). Here, for the first time, Van Giffen's ideas on the development of the Tiefstich pottery were presented in a conveniently arranged way, in the space of fifteen pages by someone who was thoroughly acquainted with the material. A plate with Drouwen pottery and one with Havelte pottery by the author accompanied the article. I have reproduced them again here (figs. 9-10).
Due to the well-arranged, clear organization of the material (thanks partly to editing by W. Glasbergen), this article had more impact than Van Giffen's more finely shaded but confusing 1927 book. Whereas Van Giffen was actually no longer occu-

pied with the typology of Tiefstich pottery – and presumably even doubted its usefulness – this article was the spark which kindled the enthusiasm of a younger generation of researchers, including myself.

2.11 THE WORK OF OTHERS IN NETHERLAND (1924-1950)

Holwerda (1924; 1925) published a map of antiquities in Netherland *(Oudheidkundige kaart van Nederland)* which included the sites of those TRB finds which were known in Leiden.
F.C. Bursch considered the cremation graves of the Late Havelte phase (cremated remains buried next to the pot) which were found by him in 1932 near ANGELSLO, as urns from the Late Bronze or Iron Age (Bursch 1937, fig. 26:6a-c, 10; Van der Waals 1964a). In 1933 Bursch carried out a small excavation on the site of a Drouwen settlement near ELSPEET on the Veluwe which had been discovered by J. Bezaan in 1930 (Appendix B7), but nothing more than a brief report resulted. He seems not to have realised that the pottery was of the Drouwen style and not of the Early Havelte style which is usual on the Veluwe (Bursch 1933, 1940). This lapse may have been the result of Holwerda's geographical, non-chronological interpretation of the differences in style.
Bursch's opinion that the Bell Beaker (*) of his Veluwe Type (Abercromby's Batavian Type) was typologically influenced by the Early Havelte amphoras (Bursch 1933) had some influence until the C14 method proved it chronologically untenable. The idea was last quoted by E. Sangmeister in 1963.
Quarrying for sand on the BAALDERES in 1937 resulted in the discovery of the largest cemetery of the West Group. Thirty-five pots were dug out of the ground by laymen in a reconstructable or complete state (an achievement), but nobody thought of establishing their relative positions (Ter Kuile 1938).
Little else was done, apart from the photographic documentation of Dutch TRB pottery collected by Knöll, and his dissertation (1939, see section 2.16).

2.12 E. SPROCKHOFF (1930, 1938)

Sprockhoff was less succesful in his studies on the Western Tiefstich pottery than in those on grave architecture. At first, he thought 'this Northwest German Tiefstich pottery is, in general, so uniform that it is hardly possible to point out any lines of development which could be used to date it with any precision' (Sprockhoff 1930). In 1938 he knew the material better. Part of the Western Tiefstich pottery could not be dated on the basis of Müller's studies (1913, 1918) on the pottery of the North Group. Sprockhoff (1938) called this a separate style, the 'Emsland Style'. This style would have been especially characterised by (in my terminology) tvaerstik ornamentation (*) which, in my opinion, is particularly characteristic for phase D. Other pottery – according to Sprockhoff synchronous with the Emsland style, but in my opinion belonging to the phases A-C – was thought to have a stronger connection with the North Group. Van Giffen (1927) had already asserted that the two categories must be considered to be consecutive. Knöll was to do this again (1938, 1939) at about the time that Sprockhoff's book appeared, but Sprockhoff preferred a parallel, simultaneous development in the same area of the Emsland style and of a sequence inspired by the North Group.
His *Leitmotiv* for the sequence of the Emsland style was derived from Müller (1918) viz. the idea that the tvaerstik line originated in the North Group as an imitation of the real wound stamp line (*), which it would eventually replace.
Sprockhoff construed four consecutive phases for the West: (1) with 'pseudo wound stamp' *(unechtes Wickelschnur);* (2) with 'unfastened wound stamp' *(gelockertes Wickelschnur);* (3) with 'undone wound stamp' *(aufgelöstes Wickelschnur);* and (4) the phase of the 'degenerate, simple ware' *(entartete, schlichte Ware),* which is, in my opinion, a remnant group in which carelessly decorated and undecorated pots from the entire Tiefstich period were collected.
These four phases would cover the whole Passage Grave Period. Phase 3 would be synchronous with the well-known pot in the deposit with copper objects from BOBERG II (OHLENBURG), which is decorated with genuine loosely wound stamp impressions (Barbed Wire (*)) (Schindler 1960, p. 91, Pl. 87:2) and which is now dated to the (Dutch) Early Bronze Age. Phase 4 would be synchronous with the *Kümmerkeramik* (which is now considered as synchronous and subsequent to Barbed Wire pottery). Phase 1 would be preceded by a phase of the late Dolmen Period, during which pottery of the West Group was identical with that of the North Group. This northern tradition would have endured for a long time in the West Group and, initially, have flowered side by side with the described *Wickelschnur* phases.
Sprockhoff was mistaken in this ingenious construction which was lucidly presented in the space of a few pages. The closed finds do not support the idea that the tvaerstik line was applied over a continually widening area. The observation that the tvaerstik line never displays real wound stamp impressions had not then been published (Knöll 1959). Van Giffen (1927) and Kat-van Hulten (1947) also described it as 'wound stamp impressions'. The idea that the final phase of the Tiefstich pottery was synchronous with the *Kümmerkeramik* was rejected a little later by Sprockhoff himself (1941, p. 20).
Sprockhoff's system was not adopted in any specialist studies; this latter term can scarcely be applied to Hoffman's article (1938). Amazingly, Sprockhoff's typochronology was exclusively used as late as 1967

in the interpretation of the Tiefstich pottery finds from the Kreis AHAUS (Voss 1967), as if the studies by Kat-van Hulten (1947) or Knöll (1959) did not exist.

2.13 MEGALITHIC TYPOCHRONOLOGY VERSUS POTTERY TYPOCHRONOLOGY

In section 2.1 we described how the 'Dolmen Period' and the 'Passage Grave Period' were defined in southern Scandinavia as the period of the dolmens and that of the passage graves (plus the last dolmens). In the North Group, both grave shapes (so also both periods) had their own types of artefacts. Theoretical difficulties arose, however, when it appeared that there were scarcely any dolmens in the West Group and that the passage graves here contained collared flasks, a shape which occurred in the North Group exclusively in the Dolmen Period.
The debate now moved into various directions:
– Jażdżewski (1932) and Åberg (1936, p. 8) dated the collared flask of the West Group in the Passage Grave Period.
– J.E. Forssander (1936) dated the passage graves of the West Group in the Dolmen Period. His principle 'that the grave types must be dated by the earliest artefacts found in them not vice versa' (1936, p. 61) is more important than his arguments to support his dating (the theory of the Seeste Vase), if only because it has been followed by nearly all TRB specialists.
– Van Giffen (1927) and especially Sprockhoff (1938) worked out Montelius' grave type series further for the West Group: the very long passage graves developed from the shortest which originated, according to Sprockhoff, in Schleswig-Holstein. This theory, which was later substantiated with closely reasoned arguments by E. Aner (1951, 1963, 1968) requires a detailed treatment (Chapter 7).
– G.E. Daniel's theory (1938, 1941) that the dolmens derived from the passage graves and were a link between them and the later stone cists, was an unconscious return to H. Petersen's theory (1881; see 2.1). Daniel doubted the correctness of Müller's pottery sequence, though later (1958, p. 55) he returned to Montelius' grave type series, presumably convinced by the modern research in southern Scandinavia.[27]

2.14 K. LANGENHEIM (1935) AND R. DEHNKE (1940)

Langenheim's book on the TRB culture in Schleswig-Holstein and southern Jutland (1935) is important for the West Group not only because it describes an adjacent pottery group, but also because it can serve as an example of a well-arranged typochronological study of Tiefstich pottery.
As Niklasson had done before him (1925), Langenheim first gave an accurate descriptive catalogue, and after that, typological series for each potshape separately. Subsequently, he grouped these in their relative chronological order. He attached enough significance to the funnel beaker profile to base the chronology of the other shapes on it. Theoretical considerations were restricted almost entirely to Schleswig-Holstein, and because of its level-headed approach and conclusions, good drawings and documentation, this book has remained a basic one for the study of the TRB culture in this area.
Dehnke produced the first great monograph on a German part of the West Group pottery (1940). The study centered on eastern Hanover; this is the part of present-day Lower Saxony between the Weser and the border with the DDR. The catalogue is very important because even small sherds were described in detail and usually illustrated. In accordance with Langenheim's book, shape-series were established and synchronized. Dehnke based his dating particularly on bowls and pails, the rim sherds of which are very useful.
In a review (1941), Knöll indicated with which of the author's points he could not agree. He pointed out that the material of the east Hanover finds is too fragmentary for the establishment of a chronological system which would be relevant far beyond this area. Besides, the cultural border between the Altmark pottery (*) and the Western Tiefstich pottery cuts right across this region.
Dehnke's great achievement is his recognition, from a few, small sherds, of a new style-group, the Haassel style (*). As nothing else has been published since then on this style from the Lüneburg Heath, the drawings and detailed descriptions in his study are still the only source for the characteristics of this style, the distribution area extending to Schleswig-Holstein and Denmark (see 6.1). For the rest, Dehnke (1940, 1940a), impressed by Åberg's *Kulturmottsättningar* (1937), arrived at 'quite fantastic theories' (Becker 1947) about the origin of the Haassel style because to him the cord impressions suggested a connection with Corded Beaker Ware.

2.15 EXCAVATIONS BY K. MICHAELSEN AND H. REINERTH (1934-1939)

Two excavations in Oldenburg have only reached the stage of preliminary publication, viz. that by K. Michaelsen of two megalithic monuments (peristalithic long barrows containing one and three passage graves, respectively) at KLEINENKNETEN near Wildeshausen (1934-1939), and that by H. Reinerth of the Tiefstich pottery settlement on a former bank of the Hunte, immediately north of Lake Dümmer (1938-1939) (called DÜMMER-NORTH in this book).
The results of the excavation at KLEINENKNETEN have been published in a short note (Michaelsen 1937). The excavator is now preparing a more complete publication.
Michaelsen (1938) was also the discoverer of the settlement of DÜMMER-NORTH which was exca-

vated by Reinerth. Apart from a first, tendentious report (Reinerth 1939) and a biting criticism of this by his ex-assistent H.W.A. Dürr (1960), a few excavation results and a small proportion of the artefacts found have been described in passing in the literature (Struve 1955; Knöll 1959; Jacob-Friesen 1959; Brandt 1967). This was generally done without publication of new illustrations, since the excavator, who has retained control of the field documentation, still reserves the right to publish everything himself. Elsewhere I tried to give a summary of the presently accessible data (Bakker & Van der Waals 1973, note 42). As Knöll (1959) has noted, this site has a special significance as one of the rare settlements between the Ems and the Elbe with Late Havelte pottery.

2.16 H. KNÖLL (1934-1968)

In 1939, H. Knöll earned his doctorate with a thesis on the Western Tiefstich pottery; his supervisor was Von Merhart (G. Merhart von Bernegg). In 1934, A. Stieren had set him to work in the Münster Museum on an inventory and classification of the sherds of the c. 150 pots which were recovered in 1928 from the remarkable megalithic graves (hybrids of gallery graves and hunebeds) WECHTE I and II (Stieren 1929). Knöll visited the relevant German and Dutch museums in 1936-38 assembling photographic documentation and short descriptions of almost all the TRB pots and the most important sherds from this region.
In accordance with the usual procedure in Germany, Knöll's thesis was not published immediately. Later, the war prevented its publication, and then, from 1948 to 1951, Knöll worked on a new version; 'everything had to be completely re-written. Some passages were omitted and were published elsewhere, some were drastically abbreviated, and major points of others (...) expanded.' The book was published in 1959. In the meantime, thorough studies on special features appeared (Knöll 1952a-d; 1953; 1954a-b; 1955; 1961). But there still remained unprinted a large number of photographs, as well as a list of present locations and references concerning the pieces from each locality, and perhaps even more (Münster Museum).
We have already mentioned that, in 1959, Knöll reduced his five phase chronology (1939) to one with three phases (figs. 5-6). In the course of the present book, it will be obvious to what considerable extent my work is based on Knöll's, and where I deviate from him. L. Kaelas (1961) and especially U. Fischer (1960) discussed this book thoroughly in their reviews. Fischer also indicated its presentational shortcomings. Since it took me months to begin to come to grips with the book, I can only agree with him. In Netherland, Van der Waals (1964a) indicated the particular significance of Knöll's typochronology for a subdivision of the Drouwen style, but scarcely any other colleagues have read the book.
Finally, I would like to refer to one further aspect of Knöll's work, which in my opinion, is more important than it seems. On the basis of his extensive documentation, he published 110 lists of the distribution of the shapes of pots and of various characteristics of the ornamentation, which were, unfortunately, accompanied only by a small number of small-scale maps. Although he demonstrated the possibilities of this method of approach in his article 'Migrations, commerce, propagation of ideas and potter's workshops in the Northwest-German Tiefstich Group' (1952c), no progress has since been made in this direction. The first essential is, of course, to bring the photographic documentation of the whole area as up-to-date as possible. Then the elements of the ornamentation should be mapped with special reference to their combined occurrences, and preferably quantitatively as well.
A short time ago, Knöll resumed publication on TRB pottery after an interval of many years (Knöll 1968).

2.17 THE WORK OF OTHERS IN GERMANY (1945-1973)

Inventories were published of several megalithic graves west of the Elbe in Germany. The publications include: two hunebeds with wooden entrances at TANNENHAUSEN in Ostfriesland (Gabriel 1964, 1968); hunebeds in the Ems area (Schlicht 1956a-b, 1957a-b, 1965); hunebeds in DÖTLINGEN, LINDERN and VISBEK in Oldenburg (Pätzold 1957, 1961; Steffens 1964, 1970); megalithic graves at DEINSTE (Wegewitz 1949; Deichmüller 1960) and GNARRENBURG (Deichmüller 1972) between the Weser and Elbe; a great number of megalithic graves on the Lüneburg Heath (Wegewitz 1949, 1950, 1954, 1955a, b, 1956, 1964, 1967; Dehnke 1970) including those at OLDENDORF (Sprockhoff 1952a; Laux 1971). Peters (1971) published the poor remains of the pottery from a dismantled hunebed at OSNABRÜCK-Nahne. Schünemann (1972) illustrated all TRB finds from the little-known Kreis VERDEN and the excavation report of a ruined hunebed at VÖLKERSEN in that area.
The c. 1200 pots from hunebed EMMELN 2 on the Ems were published in an exemplary manner by Schlicht (1968). The c. 330 pots from hunebed GROSS BERSSEN 7 on the Hümmling were published in the same way in 1972 by this author. In sections 6.5-6 we shall deal in more detail with her typological views.
Flat grave inventories were published from LANDERSUM (Beck & Lange 1950; Appendix B10), the Kreis AHAUS (Voss 1967) – both in Westphalia – and from the Ems area (Schlicht 1967). Further to the east, several new assemblages have been dealt with recently, including those of ISSENDORF (Tempel 1972; cf. fig. 65). At HAINMÜHLEN, in the Weser-Elbe Triangle, stone-lined ditches containing complete Tiefstich vessels, among which a pede-

stalled bowl (*), fig. 25, were interpreted as graves (Aust 1966), but they may represented a cult house or temple (Bakker 1970; Aust 1976).
Further investigation of the wooden wells with TRB pottery in the KARLSQUELLE or Quickborn near Hamburg (Wegewitz 1963) could, theoretically, raise possibilities for dendrochronology and C14 analysis, especially since two neolithic layers were found.
Settlements were investigated at GELLENERDEICH on the lower Hunte (Pätzold 1955; Bakker & Van der Waals 1973) and at DÜMMER-SOUTH (Deichmüller 1963, 1964, 1965a, b, 1969a; see 6.3). At WITTENWATER, Voss (1965) found the plan of a house and refuse of the Altmark Group below Bronze Age tumuli (see 1.2f).
In the adjoining part of the DDR, megalithic graves were investigated in the Altmark (Schlette 1960, 1962; Preuss 1973). Wetzel (1966) gave a brief survey of sites and finds. A pit find at DÜSEDAU (Hoffmann 1970; Behrens 1973b) is important for our knowledge of the Altmark Group.
Apart from the studies by Knöll (1959) and Schlicht (1968, 1972), no publications have shown a development of new views on the typochronology of the Western Tiefstich pottery. Whether any will emerge from the research of the artefacts found on the peaty island of DÜMMER-SOUTH, where they have been trampled and mixed up in the mud so that their chronological sequence was blurred, remains to be seen (section 6.3).

In Schleswig-Holstein and Mecklenburg, much attention was paid to the North Group pottery. I mention here the classical study by H. Schwabedissen (1953) on pedestalled bowls (*) and his preliminary reports on excavations of settlements which resulted in an Early Neolithic chronology which deviates from Becker's views (1947) (Schwabedissen 1958a, b, 1960, 1967, 1968). I shall return to this point in section 6.1. Important material was published in *Offa* and in the invaluable series *Die vor- und frühgeschichtlichen Denkmälern und Funde in Schleswig-Holstein*. Aner's studies on the Danish and Schleswig-Holstein megalithic grave typology (1951, 1963, 1969) might also have implications for pottery typochronology. Recently, H. Hingst excavated at BÜDELSDORF a MN I settlement surrounded by deep ditches, situated on an isolated loamy hill on the river Eider (1971).
In Mecklenburg, E. Schuldt and his colleagues investigated 145 megalithic chambers and stone cists from 1964 to 1973, and the results were published annually, in a very well-arranged form, in the *Jahrbuch für Bodendenkmalpflege in Mecklenburg* (1965-1973) and often in the *Bildkataloge* of the Schwerin museum as well. Schuldt summarized his results, especially those dealing with grave architecture, in a monograph (1972a; cf. also 1976). The old materials, and part of those excavated recently, were comprehensively studied by I. Nilius (1971). In the future, it will certainly be possible to improve her schematic subdivision of the Middle Neolithic of the Mecklenburg TRB ware through further analysis of the plentiful pottery from the recent excavations (cf. Schuldt 1972b) and perhaps through continuing settlement excavations. But until now, the latter were disappointing, because the pottery was scarce and post-holes and other ground discolourations did not show up (verbal information Schuldt, 1977).

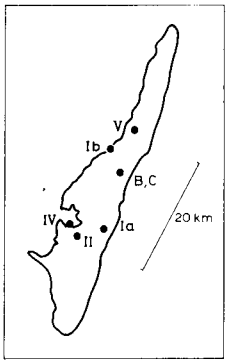


FIG. 11 Position of the Middle Neolithic type-sites, and of SKOVTOFTE and STENGADE on the island of Langeland, less than 20 km apart. B, C is STENGADE; Ia is TROLDEBJERG; II is BLANDEBJERG; III is not represented; IV is LINDØ; V is SKOVTOFTE.

2.18 THE DANISH SETTLEMENT CHRONOLOGY (1926-1973)

Meanwhile, during the 1940's new stimuli for typochronological research had materialized, once again in Denmark.
J. Winther, founder of the LANGELAND Museum, had filled the latter with objects, including those from three Tiefstich pottery settlements on this island which he had recovered during the period 1901-1942. These extensive collections of refuse from settlements dated from the Passage Grave Period, but showed clear differences in pottery style. Since they were found less than 20 km from each other (fig. 11) they must belong to different phases of the Passage Grave Period. The correct order of these phases had been indicated by Müller (1918; cf. 2.4). These refuse layers revealed a more complete picture of the original culture than the pottery in funerary assemblages and in peat-layers which had previously been the main subjects of study. Winther's fine publication (*Lindø I*, 1926, *II*, 1928; *Troldebjerg I*, 1935, *II*, 1938; *Blandebjerg* 1943) of what he judged to be a representative selection from the finds, made the material from these settlements easily accessible.

The next important step in the investigation of Tiefstich pottery sequences was taken by Th. Mathiassen (1944) who, in a diagram (fig. 12), compared the contents of Winther's villages with those of the settlements which he had investigated himself (BUNDSØ on Als: Mathiassen 1939 and TRELLEBORG on Zealand: Mathiassen 1944). Although Mathiassen did not mention this, what is involved here is the 'surface seriation' of settlement com-

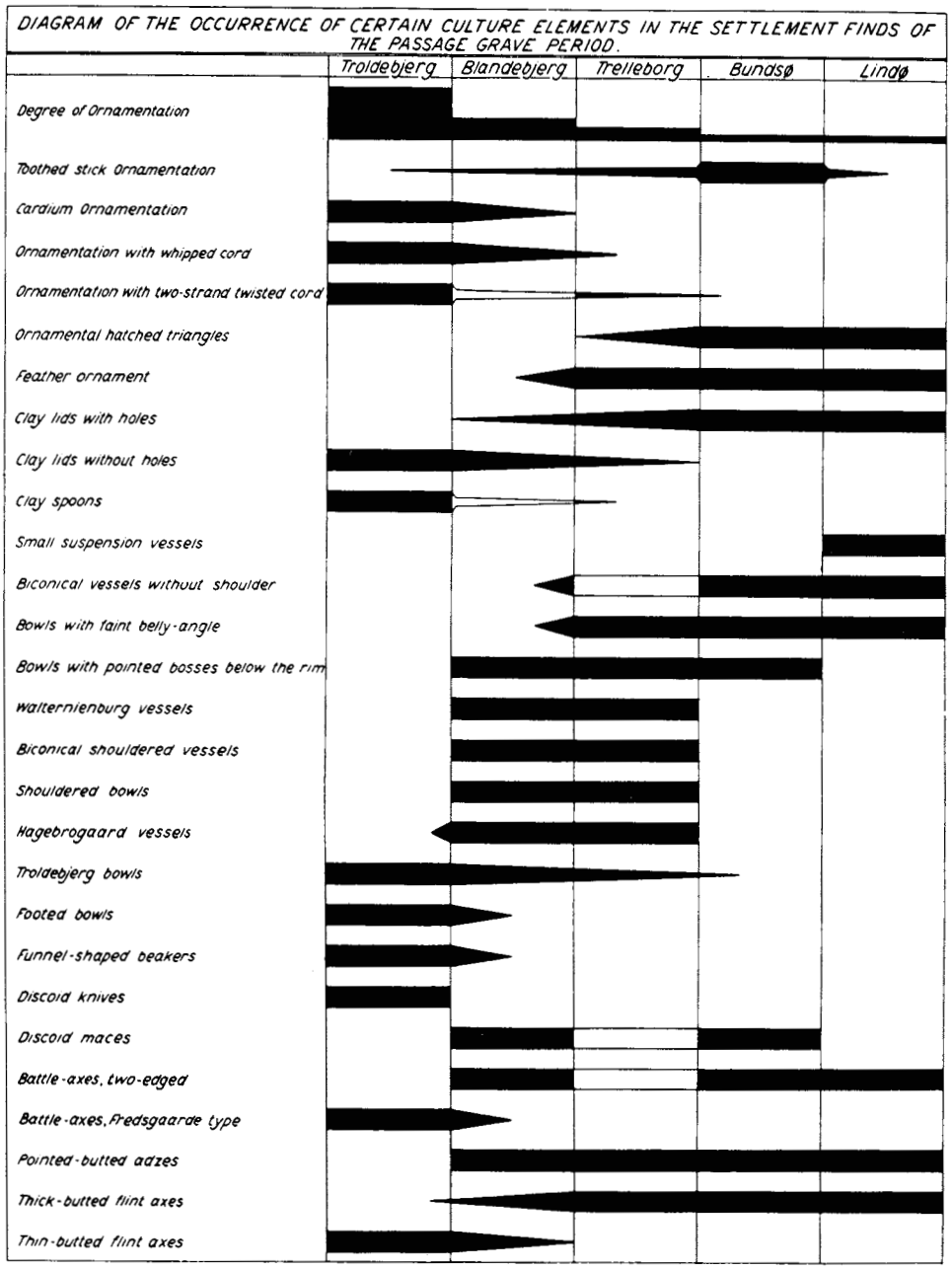


FIG. 12 'Diagram of the occurrence of certain culture elements in the settlement finds of the Passage Grave Period' (Mathiassen 1944, fig. 9).

plexes, which had been developed in North America, particularly by J.A. Ford (e.g. 1951), following the example of A.L. Kroeber (1916) and perhaps also of the Egyptologist F. Petrie (1899, 1901). Mathiassen worked his scheme out only very approximately, without detailed typological analysis of the individual objects. His only numerical data concerned the ratio of decorated-undecorated pottery from each site, calculated on the basis of Winther's counts. Apart from this, the other main piece of information in the diagram is its indication of Mathiassen's opinion on the presence or absence of (rather randomly chosen) significant features. The horizontal lines in the diagram become thicker or thinner according to the greater or lesser popularity of the feature. If a line narrows to a point halfway through an occupation phase of a settlement, this reflects the author's ideas concerning the onset or termination of the feature.

Mathiassen's sequence was based on a local sequence for Langeland in which gaps were filled up with data on sites on nearby islands. C.J. Becker, A. Bagge, H. Berg and L. Kaelas in particular have quickly applied and improved it as a chronological system covering the entire region of the North Group. In his 1948 dissertation *Mosefundne Lerkar*

(quoted here as Becker 1947), Becker regrouped the TRB culture phenomena from Montelius' Pre-Dolmen Period (I) and Dolmen Period (II) into the 'Early Neolithic' (EN) with phases A, B, C. The Passage Grave Period (III) was re-named 'Middle Neolithic (MN) and the Dagger or Stone Cist Period (IV) 'Late Neolithic' (LN). Becker retained Mathiassen's sub-division of the MN as the best available, although he was aware that other finds indicated that the wole MN was not covered by Mathiassen's sequence, so that other phases would undoubtedly have to be fitted in later (Becker 1947, p. 113). There was also the problem that not all the settlement phases could have lasted the same length of time, could have been discontinuous or might have partly overlapped (Bagge 1950). Becker (l.c.) also pointed out local stylistic deviations from the sequence in Jutland and Scania.
Shortly after this, Becker (1950) used the MN sequence, on the basis of related finds, as a time-scale for dating southern Scandinavian Pitted Ware. Bagge (1951, p. 118) synchronized the Jutish Single Grave culture (EGK) (*) – dealt with by P.V. Glob (1944) – and the Swedish Boat-axe culture with the TRB sequence for the MN.
H. Berg (1951) and L. Kaelas (1951) proved that there had not yet been any passage graves in southern Scandinavia during the Troldebjerg phase, the first phase of the MN, thus providing an additional reason for preferring the term MN to 'Passage Grave Period'. Passage graves first appeared in the region during the Klintebakke phase. This phase was defined in a publication by Berg (1951) on the basis of a collection of refuse from a pit at KLINTEBAKKE on Langeland. The phase was placed between Troldebjerg and Blandebjerg in Mathiassen's sequence.
In their substantial publication on the pottery from Scanian dolmens and passage graves (I, 1950; II, 1952), Bagge and Kaelas also dated this according to Mathiassen's phase classification, although somewhat modified. In the book, Bagge provided a very readable survey of the southern Scandinavian MN typochronology, which I have used when writing this chapter.
Schwabedissen, too, adopted the new chronological system in his study (1953) on the pedestalled bowls of the North Group in Schleswig-Holstein and elsewhere.

In 1954, Becker wrote his well-known treatise on 'The Middle Neolithic Cultures in southern Scandinavia' (Becker 1954a). Finds from two pit-fillings in STORE VALBY and settlement finds at SVANEMØLLEVEJ in Copenhagen (Becker 1954b), were placed by Becker after Mathiassen's phases, as a final phase, MN V. This Store Valby phase is thus based primarily on two type sites on the island of Zealand, but it is also represented on the island of Langeland by pottery in a passage grave at SKOVTOFTE (fig. 11). The dispute between Bagge (1950, 1952) and Becker (1947) over the numbering or lettering of the settlement phases was resolved when Becker (1954a) conformed to Bagge's views. Subsequently, Becker (1954a) related the chronology of the remaining cultures of the southern Scandinavian EN and MN to the TRB sequence.
The resulting scheme (cf. fig. 13) swept triumphantly through those parts of Europe where the TRB or related cultures had existed (fig. 1). There were high hopes that this scheme would provide a chronology comparable with the Bronze-Iron Age chronology of Montelius and Müller for the North European Plain or that of P. Reinecke for west-central Europe. The Czechoslovakian investigators, including M. Zápotocký, E.F. Neustupný and E. Pleslová-Štiková, set up comparable schemes for the South TRB Group which connected it both with the Danish scheme and with the central German scheme for the southern DDR (see 2.6 and 2.19). J. Driehaus did the same in his monograph (1960) on the Altheim TRB Group (position shown in fig. 1), which has now become a standard textbook for that part of the Neolithic which corresponds to the EN and MN in central Europe. Kaelas (1955), Bakker (1962) and Knöll (1964) dated phenomena of the West TRB Group in terms of the scheme. Bakker (1962) also did this for the Vlaardingen culture which has several TRB types among its artefacts. Various writers have also dated the phases of the TRB East Group and Southeast Group by means of the southern Scandinavian system. T. Sulimirski (1968, p. 31-32) even applied Becker's (1957) typochronology for the Nordic TRB flint axes (which will be discussed later) to axes from other centres of production in the western Ukraine. A chronological scheme in J. Lüning's monograph (1967) on the Michelsberg culture, which is related to the TRB culture, would appear to indicate that not only the phases of the Michelsberg culture are exactly synchronous with those of Becker, but also even the stratigraphical sequence in the cave of LUTZENGÜETLE in Liechtenstein!

In the meantime, Becker continued his investigations of the MN. After the discovery of large numbers of 'stone-packing graves' (*) in Jutland – TRB earth graves packed with stones and including flint axes as burial gifts, but very rarely pottery –he undertook the tremendous task of tracing the different development stages of the thin-butted to the thick-butted heavy TRB flint axe on the base of the closed finds with pottery (Becker 1957). Until the result of this study became known, Mathiassen, Becker and the other neolithicists thought that the thick-butted flint axe had been introduced into Denmark from elsewhere in a fully developed state. What are now regarded as stages in the development from thin-butted to thick-butted were then seen as hybrids of the new thick-butted form and the old, disappearing, thin-butted form. This earlier view was based on, among other things, the erroneous conviction that all the artefacts from a standard settlement should be considered as a stylistic

unit. Pit by pit, Becker checked which axes were linked to which pottery phase, and then he discovered that Mathiassen's idea of a Trelleborg-phase (MN IIb) between the Blandebjerg-phase (MN IIa) and the Bundsø-phase (MN III) was quite wrong: the ages of the pit-filling at TRELLEBORG varied widely. There were approximately fifty pits with sufficiently recognisable pottery, including 1 which dated from the EN C, 3 from the MN Ib, 17 from the MN II, 4 from the MN III, 2 from the MN III or IV and 24 from the MN V. Most of the pottery was found in the 17 pits from the MN II and is identical with that from BLANDEBJERG and not with a later (sub)phase. At first it had appeared that TRELLEBORG was later than BLANDEBJERG because of the conspicuous feather-ornamentation on sherds from what now turned out to be MN III/IV pits (Becker 1956).

This case proved that extreme care was necessary with surface seriation of the refuse of settlements *in toto*. Becker (1956, 1957) formulated the principle that the only starting point for chronological investigation was 'closed', 'unmixed' pit-contents, i.e. those pit-contents whose pottery appears to be homogeneous. He gave a special warning, too, concerning thin layers of finds, because these repeatedly turned out to have developed in the course of long, although not intensive habitation (Becker 1956, p. 108).

Becker (1957) subsequently subjected the material from the other standard sites to a critical appraisal, the most important part of which was the investigation of the groups of finds with flint axes. He included, besides, a number of brief remarks which were of great importance for the pottery sequence. Becker distinguished five successive types of heavy TRB flint axes, four of which he named – rather confusingly – after the standard sites, although the axe types appeared to occur in more than one MN phase. Although he based his axe datings on his pottery analysis, I shall subsequently assume that these axe datings are mainly correct, and use the axe types according to Becker's chronological scheme (1957, fig. 8) as an extra indication of whether or not the groups of pottery finds were mixed.

MN Ia: In the eponymous TROLDEBJERG site there is an extensive layer, which, to judge from the foreign artefacts, was situated on the surface for at least the entire Stone Age. Although the principal period of habitation (and of most of the pottery) can be dated in the MN Ia, 15% of the datable TRB axes must be regarded as contamination from the MN V+IV (Becker 1957, p. 24-25, 36-37). No indication can be obtained from axe typology concerning the possibility of contamination from the EN C.

MN Ib: There need be no doubt about the purity of the pit contents from KLINTEBAKKE. The contents of three pits at TRELLEBORG, for example, established the credibility of this phase (Becker 1957; 1956).

MN II: the greater part of the settlement layer at BLANDEBJERG was covered by an obviously undisturbed layer of burnt wall-daub. The finds underneath this layer were typologically homogeneous (Becker 1957, p. 20; 1956, note 17). An ideal, extensive closed find, therefore, for radiocarbon dating, too!

MN III: The pottery from the thick settlement layer at BUNDSØ (without separately collected pit-fillings) revealed some admixture of MN I, II and V pottery (Becker 1957, p. 25 reported which illustrations in the publications are concerned). Becker (1956, p. 97) stated elsewhere that the differences between MN III and MN IV pottery 'are in many ways so vaguely defined as yet that it is difficult to decide with a few pot fragments, to which period they belong'. The axes from Bundsø include all the separately distinguished types. It would appear that contamination with older type axes is negligible, although contamination with axes dated in the MN IV-V is considerable, which might also indicate that Becker's typochronology of the thick-butted axe is less precise than he thought.

MN IV: From the material of the extended, uncovered settlement layer at LINDØ, Becker (1957, p. 25-27) separated a number of apparently relatively undisturbed assemblages (from pit-fillings, shell middens etc.) but he remarked that there was no certainty about the extent of disturbance. He left the groups of finds which contained no axes out of consideration. The 'absolute majority' of the pottery is, however, MN IV. The fact that only a very small part of the pottery is older and belongs to the MN I or II, is reflected by the low percentage of types of axe from this period (4-6%). The percentages of the later axe types do not contradict Becker's scheme, especially since 'a few' MN V sherds were also found.

MN V: Since Becker (1954b, a) had defined this phase on the basis of a series of pit-fillings containing homogeneous-looking pottery (of noticeably poorer quality of manufacture than the older TRB pottery) and TRB stone artefacts, this phase is flawless. Besides, the 17 pits with MN V pottery in TRELLEBORG have reinforced his conclusions (Becker 1956).

When Becker (1959) revised his chronological scheme for the Neolithic of southern Scandinavia on the basis of the above and on some changes in the data of some of the other cultures concerned, he deleted the Trelleborg phase in the TRB column, with the result that the Blandebjerg phase was renamed MN II instead of MN IIa. Fig. 13 shows this revised form. A less complete third version will be discussed in sections 6.8-9 (fig. 73).

P. Kjaerum suggested (1967) renaming the MN III as the Bundsø-Ferslev phase, because a considerable and varied group of pottery, offerings in a cult house at FERSLEV near Ålborg (Marseen 1960), was typologically almost homogeneous and could serve as a better standard than the rather contaminated BUNDSØ. No substitutes have as yet been

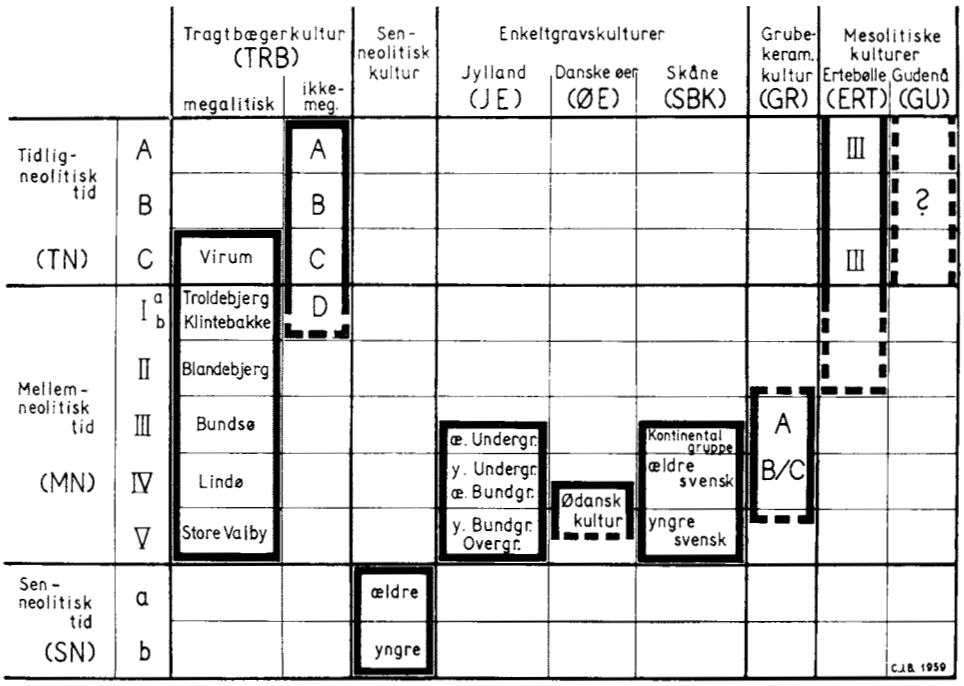


FIG. 13 'Diagram of neolithic cultures in South Scandinavia. Heavy lines indicate the duration of the different cultures; a broken line means a relatively uncertain dating' (Becker 1959, fig. 44, a revision of Becker 1954b, fig. 36).

published for TROLDEBJERG and LINDØ whose retention as type sites is not really possible, and data on the settlement at VIRUM which Becker (1954a, 1959) adopted as type site for the EN C in his chronological scheme have not yet been published. The stages of the settlement sequence EN C – MN V are essentially retained at the moment, but the sequence is based on a typochronological model which urgently requires codification.

This shortcoming is felt in particular by any foreign researcher not thoroughly acquainted with the Danish studies if he tries to relate his chronological system to the southern Scandinavian one, which, as we have seen, has become the chronological backbone for the whole of the northwest quadrant of Europe where TRB Groups are found (fig. 1). That this codification, however, involves a tremendous amount of labour will be clear to anyone who is familiar with this sort of work.

Fig. 14 gives an idea of how attractive a time-table one can arrive at when, proceeding from the partly corrected version by Bagge (1950), the most obvious defects in Mathiassen's scheme (fig. 12) have been brought up-to-date and supplemented with Becker's typochronology of the flint axes (1957, fig. 8) and K. Davidsen's investigation (1973) of the typochronology of the baking plates (section 3.4.4). The latter study also contains some remarks on the dating of the ornamental techniques and designs on other TRB pottery shapes.

Such a time-table should, ideally, be based on a local sequence and the frequency of occurrence of each diagnostic feature per phase should be determined to some extent for that location. The whole of even such a small country as Denmark is too large for this purpose. In this connection, Becker (1947, p. 113) had already pointed out differences in style between Jutland (and Scania) and the type sites. Proceeding from Becker's point, Kjaerum (1967) argued that the Bundsø-Ferslev style on Jutland and the island of Als is, at least partly, synchronous with the Blandebjerg style on Langeland and other Danish islands, which would imply that the MN II and the MN III are partly simultaneous. Winther (1943) had also asserted this. The difference in axe types at BLANDEBJERG and BUNDSØ (cf. Becker 1957) is, however, an important counter-argument, although little reliance can be placed on Bundsø as a type site, as scarcely any MN II axe types occur there (see above). (FERSLEV did not contain any axes.)

Kjaerum had arrived at his suggestion because of problems in interpretation of the temple at Ferslev. The bulk of the pottery there is in the MN III style, one pot is in the MN II style, the oldest sherds are in the MN Ib style. Kjaerum thought it was a temple which had been built in the MN Ib, filled with pottery mainly from the (immediately succeeding?) MN III phase, and then burned down. Three radiocarbon datings, too few perhaps, appeared to confirm this: two C14 datings for another burned temple in TUSTRUP (MN Ib) and one dating for Ferslev gave almost the same results.

In 1969, however, Kjaerum shifted the earliest pottery of Ferslev from Ib to early-II (Kjaerum 1969, note 24), and noted early and later MN II pottery in the KATBJERG-JORDHØJ passage grave in north Jutland. Becker (1973a) looked for a solution for the situation in FERSLEV in another direction. The excavation plan, which is not very clear, indicated that

there 'must have been not one, but two houses, the one succeeding the other, perhaps after an interval'. He also remarked (verbally, 1969) that oak temples like these could actually have lasted for centuries, unless they were accidentally or deliberately set afire.
On the basis of his research on the pottery from SÜSSAU, Kr. Ostholstein, and that portion of the sherds from BUNDSØ that are in the Kiel Museum, J. Hoika (1972) thought, on the contrary, that LINDØ and BUNDSØ (i.e. MN IV and III) were synchronous, a view which agrees to some extent with Becker's previously quoted remark that the borderline between the two style phases is so vaguely defined that difficulties arise with small sherds. Becker's axe typochronology is far less subject to these difficulties, although a check against the numerous axe finds at Süssau still has to be carried out.

In a treatise on the typochronology of the neolithic culture groups in the southern DDR, U. Fischer (1961, p. 419) expressed serious doubts about the possibility of retaining the phase subdivision of the Danish system; just as with Walternienburg and Bernburg, we may well be dealing with style traditions which overlap geographically and which 'penetrated each other's sphere of influence in several ways in space and time'. Two points must, in my opinion, be kept separate here, viz. the question of the correctness of the local sequence on Langeland, and that of the applicability of the Langeland sequence to the phenomena elsewhere in the North Group.
As far as the correctness of the local sequence on Langeland is concerned, we are doubtlessly dealing with successive phases as, in the centre of an island, at a distance of no more than 20 km from each other, phases B, C, Ia, Ib, II and IV are represented separately in settlements, and V, in graves (fig. 11). It may be no coincidence that style III, which was not found there, is now causing theoretical difficulties, and that the suggestion is being made to equate it with II or with IV.
The second question is whether the style horizons of Langeland do not cross-cut each other elsewhere. This question will be discussed in section 6.1 for some horizons which occur in both the West and North Groups. Some detail horizons of the pottery shape and ornamentation do indeed cross-cut, but, even over this distance, not to any extent which would indicate that the local sequence would deviate completely here or there from the supposed main line of the typological development of the pottery of the two groups. Of course a lot of work still remains to be done in this respect before we can consider that Fischer's doubts have been proved groundless. This entails mapping the provinces to show every detail which is thought to be significant for the typochronology, and reconstructing for many places the local sequence of the development of the pottery.
The maps that are available, do not seem to bear out Fischer's objections, generally speaking. To this can be added the fact that radiocarbon dating has confirmed the very detailed chronologies of the workers in Denmark and Czechoslovakia, by greatly extending the available time limits.

2.19 MODIFICATIONS IN NIKLASSON'S SYSTEM (1951-1953)

We stated in section 2.6 that Kupka and Niklasson systematised the typochronology of the Walternienburg-Bernburg Group. The latter author distinguished the successive phases Wa I, Wa II, Be I, Be II, Be III in what was thought to be a smooth development, and he and many others liked to regard this system as the chronological framework of the later Neolithic in the Elbe-Saale region. We have already seen that it is highly improbable that Niklasson and Kupka pictured this framework as a rigid 'chest of drawers', but some of their successors may, unconsciously, have come to do this.
In any event, U. Fischer (1951, 1953, 1961) turned against such a rigid model. Knöll, G. Mildenberger (1953) and Fischer pointed out, simultaneously and independently (Fischer 1951, note 41), that the Bernburg I phase was actually a 'contact product' between the Walternienburg and Bernburg styles. The former, with its 'angular' shapes, is closely related to the western Tiefstich pottery in the northwest, the latter, with its 'blown-up' shapes, with the Bohemian-Moravian ones in the southeast. H. Behrens (1961) compared Walternienburg-Bernburg therefore with a Janus face.
Fischer (1951) checked the available data and found, partly on the basis of Niklasson's table (1925, p. 113-118): (a) that Niklasson's phases actually occur separately; (b) that Wa I and Be II are repeatedly found together with Wa II and Be III respectively; (c) that the Walternienburg style is related to Salzmünde and to the earlier Passage Grave Period Tiefstich pottery; and (d) that Bernburg III is closely related to the Globular Amphora culture (KAK) which had to be dated after Salzmünde and the earlier Passage Grave pottery. He concluded that Bernburg started later than Walternienburg, and that the styles overlapped for a short time (fig. 15). 'In this way, the rigidity of Niklasson's system could be softened appreciably' (Fischer 1951).
It is clear from Fischer's description of his chronological model (1961 p. 417) that he visualised a sliding sequence of the type of fig. 12. It is of course an advantage that one important aspect of Niklasson's typochronology was corrected, but that does not automatically exclude the possibility of a few further refinements in the typochronology for Walternienburg-Bernburg, and even less does it imply that it has, in its improved form, lost all credibility of usefulness. This pottery is still worthy of attention as a potential chronological framework

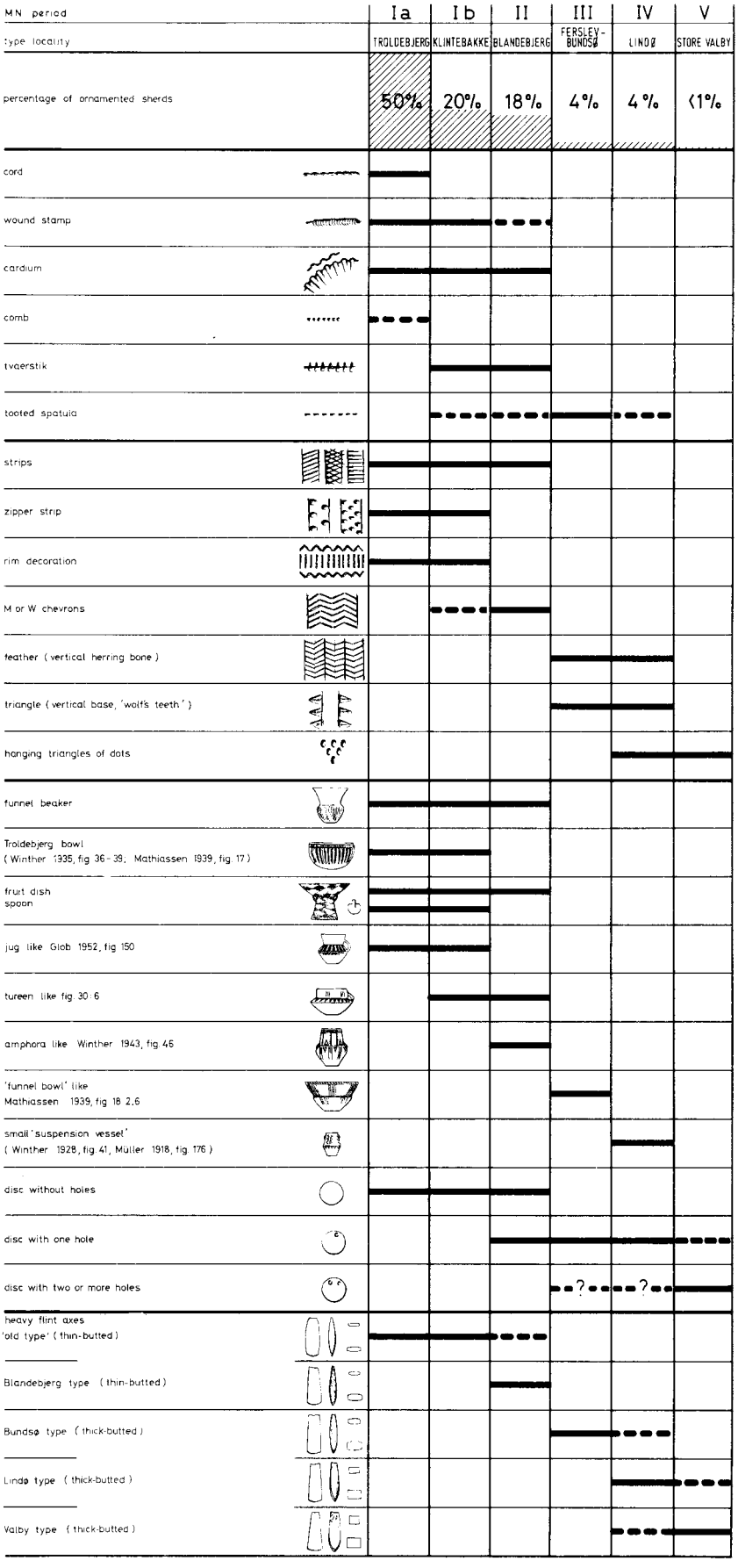


FIG. 14 Very provisional revision of fig. 12. The pottery features after Bagge & Kaelas 1950, Berg 1951 and Becker 1954a (but note considerable discrepancies to Ebbesen 1975), the baking plates after Davidsen 1975 and the flint axes after Becker 1957.

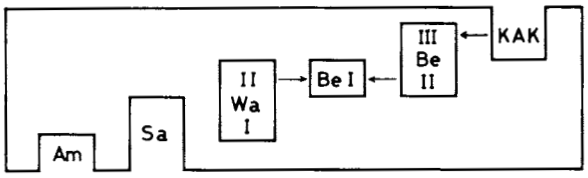


FIG. 15 Succession of Altmark, Salzmünde, Walternienburg, Bernburg and Globular Amphora pottery in the southern DDR, after Fischer's description. Arrows indicate influences or contacts.

precisely because of the links it provides between east and west, and a new analysis of the finds, which have undoubtedly increased since the twenties, would be timely.
Mention was made at the end of the preceding section of Fischer's doubts concerning the Langeland sequence – doubt resulting from his own discoveries with Walternienburg-Bernburg. Will the possible incorrectness of his scepticism towards Langeland contribute, in time, to a lessening of the doubts he entertained about the Walternienburg-Bernburg sequence?

2.20 RESEARCH IN NETHERLAND (1950-1970)

After Kat-van Hulten gave up her archaeological work about 1950, no further work was done for a while on the study of Tiefstich pottery in Netherland. The Groningen institute recovered almost casually a number of finds during the last large-scale land reclamation schemes in Drente. But Van Giffen and the other archaeologists occupied themselves mainly with other subjects. It is of great importance, however, that Van Giffen actively stimulated the development of two auxiliary sciences during these years.

An assistant appointed for the purpose, H.T. Waterbolk, developed the technique of analysis of buried and fossilised pollen from the old ground surface and sods of sandy barrows (Waterbolk 1954). By this technique, the grains of sand are removed with hydrofluoric acid. Subsequent research by Waterbolk (1956), W. van Zeist (1955, 1967) and W. Groenman-van Waateringe (1961, 1962) established that neolithic cultures in an area such as Drente often have their own characteristic pollen spectra, partly as the result of having a different economy. Unfortunately, the method has not yet been adopted to any great extent abroad, so that it has not yet been possible to check differences per type of soil for, e.g. the TRB groups. Recently, however, a detailed investigation using this method was carried out on the pollen spectra from the EN A/B basic layer of Long Barrow 8 at SARNOWO, Kuyavia (Dąbrowski 1971), and Groenman investigated samples from the barrow of Megalithic Grave IV at OLDENDORF on the Lüneburg Heath (unpublished, cf. Laux 1971) and the long barrow at LINDEBJERG in Zealand (unpublished, cf. Liversage 1970).

At the same time, H. de Vries, subsidised and encouraged by Van Giffen (Waterbolk 1974, p. 230), rendered W.F. Libby's C14 method operational (1952). Since that year, in fact, every archaeologist in Netherland has worked with radiocarbon datings, has known how to take samples, and has actually taken them. There is a long time-lag in this respect in some other countries. De Vries made material improvements in the C14 method, including that of first burning the carbon, whose radioactivity is to be measured, to carbon dioxide, as this gas can be led easily through the measuring tube, thus making a more accurate measurement possible than with the previous solid carbon method. He was also the discoverer of the De Vries effect (cf. Waterbolk 1974).
Mention should also be made of J. Wieringa's publications on the subtle relation between the locale of the hunebeds and the differences in soil type, ground water table, etc. in southeast Drente (1954; 1958; 1968).

About 1953, L. Kaelas (Stockholm) came to study the Dutch-Northwest German Tiefstich pottery, when she again tested the ideas of Forssander (1936; see 2.13) concerning the great antiquity of the hunebeds here. She did indeed find that the oldest passage graves here were built in the EN C (Kaelas 1955), whereas in Scandinavia none is known before the MN Ib. I shall return to this question in section 6.1 and Chapter 7.
Kaelas questioned Van Giffen's degenerative series of shapes of graves (see 2.9). It appeared, on application of Forssander's principle (see 2.13), that the pottery datings proved that flat graves had already been in use since the early Drouwen style. K. Michaelsen (1936) had previously come to the same conclusion. Kaelas (1955, 1959) paid scant attention to Van Giffen's three style periods, an omission which was the cause of some scepticism among Dutch neolithicists, concerning Van Giffen's sequence.

Greater attention was now again being paid to the TRB culture, and this was primarily expressed in a few short articles, whose subjects included that of the distribution aspect of this culture. A. Wouters & W. Glasbergen (1956) published illustrations of pottery found during the 1930's at HERPEN, in Noord-Brabant, south of the big rivers (Rhine, Meuse, etc.). They, just as Van Giffen and W.J.A. Willems had done before them, regarded these sherds as TRB pottery, but, in so doing, they overlooked the fact that W. Kersten had in 1939 already recognised that they came from Late Bronze Age *Kerbschnitturnen,* which were decorated with the Tiefstich technique (Kersten 1948). The additional argument of Wouters and Glasbergen, viz. the occurrence of neolithic, transversal flint arrowheads

south of the big rivers is not valid either; one can also think now of Seine-Oise-Marne or Vlaardingen contexts.
I discussed the Tiefstich pottery which was found during the 19th century at LAGE VUURSCHE in mid-Netherland (1957). A. Bruijn (1958) and G. Elzinga (1963) studied sherds from the Drouwen settlement at ELSPEET on the Veluwe. Glasbergen (1961) published an Early Havelte earth grave at KISVELD (east Gelderland). C.C.W.J. Hijszeler and A. Bruijn discovered and investigated the remains of demolished hunebed O2 at MANDER in the east of the province of Overijssel in 1957. Waterbolk (1958) published a survey of the Drente flat graves, in which he suggested that they are nearly always situated 2½ km or more from the hunebeds. Elzinga (1961) discussed two earth graves at ALLARDSOOG. S.J. De Laet considered in *The Low Countries* (1958, p. 87) the possibility that the Drouwen and Early Havelte styles represent two different, but contemporary, traditions. He did not explain this further (influence of Sprockhoff's two traditions (1938) or of Becker's megalithic and non-megalithic tradition (1947)?). This remark was omitted in *De voorgeschiedenis der Lage Landen* by De Laet & Glasbergen (1959), the successor to De Laet's book, where a brief report was given of the views of Van Giffen and Kat-van Hulten.

In private discussions, Kaelas had stressed the importance of settlement investigation for chronology. After the investigation of the Bandkeramik settlements by P.J.R. Modderman and H.T. Waterbolk had turned out to be very successful, the Groningen institute (BAI), under Waterbolk as director, and encouraged by Glasbergen, started settlement investigation of the TRB culture in 1957; a little later, the corresponding university departments at Amsterdam (IPP, director Glasbergen) and Leiden (IPL, director Modderman) followed the Groningen example.
The excavations of settlements followed now in quick succession: ANLO in 1957-58 (Waterbolk 1960, see Appendix B2); SCHIPBORG in 1959 (Van der Waals 1962); LAREN in 1960 and 1963 (Bakker, see Appendix B11); ANGELSLO in 1960-1968 (Van der Waals 1964a, 1973, see Appendix B1); BEEKHUIZERZAND in 1964 by Modderman and G.J. Verwers (Appendix B3); ELSPEET in 1965 by A. Bruijn and myself (Appendix B7); VALTHE in 1965 (J.E. Musch 1970); UGCHELEN-3 by J. Maris and R.S. Hulst (1972, cf. Appendix B16). In most cases these were only parts of a settlement, with a very thin scattering of sherds.
No clear outlines of houses or other wooden TRB constructions were convincingly established, but the question has been raised whether the wooden palisades of a kraal-like construction embedded in ditches, which were found at ANLO (Waterbolk 1960) and UDDELERMEER (Holwerda 1911, 1912) should not be assigned to the Early Havelte style phase E, settlements of which were also found there, rather than (as at Anlo) to the Early Bronze Age Barbed Wire pottery horizon. In this connection I refer the reader to section 1.2f above. In my opinion, the strong podzolisation of the kraal traces argues against TRB association. Besides, the assignment to TRB would imply that this culture had here no other constructions with heavy interred posts since these were not found.

While doubts concerning the 'closedness' of all the finds from most of the standard sites were confirmed in Denmark (Becker 1956, 1957), in Netherland it turned out that none of the settlements, with the exception of SCHIPBORG produced refuse from more than one or two of the subsequently distinguished pottery phases A-G. This characteristic held even if the site was open, with a thin refuse layer containing few finds and without pits. (See 1.2e for a possible explanation for this difference.)

After Van Giffen retired from his position as head of three institutes[28] he started, with undiminished vigour, on the restoration of the 53 hunebeds which are still in existence in Netherland. A self-imposed task, which he brought to a conclusion shortly before his death in 1973. In principle, Van Giffen's restoration work included small trial excavations. The plans of the hunebeds (Van Giffen 1925-27) could thus be supplemented with the establishing of the position of the extraction holes of vanished standing stones. The position of these holes is indicated in the ground with slabs of concrete. Hunebeds D41, D43A and D43B near EMMEN now turned out to have had a normal entrance so that the 'hunebed chamber without an entrance' could be dismissed as a Dutch type (Van Giffen 1962). The discovery of an earth grave with two decorated funnel beakers under the entrance of hunebed D32 at ODOORN, was additional confirmation that single earth graves were constructed in our country during the entire TRB period, including the megalithic phase (Van Giffen 1961a; but see 6.9). A group of three small, undecorated, stacked pots, which was found outside the peristalith of the hunebed D20 at DROUWEN, seemed to prove the existence of a pre-megalithic 'Pre-Drouwen Phase' in the West (Van Giffen & Glasbergen 1964; see, however, section 6.2).

More extensive investigations on the shape and the contents of hunebeds have also been carried out, but have not yet been followed up by a 'complete' publication. In 1957, the ruined part of the chamber of hunebed G1 at NOORDLAREN was investigated by Van Giffen, J.F. van Regteren Altena and myself; in 1968 and 1970 the stratigraphy of the recently little disturbed filling of the chamber of hunebed D26 was examined by Van Giffen, Glasbergen and myself; in 1969, 1970 and 1971, the plans of the destroyed hunebeds G2 and G3 at GLIMMEN, which were discovered by J.E. Musch, were investigated by J.N. Lanting (cf. Lanting 1975).

The inventories of earth graves in HOOGHALEN (Bakker 1970), DENEKAMP and ANGELSLO-I4 (Bakker & Van der Waals 1969, 1973) which were published during this period, are illustrated and described in Appendix B.
Bakker & Van der Waals (1969, 1973) recognised a Middle Havelte style in Drente, and advanced arguments for considering the Late Havelte as a continuation of the MN V horizon in the area of the North Group. The occurrence of a sherd of a 1a Protruding Foot Beaker (*) in flat grave 14 at ANGELSLO indicated that Becker's scheme for the Neolithic Scandinavia (fig. 13) should be revised (see section 6.8 and fig. 73).
During this period I documented the sites of TRB culture finds in Netherland and in Germany to the west of the Ems. The results of this work will be published later. It is outside the scope of the present book to mention all the newly discovered sites of finds which have been reported to me by R. van Beek (Dalfsen-Ommen), J.E. Musch (northeast Drente), G. de Leeuw (Assen Museum), R.S. Hulst (Official Archaeologist for the Province of Gelderland), A.D. Verlinde (id. for Overijssel), O.H. Harsema (id. for Drente), G. Elzinga (id. for Friesland) and R.H.J. Klok (central documentation ROB) and several others.

2.21 LATEST DEVELOPMENTS (WRITTEN IN 1977)

After the previous sections and the rest of this book had been written (1972, 1975), several important publications appeared, especially in Denmark. In Netherland, L.P. Louwe Kooijmans' *The Rhine-Meuse Delta* (1974) describes the habitation of this wet area which was avoided by the TRB population. Yet, during recent excavations on the HAZENDONK in that region, he discovered a few TRB sherds (note 3:10). A review of the neolithic cultures in N.W. Europe by the same author (1976) clarifies the general picture. J.A. Brongers and P.J. Woltering (1973) dealt with the TRB culture in their study of prehistoric economy and technology in Netherland. Quite recently, J.N. Lanting and W.G. Mook (1977) presented a detailed discussion of all Groningen C14 dates available for the pre- and protohistory of Netherland. This publication also proposes corrections of the 'Periodization of Dutch Prehistory' (*Berichten ROB* 15-16, 1965-66, p. 7-11).
The finds from the Early Havelte settlement at BEEKHUIZERZAND (Appendix B3) were published (Modderman, Bakker & Heidinga 1976). There was a good sample of undecorated pottery on this site, including a collared flask.
In 1970, C.W. Staal-Lugten finished a study of the typochronology of the more complete and decorated TRB vessels in hunebed D19 at DROUWEN.
P.J.R. Modderman now published an abstract of her work (Staal-Lugten 1976). Staal had prepared tables of the chronological succession of ornamental motifs on different parts of the pottery. In general, the main succession developed by her is not in contradiction to mine. Most of her phases concern the sequence D1-E1 of the present volume, viz. the pottery which is the most numerous and the trajectory which gave me most trouble (section 3.3).[29]
J.D. van der Waals, J.N. Lanting, W.G. Mook and A.E. Lanting published several articles about the Beaker chronology in N.W. Europe. Part of these will be dealt with in sections 6.8-9. K. Davidsen (1977) published a short article on the relation of Valby, Late Havelte and Single Grave pottery in Denmark and Netherland, which will be discussed in section 6.8.

For N.W. Germany, I mention here a lecture by F. Laux (Würzburg 1975, not yet published). He concluded that the megalithic graves between the Elbe and Weser were used only once for interment, or only by one generation, and he devised a neat cross-table of megalithic grave types and pottery stages. The latter are generally parallel with Knöll's and mine. Of the recent publications by H. Knöll (1974a-b, 1975, 1976), 1974b presents the relevant pieces of comparison to the ISSENDORF finds (not all data are dealt with in the present volume).

In Denmark, a new generation of TRB specialists has caused an eruption of publications in the archaeological journals and in the new series of monographs *Arkaeologiske Studier* edited by C.J. Becker. J. Skaarup (1973) analysed the old stratigraphical series of finds from SØLAGER and the unstratified artefacts from HESSELØ. He found that there was little evidence for a symbiosis of TRB farmers and latest Ertebølle hunter-fishers and he could prove that the EN and MN TRB culture had its own catchment settlements. (See also a review of this publication by D. Liversage (1973).)
N.H. Andersen (1974a-b, 1975a-b, 1976) found the first real stratigraphic sequence of MN pottery phases in the fill of ditches of a BÜDELSDORF-like defended settlement at SARUP on Fyn. K. Ebbesen (1975) tabulated the ornamental motifs of the numerous complete vessels from the passage graves of the Danish Isles. His matrix of these data intends demonstration that the traditional sequence of the MN settlement phases is mainly correct, but that it could better be replaced by a sequence of style phases. He also pleads for the existence of an MN IVA and an MN IVB. So far MN IV was a weak link in the sequence (section 2.18), but it is now consolidated by a large number of pottery from the graves. (See my review, Bakker 1977.) Ebbesen will publish a similar treatment of Jutish MN pottery. K. Davidsen, who disagrees with Ebbesen's MN IVB, will soon publish his book on the final stage of the TRB culture. He wrote several articles on the relation of TRB, EGK and KAK (*) in Denmark. E. Jørgensen (1977) published the excavation reports of a large number of megalithic and stone-packing TRB graves and EGK barrow graves in an area, 4 by

5 km, at VROUE in north-central Jutland. His assignment of the 'Hagebrogård style' pottery from the passage grave of HAGEBROGÅRD to the MN Ia unsettles – if generally accepted – the prevailing concept (section 2.18, also adhered to in the present volume) that no North Group passage graves were constructed before the MN Ib (cf. section 6.9, radiocarbon dating).

B. Hulthén (1977) researched manufacturing technology of TRB and other prehistoric ceramics in the HAGESTAD area in S.E. Scania by several laboratory techniques. She was able to demonstrate continuities and discontinuities in the local potting traditions, and to trace the places of origin of the different clays used for the TRB vessels. No doubt, this kind of analyses will before long be considered as an indispensable complement to typological research of prehistoric pottery.

Of different scope is a study by K. Randsborg (1975). He discerned social dimensions in Early Neolithic Denmark by using statistical spatial analyses of the type he had also applied for the Early Bronze Age in Denmark.

Some of the data of these publications are already used in sections of this book, but their real integration was, naturally, out of the question.

CHAPTER 3

Detailing and combining the pottery sequences of Knöll and Van Giffen

Knöll's chronological model (1959, p. 97 and 154) was a rough sequence model (fig. 16). A more detailed sequence might, however, be expected for the many centuries which are covered by the sequence. Section 1.3 and figs. 5-6 indicated that after combining and detailing the pottery sequences of Knöll and Van Giffen, a system was obtained of 7 or 8 partly overlapping phases (A-G). This chapter indicates how this combination was done. The major conclusions will be described and accompanied by illustrations in Chapter 4.

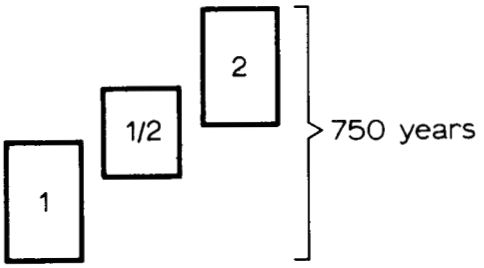


FIG. 16 Sketch of Knöll's model of the succession of his three phases of the West Group (1959, p. 97, 154).

3.1 THE TWO PILOT SERIES: SHOULDER POTS AND BOWLS + PAILS

The typological sequence of each pot shape was described step-by-step by Knöll. These series were subsequently synchronized by him on the basis of typological similarities, after which he subdivided them into three phases.
The step-by-step description of the sequence of each pot shape, however, revealed many more dividing lines, and I have used these for a further splitting into phases. Basically, two series of pot types were diagnostically useful for Knöll's typochronology, viz. (a) that of the bowls + pails and (b) that of shoulder pots (see Appendix A2c for type definitions). I have called them here the pilot series (cf. the *fossile indicateur* and the typological method as described by Montelius 1885 and 1903, compilation in Eggers 1958).

The pilot series were described in 12 pages of text (Knöll 1959, p. 64-76). The approximately 400 illustrations to which this text refers were, however, distributed among the photographic plates in such a haphazard way, that it is difficult to follow the argument. For this reason, I started with mounting copies of these illustrations in the order in which they are mentioned in the text. In general, the pilot series then turned out to look very plausible.
To facilitate working with these, I attached letters to the text so that each stage of the pilot series could be referred to. Since it was impracticable to reproduce the passages with the accompanying photographs in full, I am indicating these passages here by page-number and, in brackets, the numbers of millimetres below the top edge of the type area of Knöll's book (see Appendix A1 for the system of abbreviations for references to the illustrations). Self-evident corrections have already been included in the following lists.

Shoulder pots
(see however section 3.2 for the *amphorae*)

Knöll 1
K = p. 64 (102-155)
L = p. 64 (155) – 65 (104)

Knöll 1/2
M+N = p. 65 (170) – 66 (105). Not K11:4; K1:15; K1:4.
O = p. 66 (105) – 67 (80). Not K2:1, 15; K5:2; K6:5-6. K4:3, K3:6 and S45:3 belong to M.

Knöll 2
P = p. 67 (132) – 68 (55), but only insofar as named on p. 170 as belonging to Knöll 2. S47:5 belongs to M. K6:2 belongs to N.
Q = p. 68 (55-110)

Bowls and pails

Knöll 1	R	= p. 70 (130-190)
Altmark	S	= p. 70 (190-220)
Knöll 1	T	= p. 71 (0-40)
Knöll 1-½	U	= p. 72 (15-95)
Knöll 1/2	V	= p. 71 (40-105).K16:11 belongs to U.
	W	= p. 71 (110) - 72 (15)
	X	= p. 73 (10) – 74 (25)
Knöll 2	Y	= p. 74 (25-170)
	Z	= p. 74 (170-200)

The following modifications can be made:

1 The bowl group S, with its triangles below the rim, is typical of Altmark pottery (*).
Its chronological position will be discussed in section 6.4.

2 With the bowls and pails, Knöll drew a dividing line (V/W; p. 71 (110)) at the point where 'the zigzag line directly below the rim is replaced by a horizontal line, which is always a tvaerstik line, or something similar'. Nearly all the W-pots quoted as examples by Knöll show a predominance of the tvaerstik line as far as the horizontal lines are concerned, in contrast with the preceding stage (V) where this occurs very rarely or not at all.
We would expect the same dividing line in the series of the shoulder pots. Here, however, Knöll described, in the same breath, the shoulder pots corresponding with both of the bowl groups as 'sharply profiled', and mixed them up (M+N). I subdivide this group into M = shoulder pots without horizontal tvaerstik lines and N = those with them. If that is done, we can see that the 'narrowing of the shoulder' which Knöll observed for the subsequent phases (O+P) starts in N already, and that the transition of the latest jugs to the tureen is now nicely demonstrated. The general correctness of this subdivision is illustrated by the extensive, probably closed, pottery assemblage from HOOGHALEN (figs. B4-5). This group contains T bowls and L and M shoulder pots, but no N or W pottery or any with subsequent letters. The finds from ZEIJEN (figs. B12-15) provide another example.
The point should, however, be made that, in N and W, the tvaerstik lines should run horizontally. The occurrence of the horizontal tvaerstik line is, of course, related to the occurrence of horizontal ornamental lines. Not until 'the horizontal ornamentation begins to dominate the vertical' (Gummel, Knöll) did the horizontal tvaerstik line emerge and flourish in the West, in phases N and W. Previously, the vertical tvaerstik line had occurred in the West, though rarely. Besides transversely printed dashes or trapezes (which can be easily distinguished from the later, genuine tvaerstik line: K1:5, K25:1), a vertical genuine tvaerstik line had also appeared sometimes, and this was to become a normal occurrence on N-W and O-X pottery. On Altmark pottery, though, the fairly broad rungs of the ladders from a phase which corresponds with L-T (and K-R?) had often been executed in horizontal tvaerstik.

3 Judging from the lower ornamentation, group U of the bowls and pails, without diagnostic upper ornamentation, runs parallel with phases T and V. I subdivide them into U1 and U2, which will be roughly synchronous with T and V respectively. There is occasionally a U3 to be distinguished, presumably synchronous with W. In the absence of a complete upper ornamentation with zigzag lines, other criteria have to be applied, viz. those of the lower ornamentation. It is clear that such a switch-over to other criteria, which will not necessarily be exactly synchronous with the first ones used, leads to a greater margin of error.

4 According to the research of Van Giffen and his successors in Netherland, the Tiefstich sequence ended with the Havelte style phases. Knöll classified pottery from Early Havelte in P and Y, in the first half of his phase 2, and the few pieces of pottery from Late Havelte which he had documented in Q and Z, in the second half of phase 2.
The large majority of Q and Z consists, however, of a jumble of pots which cannot be classified in the preceding phases: a) undecorated, partly of excellent quality,[1] and b) shoddily decorated or carelessly shaped or of poor quality. These should be dismissed as pilot types.
Knöll was deceived here by the old cyclical theory, which implied that the final stages 'reflected the disorder, weariness and neglect of a craft that had long since lost the conviction and the support of the artist' (G. Schwantes 1939, p. 207, quoted by Knöll 1959, p. 83). Though Knöll argued (p. 83, 84) that, to judge from the closed finds, there had been undecorated pottery and the products of 'bunglers and beginners' at every stage, he did not draw the one correct conclusion from this, viz. that neither the absence of ornamentation, nor lack of care, nor shoddy workmanship, provide, in themselves, any criteria for dating.
Yet the real Late Havelte pottery was *not* made more carelessly or shoddily than that from preceding phases. The extent of the decorated surface decreases sharply in the course of the Havelte phases, to almost nil in Late Havelte. But it is easy to recognise these few remnants of ornamentation as characteristic for these phases.
Now that the blemishes have thus been removed from Q and Z, a few words are in order concerning the pilot types of Late Havelte. These are the 'necked bowls' (Dutch: *randkommen* or *halskommen*,

German: *Halsrillengefässe*) (fig. 36: 2, 4, 10, 12, 13) which will be subsequently indicated with the symbol Ю, and the bowls with horizontal, frequently transversely grooved cordons (fig. 36: 1, 15), indicated with the symbol Я.
We have already mentioned that Bakker & Van der Waals (1973) fitted a Middle Havelte phase in between Early Havelte and Late Havelte. A transitional type between the amphora and the pail was characteristic for this phase, which is indicated with the symbol Э (fig. 35, left).

5 Furthermore, Knöll classified a few small pots at the tail-end of Y, although they are not particularly characteristic of Early Havelte and, in my opinion, can be better considered as examples of an older stage, with an incomplete execution of the then customary ornamentation. The clearest cases are the mini-tureen 14c and the two identical little bowls 13b and 24 in the pottery group from ZEIJEN (Appendix B17, figs. B12-B15). Knöll gave, without further explanation, the same dating for the tureen as the one we prefer. It is clear that the finicky work of applying the complete customary ornamentation in miniature to this small pot was omitted, and that the pot belongs to stage M. Knöll classified, however, both bowls in Y, but they are not typical examples of Early Havelte and, in my opinion, can be considered as incompletely decorated examples of stage T (fig. 17 indicates how I see this). This involves therefore, an analogy with types U1-3 where the upper ornamentation is also 'incomplete'.
The pots which were recovered (without being further documented) from a tumulus in BÖRGER in 1889 (Schlicht 1967) appear to be such a homogeneous group, that the only bowl which shows any deviation, S49:4, and which Knöll classified in Y, should still be grouped with all the others. In this case, however, it is far less obvious that this bowl does not belong to Early Havelte. Yet, the upper ornamentation without zigzag lines and openings and the rather narrow rectangular areas underneath do not give the impression of typical Early Havelte. There are no direct parallels in the closed finds of this phase. Assignment to stages V, W or X would agree well with the dating of the rest of the pottery from this group.
I am also sceptical about some other bowls in Knöll's tail-end of Y. I would rather have dated K21:14 somewhat earlier (X?), and the limited surface area alone of the mini-pots K17:9, 18:11, 19:2, 13 and 20:7 permits only a sketchy ornamentation. It is better not to classify such pots.

3.2 AMPHORAE AND LUGGED BEAKERS

The *amphorae* are the pilot type for stage P in the series of shoulder pots because one-handled tureens and jugs scarcely occur any more. In the preceding stages the amphorae are less frequent than one-handled tureens and jugs. Besides, it is then often difficult to synchronise the amphorae in a satisfactory way with jugs and tureens, since the profile appears to follow its own rules (lagging, to some extent, behind the tureens and jugs?), and in L, M and N the ornamentation continues on to areas of the lower part of the belly, too.
The *lugged beakers* are good pilot types. They do not occur after the first three stages. They combine the upper ornamentation of the pails and bowls with the belly decoration of the shoulder pots and the profile of the funnel beaker (Knöll 1959, p. 81). Because of this, Knöll was able to base some synchronisations of the pilot series more soundly. The lugged beakers are, unfortunately, extremely rare. Knöll quoted only fourteen from the area of the West Group plus the German part of the North Group. In the Scandinavian part of the North Group the lugged beakers deviate somewhat from the above. Since several authors have accurately established the positions of these lugged beakers within their chronological systems (Langenheim 1935; Sprockhoff 1938; Becker 1947; Nilius 1971; Rech 1971), this type provides starting points for tele-synchronisations of the western system with that of the North Group; it should be noted, however, that these authors are often in complete disagreement. I shall subdivide Knöll's text in accordance with the method used already.
H = Knöll, p. 81 (190)-82 (45).He suggested the possibility of a subdivision: H1 with a more or less spherical belly, covered with ladders etc.; H2 with a slightly pinched belly, sometimes with chevron bands between strips as in H1.
I = p. 82 (45-83).
J = p. 82 (83-112).
According to Knöll, stage H forms a bridge between the R bowls and pails and the K jugs with which it is contemporary. Stage I combines characteristics of S or T with those of L. Stage J has the upper ornamentation of V. There are examples from DÜMMERNORTH (Reinerth 1939; Becker 1947, fig. 48) and HELVESIEK (Dehnke 1970).

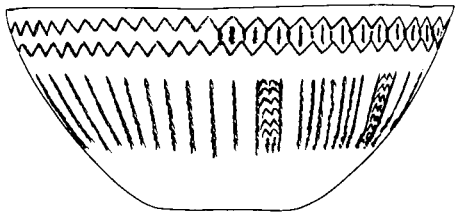


FIG. 17 'Incompletely ornamented' bowl 13b from Barrow II at ZEIJEN (cf. Appendix B17, figs. B12, 14). On the right hand side the decoration has been 'completed' following examples more typical of its period. Assen museum.

3.3 THE SEQUENCE TESTED AGAINST THE FINDS

If the stages of the pilot series are combined in accordance with the preceding criteria, the (sub-) phases A-G appear as follows:

A	= Drouwen A	(fig. 28)	= K + R + H	Knöll 1
B	= Drouwen B	(fig. 29)	= L + T + U1 + I	
C	= Drouwen C	(fig. 30)	= M + V + U2 + J	Knöll 1/2
D1	= Drouwen D1	(fig. 31)	= N + W + U3	
D2	= Drouwen D2	(fig. 32)	= O + X	
E	= Early Havelte	(figs. 33-34)	= P + Y	Knöll 2 (or Havelte)
F	= Middle Havelte	(fig. 35)	= Э	
G	= Late Havelte	(fig. 36)	= Ю + Я	

Fig. 18 indicates the distribution of the contents of different groups of finds over the various phases. At first sight this is very satisfactory: *none of these assemblages ranges over more than two, or at the most three, successive sub-phases (which are partly overlapping in time).*
A closer look, however, brings to light an abundance of questions.

1 The number of assemblages included in fig. 18 is small. They come from the enormous area stretching from Amsterdam to the Weser (only HAINMÜHLEN lies to the east of this). The list consists of various categories of finds: settlement refuse, earth graves, stone cists, entire cemeteries, offerings in a temple, finds from a hunebed barrow. More seriously, some of the assemblages are accidental finds, which were later assumed to be closed finds on the ground of typological homogeneity. If settlement finds such as SCHIPBORG (Van der Waals 1962), GELLENERDEICH (Pätzold 1955; Bakker & Van der Waals 1973) or OHRENSEN (Dehnke 1940) gave the impression of being heterogeneous, this could be explained by arguing that these places had *evidently* been occupied more than once, which does not, by the way, appear to be improbable.

2 West of the IJssel, the horizontal tvaerstik line seems to have been extremely rare, though just one new group of finds could change the picture considerably. This virtually complete absence implies that, by definition, phase D1-2 is hardly found here, and that assemblages such as LAREN and ELSPEET, or UGCHELEN 1-3, UDDELERMEER and BEEKHUIZERZAND (see Appendix B for illustrations), containing C-pottery or E-pottery contrast nicely to the (absent) D.[2] Was the Veluwe not inhabited by a TRB population during phase D, or was C and/or E pottery made there while D pottery was manufactured elsewhere? – and was there suddenly a radical change of style from C to E? (See also section 6.6.)

3 These typological criteria permit an accurate determination of only a small part of the total quantity of pottery. The rest can frequently not be placed any more accurately than in a few sub-phases simultaneously.
The evidence for this includes an analysis by A. Boomert, R.W. Brandt and P.J. Woltering (1970, 1971) of the pottery from hunebeds D43A and B, the two hunebeds within the peristalithic longbarrow of EMMEN-Schimmeres. In spite of an investment of many man-hours, only 45% (1173) of the decorated sherds (2588) and 3% (79) (!) of the 2883 undecorated sherds could be assigned to 242 TRB pots and 2 vessels from other cultures; i.e. only 23% (1252) of the total number of sherds turned out to be usable. We should note here, though, that recent digging into these hunebeds had resulted in the removal of considerable material and that a puzzle with many missing pieces is most difficult. Besides, the study carried out by this team was not exhaustive.
The 242 TRB pots included 72 shoulder pots and 123 bowls or pails; 17 of the shoulder pots and 30 of the bowls-pails could not be classified as to the typochronology. If 5.2 sherds could, on average, be assigned to one pot (1252 : 242), only some 770 sherds were of typochronological value, or only some 14% of all sherds found.
In settlements of phases A-C, shoulder pots can be recognised only with great difficulty among the decorated sherds. The impression is that these were, even originally, a very small minority. This is convenient because for Knöll's classification criteria the profile of shoulder pots from these phases is important, and it will only rarely be possible to reconstruct that from the small sherds.

4 We would not expect any more than a fairly small fluctuation to be acceptable in the ratio between the numbers of shoulder pots and bowls-pails in the course of the sequence. Only the contents of hunebeds D43A and B at EMMEN have as yet been checked on this point (Boomert, Brandt & Woltering 1970, 1971). Fig. 19 shows this ratio per phase. There were generally about twice as many bowls and pails as shoulder pots per phase. In phases D1, D2 and E, however, it was difficult to assign the shoulder pots precisely to one phase. In contrast with this, the borderline M/N, either with or without predominantly horizontal tvaerstik lines, provided few difficulties. Fig. 19 perhaps suggests that the ratio between the numbers of the two pilot series in phases D1, D2 and E is out of proportion for the number of bowls in D2 definitely seems too small. Repetition of the test with other hunebed inventories is therefore called for. With counts of E-pottery in different hunebeds (section 6.6) it was noted, by the way, that when a division according to two

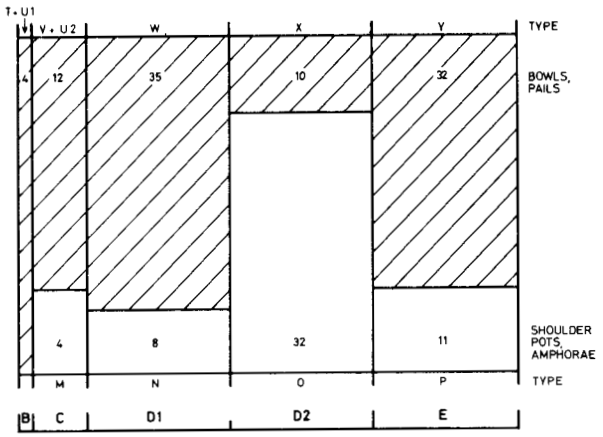


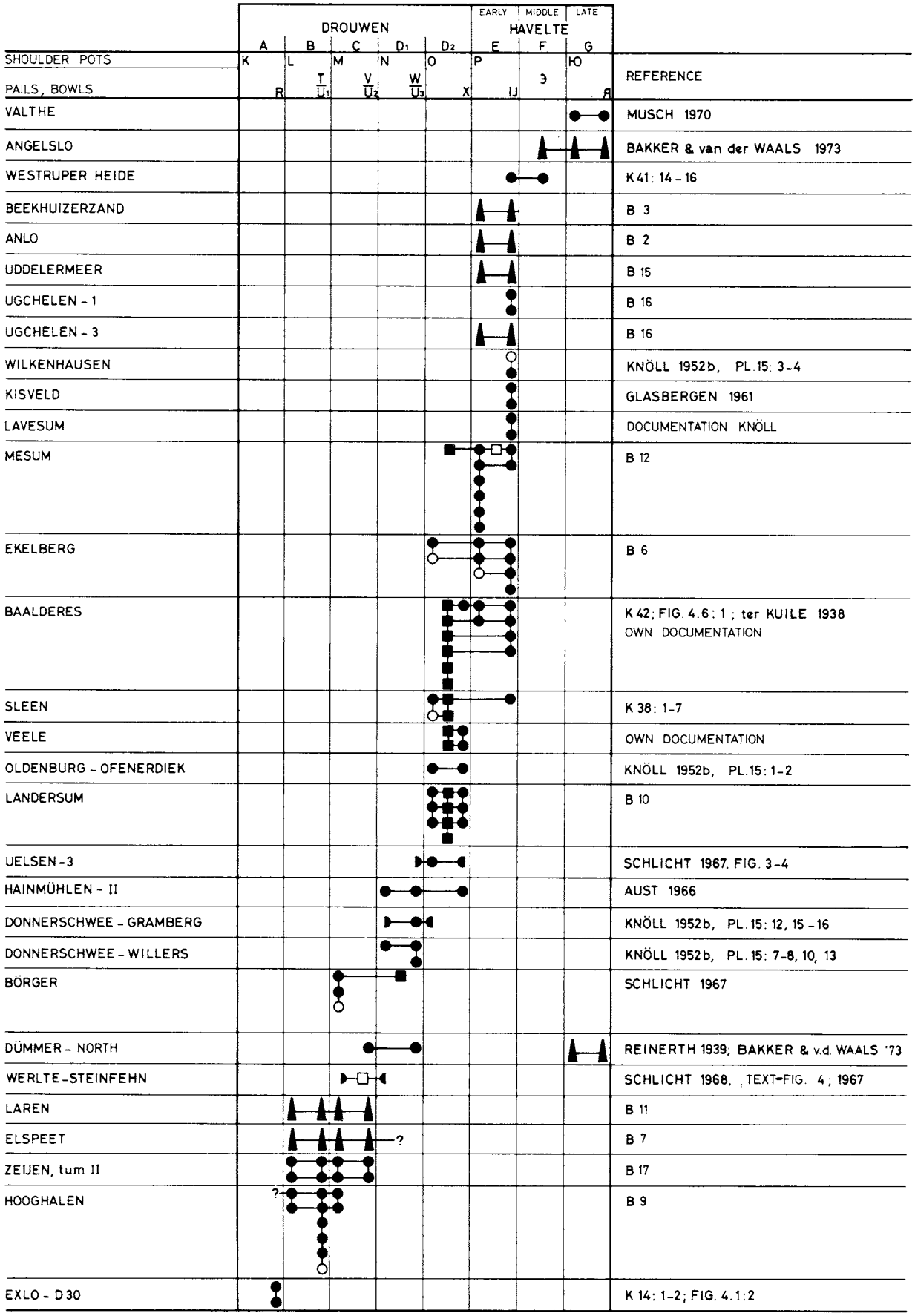
FIG. 19 Diagram of the pilot types in megalithic grave EMMEN-D43 arranged into phases. The areas of the blocks are proportional to the absolute numbers of each group. Data after Boomert, Brandt & Woltering (1971).

FIG. 18 Sequence of the pilot types in the more important closed find groups (including settlements) of the West Group. Pilot types are indicated by dots, other significant specimens by squares. Triangles indicate several specimens. Half symbols show possible alternative interpretations. Open symbols: 'uncertain'; question marks: 'very uncertain'.
The diagram shows how the typochronology presented here does work. It demonstrates that generally not more than two successive typochronological phases are represented in one closed find. It is also evident that D2 and E pottery is the most numerous.

methods of ornamentation was carried out, the ratios of amphorae to bowls showed also wide variations in each assemblage and in each hunebed.

5 A richly decorated Tiefstich pot is in itself a closed find: it is a collection of selections from the ways of dividing up the surface, the techniques of ornamentation, and the design elements current in that period, and – especially if a shoulder pot is concerned – a weighting of ornamentation against the equally variable shape. In the case of the bowls and pails, Knöll began his description with the upper ornamentation, just below the rim *(Obermuster)* on which he based his main classification. The lower ornamentation *(Untermuster)* displays its own variations and does not have an automatic positive correlation with the classification of the upper ornamentation. Such is also the case with the shoulder pots. Knöll's starting point for shoulder pots was the profile of the pot. There is a rough correlation between the ornamentation and the profile. Since I prefer ornamentation to profile characteristics, inexperience of the potter having sometimes led to deviations in the shape, I have already transferred some illustrations in the list of the stages of the shoulder pots (section 3.1).
In fact, a timetable of all these features of a pot which are thought to be of significance for dating should again be regarded as a sequence model in itself – these elements could each have had a very different life-span. It would therefore be ideal to take an extensive, localised sample (e.g. all the reconstructable pots from the north of Drente) and, with the help of a computer, to determine how many times the potentially diagnostic features occur, and to what extent they are mutually correlated. On the basis of this sample, it would then be possible to establish a sequence for the whole collection, by means of which every pot fragment in the area concerned could be relatively dated, and a statement of the margin of error given.
If necessary, a new and better phase subdivision could also be derived from this, although there is, of course, always something rather forced about such a subdivision, compared with a more fluid sequence. Some attempts in this direction, however, by J.K. Voss (Michigan) under the supervision of R. Whallon and myself, for the bowls and pails (no profile characteristics to confuse the ornamentation!) gave a clear indication of how extraordinarily difficult it is even to subdivide and tabulate all these different features.
Instead of tabulating 'everything' at random, it would perhaps be better to restrict the choice initially to those features whose chronological usefulness was established by Knöll and others.
Questions basic to Voss' investigation are: how can the many hundreds of pots from hunebed EMMELN-2 illustrated by Schlicht (1968) be objectively subdivided into style phases, and – the same question in other words – where are the best dividing lines between what have now been called D1, D2 and E (and, within E, the dividing line between E1 and E2 – see section 6.6)? Knöll himself had already complained that he had difficulties deciding in many cases if a pot should be classified in phase 1/2 or in phase 2, or in the new terminology, in stage D(2) or stage E(1).[3]

6 An obvious question is whether it is everywhere permissible to link the two pilots series to each other when setting up a subdivision into phases. It is quite conceivable that certain features might appear earlier with one pot shape than with another. Although it will never be possible to prove this by means of closed finds, we should accept as an indication the fact that although C-terrines do occur in the find in HOOGHALEN (figs. B4-5), C-bowls and pails –


DROUWEN
EARLY
MIDDLE
LATE
HAVELTE
A
B
C
D1
D2
E
F
G
SHOULDER POTS
PAILS, BOWLS
K
L
M
N
O
P
HO
R
T
U1
V
U2
W
U3
X
IJ
3
R
REFERENCE
VALTHE
MUSCH 1970
ANGELSLO
BAKKER & van der WAALS 1973
WESTRUPER HEIDE
K 41: 14 - 16
BEEKHUIZERZAND
B 3
ANLO
B 2
UDDELERMEER
B 15
UGCHELEN - 1
B 16
UGCHELEN - 3
B 16
WILKENHAUSEN
KNÖLL 1952b, PL. 15: 3-4
KISVELD
GLASBERGEN 1961
LAVESUM
DOCUMENTATION KNÖLL
MESUM
B 12
EKELBERG
B 6
BAALDERES
K 42; FIG. 4.6: 1 ; ter KUILE 1938
OWN DOCUMENTATION
SLEEN
K 38: 1-7
VEELE
OWN DOCUMENTATION
OLDENBURG - OFENERDIEK
KNÖLL 1952b, PL. 15: 1-2
LANDERSUM
B 10
UELSEN-3
SCHLICHT 1967, FIG. 3-4
HAINMÜHLEN - II
AUST 1966
DONNERSCHWEE - GRAMBERG
KNÖLL 1952b, PL. 15: 12, 15 - 16
DONNERSCHWEE - WILLERS
KNÖLL 1952b, PL. 15: 7-8, 10, 13
BÖRGER
SCHLICHT 1967
DÜMMER - NORTH
REINERTH 1939; BAKKER & v.d. WAALS '73
WERLTE-STEINFEHN
SCHLICHT 1968, , TEXT-FIG. 4 ; 1967
LAREN
B 11
ELSPEET
?
B 7
ZEIJEN, tum II
B 17
?
HOOGHALEN
B 9
EXLO - D 30
K 14: 1-2; FIG. 4.1:2

which are usually twice as numerous – do not. If we compare the illustrations of the two types of pilot shapes of phases B and C, the question arises whether the breaks between the L and M shoulder pots and the T and V upper ornamentation of the bowls and pails have, after all, been mainly synchronous.

7 The phase subdivision A-G holds for the area west of the Weser, and, with certain reservations, for the 'Elbe-Weser Triangle', north of the line Bremen-Hamburg. Between the Weser and the Elbe a confusing factor is the old-fashionedness of the Altmark pottery (*). There has long been a need for a typochronological investigation of this Group in both the Germanies (see Appendix A2b and section 6.4).

Conclusion: the subdivision into phases A-G is certainly not flawless. We will accept it in the form proposed here, since a basically better dating system would require an extremely time-consuming investigation.
The most unsatisfactory point is still the position of the line of demarcation between Knöll 1/2 and 2, i.e. between D and E. This is not so much a matter of distinguishing 'typical Drouwen' from 'typical Early Havelte', but more of drawing a line through a large number of transitional shapes, which were often decorated with tvaerstik lines. In the absence of reliable closed finds with this D2 or E(1) pottery from S.W. Lower Saxony and N.E. Westphalia, any suggested solution will remain subjective (cf. section 6.6). The problem is nevertheless a relatively important one, since most of the pottery from hunebeds belongs to phases D and E (cf. fig. 19). This numerical predominance is also reflected in fig. 18.

3.4 OTHER POTTERY TYPES

3.4.1 Funnel beakers

The 'normal' funnel beaker (*) has vertical lines on the belly and an undecorated or lightly decorated, cone-shaped or cylindrical collar. There are also entirely undecorated specimens. Both decorated and undecorated specimens occur from A to D inclusive, sometimes as late as E(1). They are absent in F and G. As far as E(2) is concerned, the undecorated funnel beaker (fig. 34:7) with thick base-plate, which easily breaks off (known from UDDELERMEER, STAVERDEN, BEEKHUIZERZAND and ANLO) seems to be only a vague shadow of the earlier funnel beaker. In complete contrast to earlier opinion (Chapter 2), the profile of the normal funnel beaker is even less useful for the typochronology of phases A-D than the *Kugeltopf* for that of the Middle Ages. Knöll was the first to realise this (1959, p. 85, 92).
In my typology, which is partly based on that of Knöll (1959, p. 76-79), I subdivided the funnel beakers into Groups I-IV: *Group I* contains the well-made, smoothly shaped funnel beakers with a definite kink in the profile at the junction between neck and belly; *Group II* contains the equally well-shaped funnel beakers which display a smooth transition at the neck-belly junction; *Group III* contains the specimens which are completely useless for typochronology on account of their shoddy workmanship; *Group IV* is the giant funnel beakers of the settlements, which are extremely rarely found in graves.

Group I will be subdivided into four shapes. *Shape I.1* has a globular belly, whose maximum width is at the midpoint of the belly height; *Shape I.2* has a kinkless, nicely curved belly, whose maximum width is at about 3/4 of the belly height; *Shape I.3* has a pronounced kink in the belly, the profile is Z-shaped; *Shape I.4* has an extremely narrow, angular or more rounded shoulder ledge.
Shape I.1, the 'primeval beaker' *(Urbecher)* of earlier authors, could well have been early to the west of the Weser, at least according to negative evidence. It is very rare there, as are A inventories. The shape seems to be absent in the (extensive) hunebed inventories with only C and later pottery; but it does occur sometimes in hunebeds with A and B pilot shapes. There is, however, a snag: east of the Weser it still occurs in association with C pilot types (ISSENDORF, fig. 65 and Tempel 1972, fig. 7), and it is possible that the rare specimens to the west of the river could have been imported.
Shape I.2 is associated with pilot types from the entire Drouwen period: with B (fig. B13:37), with C (figs. B10:1, B13:14a, B15:45), with D (Knöll 1952b, plates 15:12, 15-16) and with D+E (K41:19).
Shape I.3, with its angular, Z-shaped profile, is, one would have thought, characteristic for phase C and, possibly, D1. This shape was found in a B+C context (figs. B12:13c, B13:14b) and a C or D1 context (WERLTE-STEINFEHN, Schlicht 1967; 1968, p. 59). The lugged beaker (fig. 20), however, combines a

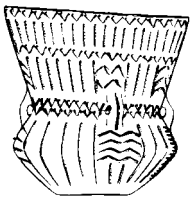


FIG. 20 Lugged beaker from hunebed EXLO-D30. Assen museum.

I.3 shape with a B rim. If the dating in the C phase of Shape I.3 is approximately correct, this lugged beaker should, by itself, be regarded as a closed B+C find.
Shape I.4 is known from a B+C context (fig. B14:21), a D1 context (K38:18) and an E1+E2 context (fig. B18:5). The later specimens appear to show a tendency towards reverting to the I.2 profile. Their cylindrical, short necks generally betray them, however.

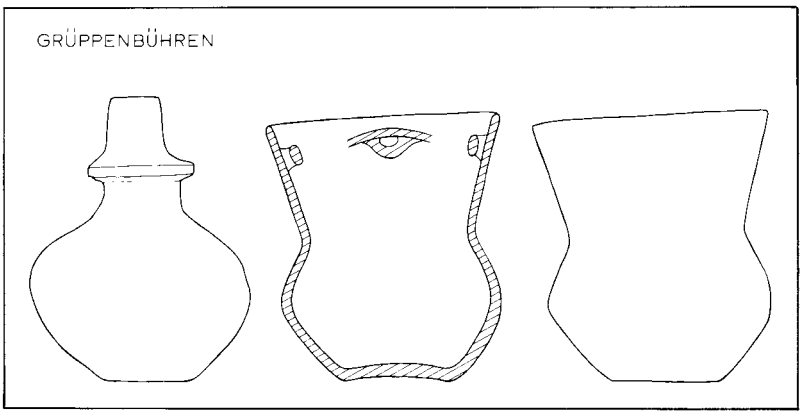


FIG. 21 Funnel beaker with two interior lug handles and collared flask from GRÜPPENBÜHREN, probably from a flat grave. Oldenburg museum, 1719-1720.

Group II will be subdivided into three shapes:
Shape II.1 has a similar belly as I.1. Some associations are known with B+C pilot shapes (fig. B5:15) and with a round-bellied collared flask which is undecorated, like the funnel beaker itself (fig. 21).[4]
Shape II.2 has a similar belly as I.2. One specimen is known in a D+E1 context (K38:2).
Shape II.3, with a similar belly as I.3, is known from the D+E cemetery at BAALDERES (K41:9, 25; K42:6, 14, 24). These specimens may be grouped in one continuous series from funnel beaker to double-cone shape and to high conical bowl with a cylindrical neck, on which sometimes the ornamentation is the only reminder of its origin. Probably the profile of E-shoulder pots, such as K42:22, was one of the influences on this development.

Group IV appears to have contained an analogous variety of shapes and possible datings, but in this instance we can add little, since the sherds from the settlement refuse rarely permit reconstructions of profiles. These storage and cooking funnel beakers occur in B+C settlements (figs. B6-10) and – although settlements from that period are not well-documented – a specimen (fig. 9, bottom left) from a hunebed inventory with mainly D and later pilot types (HAVELTE-D53) indicates that they were current for the entire Drouwen period. Perforations below the rim occur up to at least B+C (figs. B6-10); in the same contexts, but also in a D context (fig. B15:13), we find zones with only very short vertical lines alternating with zones with lines over the whole belly. Therefore, neither of the two characteristics can, in itself, justify an early dating.

The above survey has only confirmed Knöll's findings that the funnel beaker is of little diagnostic use in distinguishing between phases A-D. This fact was underlined once more by a closed find which was unearthed during the investigation carried out by Van Giffen, Glasbergen and myself of hunebed D26 in DROUWENERVELD (1968). Three funnel beakers (fig. 22) were found, buried in sand among and under some stones, between the peristalith and the chamber, on the northeast side. There were scarcely any traces of differences in humidity which would indicate the presence of a pit, yet the beakers and the stones had been positioned in the ground in such a way that they could only have been buried at the same time. One beaker was complete, one was only slightly damaged, the neck of a third one had been severed either long ago or in excavation. If the funnel beaker on the right of fig. 22 had been found in isolation, it would almost certainly have been thought to be typologically very early. This perfectly finished specimen has a rounded belly and a wobbly base. A much larger funnel beaker from the early EN in Schleswig-Holstein has the same proportions (SATRUP-SÜDENSEE DAMM, Schwabedissen 1967, fig. 5a). The two other funnel beakers, of shapes I.3 and I.4 or II.3, however, save us from going astray, since they make probable a dating in phases C or D, but not in A or B. Apparently, the little wobbly-based beaker must be seen as a representative of

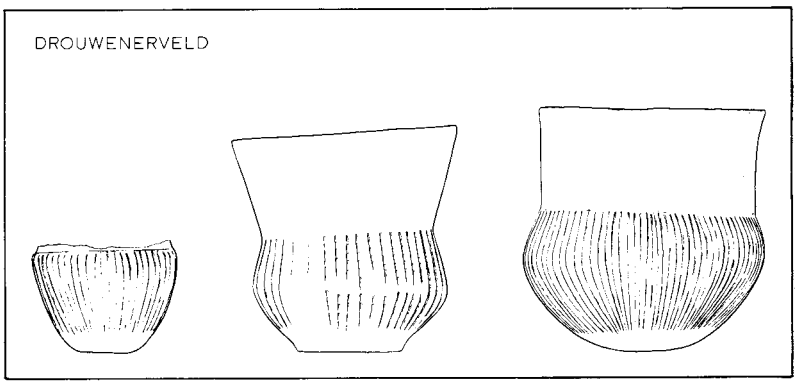


FIG. 22 Funnel beakers from the same pit between chamber and kerb of hunebed DROUWENERVELD-D26.

FIG. 23 Sherds of the folded-out and fingertip-impressed rim of a funnel beaker from megalithic grave EMMEN-D43. Leiden museum.

shape I.4, comparable with fig. B15:12a. This is more or less confirmed by the short cylindrical neck.

Among the finds from the megalithic grave D43 at EMMEN are three sherds which are unique, viz. rim sherds of a storage funnel beaker with a folded-out and fingertip-impressed rim (fig. 23). The oldest pilot shapes found there belong to the Drouwen B phase (fig. 19). The documentation of these excavations does not indicate whether this funnel beaker came from either of the two hunebed chambers (D43A, B) or from the soil of the barrow. At the moment, the uniqueness of these sherds permits two sorts of speculative explanation: (a) to assume chronological contact with the EN A/B (–C?) horizon, in which similar funnel beakers occur in the TRB North Group (west of the Elbe in the find of ENGERN-BRINKHOF: Brandt 1967, p. 40-41), but which horizon is, in my opinion, much earlier than Drouwen B; or (b) to conclude that it is an imported pot from the Michelsberg culture or of other contemporary culture groups (see section 6.9).

3.4.2. Collared flasks

Collared flasks (*)are not numerous. In hunebed inventories to the west of the Weser, they rarely amount to 9% of the total number of recognised pots. This is no underestimate, since their sherds are easily identifiable by the shape of the neck and the roughness of the inner surface above the shoulder. In settlements, too, collared flasks are either absent or found as a low percentage of the total (Bakker & Van der Waals 1973, note 71).

In general, the ornamentation is scarcely more useful for typochronology than that of the funnel beaker. The small number of exceptions to this (collared flask K32:16 from DROUWEN-D19 is a well-known example), the few closed finds with collared flasks, and their presence or absence in hunebeds with or without pilot types of certain phases are strong indications that the development of the profile of the collared flask must be considered of even less use for typochronology, if that were possible, than that of the funnel beaker. The collared flask demonstrates all too clearly how misleading terms such as 'round-bellied phase' and 'angular phase' are for Knöll 1 and Knöll 1/2 respectively.

The occurrence of collared flasks spanned the phases A-G. I had my doubts about this supposition of Knöll's on account of their absence in settlements and flat graves of phases E-G in Netherland (Bakker 1962). In Germany, the only reliable find was of two examples in a D+E context (fig. B18), so that it seemed that the collared flask had disappeared at the same time as the belly-fringed funnel beaker. Kaelas (1955) had entertained the same suspicion. However, three undecorated collared flasks, each with a different profile, and discovered in G contexts (fig. B21), proved that Knöll was correct (Bakker & Van der Waals 1973).[5]

Undecorated collared flasks with perfectly spherical bellies (K32:6, 8-10) occur in hunebed inventories without A-C pottery, even in areas where these early phases are completely absent (Knöll). Examples of such hunebeds are the following: HAVELTE-D53 (certainly no A-B but two C pots plus a majority of D-G pots), WECHTE-1 (D1 plus subsequent phases, one pot possibly C: K17:2), HEIDEN-Düwelsteene (D and later, Knöll 1959, p. 100, note 67), DÖTLINGEN (Pätzold 1957, fig. 2k, 2n; 1961; the earliest of the illustrated pots belongs to C (Pätzold 1961, fig. 2:38), the rest is D or E), LINDERN (Steffens 1964; earliest shape is C, the majority is later). In GRÜPPENBÜHREN, a spherical-bellied flask was probably buried in the same flat grave as a II.1 funnel beaker with pierced lugs inside the shoulder (fig. 21).[4] An assemblage with a little spherical-bellied flask from the edge of hunebed DROUWEN-D20 will be discussed in section 6.2.

Collared flasks with a straight-lined double-conical belly profile were also classified by Knöll in his phase 2 (E-G), but if the shoulder was convex, he sometimes, though not always, placed them in 1/2 (C-D). Such a collared flask occurs indeed in a C or D1 context (WERLTE-STEINFEHN, Schlicht 1967; 1968, p. 59). The occurrence, however, of collared flasks (K32:2-3) with a convex shoulder and a sharp kink in the belly in WECHTE-1 (D and later?, see above), shows how unreliable such criteria are.

A 'dash ornamentation' *(Stäbchen Muster)* sometimes occurs on both double-conical shapes (K32:3, 12, 33:1, 2, 16). The five find-sites of collared flasks with this ornament are situated on a 150 km long line – perhaps a long-distance trail – from GROSS REKEN in Westphalia to WILDESHAUSEN in Oldenburg. The finest specimens were found near OSNABRÜCK, halfway along the line. The other specimens may be copies (Knöll 1959, list 97, map 19; 1952c).

Fig. 24 shows the three ways in which the collar could be attached to the flasks – perhaps an additional criterion for subdivision in the future.

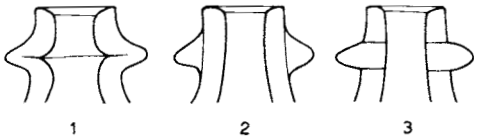


FIG. 24 Sketch of the three ways of constructing the collar of a collared flask.

3.4.3. *Biberons and spoons*

TRB *biberons* (*) (sucking cups) are found in two areas west of the Elbe. The large majority occur regularly, though infrequently, in the region to the west of the Ems and in a narrow strip along the eastern bank of this river.[6] They are characteristic of Drouwen B+C and D contexts (figs. B3:13a, B7:2, B12:13d, B15:3b). They are always undecorated, with a hollow stem open to the cup, tapering off to a narrow opening.

Near the Elbe, a few undecorated biberons were found which, although they are of similar shape, have stems which are thicker or bend outwardly at the ends (RAHMSTORF-7, Wegewitz 1967; ISSENDORF-A: fig. 65). These specimens were possibly produced by the Altmark Group, and their context does not contradict an approximately similar age.

Biberons occur with a great number of neolithic culture groups of various periods. Their infrequency in groups without deep refuse or storage pits or without the custom of putting them in graves, suggests that it was an article then in general use, but now seldom found. Without much doubt, they were used as sucking cups (Bakker, Vogel & Wiślański 1969; Eibner 1973).

Spoons (*) are much rarer in the West Group. It is often impossible from descriptions (e.g. Deichmüller 1960) to be sure whether an item described is a biberon or a spoon, because there is often no distinction made (the handle might, or might not be open to the cup). Knöll (1959) did make this distinction. It appears from his List 108 that only one spoon with a hollow handle was found west of the Elbe (HEESSEL). This spoon corresponds in shape with similar spoons in the North Group across the Elbe (Schwabedissen 1953; Knöll 1959, list 108). Those of the North Group are dated to the MN I-II (Davidsen 1973, note 34). According to Knöll's List 107, spoons with a solid handle occur three times west of the Elbe.

3.4.4. *Discs or baking plates*

The earthenware disc (*) served as a baking plate and very rarely as a pot lid (Davidsen 1973; Lüning 1967, p. 65).[7] It occurs regularly in the settlements of every phase of the West Group, and sometimes in the graves.

Undecorated discs without holes, but with the imprints of fingers on the rim, are characteristic of all the phases of the Michelsberg culture (Lüning 1967) and of the EN A/B of the TRB culture. These were common up to the EN C in Denmark, but were no longer present in the MN (Davidsen 1973). Discs of this type are known from two TRB (?) sites west of the Elbe. The baking plates from the EN A/B find group (?) in ENGERN-BRINKHOF display the mat print which is characteristic of the Michelsberg culture (Brandt 1967, plate 40; 1971, p. 66; Davidsen 1973, p. 41; see also section 6.3). At GÖTTINGEN-GRONE, also situated along the northern margin of the Mittelgebirge, a site with Baalberge pottery also produced baking plates with fingertip impressions on the rim and mat prints (Maier 1970, fig. 7: 12-13; see section 6.3).

The discs of both the Vlaardingen (VL) Culture and the TRB West Group are perfectly comparable as to their diameter, smoothness of the rim, the presence of round 'holes' (1.5 to 2 cm wide), and the patterns of ornamentation with the MN discs of the TRB North Group. Similar holes and designs are not or scarcely found elsewhere (Behrens 1963; Davidsen 1973).

Technological improvements make the disc a good indicator of period. During the MN, first one hole was made in the Danish disc, later two, sometimes three; a stick could be inserted in these holes, later perhaps a stick bent to form a pair of pliers, so that the disc could be extracted from the hot ashes.

These holes – even if there is only a single one – are generally eccentric (Davidsen 1973), and the number of holes can only be determined in the cases of more or less complete specimens. For this reason, even with the enormous amount of Danish material, Davidsen (1973) could not establish the life-span of the successive types with complete certainty. He investigated 3000 sherds from discs from 127 of the 137 known sites in Denmark. There were no significant changes in the diameter of the disc (10-29 cm, in miniature discs 4-10 cm) during the MN; but there were changes in its thickness.

In large collections of every phase, the modal value shifts systematically from 1.7 cm in the MN I to 2.9 cm in the MN V. The thickest discs of each phase, too, become progressively thicker. Discs without any holes and with a smooth rim occur from the EN C up to and including the MN II; discs with 'perforations' (defined by a diameter of 1 to 5 mm) from the MN I up to and including the MN II; discs with one hole (generally eccentrically positioned) from the MN II (Ib?) up to and including the MN IV (or V?). Discs with two holes are characteristic of the MN V, but may already have appeared in the MN III/IV. In addition, Davidsen gave, where he could, an accurate statement of the life-span of the different styles of ornamentation.

At the present time, we know of only a few, generally small, sherds from the TRB West Group. 11 sites have been reported from Germany (Knöll 1959; Behrens 1963; Davidsen 1973).[8] An investigation of the collections would double this number at least. In 1959, Knöll did not yet know of any discs from Netherland. Behrens (1963) mentioned 3 VL and 8 TRB sites. The estimated number is now nearly four times as high. It appears that in VL and TRB settlements in Netherland the sherds of discs comprise barely 1% of the total number of sherds.[9] A minority were decorated. With the VL culture, the soft sediments in the settlements yielded large numbers of sherds, including quite a lot of disc fragments, a few of which were large. Since the VL

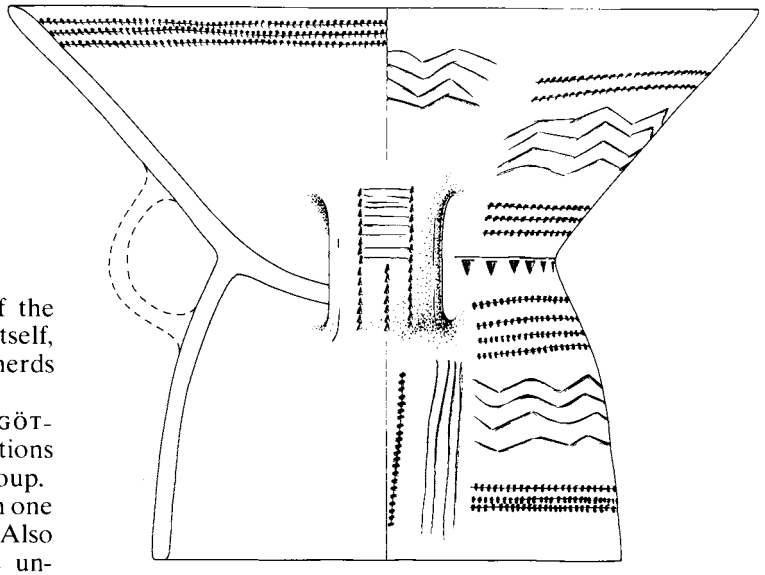


FIG. 25 The pedestalled bowl from the cult house at HAINMÜHLEN. Bremerhaven museum.

discs could only have derived from those of the western TRB group (this derivation is, in itself, highly interesting), I shall discuss the VL sherds here, too.

Apart from those in ENGERN-BRINKHOF and GÖTTINGEN-GRONE, discs without holes or perforations are unknown in the area of the TRB West Group. An almost complete disc, undecorated and with one hole in the centre, is known from WYCHEN. Also from WYCHEN are a disc (number of holes unknown) decorated in Tiefstich similarly to Davidsen 1973, fig. 3 and another with pointillé ornamentation on both sides and eccentric hole(s) (Bakker 1962, fig. 12:6). Apart from an undecorated collared flask (Kaelas 1955, fig. 17:9), no other ceramics that could be assigned to the TRB culture have come to light at Wychen – which is situated near Nijmegen south of the Rhine – in spite of great archaeological activity. None of the specimens were in a datable context. It would therefore seem to be more plausible to assign the discs from Wychen to the VL culture.

The only known fragment of a VL disc with at least two eccentric holes comes from VLAARDINGEN (Bakker 1962, fig. 12:3). The other VL discs appear to have had eccentric holes. Some of them have pointillé ornamentation, concentric lines and a zigzag line (Bakker 1962, fig. 12) or a combination of both (Glasbergen et al. 1967, fig. 37: VOORBURG).

From a TRB context come discs from ELSPEET (phase B+C, figs. B7:13, B9:76) whose radial groove decoration on both sides might be an indication of one central hole. Discs with perforations along the rim (figs. B6:10; B10:32) are known from B+C assemblages. Among them is a fragment of a disc with at least one hole near the rim (fig. B9:75). From a D context comes a disc with, presumably, two holes around which circles were incised (ZANDHORST, Enschede museum 664).

In the E2-settlements of UDDELERMEER, BEEKHUIZERZAND and ANLO sherds were found of undecorated discs with narrow perforations along the rim. At Beekhuizerzand, one fragment has a central perforation, another one a central hole (Modderman et al. 1976). At Anlo, one fragment displays an eccentric hole near the rim (Bakker 1962; Van der Waals 1964a).

From F+G or G assemblages, a number of discs with at least one hole near the rim are known. One disc has pointillé decoration around the hole(s) (Bakker & Van der Waals 1973, fig. 6, 7(?), 10:6; Musch 1970).

According to Kat-van Hulten's reconstruction drawing (c. 1950), a disc from hunebed D53 at HAVELTE is a specimen without preserved holes and with perforations. One central (?) perforation was ringed by a circle from which lines radiated. The oldest pilot pottery from this hunebed is characteristic of phase C (a very small proportion), the majority of D-G. Decoration of baking plates by radiating lines or incisions is further known from LANDERSUM (D2, see Appendix B10) and hunebed D19 at DROUWEN (Musch's collection). No holes are present in either of these fragments.

On comparison with Davidsen's data, perforations appear to have continued longer in Netherland (B+C up to and including F+G) than in Denmark (MN Ia-II). This difference does not seem to be of much significance, since in Denmark we find, during the whole of the MN, a ring of pits in the surface of the discs, and the Dutch E perforations are simply punctured pits. If the Danish datings were to be applied to the Dutch discs literally, the VLAARDINGEN disc with two holes would have to be classified preferably in the MN V, but a lack of information prevents us from saying with certainty whether or not discs with two holes had occurred earlier in Denmark, in the MN III-IV. One would be inclined to say that this was indeed the case in Netherland, considering the disc from a D context in ZANDHORST which probably had two holes and which is estimated as synchronous with MN II(-III?). One (VL?) disc from WYCHEN has an ornamentation which would be dated in Denmark to MN II. The central hole in the other disc from Wychen would correspond, in Denmark, to MN I-IV(-V?). From the West Group, so far an E2 parallel from BEEKHUIZERZAND is known. E2 would about correspond to MN III-IV. Considering this scanty evidence altogether, we could assume a period of intensive contact between VL and (West) TRB at about MN II-III, with a somewhat earlier beginning than has been assumed up until now.[10]

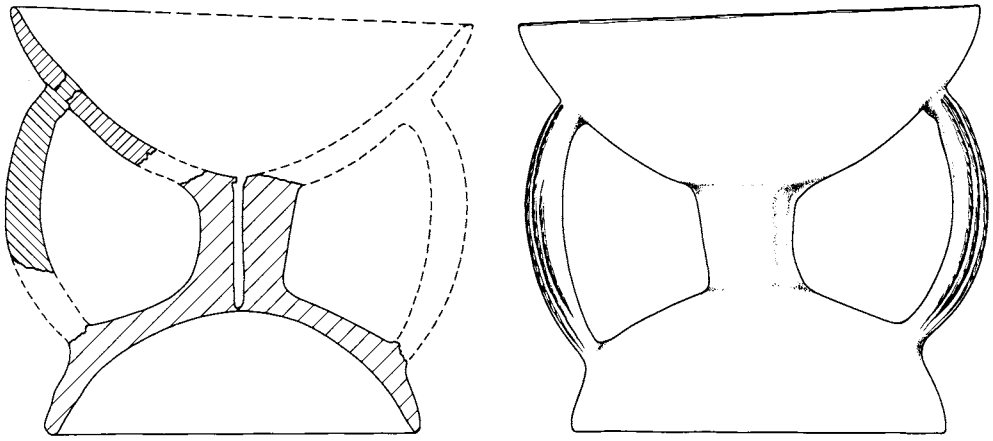


FIG. 26a The pedestalled bowl from hunebed DROUWEN-D19: reconstruction from three fragments. The well-known and largest fragment belongs below. Holwerda and Louwe Kooijmans recognised a handle and an upper rim sherd. Leiden museum.

In section 6.9, we shall discuss J.J. Butler's telesynchronisation (1963) of the TRB discs from BOGNAESGÅRD, near Copenhagen, with the golden discs from County WEXFORD, Ireland.

Finally, the historically-minded reader should know that the *disci* about which N. Westendorp wrote (1815, 1822) are not TRB pottery discs, but Carolingian loom weights with stamped-in crosses and similar figures. The first description of *disci* from Drente had been J. van Lier's (1760). They had not been found in hunebeds, but they had gradually been attributed to the hunebed builders. L.J.F. Janssen (1848), who knew the material from Dorestad well, corrected this misapprehension.

3.4.5. Pedestalled bowls, drums and similar shapes

A *pedestalled bowl* (*) from the temple in HAINMÜHLEN to the east of the Weser (fig. 25; Aust 1966), which is associated with D1+2-pottery (Aust 1976; illustration p. 100) and also bears tvaerstik lines itself, is a direct parallel to those of the North Group. H. Berg (verbal communication 1969) dated this bowl to the MN II. No other pedestalled bowls in a North Group style (Schwabedissen 1953) are known from the West Group.

The bowls of the West Group of phases C-D occasionally have a conical or cylindrical *foot-ring* which is a few centimetres high (fig. 30:4). The predilection of the Havelte potters for a shallow foot-ring only a few millimetres high possibly goes back to these taller predecessors.
The foot-rings of the bowls of the Drouwen phases rarely have rectangular or oval openings (hunebeds DROUWENERVELD-D26; GIETEN-D14, communication J.N. Lanting; WEERDINGE-D37a, communication J.E. Musch. None of the specimens completely reconstructed).

The following, mostly undecorated, *footed bowls* are at the present time still very rare or unique. The more complete specimen of two undecorated bowls on foot-rings from a B+C context in ELSPEET (fig. B7:1, 5) is highly polished. The rim of the foot-ring

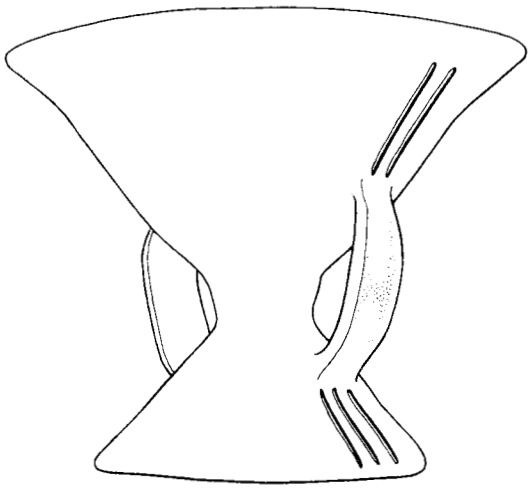


FIG. 26b Pedestalled bowl from outside a hunebed in the FISCHBEKER HEIDE near Hamburg-Harburg. After Sielmann 1975, figs. 7, 9-10. Scale not indicated. Harburg museum.

is reminiscent of that of a drum from HASSEL (Dehnke 1940, fig. 4a). The smaller fragment bears some similarity to undecorated footed bowls from ISSENDORF (fig. 65) and KLOSTER (Dehnke 1940, fig. 5b).
The well-known fragment of a footed bowl from hunebed DROUWEN-D19 could be completed in a drawing (fig. 26a). Holwerda (1915, p. 32, plate 16:5) had already found a separate fragment of one of both handles and L.P. Louwe Kooijmans recently fitted the plug of this handle into a rim sherd. All the fragments are of the same manufacture. One of the stopped ends of the hollow stem had partly opened again during the firing. Only the handles of this *depas amphikypellon* (Holwerda) had been decorated. Neither the fine Tiefstich lines on it nor the other finds from the hunebed permit any more accurate dating than phases B-E.
A good parallel is the recently discovered footed bowl (fig. 26b), from a hunebed on the FISCHBEKER HEIDE, Kr. Harburg, having three vertical grooves below and above the handles as the only ornamentation (Sielmann 1975, figs. 7, 9, 11).

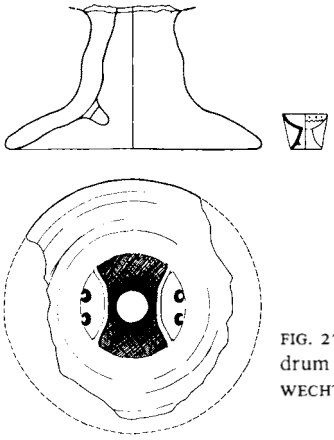


FIG. 27 Lower part of a pottery drum from megalithic grave WECHTE I. Münster museum.

The undecorated foot with small inner pierced lugs and a sound-hole from WECHTE (fig. 27; K35:17) could, in Knöll's opinion (1959, p. 27), have come from a *drum*. Fig. 27 shows how cords through the inner lugs could have been used to attach non-ceramic handles. The tension cords of the membrane could also have been attached to them. The fact that the foot-ring had been broken off at the presumed points of tension below the lugs fits in well with this theory.

Artefacts which are unmistakably drums – with sound-holes in the base and external knobs or pierced lugs to attach the membrane of the drum to – can scarcely be considered characteristic of the West Group of the TRB culture. They occur in the area that is indicated in fig. 1 as an area of overlap of the West and the Altmark Groups.

The drums are closely related to those which were found in the contiguous part of the southern DDR, in the Salzmünde, Walternienburg-Bernburg and Altmark TRB Groups and in the Schönfeld Group as well. Fischer (1951) gave an admirable survey of the typological characteristics of the drums of each of these groups (shape, ornamentation, position of the pierced lugs or knobs for attaching the membrane of the drum). Since then, the number of drums has increased to such an extent that a new survey would be desirable. Eight new ones have been found in megalithic graves near Lüneburg (Körner & Laux 1971). Behrens (1973b) illustrated many new finds from the DDR.

My impression is that the occurrence of pierced lugs (as opposed to knobs) can no longer be regarded as exclusively characteristic of Walternienburg and Schönfeld. Fischer (1951) pointed out the mutual contacts between the culture groups which are reflected in the drums. The above-mentioned drum from HASSEL is also an illustration of these contacts. Its shape and the fact that it is decorated make it characteristic of Walternienburg. It was, however, found in a West TRB context and the nature of the ornamentation shows a closer relationship with other pots of the West Group than with Walternienburg drums. The triangles on the kink are also found on the pedestalled bowl, fig. 25, from HAINMÜHLEN.

3.4.6. Miscellaneous

In the West Group, as in the North Group, *spindle-whorls* are as rare as snow in summer. Knöll (1959, p. 34) reported them only from DOHNSEN (Altmark Group) and ALTENWALDE. Only one is known from Denmark (SLOTSBJERGBY: Lomborg 1975).

Knöll (ibid.) reported *loom-weights* from HORNEBURG and DÜMMER-NORTH. I know of no other examples in the West Group.

A 5 cm long I-shaped *'bobbin'* comes from PAPELOZE KERK-D49 (IPP photograph 65-429 PA); it could be a TRB artefact.

Unique until now in the West Group are three miniature *models of wooden benches*. One specimen is from hunebed HAVELTE-D53 (fig. 9; K35:21). It has a solid, flat, oval foot, and an oval top with upwardly curved ends (length 3.5 cm, width 2.2 cm, height 2.8 cm). Van Giffen described this object as 'stool-shaped', but he interpreted it as a 'moon-idol', 'horn-symbol' or 'neck-rest'. Related to this object are the two models of benches (2 and 3 cm high respectively) from the E-settlement in ANLO (Waterbolk 1960, fig. 41); these stand on four small legs and their shape is reminiscent of hollow molars. In D53, the earliest pottery could be assigned to Drouwen C and D – the majority belong to phases E and G. Behrens (1973a) published four, somewhat larger Bernburg bench models ('thrones of gods') and pointed out Jevišovice C1-parallels in Moravia.

Perforated pot bases (figs. B6:7, 8, B8:50) occur in ELSPEET (phase B+C). This is also the case in ANGELSLO (phase F+G) (Bakker & Van der Waals 1973, p. 28). The rest of the shape of these pots is not known; the sides rise rather steeply from the flat base. The perforations – made before the firing – are narrow, so that no further comparison with the 'strainers' of the Polish TRB groups can be drawn (Jażdżewski 1936, p. 350, 361, fig. 241).

Around 1800 three, 14-17 cm long, *boat models* were found in Drente (Pleyte 1882, plate LXV:7-8; Leemans 1871). The usually reliable J. Hofstede thought that one had been found in hunebed LOON-D15 (Van Giffen 1927, p. 60-64). The find spots of the two other models are unknown. The following points argue against assigning them to the TRB culture: (1) not a single other specimen has ever since been found in a TRB context (or in any other context, for that matter), (2) the manufacture (*'Kugeltopf'* according to Van Giffen 1927, p. 62) and (3) the modern design of the boats: modern rudder attachments, and what are, apparently, holes for a forestay and a bow flag.

CHAPTER 4

Outline of the development of the pottery in phases A-G

This chapter describes some of the main lines of development of the Western Tiefstich pottery. Figs. 27a-36 show a selection of the pilot types which are characteristic of the phases, the bowls and pails (*) and the shoulder pots (*). The basis for this subdivision into pottery phases was described in the preceding chapter. The term 'pottery phase' should be understood as the period of currency of the pilot types which are characteristic of it. Such a 'phase' partly overlaps the following phase and the preceding one: while pilot types of the preceding phase were still being made, the new ones were already appearing. It was possible for one potter to include certain features of both phases in his products, they may even be found combined on one pot. For this reason, the actual development had more nuances and was less clear-cut than that of the motor car body, for example, and a subdivision into phases is an oversimplification.

The example of the motor car body also reminds us that changes in style are not necessarily due exclusively to fluctuations in public taste concerning style. Changes in the manufacturing technique, or in the practical demands made on the pottery by society were also significant factors. But I will pass over the question of whether the process was one of technology adapting itself to these demands and to public taste in style, or vice versa, or both.

We are here particularly interested in *the usefulness as a time indicator* of the pottery which evolved as a result of such processes; processes which are far from being fully understood. But an investigation (which has not yet been undertaken) into the techniques which were used by the potters might also be useful for finding additional dating criteria. I can only report in general terms that the grit-temper of the pottery – normally finely pounded granite – and the quality of the pottery reveal no noticeable changes in the course of time. This applies to phase G, as well, although the MN V pottery in Denmark which is contemporary with it is of inferior quality to that of the older phases there.

Two threads run through the stages of change in the pilot shapes: (a) the changes in the design of the ornamentation and (b) those in the profile, especially of the shoulder pots. I have restricted myself to these in this outline but there are many more changes interwoven with these two major strands (which is a pleasant possibility for the investigator for checking and refining the typochronology).

a Initially, the designs were applied in vertical patterns only; they were composed mainly of narrow vertical strips (stage A). These gradually made way (in stages B and C) for horizontal features, which finally gained equal importance or began to be predominant (stages D2-F). At the same time, the patterning became freer, while the proportion of the surface which was decorated decreased – as did the proportion of decorated pottery in general. During phases E-F, ornamentation was restricted to the shoulder and the rim. By stage G, the decorated surface was reduced to nearly zero.

b In stage A, the shoulder pots (jugs, *) had an undecorated neck and a round, decorated belly. In stages B-C, the belly acquired a continuously sharper kink, underneath which the decoration disappeared, but then decoration began to cover the neck as well as the shoulder. At the same time, the pots were becoming wider: the 'jugs' became 'tureens' (*). After that, the profile again became less sharp (D). During phase E, the amphora (*), which up until then had played a modest role, largely replaced the tureen. It was now a pot which, instead of the angularity of the C tureens, combined an elegant alternation of curved and straight lines with a certain degree of sturdiness. The simple shape of bowls and pails lends itself less easily to changes and is thus less characteristic.

I consider the ornamentation of the pilot types (technique, motifs, grouping) to be more important as chronometer than the shape of the profile which was dependent to a greater extent than the former on the expertise of the potter; and anyway, as soon as a dating has to be furnished from small sherds, there is little choice. Figs. 37-40 indicate the distribution of phases A+B, C+D, E and G.

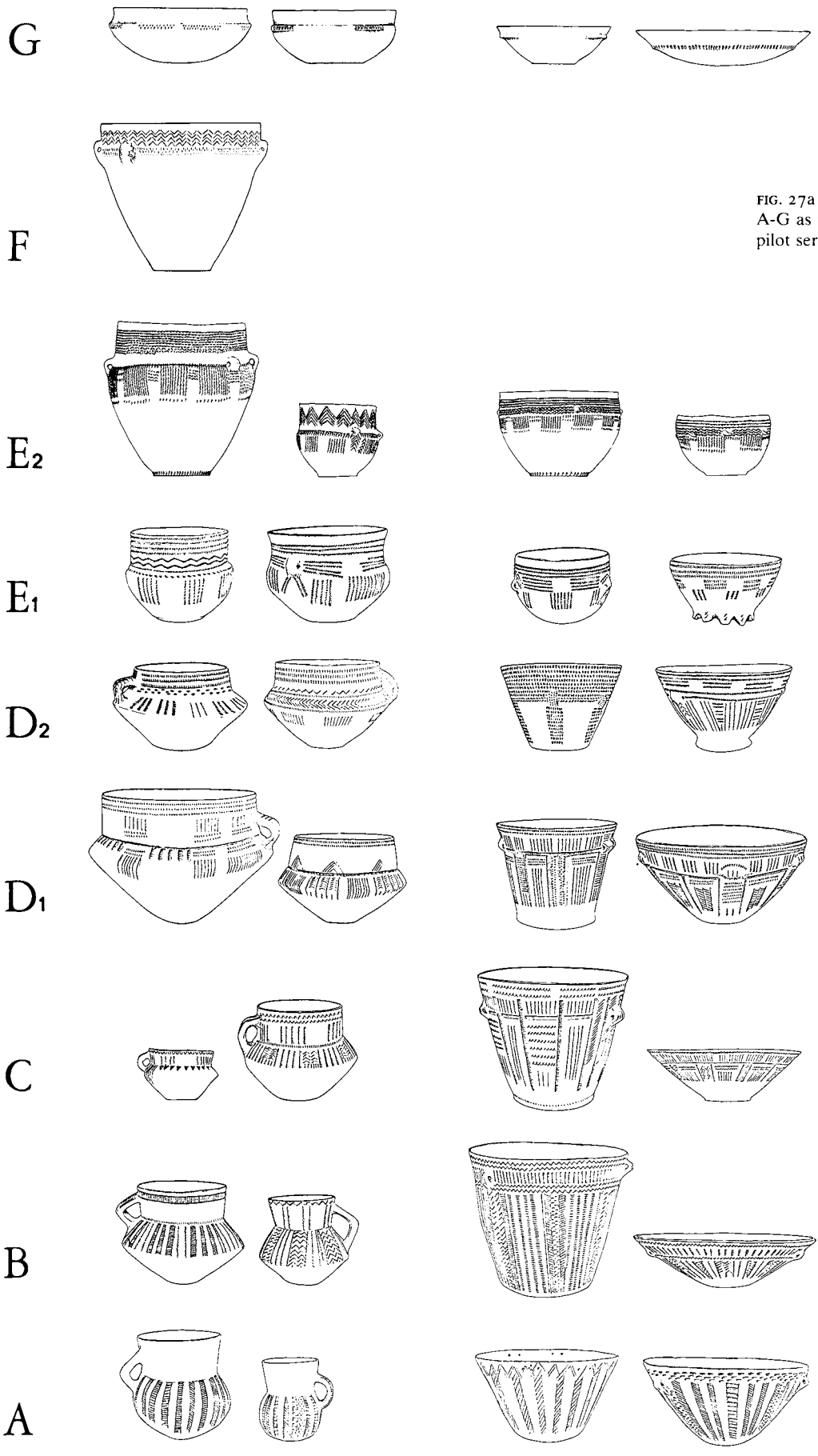


FIG. 27a The pottery phases A-G as represented by both pilot series. Scale 1/9.

FIG. 28 Pilot types of Drouwen A pottery (upper) and related pottery. (1) DÖSE (S35:1; D13:1; L21); (2) EXLO-D30 (K14:1); (3-4) BRONNEGER-D21 (K1:1; K14:8); (5) HAASSEL I (D13:5; S35:2); (6) TOSTERGLOPE (D13:4; S40:3); (7) TANNENHAUSEN (according to original; neck missing). Scale c. 1/3.

DROUWEN A (fig. 28)

Bowls, pails: The narrow ladder-strips and other vertical strips of the lower ornamentation *('Untermuster')* leave scarcely any room for upper ornamentation *('Obermuster')*. There are pierced lugs in the transition area between upper and lower ornamentation.

Shoulder pots: The jug from BRONNEGER (fig. 28:3) has a rounded belly which is decorated with strips from just above the base up to the base of the neck. The slightly funnel-shaped neck is undecorated. The jug from DÖSE (fig. 28:1) is virtually identical with it, although the strips are more varied and the handle, too, is decorated.

These jugs are in many respects similar to jugs from TANNENHAUSEN (fig. 28:7), HAASSEL (fig. 28:5) and TOSTERGLOPE (fig. 28:6), although the belly ornamentation of the jugs from these three sites is different. The first two of these three jugs probably belong to the style of the early Altmark pottery (*), the jug from Tosterglope may be as early as the end of the Haassel style (*) which preceded it (section 6.1). The triangles in the upper ornamentation of

the bowl or pail from EXLO (fig. 28:2) also suggest a connection with the Altmark pottery. But it would seem to be going too far to incorporate the Drouwen style in Drente with the Altmark pottery, as Dehnke (1940) advocated. The jug from TANNENHAUSEN is presumably an imported piece of Altmark pottery.[1]

The *lugged beaker* from a small hunebed at VALTHE (K11:5) is a direct counterpart to the lugged beaker from NEUMÜNSTER-GADELAND, which has an upper ornamentation of maggot impressions (*) in the style of the bowl from BRONNEGER (fig. 28:4). There were apparently good communications with Schleswig-Holstein and southern Denmark, as well.

The *distribution of the A pottery* has not been mapped in detail; in Netherland, it occurs fairly frequently on the Hondsrug in Drente and also at RIJS in the southwest of Friesland, but not to the south of Drente. From northwest Germany, I know of only the above-mentioned jugs from TANNENHAUSEN, in Ostfriesland, and from DÖSE, near Cuxhaven, and besides that, the finds of the early Altmark pottery which Dehnke and Knöll reported east of the Weser.

DROUWEN B (fig. 29)

Bowls, pails: The upper ornamentation is now wide enough to accomodate pierced lugs (and they are generally present). The ornament consists of evenly spaced vertical lines between two horizontal zigzag lines. In the lower ornamentation, the ordering of the strips shows more of a rhythmical pattern than was previously the case. Wider strips filled in with M's or W's placed one on top of the other, already give a more horizontal emphasis.

Shoulder pots: The belly has now a kink in the middle, below which the pot is a conic section, mostly undecorated, and above which it is a spherical section. The main emphasis of the decoration is concentrated on this rather convex shoulder. This decoration, in fact, has much in common with the lower ornamentation of the bowls-pails. The fact that the neck is now decorated as well is a novelty. There is a zigzag line or a ladder-strip along the rim, below which are sometimes widely-spaced vertical lines.

The *distribution of the B pottery* (fig. 37) is largely identical with that of Knöll's map of phase I (1959, map 21). It was possible to complete the picture in mid-Netherland. Outposts such as LAREN, ELSPEET and MEHRINGEN extend to the line Hilversum-Oldenzaal-Dümmer.

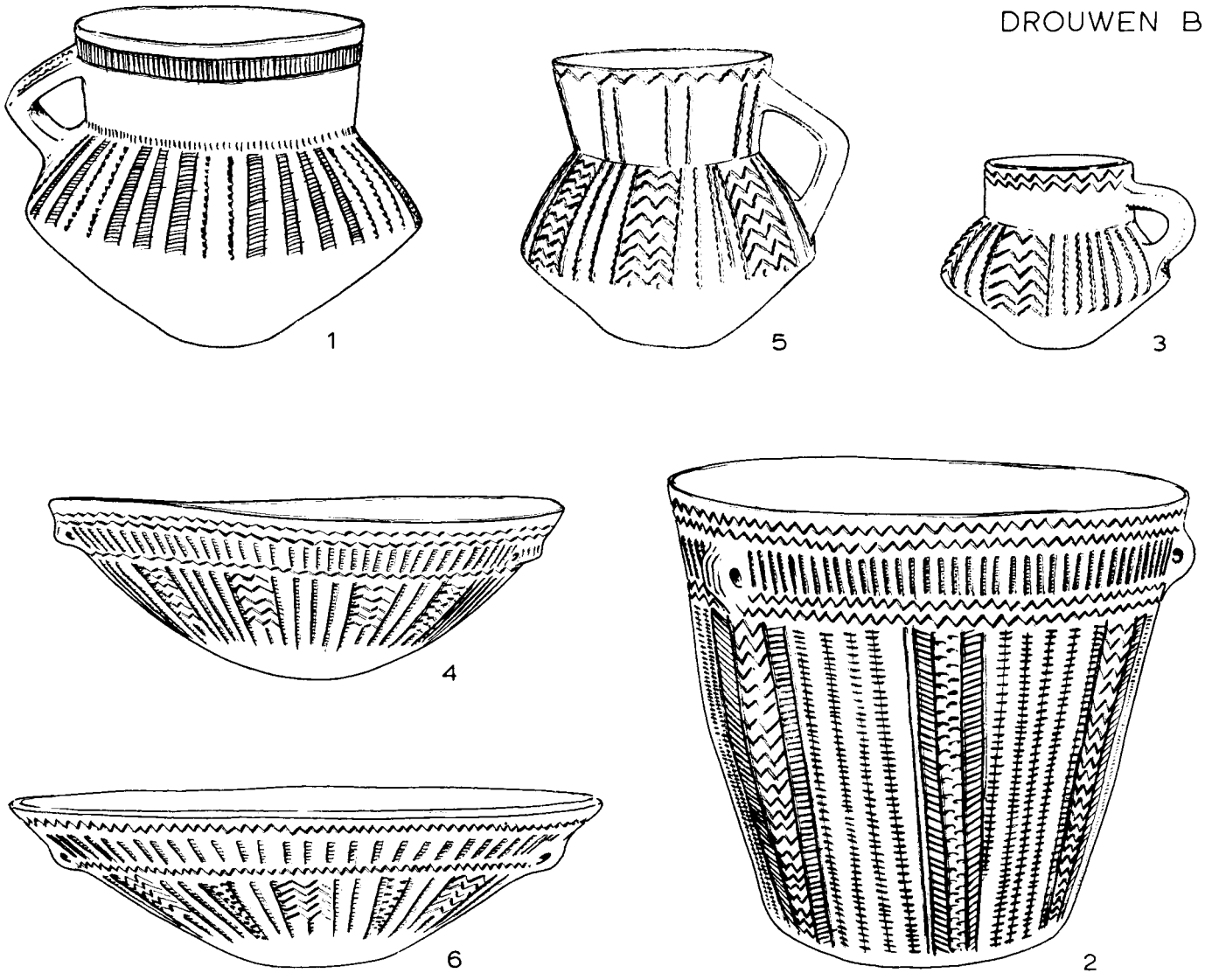


FIG. 29 Pilot types of Drouwen B pottery. (1) NIEUW WEERDINGE (K1:5); (2) BRONNEGER-D21 (K25:1); (3) WESTERLOH (K1:7); (4) EXLO-D30 (K14:12); (5) GROSSEN GING (K1:2; D16:3); (6) DROUWEN-D19 (K15:5). Scale c. 1/3.

DROUWEN C (fig. 30)

Bowls, pails: Instead of the zigzag line(s) at the base of the upper ornamentation, there is now a straight grooved line or a Tiefstich line. The upper rim of this zone continues to be executed in zigzag line(s) which can be replaced by a skating-motif (*) line (fig. 30:7), but these are often divided into small sections by equally-spaced breaks. The vertical lines are often in groups, separated by somewhat wider open spaces.
The composition of the lower ornamentation is also more complicated now, with an alternation of horizontal zigzag line-blocks, vertical sections and spaces in between. The strips which were part of a more strictly vertically-ordered lower ornamentation are becoming more infrequent. The contrast between the pails fig. 29:2 and fig. 30:7 is illustrative: the ornamentation of both is strictly 'geometrical' but that of the latter shows a strong increase in the horizontal element. At the same time, the lower ornamentation moves into the area of the upper zone; heavy vertical 'block boundaries' from the first continue into the second.
Shoulder pots: The profile of the pots becomes rectilinear, with a sharp kink in the belly. Simultaneously, the pots become wider, there are 'tureens' now, alongside 'jugs'. The ornamentation is essentially similar to that of the bowls-pails. The tureen with pendant hatched triangles on the shoulder, a newcomer, is a very widespread type (section 6.4).
The *distribution of the C pottery* (fig. 38) does not differ very much from that of the B pottery. Not a single tureen with shoulder triangles has yet been found in Netherland to the south of Drente (cf. Knöll 1959, map 8), but this might just be a coincidence or a reflection of the relative rarity of this pot in the settlement finds (cf. section 3.3(4) on the ratio bowls:shoulder pots), since bowls-pails of the C type do occur there (Knöll, list 44), mainly in the same find-sites as B pottery.

DROUWEN D (figs. 31-32)

The horizontal lines of ornamentation are now executed predominantly in tvaerstik lines (*). If the basic design of the ornamentation is still similar to that of the C pottery, we can refer to it as:

D1 pottery
Bowls/pails: The area of the rim is underlined by either a straight line or a Tiefstich line (as on C pottery), or by the same horizontal tvaerstik lines as now run round the rim. The rim area still retains vertical lines, arranged in groups.
Shoulder pots: The profile of the tureens of phase D (jugs are now absent) is generally wider and less rectilinear than in phase C. The ornamentation in D1 still bears a strong resemblance to that in C, but nearly every horizontal line is now a tvaerstik line.

D2 pottery (which cannot always be sharply distinguished from D1, and often not from the pilot types of the following horizon, E1, either) has no vertical lines in the rim area of the *bowls/pails*. These have been replaced by groups of short horizontal tvaerstik lines, placed one on top of the other, and other motifs. The pail is now in its decline. In the *shoulder pots,* the transition between the neck and the shoulder becomes less abrupt, and virtually no more triangles are to be seen on the shoulders of the tureens.
The distribution of the D pottery corresponds largely with Knöll's distribution of phase 1/2. The uncertainty about what exact should be included in D1, D2 or E1, however, becomes a factor in our evaluation of this map, since the Münsterland was about to become inhabited in the period of this pottery. The most southern find site on the Ems of what can with confidence be described as D1 pottery is SCHÖPPINGEN (grave 1970, *Neujahrsgruss Museum Münster* 1971, photograph 2). It is remarkable that D pottery appears to be virtually absent in Netherland to the west of the IJssel. There is still too little known about the southwest of the province of Overijssel and about the part of the province of Gelderland to the east of the IJssel to enable us to make any pronouncement concerning the absence of D pottery there (cf. 3.3(2) and 6.6).

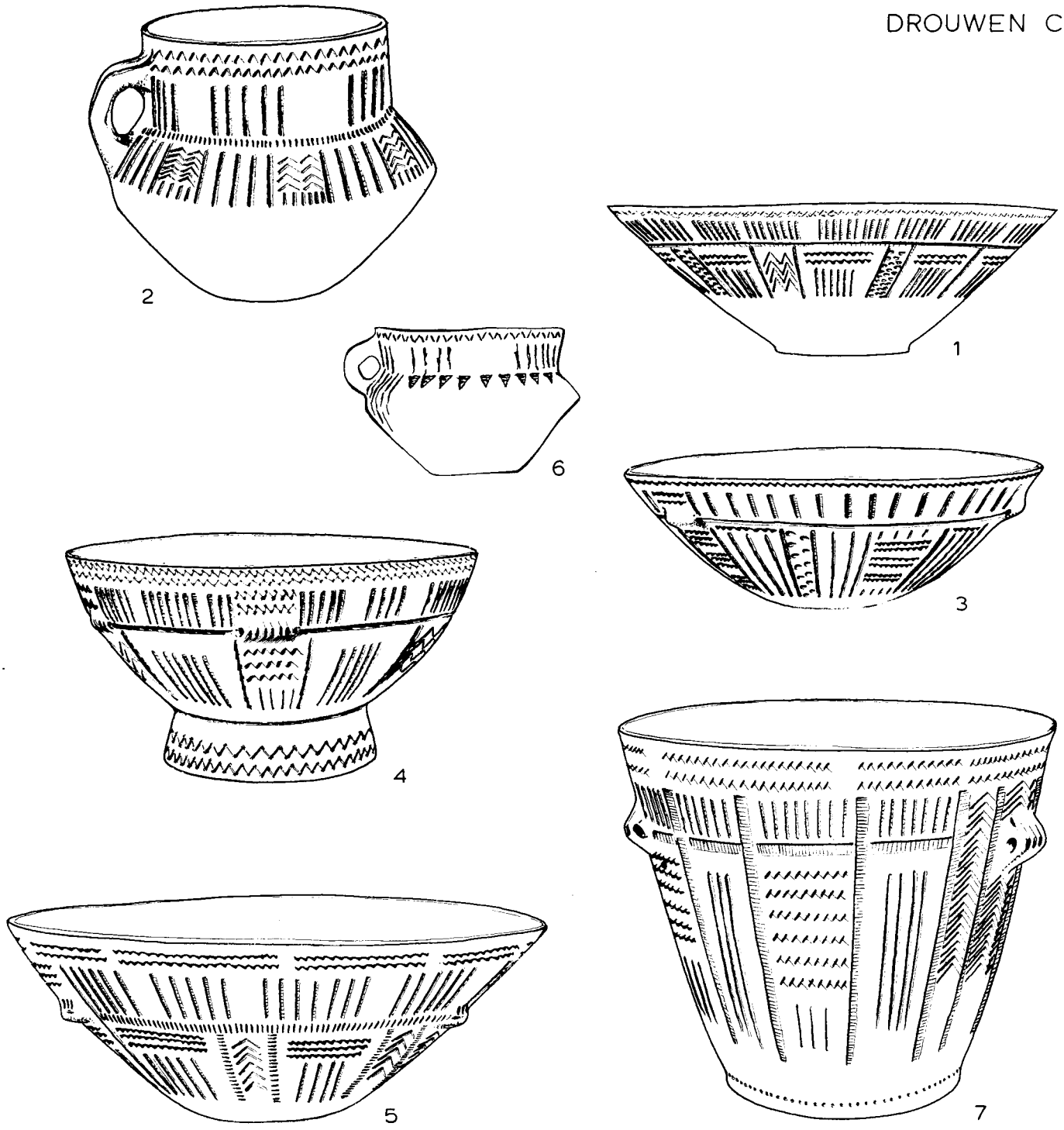


FIG. 30 Pilot types of Drouwen C pottery. (1) DROUWEN-D19 (K15:1); (2-3) BRONNEGER-D21 (K2:13; K14:9); (4) BRONNEGER-D22 (K15:8); (5) BRONNEGER-D21 (K16:6); (6) HOOGHALEN (original); (7) BRONNEGER-D21 (K25:3). Scale c. 1/3.

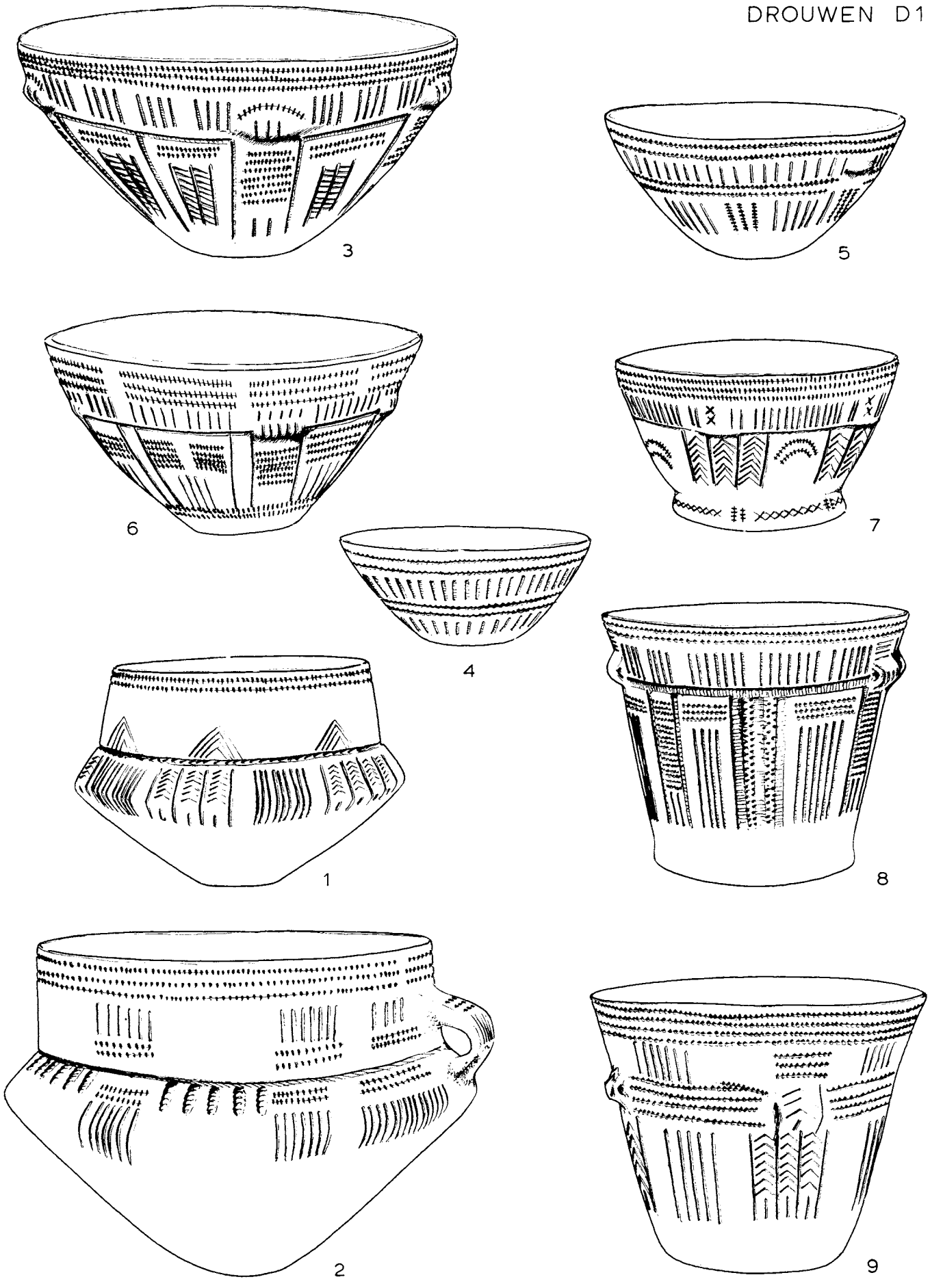


FIG. 31 Pilot types of Drouwen D1 pottery. (1) SEESTE (S47:6); (2) BRONNEGER-D21 (K3:7); (3) EMMEN-D43 (K17:10); (4-7) DROUWEN-D19 (K17:4; K22:4; K18:2; K20:17); (8-9) BRONNEGER-D21 (K25:9; K25:7). Scale c. 1/3.

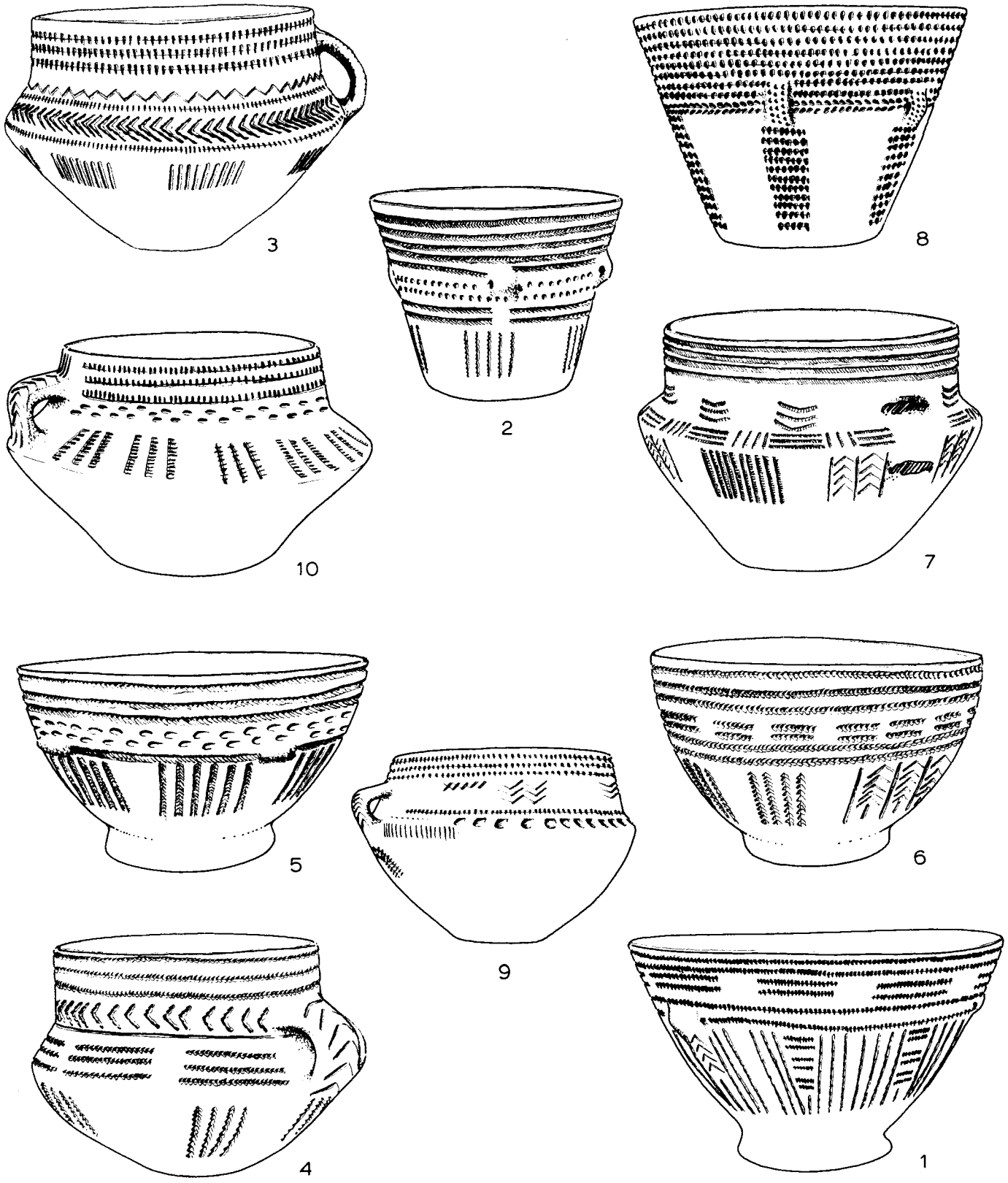


FIG. 32 Pilot types of Drouwen D2 pottery. (1) BRONNEGER-D21 (K19:16); (2) SEESTE (K27:4); (3) DRIEHAUSEN (S47:7); (4) WECHTE I (K3:1); (5) WESTERHOLTE (K16:3); (6) THIENE (K17:1); (7) GRETESCH (S43:6); (8) BAALDERES (K42:23); (9) DROUWEN-D19 (K4:11); (10) WECHTE I (K5:1). Scale c. 1/3.

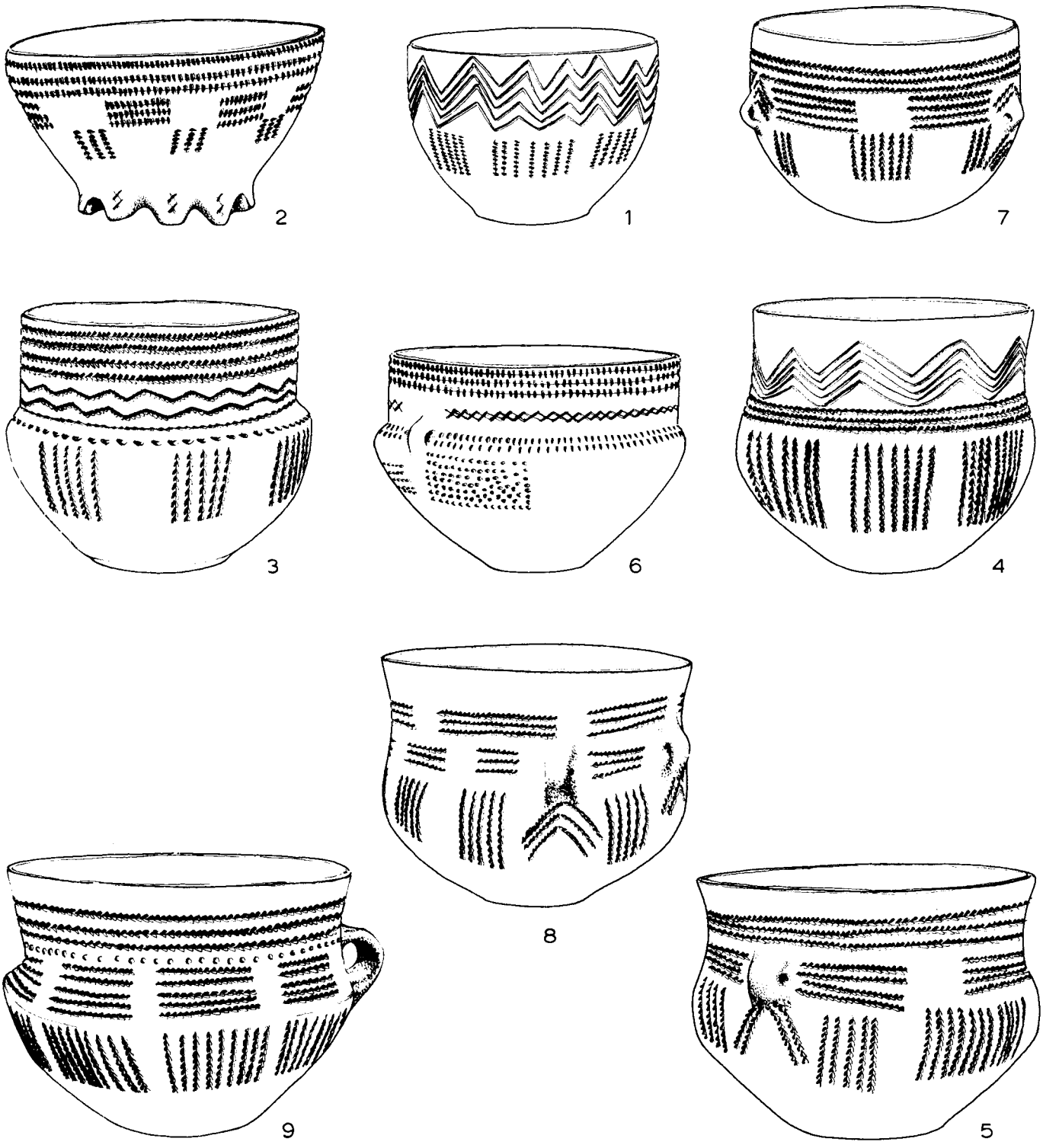


FIG. 33 Pilot types of Early Havelte pottery (E1, tvaerstik facies). (1) WECHTE I (K21:8); (2) BRONNEGER-D21 (K22:10); (3) LEER, Kr. Steinfurt (K6:4); (4-5) WECHTE I (K8:3; K13:5); (6) DROUWEN-D19 (K8:5); (7) DARPVENNE (K20:13); (8-9) WECHTE I (K13:1; K5:9). Scale c. 1/3.

EARLY HAVELTE (E1-2) (figs. 33-34)

This horizon is most clearly represented by the pottery of the *Uddel facies* (E2) from settlements and graves at UDDELERMEER, UGCHELEN, BEEKHUIZERZAND and ANLO (see section 6.6). See figs. B:19-20 and fig. 34.

Shoulder pots: High or low amphorae with a cylindrical neck which sometimes widens a little or narrows towards the top, with a truncated, pear-shaped belly and with 2 to 4 pierced lugs (sometimes knobs) in the angular neck-shoulder kink. Footrings are favoured, the base always being raised a

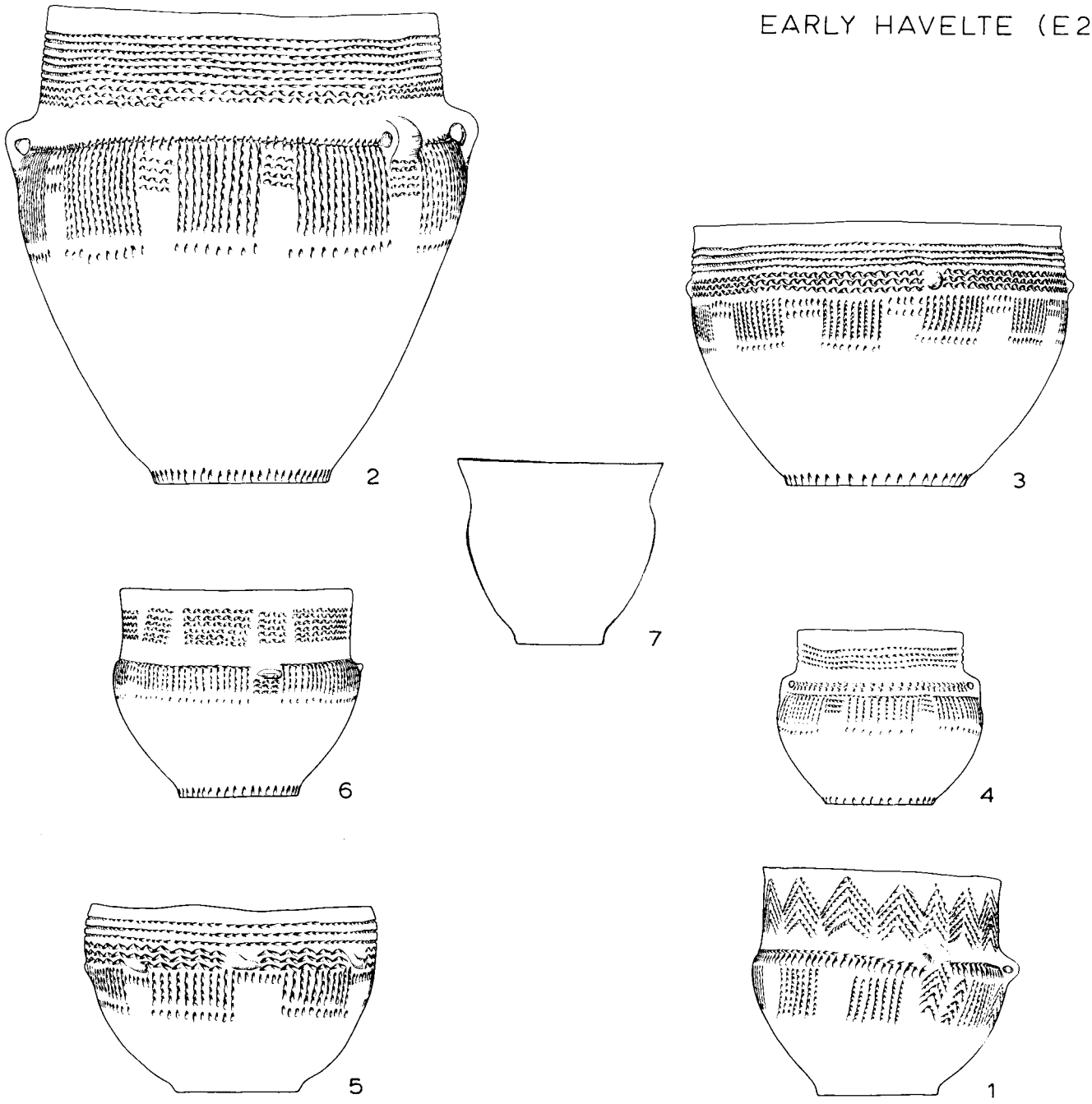
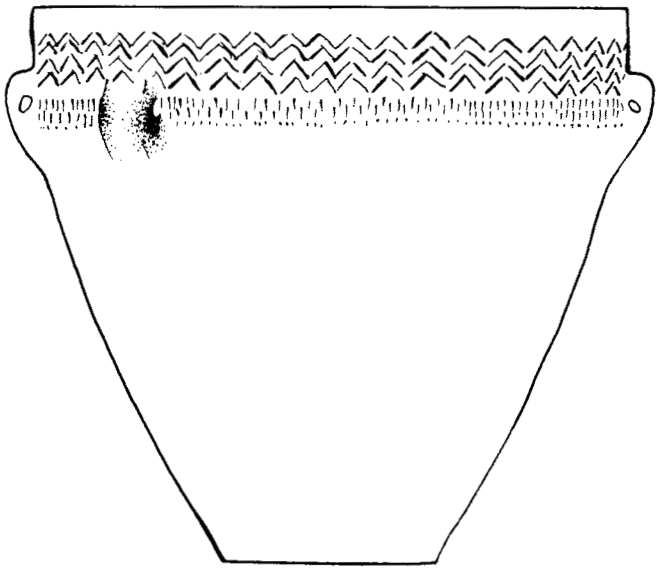
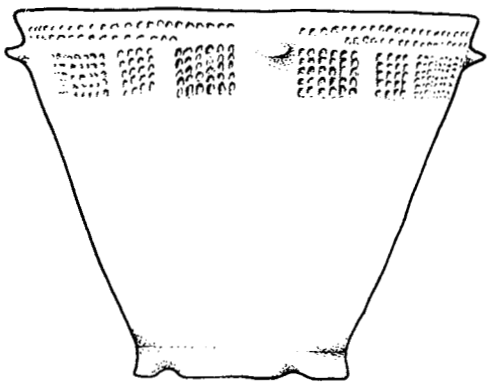


FIG. 34 Pilot types of Early Havelte pottery (E2, Uddel facies). (1) BAALDERES; (2-7) UDDELERMEER. Scale 1/3 (according to plaster copy (1) and originals in Leiden Museum).

little. Sections were often cut out of a somewhat higher foot-ring, so that separate legs resulted. Such legs may also have been shaped separately (fig. 33:2). The decoration has shifted upwards to the rim and the neck-shoulder kink, from which it is suspended, as it were. The design was applied with the point of a quill (point stamp technique, *) or with the rectangular, narrow end of another implement. On the neck, there is often an ornamentation which consists of two adjoining horizontal zones; for example, point stamp lines above, an equal number of fine zigzag lines below. But we also find rim ornamentations consisting of only one of the possible varieties, e.g. a series of large zigzag lines. In the belly ornamentation, a preference is shown for blocks of vertical lines which hang from the line in the neck-shoulder kink. There is frequently one tear-shaped impression under each line, like the fringe of a carpet. The space between these blocks can sometimes be occupied by a horizontal pattern: a row of separate point stamps or a small block of horizontal zigzag lines. There is often a small row of point stamps on the outside of the foot.

The *bowls* are often hemispherical in shape, or the sphere is cut off above the diameter. A thin rim, extending outwards, sometimes confers a delicate air. The shape of the foot is the same as that of the amphorae. The ornamentation is a simplification of that of the ampphorae: the border line on the base of the neck is omitted and the belly ornamentation is transferred to just below the neck ornamentation. If





MIDDLE HAVELTE (F)

FIG. 35 Pilot types of Middle Havelte, F. Part of the amphorae with encircled numbers in fig. 10 may also be considered as pilot types, but an exact typological boundary with the preceding phase has not yet been defined.
(1) ANGELSLO, grave 4; (2) GLIMMEN, pit next to hunebed G2. Scale 1/3. After Bakker & Van der Waals 1973.

there are knobs, they are on the boundary between the two ornaments.
Funnel beakers with a belly-fringe are completely absent in facies E2: they belong to A-D pottery and their latest possible appearance is in facies E1. Characteristic of E2 (E1 too?) are undecorated funnel beakers, whose disc-shaped, flat base-plate breaks off easily (fig. 34:7). In preceding phases, similar bases can be seen in the pail.
Facies E1 (fig. 33) occurs in a slightly more easterly area than E2 (fig. 34), but there is a wide region of overlap (section 6.6). To E1 was assigned the pottery which, as regards shape and arrangement of ornamentation, is identical to E2, but whose ornamentation was applied in tvaerstik lines or with a heart-stamp, hollow-stamp or double stamp (*). Also to the E1 facies belong the so-called 'Wechte tureens' (*; K13; figs. 33:5, 8) and the sometimes almost double-conical terrines which seem to continue the Drouwen tradition to some extent, especially to the east of Netherland (K7:11).
No good closed finds of the E-horizon are known as yet in the area of the E1 facies and, partly for this reason, it is often difficult to make a distinction between E1 and D2 (see section 6.6).
The *geographical distribution of E1 + E2 pottery* (fig. 39) is wider than that of any other phase. The Veluwe and the Münsterland were then densely populated.

MIDDLE HAVELTE (F) (fig. 35)

'Phase' would actually seem to be too big a word for this typologically transitional stage. Kat-van Hulten (1947) pointed out the occurrence in Drente hunebeds of transitional shapes between the Early Havelte E2-amphorae and pottery types of the Late Havelte style (G). Both the indentation of the profile and the ornamentation became further reduced (figs. 10:22, 25, 29-31). The amphorae developed partly in the direction of the necked bowls (G) (fig. 10:30, 34); included in the features which the two types can have in common are III-ornamentation on the shoulder, and sometimes already a ridge there. Furthermore, the amphorae developed partly towards a sort of pail with two pairs of pierced lugs; only the ornamentation (and sometimes the rudiments of the old indentation) betrayed its derivation from the amphorae. These pots occur in the settlement and the cemetery of ANGELSLO, in which Late Havelte is amply represented, but Early Havelte is completely absent (Bakker & Van der Waals 1973; cf. also sections 6.8-9).
The transition from E2 to F must have been a gradual one, as can be seen both from Kat-van Hulten's smooth sequence (fig. 10) and from the grave assemblage of WESTRUPER HEIDE (K41:15-16).
Our knowledge of the *geographical distribution of Middle Havelte pottery* – still, in fact, only of one particular type of pot(!) – is still limited to a number of hunebeds (in which F and G sometimes occur while E is absent) and other places on the Drente plateau, EMMELN-2 on the Ems, and WESTRUPER HEIDE on the Lippe (Bakker & Van der Waals 1973, notes 24-28), if we ignore some less convincing possibilities further east.[2]

LATE HAVELTE (G) (fig. 36)

One of the pilot shapes is the *straight-sided, wide bowl,* with, on the outside, a few centimetres below the rim, a ridge, often interrupted and either transversely carved or impressed (fig. 36:1).

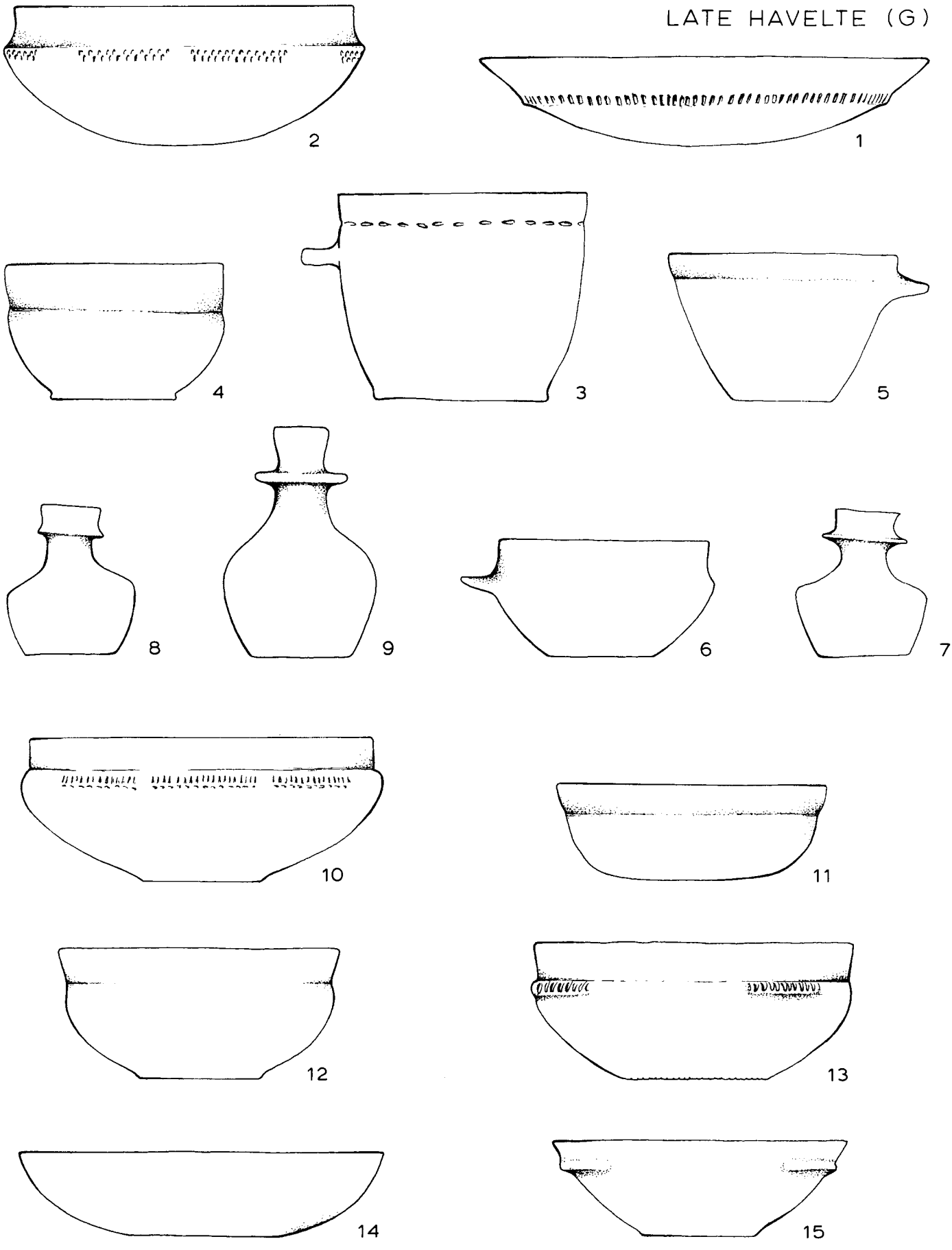
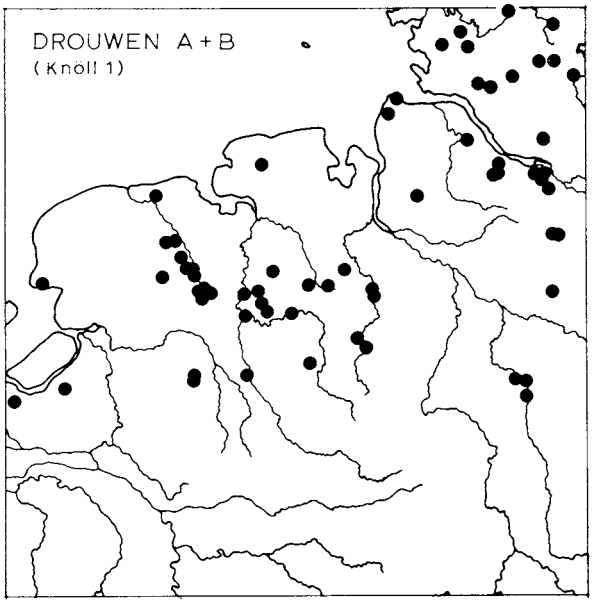
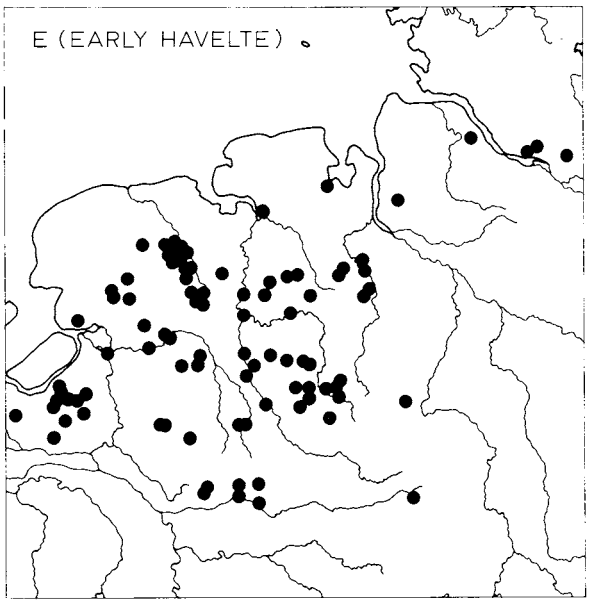
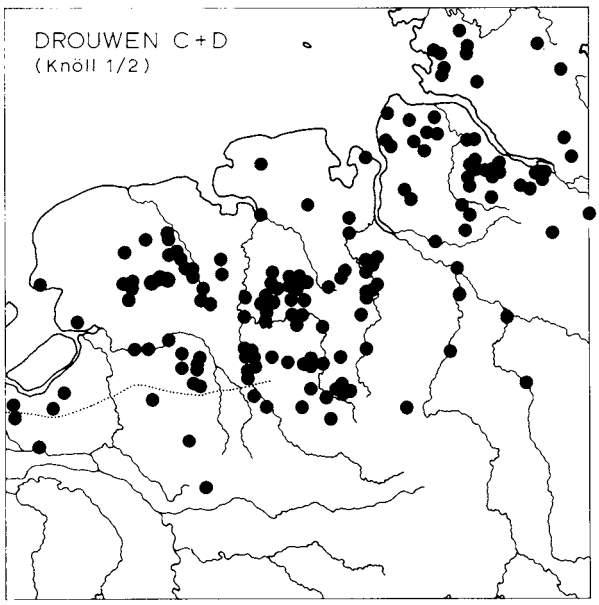


FIG. 36 Pilot types and other pottery of the Late Havelte phase, G. (1) NOORDLAREN-G1 (in chamber); (2) HOGE LO, Noordbarge; (3, 13) ALLARDSOOG (same flat grave); (4) HUDE; (5, 10) SPIER (pit next to hunebed D54a); (6, 9, 11, 14, 15) ANGELSLO; (7-8) DENEKAMP; (12) SCHIPBORG.
Scale 1/3. After Bakker & Van der Waals 1973.







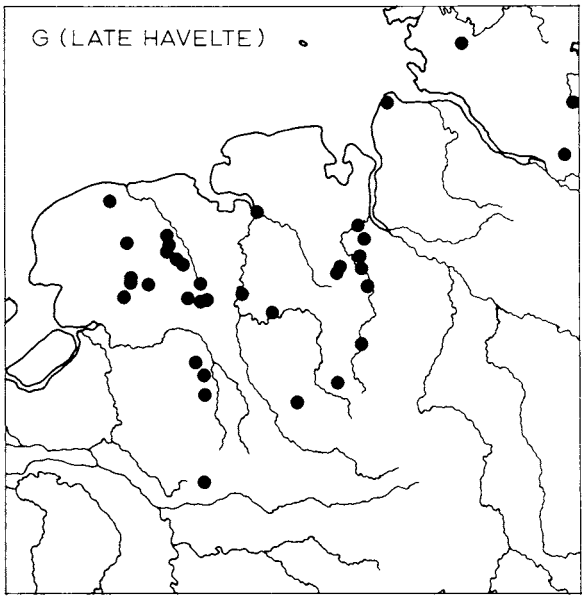


FIG. 37 Distribution of Drouwen A and B pottery (Knöll 1), after Knöll 1959 and my own documentation.

FIG. 38 Distribution of Drouwen C and D pottery (Knöll 1/2), after Knöll 1959 and my own documentation. Dotted line indicates southernmost known extension of C pottery. The southwesternmost findspot, REMMERDEN, gem. Rhenen, concerns sherds of large belly-fringed funnel beakers, which are not, in fact, any closer datable than to Drouwen A-C. This recent find (1978) is not yet mentioned in the text.

FIG. 39 Distribution of Early Havelte (E1 and E2) pottery. Cf. figs. 69-71.

FIG. 40 Distribution of Late Havelte (G) pottery.

Other pilot shapes are the *necked bowls* (*) (figs. 36:2, 10, 13). These are distinguished sometimes by a ridge on the shoulder of the type described above, and often by small rectangular blocks of point stamp or comma-shaped impressions (cf. also fig. B21:1). In the Drente hunebeds, this pottery is conspicuous by its hardness and polish and sometimes by a reddish-brown slip. High *bucket shapes* with faint suggestions of shoulders, and with either stem-like or lip-shaped handles, also occur (figs. 36:3, 5). Moreover, the variation in the shapes in this phase was presumably greater than can be determined at the present time (figs. in Bakker & Van der Waals 1973). *Collared flasks* were also drawn in fig. 36 to illustrate the fact that these were then still part of the assemblage (and in all the preceding phases).

Our knowledge of the *geographical distribution of the pottery* of this horizon (fig. 40) is still limited on account of the extreme difficulty in recognising this pottery. Sherds rarely have sufficient characteristics to make an identification possible. It is often impossible – even for the expert – to distinguish this pottery from Iron or Bronze Age pottery. In the Hunte region, for example, it seems to be completely lacking in carved ridges or Tiefstich ornamentation. The Late Havelte pottery from the DÜMMER-NORTH settlement (recognised as such by Knöll) was, for this reason, originally taken to be La Tène pottery (Bakker & Van der Waals 1973, note 42).

CHAPTER 5

Flint and stone artefacts

The flint and stone artefacts[1] of the West Group are less well-known than the pottery. Virtually no attention has been paid to the small flint artefacts. Systematic research on the axes and battle-axes had stagnated in the West after Åberg's pioneering studies (1916a, b; 1918) until the 1950's and 1960's when K.H. Brandt (1967, 1971), P. Herfert (1962), M. Addink-Samplonius (1968) and others resumed work on this subject. Quite recently, K. Ebbesen (1975) published an elaborate typochronology of the Danish Flat and Double battle-axes. Because this chapter had been translated into English already, sections 5.6.1-2 could only be adapted in part to Ebbesen's data.

The range of shapes of the battle-axes has now been established in broad outline, and the emphasis is on the determination of the exact chronological significance of each type. This is often still very difficult owing to the relative rarity of TRB battle-axes in general, and of those in a datable context in particular. In the case of the far more numerous flint axes, the crucial problem is that of classification into types. Their shape is much simpler than that of the battle-axes, and there are only slight differences in the types aimed at by the makers and users; these types often merge into each other, even if no repeatedly re-sharpened, re-shaped or damaged pieces are considered. Moreover, the stone (non-flint) axes weathered badly.

This chapter attempts to give a complete inventory of the Dutch TRB battle-axes so that Brandt's maps can be completed on the western side. I shall discuss the few specimens of Dutch TRB axes and chisels where a datable context is known. As far as the small flint artefacts and the non-cutting stone implements are concerned, I have restricted myself to some brief remarks on a few finds with which I am familiar.

As far as the pre-1900 history of the investigation of stone and flint artefacts of the West Group is relevant, this was described in Chapter 2. In our century, it is particularly noticeable that the subject in general has received very little attention after and apart from N. Åberg's great activity, and preceding a revival beginning c. 1950. For the authors not mentioned here, I refer the reader to Brandt (1967).

5.1 SMALL FLINT ARTEFACTS

The study of the small flint artefacts has actually not even started. It is to be doubted whether such a study would produce detailed chronological results, but it might perhaps throw up some information about the ethnic substrata whose fusion led to the population which made the Western Tiefstich pottery. Whereas the flint artefacts of the North Group are much larger (Schwabedissen 1968, fig. p. 21), the Western scrapers are generally smaller than a Dutch guilder. This microlithic nature is a striking feature of the other tools, too.[2]

This situation corresponds with that of the TRB East Group, the flint artefacts of which were described in fairly great detail by Jażdżewski (1936, p. 376). At first sight, only the arrow-heads are noticeably different, predominantly trapezoidal in the West, just as in the North, triangular in the East; there are a few exceptions.

Jażdżewski (ibid.), like every other author, including those in my country, ascribed the poor quality of the flint artefacts to the inferior nature of the local moraine flint of the North European Plain, in contrast to the excellent flint of the North. R.R. Newell, however, pointed out (in a private discussion) that local manufacture of macrolithic flint artefacts was certainly possible here in the West, if only the will existed. This was the case, for example, with the flake axes of the mesolithic De Leijen-Wartena Complex (Newell 1970) which may be as long as 15 cm. Such macrolithic specimens seem to be nonexistent or scarce in a TRB context – except the ground *Flint-Flachbeile*.

The artefacts of the TRB West Group were made of local (moraine) flint or discarded flint axes. The *scrapers* predominate numerically in the settlements. In ELSPEET, artefacts and waste flint chips turned out to have had an average weight of 4.6 gm. The scrapers, 78% of the recognized artefacts, had an average weight of 4.2 gm (measurement A. Boomert). In other places west of the Weser, the proportions appear to be about the same.

Long blades and *large cores* are virtually absent everywhere. *Sickle blades* with retouched sides and sickle gloss regularly occur in settlements and mega-

lithic graves (ANLO, Waterbolk 1960, fig. 40:11; TANNENHAUSEN, Gabriel 1964; DROUWENERVELD). Small numbers of *borers* occur in the settlements (Waterbolk 1960, fig. 40:6; Bakker & Van der Waals 1973, fig. 7).

Flint *hammer-stones,* a fairly common implement, were made from discarded axes (fig. B3:16) or nodules. A hammer-stone found in the settlement at LAREN is spherical with a diameter of 7.5 cm. *Pick-like strike-a-lights(?)* are normal objects in megalithic graves and settlements (LAREN; ELSPEET; ANLO, Waterbolk 1960, fig. 40:13; EMMELN-2, Schlicht 1968, figs. 962-968). These were also found in individual graves like DIEVER and ZEIJEN. These objects, which can have a length of 8 cm or more, were made from discarded, sharpened flint axes, old hammer-stones or other pieces of flint. The wear-gloss which they sometimes show near the point might indicate another use than that of striking sparks.

Trapezoidal arrow-heads are the normal type of arrow-head. These are particularly abundant in those hunebed inventories whose recovery involved the use of a sieve, although this is not always the case (GROSS BERSSEN 7, Schlicht 1972). 573 pieces were found among the 1200 pots in hunebed EMMELN 2 (Schlicht 1968). Hunebed DROUWENERVELD-D26 produced more than 100, in addition to more than 130 pots. Schlicht's figures 969-972 give a good general impression of the shape and the dimensions of these arrow-heads. A high trapezoid is the normal shape, but deviations such as high triangles and high rectangles occur. Whenever the piece of flint already had the shape the maker was aiming at, no further chipping was done. *Other shapes of arrow-heads* are so rarely found that they are probably intrusions in the TRB find-groups from other contemporary or non-contemporary cultures (e.g. fig. B16:4).

The most westerly '*Dicke Flintspitze*' (Langenheim 1936) known to me, a 22 cm long bifacially worked flint dagger with a convex-diamond-shaped cross-section (maximum 3.5 x 2 cm) and plan similar to Langenheim 1936, fig. 2c was found at GELLENERDEICH, slightly east of Oldenburg (Pätzold 1955, fig. 2a). The TRB pottery found in this settlement spans phases C-D and G, and perhaps also E. This implies a maximum age of MN Ib-II for this *Spitze.* According to the pottery found with it, a *Spitze* from the Holstein megalithic chamber in FLEHM (Sprockhoff 1958) cannot be earlier. This date corresponds roughly with the minimum age which Langenheim (1936) thought acceptable: 'at the latest in the earliest Passage Grave period, the majority probably in the Dolmen period'. They remained therefore presumably in use over a somewhat longer period. The Danish literature tends to regard these objects as flint halberds rather than daggers.

The Meuse flint pebbles (blue Tertiary flint eggs) which were found in ELSPEET might have been used as *pottery polishing stones* (suggestion A. Bruijn; see also N. Westendorp's corresponding explanation as early as 1822 of the marble from hunebed D13).

5.2 NON-CUTTING STONE IMPLEMENTS

Heavy grind and polishing stones, quern-stones and some *hammer-stones* are found mainly in the settlements.

The B+C settlement at LAREN (Appendix B11) was situated ½ km from the ice-pushed sand-ridge of the Gooi, which was rich in stones, but in the site itself, on Coversand, there were no naturally available stones any bigger than fine gravel. The excavation therefore afforded a picture of what had been considered necessary to transport to the site. G.J. Boekschoten (Geological Institute Groningen University) identified the types of stone (see Appendix B11 for details). Of the 125 kilos which were recovered viz. 1475 pieces of stone, half was Dala sandstone, approximately one fifth was other sandstones or quartzites, and about one fourth crystalline rock. Apart from an occasional hammer-stone of crystalline rock and a few smaller polishing stones, the vast majority consisted of fragments of saddle querns and large grind and polishing stones. The large grind stones were of sandstone or quartzite (especially Dala sandstone). All had been shattered, but fragments which could be fitted together suggest that the largest of the grind stones were as large as 40 cm long.

H. Berg's description of Danish TRB grind stones (Berg 1973, p. 70) would seem to be entirely applicable here: 'Flint axes were sharpened on large, flat stones, generally sandstone, rarely the more roughly-grained granite. They generally have an irregular rectangular shape, and they are 30-40 cm long, but longer ones also occur [fig. 41a]. The longitudinally-running polishing surface was only slightly hollowed out and rises slightly towards the edges of the stone. If the hollow became too steep-sided, the grind stone could not be used any longer and the steep parts were then removed by splitting them off. (. . .) Complete grind stones are very rare in Middle Neolithic settlements; they are found there, strangely enough, almost exclusively as small fragments. The reason why the worn grind stones were deliberately shattered is not clear.'

This was also a problem in LAREN.[3] The fractured fragments show no further signs of use. Occasionally fragments were used in the flooring of megalithic tombs (NOORDLAREN-G1). Smaller polishing stones were also found in LAREN, including an *arrow-shaft or awl straightener* of the same type as that from LANDERSUM (fig. B15:27).

The *saddle querns* in LAREN had also been shattered (for admixture to potter's clay?; many of the fragments bear pick-traces[3]). Complete quern-stones and the upper rubbing stones are sometimes found together, e.g. in the settlement at ANLO (Waterbolk 1960, plate X:1) and in the stone packing of grave 'd' at EKELBERG (Appendix B6).

The LAREN *hammer-stones* are round, easily handled stones: flint, often quartz, and occasionally crystalline pebbles. Discarded axes, made of flint or other types of stone, were often used as hammer-stones (stone cist VALTHE, cf. note 7:6; stone cist DIEVER (fig. B3:16) etc.). No stones showed evidence of having been used for copper-working.
For the discussion of stone *mace-heads* which might perhaps be assigned to the West Group, see section 5.7.

5.3 FLINT AXES AND CHISELS OF RECTANGULAR CROSS-SECTION

The TRB flint axes and chisels of rectangular cross-section were partly imports from manufacturing centres in the territory of the North Group, and partly local products of the West Group, which are typologically comparable with those of the North Group. The chisels have parallel sides and a cutting edge with a maximum width of 3 cm (Malmer 1962) or 2.8 cm (Højlund 1974). Malmer added that the maximum 'butt angle' (*Schmalseitenwinkel,* Malmer, p. 360) is 3°. These limiting values were established for the Swedish Boat-axe culture and the Jutish EGK but seem to be applicable to the TRB axes and chisels as well.
In southern Scandinavia, the axes with a rectangular cross-section are subdivided into thin-bladed and thick-bladed axes. The limiting value of the thickness, measured at the 1/3 point of the length near the butt, is 2 cm (Malmer) or 2.5 cm (Højlund). This limiting value, which was established for axes of the Beaker cultures, is also being applied to the axes of the TRB culture (Skaarup 1973, p. 28; 1975, p. 38, however, uses a value of 2 cm as the maximum thickness of the thin-bladed axe, wherever it is measured).
Becker (1973a, p. 158-163) distinguished a middle-bladed axe in the TRB culture (thickness near the top, at 1/3 length 1.7-2.8 cm; longer than 20, generally longer than 22 cm) as well as thin-bladed (id. 0.9-2.0; not longer than 20) and thick-bladed types (id. 2.2-c. 5.0). The middle-bladed type will not be discussed any further, since it was probably not exported to the southwest (Becker 1973a, fig. 42). This type may, however, have influenced Højlund's limiting value between thick- and thin-bladed axes (Højlund 1974, fig. 4).
The TRB thick-bladed axes are classified as thin-butted and thick-butted types. Becker (1957, 1973a) subdivided the former class into an Old type and a Blandebjerg type, the latter into a Bundsø, a Lindø and a Valby type. These were current in this order – they demonstrate the gradual (functional?) development of the heavy flint TRB axe from thin-butted to thick-butted (see also section 2.18).
Concerning type definitions, Malmer's arguments (1962) brought about the present-day trend towards metrical description and distribution curves of the proportions which are considered significant on the basis of a large number of specimens from diagnostic contexts. Against this, Becker (1973a) raised the objection that we cannot just measure any collection of axes which are generally worn and sometimes reshaped. The measurements should be based on virtually undamaged specimens. Subsequently, a check can be done as to which remodelled axes also belong or have belonged to the type. But such specimens must not be a factor in determining a type and its metrical definition. Consistent with this is Becker's assertion that only a very small proportion of the axes found can be typologically classified. This is a matter of a basic difference in approach between Becker and Malmer-Højlund, at least on paper.
Perhaps both approaches can be justified, provided that the resulting values are not heedlessly interchanged. A knowledge of the dimensions of the worn axes in graves and settlements is necessary to enable us to derive the maximum benefit from closed finds, stratigraphical series (cf. Skaarup 1973, 1975) and regional inventories.

An inventory of the TRB axes of the West Group in Lower Saxony and Münsterland prepared in 1949-53 and 1957-62 was published by Brandt (1967). Since the Scandinavian studies quoted above were not yet available at that time, Brandt arrived at a classification of his own, which was partly based on older German studies of the material from his area of study, although this region had yielded remarkably few reliable closed finds. Brandt's types are based on the total amount of (partly worn) neolithic material, a fact which might imply that it could have been better to characterize the original TRB types in a somewhat different way.
The applicability of his typology has not yet been tested by years of general use, and the types have not been so sharply defined as is now being attempted by the Scandinavian prehistorians. It is, in fact, by no means inconceivable that the TRB West Group had its own norms for its types of axes, especially if locally manufactured axes were concerned.
The characteristics of such local types might then partly overlap those of one or more of the southern Scandinavian types described above. Such is certainly the case with the TRB *Flint-Flachbeil,* which was manufactured to the west of the Elbe from moraine flint. This type of axe has not been observed in Denmark and Schleswig-Holstein; Brandt mapped it as far as the Schleswig-Holstein border. These are short axes; 65% are 5-10 cm long, 35% are 10-15 cm long. The poor quality of the moraine flint did not allow for any well-made specimens: they are often described as 'shoddy' in the literature. If the longest *Flint-Flachbeile* were actually not made from the remains of large imported axes, we must be alert to the possibility that the moraine flint to the west of the Elbe apparently permitted the manufacture of 5-15 cm long axes, including imperfect, short imitations of the southern Scandinavian thick-blades axes.

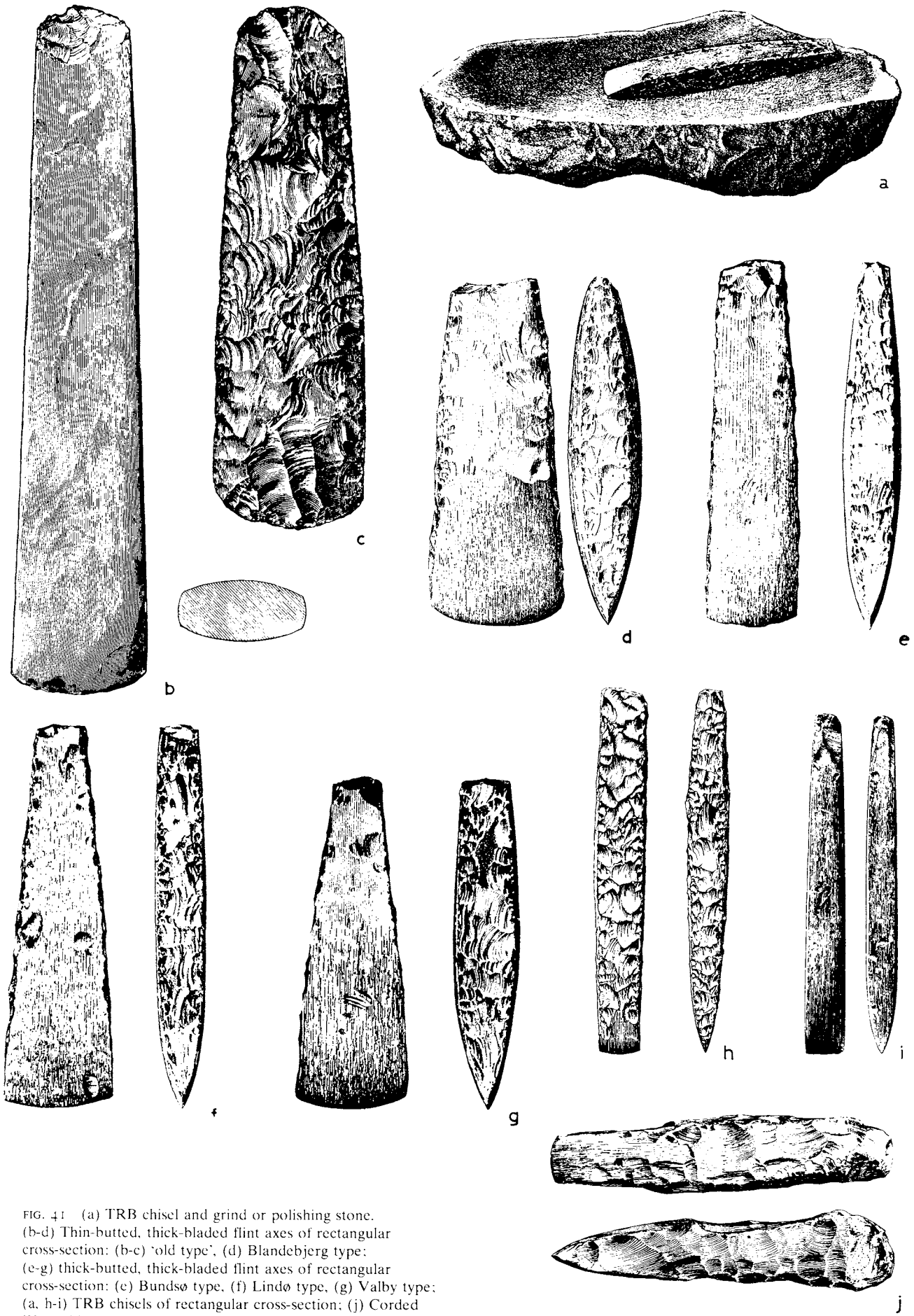


FIG. 41 (a) TRB chisel and grind or polishing stone. (b-d) Thin-butted, thick-bladed flint axes of rectangular cross-section: (b-c) 'old type', (d) Blandebjerg type; (e-g) thick-butted, thick-bladed flint axes of rectangular cross-section: (e) Bundsø type, (f) Lindø type, (g) Valby type; (a, h-i) TRB chisels of rectangular cross-section; (j) Corded Ware chisel of rectangular cross-section. According to Achterop 1960 (h, PEEST, i, DE REEST), further Scandinavian examples, according to Berg 1973 (a, d-g, j) and Montelius 1906 (b, c).

Concerning the thin-bladed axes – which in Denmark were originally no longer than 20 cm (Becker 1973a, p. 159), and generally 15 cm or less – the question arises as to whether they were also imported by the TRB West Group, or whether they were manufactured locally here, perhaps in accordance with other typological norms. However, they are as yet virtually unknown in closed finds with TRB pottery in the West Group. It is not to be expected that an investigation into the type of flint of the TRB axes will ever be able to solve this problem satisfactorily, since the moraine flint was transported by glaciers from Scandinavia to the North European Plain, and thus is essentially no different from Scandinavian flint, apart from the fractures which developed during its transportation.
For the moment we must content ourselves with the unsatisfactory rule of thumb that specimens of the thick-bladed TRB axes with an original length of more than c. 15 cm will be imported pieces, and that this is probably also the case with the originally shorter specimens if they are well made. As we shall see, the rather numerous thin-butted, thick-bladed axes are particularly important for typochronology. Only a small minority of these is shorter than 15 cm[4] (12, presumably partly worn, specimens are recorded by Brandt, 1967, p. 95-96). The few thick-butted, thick-bladed axes which are associated with TRB pottery, will certainly have to be re-tested against the Becker typology, to enable us to derive the maximum chronological benefit from them. Taxonomically, the most difficult of the axes with a rectangular cross-section are those which are less than 15 cm in length. But even the identifiable specimens are typochronologically of little significance (thin-bladed axes and *Flint-Flachbeile*).

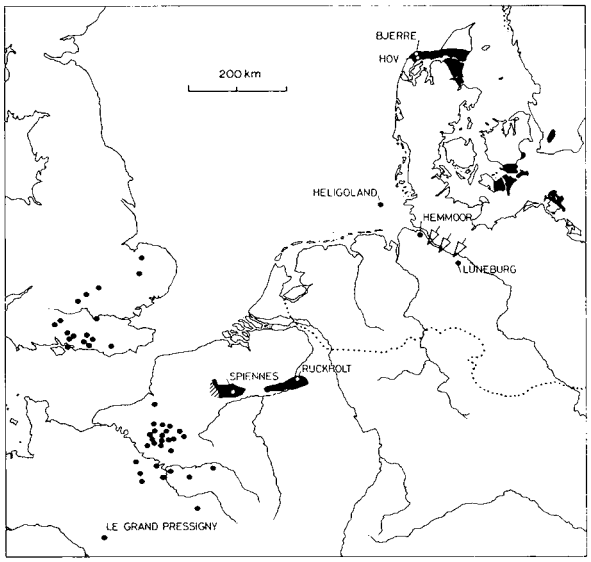


FIG. 42 Flint sources at or near the surface (references in note 5:7). Dotted line indicates southern boundary of erratic northern flint. Black areas in the northeast indicate Senonian 'writing chalk' with good flint. This flint is also found in coastal barriers in the Kattegat and Baltic area (not indicated). Danien chalk with inferior flint not indicated. In the Benelux, black areas show the chalks with good flint. Dots indicate flint mines or, in the case of HELIGOLAND, HEMMOOR and LÜNEBURG, outcrops where flint axe fabrication could, in theory, have taken place. A map of the extension of flint-carrying chalks in England and France was not available. Arrows indicate the Elbe crossings described in the text and in the caption of fig. 43.

Another major problem is the fact that – with the exception of the thin-butted axes – flint axes and chisels with a rectangular cross-section were used in the EGK, and sometimes in other neolithic culture groups, as well as in the TRB culture. The TRB axes and chisels are generally better shaped and polished than those of the EGK. In the TRB group the surface of the cutting edge was finished on a heavy grind stone, and the parallel grooves of the quartz grains of this stone are conspicuous on the surface of the axe (like a freshly surfaced ice-rink). In the EGK group, the polished surface rises and falls with the irregularities in the surface of the axe (like a well-trodden snow-ice track in the sun).
The reasons for these cultural differences are not clear. As an explanation we would have to assume strictly separate chains of manufacture, distribution, use and wear for the TRB and EGK which were synchronous during the MN III-V/Undergrave Period (fig. 73); this would have all sorts of interesting cultural-historical consequences which as yet have scarcely been considered (cf. Becker 1973a, p. 173). No statistical investigation concerning the tenability of these criteria has been carried out. It is, however, by no means always possible to decide to which type an axe belongs. Besides, there are exceptions, and, in any case, 'typical' TRB axes occur in the EGK Boat-axe culture (cf. Malmer's photographs). EGK axes, however, are probably not present in any TRB context.
The fact that this mingling did occur right into Netherland is demonstrated by the axe-hoard (no. 1)[5] from DE PIEPERIJ (Achterop 1960, p. 180, fig. 1) where there are unmistakable EGK axes next to TRB ones (Van der Waals 1964a, p. 49). Brandt (1967, p. 167) also considered the possibility of a mingling of TRB and EGK axes during the export to the territories of the West Group.

In view of the above, it would perhaps be better to postpone for the present the compilation of a comprehensive inventory, which would be desirable for many reasons, of the Dutch flint axes with a rectangular cross-section. It would seem advisable to wait until new typological criteria, substantiated metrical-statistically as far as possible, have crystallized as a result of the once again strongly increased Scandinavian interest in the subject. There is only a small number of axes in Dutch TRB contexts. In the future, the most profitable approach to the problem

might be a two-pronged one: empirical research into the proportions, the degree and method of finishing of the specimens in our axe hoards and research into criteria for distinguishing between TRB and EGK axes, proceeding mainly from the *Flint-Flachbeile* which are known here in fairly large numbers from EGK graves.

5.3.1 *Thin-butted, thick-bladed flint axes of rectangular cross-section (fig. 41b-d)*

Brandt's type-description (1967, p. 94-96) does not conflict with that of Becker's for the Old thin-butted type plus the Blandebjerg thin-butted type (1957, p. 13; 1973a, p. 126). Moreover, Skaarup found that for 50 Langeland thin-butted axes the maximum angle between the broad and narrow sides, 5 cm from the butt, is more than 105°, whereas for 50 Langeland Lindø and Valby thick-butted axes, with two exceptions, this angle is less than 105° (Skaarup 1975, p. 38).

The difference between Brandt's definition of the thin-bladed axes and that of his Scandinavian colleagues (see 5.3) can have the result that a few thin-bladed, thin-butted axes with a length of 9.5-20 cm were grouped with the thin-butted axes by Brandt, but in view of the fact that in Denmark thin-bladed, thin-butted axes are dated analogously with thick-bladed, thin-butted axes (Becker 1959), this has no disruptive effect on the chronological conclusions, nor presumably on the general distribution picture.

Brandt's distribution map (fig. 43) demonstrates the influence of a stream of imports of thin-butted axes via the Elbe crossings at WEDEL-STADE and ALTONA-HARBURG. This implies that these axes originated from north Jutland,[6] and none, or scarcely any, from the eastern Danish islands or from RÜGEN, since a majority of such specimens would have arrived via the Elbe crossing at LAUENBURG-ARTLENBURG (cf. fig. 44). A possible flint outcrop near LÜNEBURG, was clearly not the origin of these axes. This possibility, however, cannot be definitely excluded for the HEMMOOR flint outcrop. This is equally valid for that of HELIGOLAND, if the export took place via Holstein and STADE (fig. 42).[7]

In southern Scandinavia, the Old type was dated by Becker (1957, 1973a) in the EN B-C and the MN I-II, and the Blandebjerg type in the MN II. As far as the MN is concerned, the chronological data from N.W. Germany (see Brandt) and Netherland are in agreement with this. Specimens are known from the Dutch hunebeds DROUWEN-D19, TINAARLO-D6e/f, and ZEIJEN-D5 (with a polished butt).[8] The earliest pottery contained in these graves is of A or B type. The thin-butted axe fragment from MIDLAREN (fig. B1:28) originates from an A+B context; that from a pit within the peristalith of D43 at EMMEN from a B context (Appendix B13). The contents of the B(+C?) grave 'a' in ZEIJEN (fig. B13, Appendix B17) include the butt (30) of a thin-butted flint axe with polished narrow sides (i.e. of the Old type) and a short thin-butted axe (3) which had been drastically reshaped by wear and chipping. There is an 'Old' thin-butted axe (Appendix B7) from a B+C context in ELSPEET. I do not know of any specimens of the type from a later context. Fine specimens were present in Dutch axe hoards (including nos. 2-6, 8, 12, 14-16; 4 possibly also contained what was perhaps a Lindø-type of thick-butted axe which was found there later).[9]

The EGK did not yet exist in the MN I-II (fig. 73). Consistent with this is the fact that virtually no thin-butted axes are known from an EGK context. The two, much-quoted exceptions can only be regarded as proving the rule (WOHLERST, Kr. Stade, Brandt 1967, p. 97, plates 32:8-9; RUMOHR, Kr. Rendsburg, Struve 1955, plates 6:1-2); possibly these were found somewhere at a later date and put to use (cf. also Becker 1973a, p. 139, note 27).

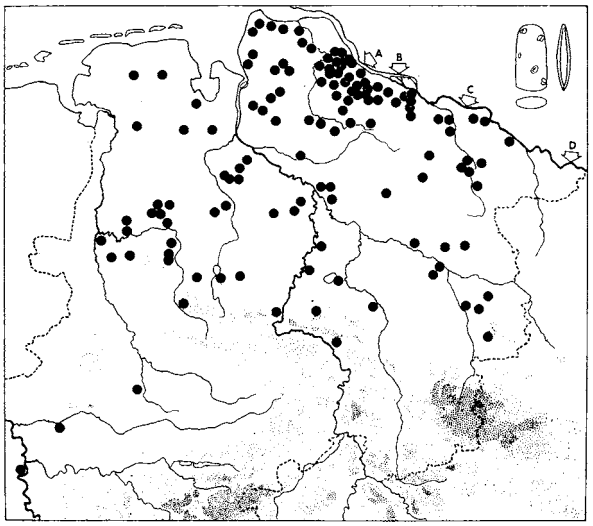


FIG. 43 Distribution of thin-butted, thick-bladed flint axes in N.W. Germany, according to Brandt (1967, map 24). A-D indicate the Elbe crossings of WEDEL-STADE, ALTONA-HARBURG, LAUENBURG-ARTLENBURG and LENZEN-PEVESTORF, respectively.

5.3.2 *Thick-butted, thick-bladed flint axes of rectangular cross-section (fig. 41e-g)*

Definition: those of Becker's Bundsø, Lindø and Valby types (Becker 1957; 1973a, p. 126-128). Differences between these and middle-bladed axes: Becker 1973a, p. 160-161. For the Lindø and Valby types, the maximum angle between the narrow and broad sides, measured 5 cm below the butt, is generally less than 105° (Skaarup 1973, p. 38, cf. 5.3.1). Brandt emphasized (1967, p. 109-118) that, in his area of study (fig. 44), only a very small minority of the axes of this shape should be assigned to the TRB culture on the basis of their finish. An overwhelming

majority would have to be assigned to the EGK according to the criteria described in the introduction of section 5.3 (and a few more: Brandt, p. 115). Consistent with this, 2/3 of the northwest German thick-butted axes came from barrows and only a minority from megalithic graves, and some of the latter can also be assigned to the EGK without any difficulty. Brandt knew of scarcely any specimens from an irrefutable TRB context. Whether the specimen (Brandt 1967, pl. 42:6) from DÜMMER-N is a TRB type typologically remains to be seen. In addition to TRB pottery, Corded Ware and other Beaker pottery were also found here (Bakker & Van der Waals 1973, note 42).
Only the cutting edge of the large flint axe from the megalithic grave OLDENDORF-II (fig. 64) was polished, so that it is actually unsuitable for typochronological classification. Sprockhoff (1952a) described it as thick-butted. The butt is composed of a plane with a cortex of c. 1.5 x 4 cm. The implement could best be characterised as a Bundsø axe, a type which occurred predominantly in the MN III and perhaps sporadically in the MN II and IV (Becker 1973a, p. 127). The pottery which was found in the burial chamber alongside the axe presumably originated from the same single burial (Sprockhoff 1952a). Pilot shapes from it belong to Drouwen C, and correspond with pottery from the Danish phases MN Ib-II, certainly not III.
An axe of the Lindø type which is typically TRB with respect to its finish comes from a D2-TRB context in LANDERSUM (Appendix B10, fig. B15:25). The small sherds of one All-Over-Ornamented Bell Beaker (Beck & Lange 1950, F24) are in the minority among the quantity of TRB pottery from this find-site to such an extent that it would be far-fetched to assign it to the EGK. Lindø axes in Denmark can be dated in the MN IV-V (Becker 1957; 1973a; cf. fig. 14) but this would appear to be too late for the D2 phase of the West Group (see section 6.9).[10]
According to Achterop (1960), thick-butted flint axes frequently occur together with thin-butted ones in the Dutch axe hoards.[11] In Netherland I know of no thick-butted axes which are associated with TRB pottery.

5.3.3 *Thin-bladed flint axes of rectangular cross-section*

Brandt's definition of thin-bladed axes of rectangular cross-section, which he called *Dünnblattige Flint-Rechteckbeile* (Brandt 1967, p. 118-122), viz. 'maximum thickness is less than half the maximum width', differs basically from the definitions (quoted in the introduction to section 5.3) of the Scandinavian researchers for which Malmer's measurements (1962) were the foundation. Becker called Brandt's definition 'completely useless for the southern Scandinavian material' (1973, p. 162). He did not say whether this statement had an experimental basis.

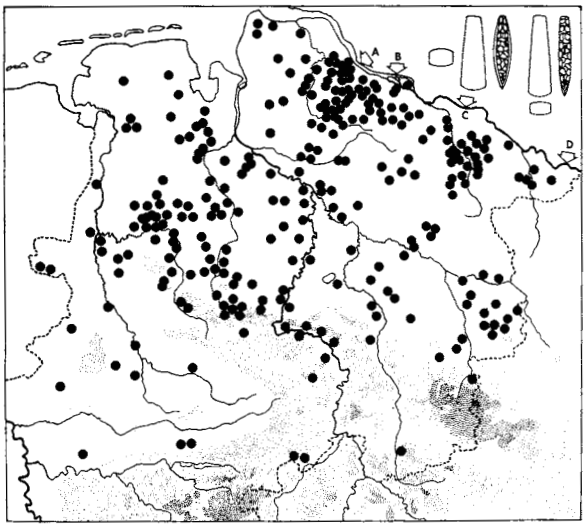


FIG. 44 Distribution of thick-butted, thick-bladed flint axes in N.W. Germany, according to Brandt (1967, map 27). A-D indicate Elbe crossings (see caption fig. 43). Note that a greater part of these axes may not have been used by the TRB culture, but by the EGK.

The Scandinavian definitions of thin-bladed axes were based mainly on small EGK axes (see 5.3) but are quite satisfactory for thin-bladed TRB axes (communication Skaarup 1975). Brandt's definition, formulated before Malmer's, was partly based on thin-bladed axes from Lower Saxony and East Germany which presumably should be assigned to the Globular Amphora culture (KAK) (*), and whose proportions perhaps differ from those of the Scandinavian thin-bladed axes.
In contrast with his Scandinavian colleagues, Brandt also distinguished the *Flint-Flachbeil* and he includes among them (in my opinion, correctly) a number of small axes from Lower Saxony which would be classified as thin-bladed in Denmark. The axe from SØLAGER II (EN C, partly also MN I-II according to Skaarup) which Becker (1947) and Skaarup (1973, p. 88, fig. 32:1) classified as thin-bladed, would presumably have been classified as *Flint-Flachbeil* by Brandt. It is, of course, not very likely that this perfectly finished little axe from the north of Zealand would have been imported from the West Group – this case, however, illustrates the overlapping of two definitions which are obviously valid in their own areas. Many of Brandt's thin-bladed axes conform to the Scandinavian definition, too.
Brandt was doubtful as to whether the TRB group had used thin-bladed axes at all. He pointed convincingly to the partial mutual exclusion of thin-bladed axes and TRB habitation (cf. Brandt's map 28 with my figs. 2-4). I know of no specimens from a TRB context in Netherland, nor does Brandt from northwest Germany.
In Scandinavia, the thin-bladed axe was current from the EN C up to and including the MN V, and

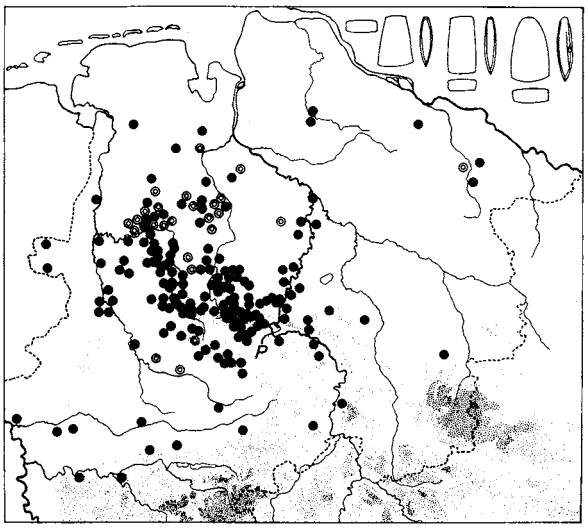


FIG. 45 Distribution of flat axes of 'Lydite' (dots) and 'other silices' (rings) in N.W. Germany, according to Brandt (1967, map 26). P indicates Porta Westfalica (centre).

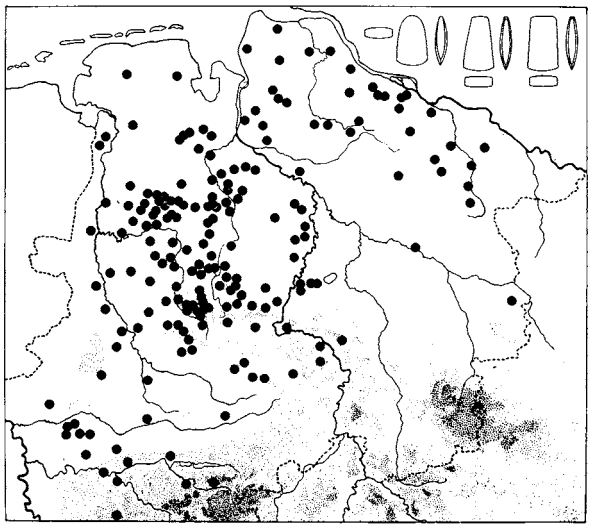


FIG. 46 Distribution of *Flint-Flachbeile* in N.W. Germany: a substitute of local erratic flint for the heavy Danish axes. After Brandt (1967, map 25).

the development of its proportions seems to have been analogous to that of the thick-bladed axes (Skaarup 1975, p. 38). During the period of the thin-butted, thick-bladed axe, however, thick-butted, thin-bladed axes were already current among the thin-butted ones, as Skaarup (verbal communication 1975) certainly does not regard the thick-butted specimens (Skaarup 1973, fig. 47:5 and 14:10) from STENGADE II and I (EN B and EN C respectively) as later intrusions, partly on the basis of other Danish find-groups.

5.3.4 *'Flint-Flachbeile' and 'Lydit-Flachbeile' of rectangular cross-section*

Brandt's definition of the *Flint-Flachbeile* (1967, p. 102-108) presumably developed empirically after he realised that this group of flint axes was perfectly comparable, with regard to proportions, with those of the *Lydit-Flachbeile* whose centre of production he was able to pin-point in and around the WIEHENGEBIRGE. From this place comes a Malm stone which is varyingly described by geologists as lydite (Correns), *Kalkkieselschiefer* (Frechen) or Malm quartzite. The stone is a nodule left over from a chalk-like formation after weathering (Brandt 1967, notes 818 and 826; additional information G.J. Boekschoten).

Fig. 45 (Brandt's map 26) shows a perfect example of an oblong production area (from the Upper Hase to the Weser) with a marketing area shifted to the northwest on account of the location of the TRB population, its principal customers. Most of the axes did not travel very far. There was a closed distribution area extending to about fifty kilometres from the Wiehen mountains. Since some pieces were traded in Lower Saxony as far as 160 km away, they are to be expected throughout the whole of the Dutch TRB area, but this has not yet been established. Less understandable is the distribution of the axes described by Brandt as axes of 'other silicae (quartzites)' in the periphery of the trading area of the *Lydit-Flachbeile*.

The distribution picture of the *Flint-Flachbeile* (fig. 46, Brandt's map 25) shows a more even spread over the territory of the West Group than the two other types of *Flachbeile* although still with the same emphasis on the TRB region between the Weser and the Elbe. This obviously is also a locally made tool for which the moraine flint was available everywhere in the area. The light density of distribution between the Elbe and the Weser indicates that the two local potential outcrops of flint (fig. 42) were not used to produce this type of axe; no TRB axes were therefore made there, or only 'superior grades'.

The map can be interpreted as showing that the *Flint-Flachbeil* was a local substitute axe, especially in those areas where imported axes were expensive. Brandt's definition of the *Lydit-* and *Flint-Flachbeil* can be summarised as follows: a relatively large width and a relatively thin blade. The width is greater than half the length; slim axes whose width is less than half the length are exceptions. The broad side is quite varied in outline (bell-shaped, trapezium-shaped and rectangular) and generally asymmetrical. The edge is generally fairly rounded. Every specimen was polished on all sides, including the butt (in contrast to the thin-butted, thick-bladed axes). Unpolished narrow sides are the exception.

Cutting-marks show that some *Lydit-Flachbeile* were shaped by means of a saw. 65% of the flint axes are 5-10 cm long, 35% 10-15 cm. C. 80% of the lydite axes are 5-10 cm long, the remainder 10-15 cm (3 are larger) (Brandt 1967, p. 102-103).
Flint-Flachbeile seem to occur in all the TRB phases of the West Group: they were found, for instance, in closed finds containing pottery of phases B+C (?) (fig. B3:8, 30, 14); D1 (Michaelsen 1936); D2 (fig. B15:26, E2 (Waterbolk 1960, fig. 41:K11, a stray find in a site which also yielded much Beaker pottery).
Brandt established that, in northwest Germany, *Flint-Flachbeile* occurred in a TRB context exclusively, and never in an EGK context. The very small number of finds from barrows contrasted with the large number in megalithic graves or TRB single graves and settlements. The tenability of this view is, however, open to question. Dutch Beaker specialists, such as A.E. Lanting, J.N. Lanting and J.D. van der Waals, are rather sceptical about it, since, among the little axes in Beaker graves, there are several which could pass for TRB *Flint-Flachbeile* as far as shape, polishing technique and other aspects of the finish are concerned. It would have to be established whether the polished butt is a distinguishing feature here, but this is to be doubted; the length-width ratios were partly determined by the amount of re-shaping.
An example of these problems is a small flint axe from an early Corded Ware grave inventory in EESERVELD, which would be a *Flint-Flachbeil* in Brandt's terms and a thin-bladed axe in Scandinavian terms; the rectangular cross-section and TRB type of polishing would have led to its classification in the TRB culture if a stray find had been concerned (Bakker & Van der Waals 1973, fig. 16:1).

5.3.5 *Chisels of rectangular cross-section*

This type of chisel was used by the TRB culture (fig. 41h-i) as well as the EGK (fig. 41j) both of which, presumably, generally polished these chisels in their own characteristic ways (see 5.3).[12]
Brandt did not discuss the occurrence of this type in Lower Saxony. In Netherland, a 23½ cm long specimen was found in hunebed EEXT-D13 (Van Lier 1760, plate II:5, now lost). A broken, but still 15 cm long, chisel, with a typically TRB finish on its four sides, was found with a Drouwen collared flask in a stone-packed grave near ODOORN.[13]
Chisels occurred in the Dutch axe hoards 1, 5, 8 and 15.[14] There was a typical TRB chisel in hoard 1, associated, among other things, with EGK-like axes. The other three hoards contained axes, the finish of all of which can be considered to be more or less typical of the TRB culture, as is also the case in the hoards of AHLHORN and MANDELSLOH in Lower Saxony (Brandt 1967, plate 43). Thin- and/or thick-butted, thick-bladed axes occurred in these hoards, but the shape of the chisel itself varies only in length. The fact that they were also used by the EGK points to the possibility of the TRB West Group having imported such chisels from the territory of the North Group during all its phases.
The EGK chisels occurred in all EGK phases (Højlund 1974).

5.4 FLINT AXES AND CHISELS OF OVAL CROSS-SECTION

Axes and chisels with an oval cross-section were produced in the axe factories of the 'Meuse flint' zone from Aachen to Valenciennes – all their polished products have the oval cross-section – but also in the Danish flint area (and Rügen?) where they form a very small minority in comparison with the great masses of axes and chisels of rectangular cross-section. We cannot completely exclude the possibility that small axes and chisels of oval cross-section were sometimes made from local flint to the west of the Elbe, too.
Although the flint from the 'West European' area of production differs from that of the 'Northern' area – the former is non-translucent and granular, the latter more glass-like – it is often not possible to see which one is involved, especially if the secondary matrix of an axe has completely changed its colour and transparency, if any. The difficulty of distinguishing moraine flint from the North European Plain west of the Elbe from Scandinavian flint has already been discussed.
In the following, I shall make a distinction between large axes (originally longer than 15 cm) and small axes and chisels. In all probability the large axes from Western TRB contexts in Netherland were imported exclusively from the Aachen-Valenciennes region, which was less than 150 km away; this is less certain for the chisels and small axes.
It has long been customary to subdivide the large, West European flint axes into those with high-triangular broad sides (Brandt: 'point-butted'; Hoof 1970: 'S1') and those with high-trapezium-shaped broad sides (Brandt: 'thin-butted'; Hoof: 'S3'). Hoof distinguished yet another, intermediate group ('S2'), and Scollar (1959) suggested that there had been a certain preference for narrow rectangular sides, but, numerically and typologically, by far the most important groups are the first-mentioned two. These often differ in profile because the point-butted axes start to taper off towards the butt at a lower point than the thin-butted, whose profile tends to be more like a Zeppelin.

5.4.1 *Large point-butted flint axes of oval cross-section*

Type description: Brandt 1967, p. 82 ff. In Dutch hunebeds at least two axes have been found whose shape recognisably corresponds with this type description. According to a report by J. Hofstede (1809), there was one from hunebed ANNEN-D9,

the butt of which was recently broken off (Leiden museum AM2; Pleyte 1882, plate 52:7). A complete specimen was found in hunebed DROUWEN-D 19 (Holwerda 1913a, fig. 9:8). Both are the remnants of long, heavy axes (length c. 25 cm?) which have been greatly shortened by repeated resharpening. Brandt (p. 83) reported another such axe from hunebed Schlingsteinen near LINDERN. These axes have also been found in the Gallery Graves of Hessen-Westphalia.

A splinter from an axe of oval cross-section of non-translucent, granular (Meuse) flint from the B+C settlement at LAREN originated, more probably, from a point-butted than from a thin-butted (5.4.2) axe.

In my opinion, the occurrence of these axes in hunebeds implies that this type of axe remained current until at least the MN I (see 6.1); this differs from Brandt's chronological table. If my expectation is correct and an investigation of the flint material from the eponymous site of the Vlaardingen culture were to establish the presence of the type there,[15] too, it would even have remained in use as long or nearly as long as the type which will be discussed in 5.4.2. The first occurrence of the axe goes a very long way back.

As a supplement to the reports by Brandt and Hoof, I can add that, in SPIENNES, Verheyleweghen found the butt of such an axe in plot 6X, on the steep bank of the River Trouille (Brussels museum JV 3512). According to Verheyleweghen's theory (1963, 1967), this find involves phase I of the extraction of local flint. This phase was C14 dated at 3470 ± 70 BC (GrN-4674, *Radiocarbon* 9, 1969, p. 132). Another specimen was found in lot 204C (northern part; Brussels museum JV 13903), which area would have been in exploitation during Verheyleweghen IV. Seine-Oise-Marne pottery occurred at the site during phases III-IV.[16] A clear representative of the type was found near (in?) the well-known proto-gallery (?) grave in STEIN near Maastricht (Modderman 1964), for which a C14 dating of 2830 ± 60 BC (GrN-4831, *Radiocarbon* 9, 1969, p. 124) is available.

5.4.2 *Large thin-butted flint axes of oval cross-section*

Type description: Brandt 1967, p. 87 ff. A typical representative of this type was associated with TRB pottery of phase G in a flat grave at DENEKAMP (fig. B21). This axe is also a good example of the so-called 'Vlaardingen Type' of flint axes (Bakker & Van Regteren Altena 1962), which is easily identifiable if they have a minimum length of 15 cm. 'Vlaardingen axes' occur in settlements of the Vlaardingen (VL) culture in VLAARDINGEN, HEKELINGEN, LEIDSCHENDAM and VOORSCHOTEN. The TRB phase G ended approximately 2150 BC. At VLAARDINGEN, Vlaardingen axes do not occur any longer in the layer containing *maritimo* Bell Beakers (C14 datings c. 1940 BC). In the lower VL layers (C14 datings between c. 2380 and 2240 BC), however, this is the most usual type among the axes (very many fragments, on one occasion complete; Altena et al. 1962-63; *Radiocarbon* 5, 1963, p. 177-178). In VOORSCHOTEN, most of the axe fragments which occurred in all the VL layers probably originated from this type too. The C14 datings here spanned the period c. 2150-2050 BC (Glasbergen et al. 1967).

The Vlaardingen type was thus still being exported to the north of Netherland, about 2380-2150/2050 BC, but this export stopped before 1940 BC. This halt took place in the Ground Grave Period (cf. fig. 73), and coincided with, or preceded, the export horizon in the Early Ground Grave Period of Grand Pressigny daggers from central France to the same area (Van der Waals, in Bakker & Van der Waals 1973). Whilst the Vlaardingen type of axe is found evenly spread in the whole Pleistocene area of central and northern Netherland, it seems not to have reached N.W. Germany east of the Ems. The only exception to this distribution is a find from LEHRTE, Kr. Meppen, just east of this river (information K.H. Brandt, Bremen). It is not easy to understand this distribution. Why is the Ems river here a barrier whereas it never is for other artefacts? Counter-pressure by the *Flint-Flachbeil* and the Scandinavian axe imports may have been a factor, but this does not explain why Vlaardingen axes occur so regularly in the Dutch hunebeds region.

This Vlaardingen type was found in Belgium[16] in Seine-Oise-Marne and Michelsberg contexts. One specimen was found among exclusively Seine-Oise-Marne artefacts in the small cemetery in front of the Trou des Blaireaux near VAUCELLES (Brussels museum, never completely published; De Loë 1928, p. 144-148; Rahir 1928, p. 27-34; Mariën 1952, p. 152-158; Bosch Gimpera 1924, p. 398-404). Other specimens occurred in or near Michelsberg settlements in Belgium: BOITSFORT (Lüning 1967, pl. 2:2, p. 191-192), GENVAL-MAUBROUX (Brussels museum B3066), OTTEMBOURG-GRÈS DOICEAU (Brussels museum B1223, B1137).

In the flint zone, this type was found at SAINT SYMPHORIEN (Brussels museum B2433, B811, B2055, B2433, HN 1329) and in SPIENNES. In the latter site, specimens have been found in find-groups assignable to Verheyleweghen's phases II or III (Brussels museum JV 11.125), III (ibid. 6806, 6807, JV 12366, JV 12391) and IV (ibid. JV 14078). Although I have not seen a real Vlaardingen specimen from phase I, the type may have been in production because of the similarities in proportions of the small axe JV 3134. Hoof (1970, pl. II:89) found a rough-out at RIJCKHOLT and mentioned another rough-out from that site in the Maastricht museum. During the large-scale excavations of the ALDENHOVEN area, stray Vlaardingen axes were found which are made from flint from an outcrop near VALKENBURG (information from A. Zimmerman, Cologne; and from P.W. Bosch and

W.M. Felder, Heerlen, who recently identified the outcrop. Cf. Engelen 1976).
Only further investigation in the Meuse flint zone and its surroundings will enable the establishment of the approximate date at which this very characteristic type of axe was first developed.[17] The question of whether there was intensive contact with England, where this type, or at least closely related shapes, was made, would also need further consideration. It is very remarkable that, in the Benelux countries, this type of axe underwent no alterations in shape during its long period of use, in contrast with the southern Scandinavian thick-bladed axe of rectangular cross-section.

5.4.3 *Small flint axes and chisels of oval cross-section*

Small flint axes of pointed oval cross-section and with high-trapezium-shaped broad sides were called 'Viervitz axes' in the older literature after a hoard in VIERVITZ on Rügen. Hoof (1970, S5, partly also S6) also used this name. Brandt (1967, p. 90 ff) called them *Dünnblattige Flint-Ovalbeile*. His measurements indicate that in Lower Saxony they were 4.4 to 14.7 cm long (c. 68 specimens); 60% were shorter than 10 cm. Little axes like this are 'common throughout the world' (Tallgren, quoted by Brandt). There appear to be no conspicuous concentrations in the distribution maps of N.W. Europe. The areas of their manufacture include the Meuse flint zone from Aachen to Valenciennes, the western Baltic flint region, and perhaps the Polish flint-mining areas as well.
There are many exceptions to Brandt's rule that the majority of the axes of northern and eastern origin have a straight cutting-edge, in contrast with the products of Meuse flint (cf. Hoof 1970); Brandt (1967, p. 91) had difficulties in distinguishing between the two categories in Westphalia (which belongs to the importing region of Meuse flint axes – see also Gabriel 1974). If the relatively open space immediately to the east of the Dutch border on Brandt's distribution map is not a coincidence, there might be a 'no man's land' between the importing areas of the Meuse flint products and those of the western Baltic axe factories (cf. Siuchniński 1969, map VII). This open zone would then coincide to some extent with that where *Flint-Flachbeile* had been most popular. According to this argument, the northern Dutch Viervitz axes would have to have been imported from the Meuse region.
The possibility that they were manufactured from the local moraine flint cannot, however, be completely ruled out.[18]

A Viervitz axe was found in a definite TRB-context in grave 'a' near ZEIJEN (fig. B13:6). The context of the pottery (B+C) differs from the much too narrow chronological margin which Brandt (1967, folding-out table) allowed for the type, but it tallies with the productive period of the Meuse flint axe factories (see sections 5.4.1-2 and also Van Haaren & Modderman 1973). Two small flint axes of oval cross-section were found in hunebed D53-HAVELTE (7 and 12 cm long respectively: Van Giffen 1927, plates 154:27, 35). A very worn specimen came from the ruined hunebed D13b-EEXT (Van Giffen 1944c, fig. 8:1927/9.3n). Both hunebeds contained Beaker pottery as well. Brandt reported that two megalithic graves between the Elbe and the Weser had yielded respectively three and one axes of this shape. In the early EGK graves axes of this type are lacking. Three of such axes in AOO (*) graves in the Meuse and Rhine area must have been imported from the Meuse flint factories (Lanting & Van der Waals 1974, p. 66). Two of these axes are quite typical for the Viervitz type. Somewhat later is the fragment of a small flint axe from MOLENAARSGRAAF, a Veluvian Bell Beaker and Barbed Wire settlement in the Dutch delta (Louwe Kooijmans 1974, fig. 95s, p. 234). This axe had an oval cross-section, but also flattened narrow sides.
In the area of the North Group, the axes of this type are usually dated in the second half of the MN and in the EGK period – mainly on the basis of closed TRB and EGK finds which contained a variant of the Viervitz axe with a gouge-cutting edge. (This gouge variant is extremely rare west of the Elbe.)

'Viervitz chisels' (narrower than c. 2-3 cm) were, I have the impression, not deliberately made as a type in the Meuse region. On the other hand, a very characteristic shape, the 'cigar chisel', was a usual product of the 'western' flint mines, including central France. In VLAARDINGEN, for example, it was used by the Vlaardingen culture (Altena, and others, 1962, p. 33, fig. 9, third from left, bottom row, rounded-oval cross-section). It can also be expected in a Dutch TRB-context.

5.5 STONE AXES (EXCLUDING THOSE DISCUSSED IN 5.3.4)

Brandt (1967, IV.1-3) classified these axes according to their cross-section as *Fels-Rundbeile, Fels-Ovalbeile* and *Fels-Rechteckbeile*. The types of stone of which they were made were only occasionally identified. The stone was presumably selected mainly from locally available material, which will have displayed only insignificant differences since we are here dealing with the once ice-covered plains of the TRB area. Nevertheless, the hardly satisfactory typology would receive strong support if we could prove which types of axe were imported from outside the moraine area; it appears that the *Walzenbeile* (real *Fels-Rundbeile*), which were also found far to the south of the Meuse and Rhine delta, were made preferably from a certain type of fine-grained quartzite. *Fels-Rundbeile* are absent from TRB West Group assemblages.

5.5.1 Stone axes of rectangular cross-section

These axes occur regularly in TRB contexts in Netherland. They seem to be nearly always present in settlements. Both the slim *Fels-Rechteckbeile* and the broad ones are involved in this category, according to Brandt's terminology (1967, p. 140-148). Mention can be made of specimens from the settlements of ANLO (?; Waterbolk 1960, fig. 41); LAREN (Appendix B11); BEEKHUIZERZAND (Appendix B3); from a flat grave at EKELBERG (fig. B17:14); from a small hunebed at VALTHE (note 7:6; greatly reduced in size due to secondary hammering) and from hunebeds DIEVER-D52 (among the TRB sherds in a 20th century displacement next to endstone SL2 found during a trial excavation by Glasbergen, 1971) and ANGELSLO-D46 or 47 (Leiden Museum AMKZ.91, asymmetrically worn fragment: Pleyte 1882, plate 11:3). The axe hoard at BOERAKKER (no. 18, Achterop 1961a) contained two characteristic, slim *Fels-Rechteckbeile* (length 20 and 26 cm) of diorite and gabbro, as well as two rough-outs of thick-bladed flint axes (Old/Blandebjerg type, length 23.5 cm and Blandebjerg/Bundsø type (?), length 17 cm).

Brandt's conclusion (p. 146-147) that these axes were culturally, chronologically and geographically indifferent throughout the EN and MN does not exactly encourage a detailed discussion of the morphology of the axes known from TRB assemblages. An investigation of the fairly numerous axes of rectangular cross-section from reliable Beaker contexts may result in a determination of their characteristic properties – and, subsequently, in a delimitation of these with respect to the characteristics of the axes which can be assigned to the TRB culture.

5.5.2 Stone axes of oval cross-section

Brandt's definitions (1967, p. 133-139) do not always help us to distinguish between a *Fels-Rechteckbeil* and a *Fels-Ovalbeil*. His illustrations suggest that he had difficulty with this himself, and also with distinguishing the *Fels-Rundbeile*, which would have disappeared before Drouwen A (Brandt 1967, plates 23-25).

Fels-Ovalbeile have been found three times in a Tiefstich pottery context in N.W. Germany. One of them formed part of the stone walling of the peristalith of Long Barrow I at HAASSEL, which would imply an EN C (or early MN I) date for its first period of use (section 6.1). The excavation of the settlement at DÜMMER-N yielded two (oldest pottery Drouwen C, plus much G pottery). In Netherland, three are known from comparable contexts. In 1809, J. Hofstede unearthed a point-butted specimen (Variant 1) in hunebed LOON-D15 (Pleyte 1882, plate 64:3; it cannot be found in the Leiden museum at present). The fact that a blunt-butted specimen (Variant 2) was found adjacent to hunebed TINAARLO-D6 is less significant.[19] A burned cutting half of a very large specimen was found in the B+C settlement of LAREN (Appendix B11).

It therefore seems probable that the *Fels-Ovalbeil* – continuing pre-TRB traditions – remained current into the MN Ib (if not MN II). Brandt supposed that it disappeared from circulation after this time. There are, however, some indications which would appear to contradict this. In the first place, a point-butted specimen was found in a 'pit house' – a grave? – in KÄRLICH, Kr. Koblenz, which also contained an 'undecorated Cord Beaker' and a flint dagger (Hoof 1970, table III; Gatermann 1943, p. 88). This suggests a dating in the MN III-V or later (see 6.8; without an illustration it is impossible to give an exact dating). Now that it has been shown that thin-butted flint axes of oval cross-section were made from Meuse flint as late as in the MN V, (section 5.4.2), one wonders whether the *Fels-Ovalbeile* found in the manufacturing centres (Brandt, notes 1105-6) were not used there for just as long.

Finally, stone axes of oval cross-section and even some of circular cross-section have been found in a Bell Beaker or Bronze Age context. Although they had been transformed into copper-working tools, the fact that they were used for this purpose suggests that they were contemporary, rather than long-forgotten axes. I would remind one of the specimens[20] in the find-groups of SOESTERBERG (Bell Beaker period) and WAGENINGEN (post-Bell Beaker period). The occurrence of a stone axe of oval cross-section in the Bronze Age Montelius III hoard of VEENENBURG, however, underlines a weakness in this argument, since nobody believes that these axes were still being made then.

5.6 BATTLE-AXES

Neolithic 'battle-axes' are stone, tomahawk-like axes with a shaft-hole. Possession of a battle-axe may have indicated a certain distinction, e.g. to TRB village authorities. TRB battle-axes[21] can be distinguished from most of the other neolithic battle-axes by their vertical symmetry (Jażdżewski 1936): the halves above and below the plane through the length-axis and at right angles to the axis of the shaft-hole are mirror images. This plane of symmetry is generally flat, but sometimes (although not in Netherland and northwest Germany) it is curved or bent somewhat so that the ends point downwards. TRB battle-axes are subdivided into three main groups, although many details point to mutually synchronous or diachronous characteristics:

5.6.1 Flat battle-axes (fig. 47a) (*Flache Hammeräxte* according to Brandt 1967);

5.6.2 Double battle-axes (fig. 47b-f; 48a-g) (*Doppeläxte* according to Brandt);

5.6.3 Knob-butted battle-axes (fig. 48h) *(Knaufhammeräxte)*.

The Flat battle-axes are generally older than the Middle Neolithic Tiefstich pottery of the West Group and we shall not devote much attention to them here. On the other hand, characteristic, local

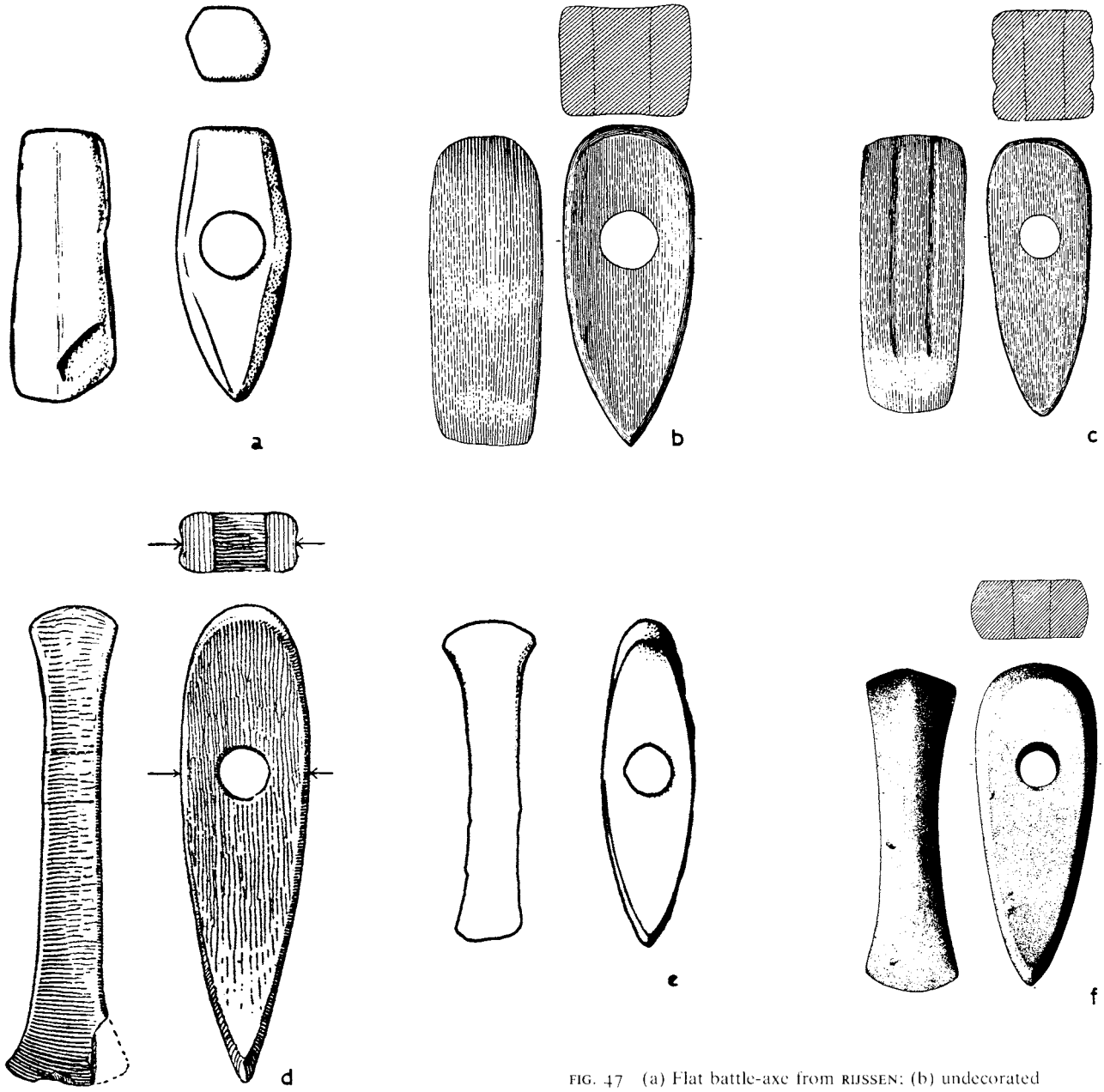


FIG. 47 (a) Flat battle-axe from RIJSSEN; (b) undecorated A0-axe from SCHAUEN, Kr. Halberstadt; (c) decorated A0-axe from SCHWANEBECK, Kr. Halberstadt; (d) Troldebjerg-Fredsgårde axe from BRUCHWEDEL, Kr. Uelzen; (e) idem from BORGER (Dr.); (f) Bohemian-Polish A1 axe from the HUTBERG near Wallendorf, Kr. Merseburg. According to Herfert (b-c, f), Jacob-Friesen (d), and IPP-photographs 72-194F-26/29 (a) and 66-575-26/30 (e).

types of the double battle-axes and of the knob-butted battle-axes developed in the West Group, and these require a more detailed discussion.

5.6.1 Flat battle-axes

(Jażdżewski's 'Type X' (1936); Brandt 1971; 1967, p. 20-27, plate 3) (fig. 47a). This type was certainly not numerous in Netherland. So far, I know of only one convincing specimen (fig. 47a) and dots are sporadic on the distribution maps for some distance from the eastern and southern Dutch borders.[22]

The Dutch specimen was found in 1907 in RIJSSEN, Overijssel, on the Essteeg (IPP-photograph 72-194F-26/28, Enschede museum 500-120/708; co-ordinates c. 28D:232.1/480.5). It is made of diabase and belongs to Brandt's Variant 1d.

These battle-axes occur from Ghent to Gdańsk, and from Vienna and Berne to southern Scandinavia. A recent article by Brandt (1971) concerning the dating revised his own previous work (1967) and that of Herfert (1962). The dating evidence shows that these axes were current in the whole of the EN and that they disappeared around the beginning of the MN I.[23] Specimens occurred in the EN C Haassel-Fuchsberg settlements SACHSENWALDAU = SCHÖNNINGSTEDT = OHE (Brandt 1971, note 5) and SCHWISSEL (Behrends 1971) in Schleswig-Holstein. But they have not been found in a single

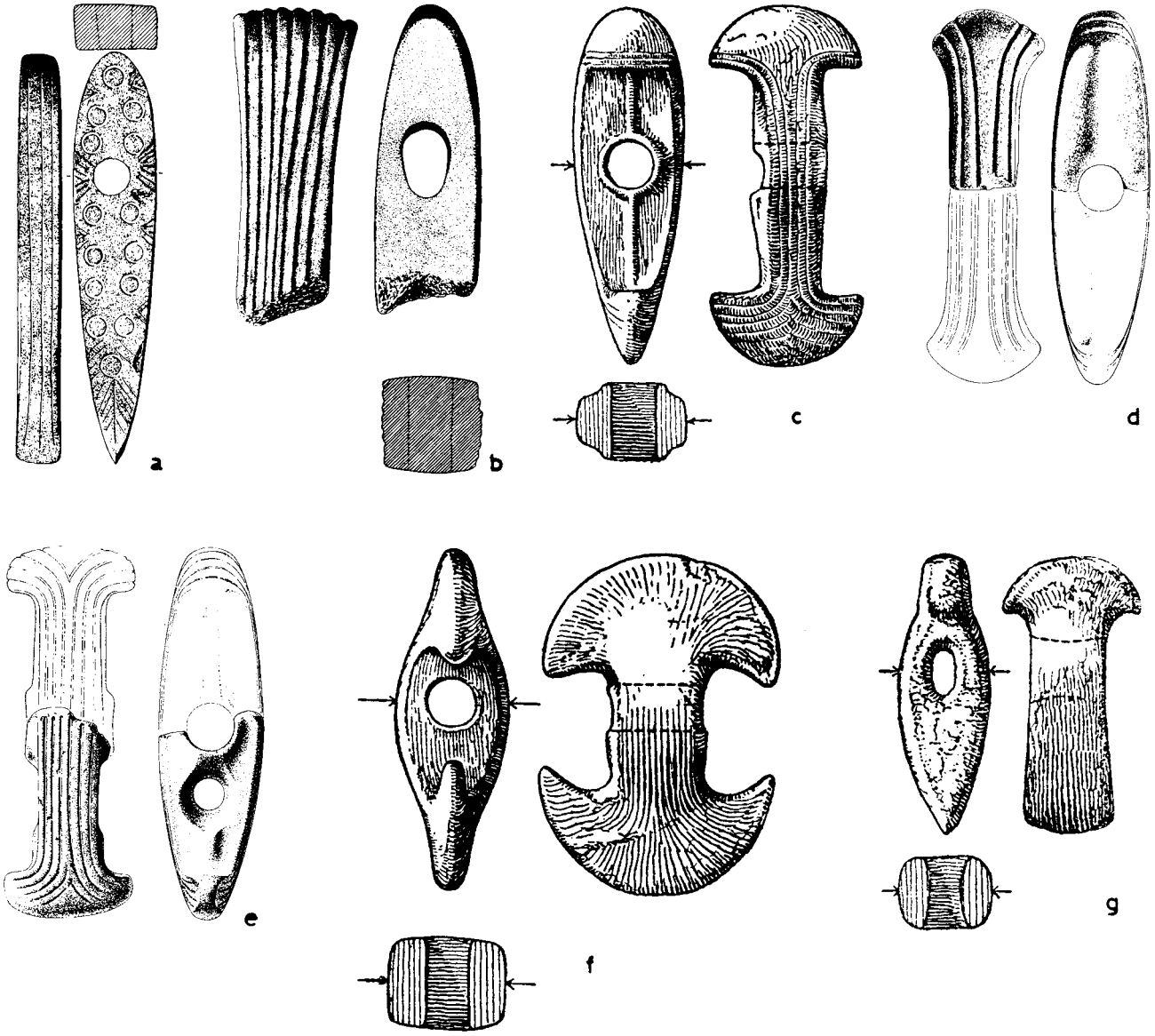


FIG. 48 (a) A1-axe of Saxon type from RASSNITZ, Kr. Merseburg; (b) A1-axe of Harz type from HARRAS, Kr. Artern; (c) Hanover battle-axe from BUXTEHUDE, Kr. Jork; (d) idem from WEERDINGE (Dr.); (e) idem from HAMRIK (Gr.); (f) Amazon axe from STEINBECK, Kr. Harburg; (g) Fan-butted axe from LÜNEBURG; (h) Dutch type of Knob-butted battle-axe from WAPENVELD (Gld.). According to Jacob-Friesen (c, f-h), Herfert (a-b), BAI-drawings by H. Roelink (d-e) and IPP-photographs 66-544-19a/23 and 66-559-17 (h).

megalithic grave of the West Group, which is an indication that they had already disappeared in the West by the MN Ia (cf. section 6.1).

5.6.2 Double battle-axes

(Brandt 1967, p. 34-43) (fig. 47b-f; 48a-g). Brandt subdivided the double battle-axes into three main groups A-C. Brandt-C, the fan-butted battle-axe *(Axt mit Nackenkamm)* (fig. 48g), is characterised by a fan-shaped butt and an oval shaft-hole. Brandt-B, the Amazon battle-axe (fig. 48f) has a cutting edge at both ends. It is the only more or less true double axe of the Double battle-axe family. Brandt-A (fig. 47b-f; 48a-e) has a sharp cutting edge and a blunt butt. Brandt-A is subdivided further according to the profile; in A1, the cutting edge and the butt either do not expand, or do so very

gradually – the upper and lower faces are flat to slightly concave. In A2, the cutting edge and the butt widen 'in a sharp, short curve, or an angle' far beyond the upper and lower faces. Moreover, according to Brandt, A2 battle-axes in the West Group always have a ring-formed collar around both shaft-hole openings.
Several variants of Brandt-A from the southern DDR were described by Herfert (1962). Fig. 49 is an attempt to classify the variants of Brandt-A according to the 12 combinations of the shapes A0 (see below), A1 and A2, and the additional line or groove ornamentation on the sides and two collars which can be applied in combination or separately. Four of the 12 possible combinations do not appear to occur. In section 5.6.2.1, the A0 shapes will be discussed, in section 5.6.2.2 the A1 shapes, excluding the few which, on the basis of additional characteristics, are included in the group of the Hanover battle-axes, to which all the other A2 battle axes also belong (section 5.6.2.3). The Amazon battle-axes (Brandt B, Ebbesen B-C) will be discussed in 5.6.2.4, the Fan-butted battle-axes (Brandt C, Ebbesen D) in 5.6.2.5.

combinations of features	1	2	3	4	5	6	7	8	9	10	11	12
A 0	●	●	●	●								
A 1					●	●	●	●				
A 2									●	●	●	●
grooves or gullies in the narrow sides		●		●		●		●		●		●
double collar			●	●			●	●			●	●
	A0 - undecorated	A0 - decorated	non - existent	non - existent	Troldebjerg - Fredsgårde Bohemian - Polish; Saxon	Harz; Saxon; Boh. - Polish	Hanover (A1 0)	Hanover (A1+0)	non - existent	non - existent	Hanover (A 2 0)	Hanover (A 2+0)

FIG. 49 Taxonomy of the Double battle-axes Brandt-A. The combinations 3-4 and 9-10 are not seen in reality; this is evident for 3-4, the non-existence of 9-10 follows from Brandt's observation that A2-axes always have collars around the shaft-hole.

5.6.2.1 Squat double battle-axes with a round butt (Shape A0, fig. 47b-c). Herfert (1962) was the first to identify these as a type. Brandt (1967), who had not yet done so, included a few specimens under A1. I call this shape A0 to distinguish it from A1 and A2. Only the combinations 1 and 2 of fig. 49 are known.
A0-undecorated (Herfert plate I: 3-4, II, IV:2; combination 1). Herfert mentioned finds in Baalberge and Luboń contexts. The two specimens known from Luboń sites (Jażdżewski 1936, fig. 664, 774) have quite different shapes. I do not know of any really clear specimens from Netherland. In the West, where there would appear to be no unmistakable specimens of the type, there is a danger of confusing it with *Arbeitsäxte* (axe-hammers) and doubtful variants of the Emmen type, which were dated to the Late Neolithic and the Bronze Age (Lanting 1973a, p. 297). This also applies to A1 battle-axes with no expanding butt and without either a cutting edge or ornamentation. Jażdżewski (1936) included both the examples quoted among the *Arbeitsäxte*.
A0-decorated with 1-2, or 5-6 broad grooves on the neck-half of the side (fig. 47c; Herfert plate III; Brandt plate 29:6; fig. 49: combination 2). This type appears to occur both in the Elbe-Saale region and in southeastern Lower Saxony. It is not present in Netherland. Herfert knew of no easily datable pieces, but assumed the EN C and Salzmünde. The specimen from GLIENITZ (Brandt 1967, plate 29) was found in a badly damaged megalithic grave along with six thin-butted flint axes with a rectangular cross-section and D1-Tiefstich pottery. In this case, it was impossible to obtain a dating from the few pieces of pottery (most of it was undoubtedly lost). Both the type of grave and the flint axes point to a continuation of the last (?) of the A0 battle-axes into the MN I.

5.6.2.2 Troldebjerg-Fredsgårde battle-axes (Shape A1; fig. 47d-f; 48a-b). Herfert used this term collectively for all the A1 battle-axes (excluding the Hanover battle-axes). This group can be broken up into four regional groups, starting with the 'Pan-European' shape which is identical with the Troldebjerg-Fredsgårde battle-axes in the strict meaning of our Danish colleagues.
a Pan-European A1 type (fig. 47d-e; Herfert 1962, plate IV:1, 3-4; V; VI; Brandt 1967, plate 5:1-2). Combination 5 of fig. 49, although without a hexagonal cross-section. Like Åberg did before him, Ebbesen (1975) divided these battle-axes into a Troldebjerg type and a Fredsgårde type. At the shaft-hole, the width of the former is two times the height, or less. With the latter type it is more.
The Troldebjerg type was found only in MN Ia assemblages. Ebbesen (p. 188) dates the lugged beaker (*) with Luboń ornament from an assemblage with a Troldebjerg axe at SKØRPING (Nordman 1935, figs. 23-24) to this period. A new assemblage (Skov 1975) from a polygonal dolmen with a long passage at STENDIS might be relevant here if the axe is not of the Fredsgårde type. The lugged beaker in this assemblage is of MN I type, in my opinion it may even be MN Ib. Besides, MN Ib is the earliest known date for the Scandinavian passage graves and the Stendis dolmen is a passage grave.[23a] The Fredsgårde axes have been found in MN Ia, Ib and II contexts, including passage graves (Ebbesen, p. 188).

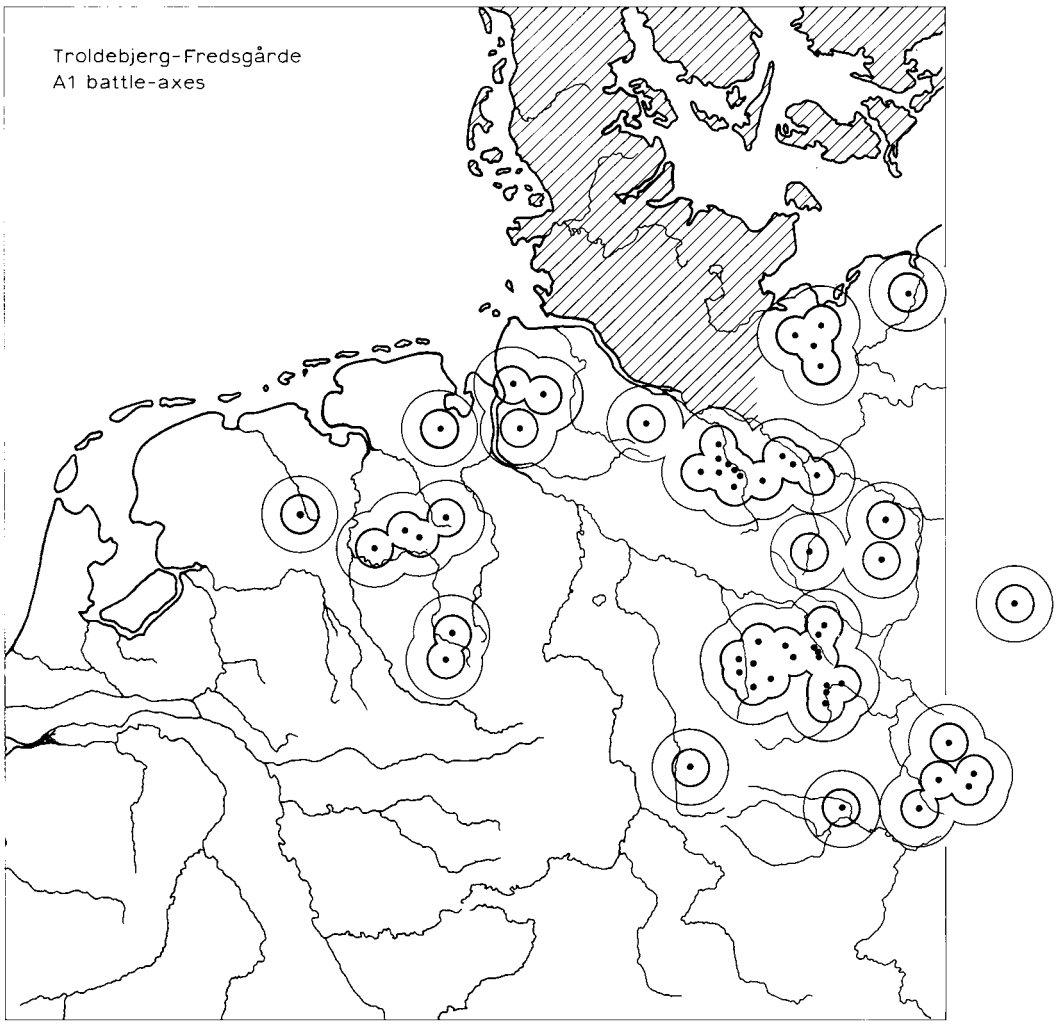


FIG. 50 Distribution of undecorated Troldebjerg-Fredsgårde battle-axes, according to Brandt (1967, map 9), Herfert (1962, map 1: *Gemein-europäische Formen, Böhmisch-Polnische Variante*) and Nilius (1971, map 13). Because there are systematic differences between the taxonomies of the cited authors, some finds may have been indicated more than once. The hatched area has not been mapped (but see now Ebbesen 1975).

Herfert, Brandt and Ebbesen cite a number of Salzmünde assemblages with Troldebjerg-Fredsgårde axes from the southern DDR and Bohemia. The alleged Troldebjerg-Fredsgårde axe from LUBOŃ-4 in Poland (Ebbesen, p. 202) is in fact the chronologically less valid undecorated A0 axe-hammer from GOŁĘCIN-4, mentioned above (Jażdżewski 1936, fig. 774, p. 39, 281, 373; 'Luboń' in German text p. 373 is a printing error).
Brandt's types A1a and A1b correspond, mainly, to Ebbesen's Troldebjerg and Fredsgårde types. No unornamented Troldebjerg axe is known from megalithic graves of the West Group (Brandt 1967, note 276, list 5). Two or three Fredsgårde axes are reported from megalithic graves (type unknown) (ibid.). Fig. 50 shows the distribution of unornamented A1 axes, including the Bohemian-Polish type (see below). I only know of one unornamented A1 axe from Netherland, a Fredsgårde axe:

BORGER, province of Drente (fig. 47e)
Very weathered specimen, 15 cm long, with a rather pronounced expansion of the butt and because of re-sharpening a less pronounced expansion of the cutting edge (heights 4.6; 2.1; 3.2 cm respectively). Hole (diameter 2.5 cm) situated only slightly behind the centre. No collar or midrib on upper and lower faces. Rectangular cross-section (width 4.4 cm). Original surface completely worn away. Diabase (determination P.H. de Buissonjé). Found during ploughing. Bought from the finder by H. Westendorp in 1927-28. Arnhem museum. Documentation Addink No. 99. IPP-photographs 66-575-26/30.[24]

The Pan-European axe was the prototype for the development of the Hanover axe in the West and the Saxon and Harz types in the Southeast. The

Borger specimen already tends towards the Hanover type in its proportions and the position of the hole; in the Pan-European type, the hole was originally closer to the rear.

b Bohemian-Polish A1 Type (fig. 47f). Fig. 49, combinations 5 and 6, but with hexagonal cross-section. See Herfert for this type which is distributed mainly in Poland and Bohemia and only rarely has zigzag decorations. Herfert believed that a Salzmünde date is probable in the southern DDR and Bohemia. One fragment was found in the Luboń site GOŁEÇIN-4 near Poznań (like Jażdżewski 1936, fig. 962; cf. ibid. p. 373, 281 (above), 39 (below, (d)), 85).

c Richly decorated A1 axes of the Saxon Type (fig. 48a; Herfert, plate VII). Shape as with the Pan-European Type, with an elongated rectangular cross-section, cutting edge and butt which scarcely widen and have considerable length. There are often parallel grooves on the sides (fig. 49: combination 6). Characteristic of these axes is the decoration consisting of little circles drilled into the upper and lower faces and various other ornamentations. The eleven specimens plus a doubtful one, are restricted to an area less than 150 km wide around HALLE (fig. 51). A specimen from DUNA PENTELE in Hungary (Åberg 1918, fig. 28) is certainly related to them. Fischer and Herfert suspected a connection with Salzmünde, for reasons which include the distribution picture and motifs of ornamentation. Direct associations are unknown. F. Schubert (1965) discussed a possible connection with copper 'axe-adzes' from the Carpathian region.

d Harz Type (Shape A1, fig. 48b). Fig. 49, combination 6, with line ornamentation on the sides, but not on the upper and lower faces. These are distinguished, by the absence of collars and a midrib, and by the slight widening of the cutting-edge and butt in profile, from the A1 battle-axes of the Hanover type (5.6.2.3), which was regarded as a close relative by Åberg and Herfert. The latter, therefore, calls them 'the Harz variant of the Hanover type'. All the specimens mentioned by Herfert are stray finds, strangely enough situated exactly along the edge of the 'clusters' of undecorated A1 axes (figs. 51 and 50).

One specimen (fig. 48b) already had the oval hole of the fan-butted battle-axe (5.6.2.5).

5.6.2.3 *Hanover battle-axes* (fig. 48c-e). This type embraces the shapes A1 and A2 and the combinations 7, 8, 11 and 12 of fig. 49.[25] Åberg (1916b) recognised it as a separate type. He named it after its main distribution area, the province of Hanover, which, together with Oldenburg, now constitutes the 'Land' of Lower Saxony. In the article in which he gave this type its name, all the present-day problems were already considered. Åberg thought the following properties were characteristic of the type: (a) collar on upper and lower faces, (b) lines which are parallel with the upper and lower faces in the sides and (c) a midrib along the length axis on the upper and lower faces.

Characteristic (a) is a *conditio sine qua non,* (b) and (c) are optional. Brandt's extremely brief communications imply that (d) no midrib has ever been found without collars. All the A2 axes have these (Brandt, p. 35), only two of them have no midrib (Brandt, note 260). The number of A1 axes with collars but with no midrib is greater. In fig. 49, these include the combinations 7-8 and 11-12, in Brandt's list no. 5 (1967) the combinations A10, A1+0, A20 and A2+0 ('0' stands for collars and '+' for ornamental grooves).

Åberg (1916b, 1918) pointed to the unmistakable relationship with the Saxon and Harz types, and also with the B axes with collars (5.6.2.4). In the last-mentioned case, the collars are the connecting factor, and these are found on most of the knob-butted battle-axes of the West Group as well. Åberg correctly saw the collars as a peculiarity of the West TRB territory.

At least the following Hanover axes occur in Netherland:

HAMRIK, gemeente Marum, *province of Groningen* (fig. 48e)
Shape A2. Cutting half with secondary hole. Collar and midrib on upper and lower faces. Six grooves on the narrow sides, nine near the cutting-edge. Found under peat near the Oude Diep at Hamrik.
Groningen museum 1959/711.

ANDEREN, gem. Anlo, *province of Drente*
Complete, slender specimen. Partly weathered. Shape A2. Length 22 cm. Semicircular ends. Collar and midribs on upper and lower face. Four grooves in side faces. Coördinates of locality: 12G:234.25/556.08. Found after potato lifting.
Assen museum 1976/7.1; IPP-photographs 76-678-12/20.

LAAGHALERVELD, gem. Beilen (Dr.)
Small fragment of central part. Shaft-hole with collars. Two wide grooves in side faces. Excavated by Van Giffen from the soil of Barrow I which dates from the Bell Beaker period (Lanting 1973, p. 267-268). Coördinates of locality: 17B:231.08/547.94.
Assen museum 1930/9.17; IPP-photographs 76-681-3/9.

ODOORN, gem. Odoorn (Dr.)
Cutting section, broken off before the hole. Midrib on the upper face. 5 parallel grooved lines on the side faces. Found in a field in the Oude Kampen to the northeast of Odoorn in 1962. Collection of H. van Es (Oosterhesselen).
Documentation J.D. van der Waals.

WEERDINGE, gem. Emmen (Dr.) (fig. 48d)
Shape A1. Butt half. Green diabase. Midrib on up-

per and lower faces. Four grooves on the side faces. Found to the east of the hamlet.
Assen museum 1896/2.3; IPP-photographs 76-680-24/30. Åberg 1916a, fig. 29; 1918, fig. 21 (as 'EMMEN').

ZUIDBARGE, gem. Emmen (Dr.)
Well-polished, unfinished specimen whose proportions could more probably indicate a Hanover than an Amazon axe. General shape is indicated, but shafthole, collars, midribs and side-grooves are still lacking. Diabase.
Leiden museum c. 07.6.11; IPP-photographs 76-682-5/11. Åberg 1916a, p. 65 (2) reported this specimen under 'EMMEN' as 'not characteristic'.

Probably TWENTE, *province of Overijssel*
Shape A1. Butt half. Green diabase. Collar on upper and lower faces. No midrib. 4-5 grooves on only one side face. These grooves were partly incorrectly spaced, compensation for which was made by additional lines. A finished specimen, which was in use and then broken.
Enschede museum 521. Find-spot indicated as WOOLDE, but A.D. Verlinde reported that the former Keeper Ter Kuile catalogued under 'Woolde' a collection of artefacts from Twente, of which the exact find-spots were unknown to him. IPP-photographs 72-194E-32/35.

The following can be added to Brandt's reports for Germany, west of the Elbe:

DOBROCK, Kr. Hadeln
Half of an A+0 specimen. Found in 1935 during digging in the garden of the Waldschlösschen. Lamstedt museum 340. Poor quality illustration: W. Klenck 1957, p. 122, plate VI:43.

FLÖGELN, Kr. Wesermünde
In 1973, half of an A2+0 battle-axe was found in front of the entrance to the T-shaped passage grave Flögeln 132 among a lot of Tiefstich pottery (D1 and later, possibly earlier phases as well). Aust 1976, illustration on p. 101 and examination of a selection of finds. Bremerhaven museum.

LEER-WESTERHAMMRICH, Kr. Leer
Well-preserved A2+0 Hanover battle-axe, found in a megalithic grave which had been destroyed in the past. Oldest pottery is B, phases up to and including G are represented in the grave inventory (Bakker, in preparation).

RHODEN, Kr. Halberstadt (just across the DDR border)
A1+ battle-axe with midrib. Herfert (1962, plate IX:6) classified it incorrectly as a Harz type.

SATTENHAUSEN-RIEKENRODE, Kr. Göttingen
Shape A1. Cutting-half with collar and midrib on upper and lower faces. Identification and illustration: R. Maier 1970, p. 77-78, fig. 9:5; 1971, pl. 21:5. The chance that it is a knob-butted battle-axe (like Brandt 1967, plate 4:3, with midribs) is slight.

STEINFELD, Kr. Bremervörde
Rough-out. 'Amphibolite'. Shaft-hole. Indications of the presence of collars and midribs, final polishing and possible grooved-line ornamentation not yet present. Found during ploughing (Deichmüller 1969b, p. 109-112 with illustration).

Later addition: ACHIM-BIERDEN, Kr. Verden
Half of an A2+0 specimen. Greenstone. Stray find 1973, 1 m deep. Schünemann 1975, fig. 1. This find spot is not indicated in figs. 51, 57, 58.

Rough-outs of the Hanover type are only rarely mentioned in the literature. The specimen from STEINFELD is one example, and that from ZUIDBARGE is possibly another.

The distribution area of the Hanover battle-axes is compact (fig. 51). Brandt's map 9 shows that the distributions of A1-with-collars and A2 (which always has collars) are identical, and this is also the case with the ratio of the combinations 7 and 11 to 8 and 12 (fig. 49). The distribution of the Hanover type extended only very slightly further than Lower Saxony. Northeast Netherland and the bank of the Elbe in Schleswig-Holstein fall just within what I have called the 'closed distribution area'.[26] It is possible that the little-known central Weser area also belonged to it.
To the west and south, the Hanover type conforms remarkably closely with the area containing A+B and C pottery. Hanover battle-axes are absent in those places where only later pottery phases occur (cf. figs. 37-38). A lack of research cannot be the reason for this. The type does not extend to the DDR, and only slightly into Denmark.[27] The five finds in Schleswig-Holstein, two of which were found on sites immediately adjacent to the area west of the Elbe, do not give the impression that the type had been very common there. West of the Elbe, its absence south of the line Bremen-Hamburg, in the territory of the Altmark Group, is particularly noticeable, because it may be an indication of the peculiar, conservative nature of this Group. The fact that the Pan-European battle-axes accumulated here (fig. 50) suggests a local preference for this type.

The dating of the Hanover type was checked by Brandt (1967) and there are, at the moment, scarcely any new facts to be added to the ones collected by him. The distribution picture points to a currency during (part of?) pottery phases A-C. The numerous finds in T-shaped passage graves reported by Brandt and myself also testify to its popularity at this time. The Hanover battle-axe from Lake Dümmer (DÜMMER-M) was recovered from the lake along with a fragment of a B-bowl, a normal funnel beaker and finds of other periods (Michaelsen 1938, fig. 2).

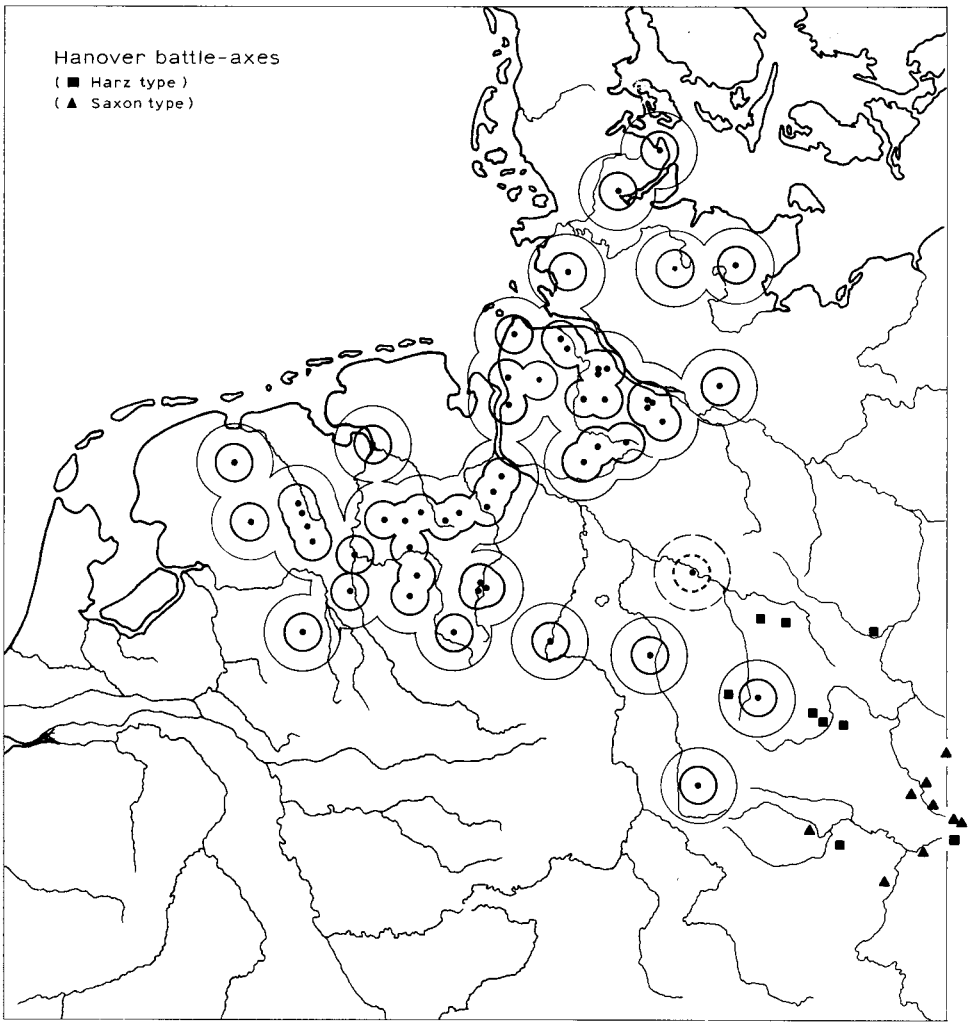


FIG. 51 Distribution of Hanover battle-axes and the Harz and the Saxon type, according to Brandt, Herfert, the DVFDFSH, J.J. Butler's and J.D. van der Waals' documentation (Schleswig museum) and the text.

Another specimen was found near the settlement of DÜMMER-N (Reinerth 1939). The pottery from the settlement covers phase G as well as phases C, D1 and (pot 15) D2. The occurrence of a complete specimen in an earth grave along with C (or D1) pottery (WERLTE-STEINFEHN: Schlicht 1967; 1968; Brandt 1967) is an indication that the type had remained current (sporadically?) until then. Summarising, we can assume a period of currency in the period from B (or A?) up to and possibly including D1, with greatest frequency in B-C. This corresponds with c. MN I-II in Danish terms.

5.6.2.4 *Amazon battle-axes* (Brandt-B; Ebbesen B-C, fig. 48f). Fig. 52 shows that this type is fairly general in Lower Saxony between Hamburg, Bremen and Cuxhaven, and to the north of the Harz, but that it quickly becomes rare between those areas and to the west. Its absence in Netherland fits in with this picture. For this reason, the find of a B3b battle-axe with slight indications of collars in LAARNE in northwest Belgium (Nenquin 1963, fig. 2) must be distrusted. Outside Lower Saxony, the type occurs mainly in southern Scandinavia, Schleswig-Holstein, the DDR and northwest Poland. Brandt (1967), Herfert (1962), Nilius (1971) and Ebbesen (1975) mentioned quite a large number of associations, in the east with Walternienburg-Bernburg and Havel pottery, in the North Group with MN Ib-V TRB pottery. Ebbesen (1975) divided these axes into five subtypes which form a chronological sequence: B1 (MN Ib), B2 (II-III), B3 (IVA), C1 (?), C2 (V). C-axes are absent from the area of the West Group (Ebbesen, p. 204 and Brandt's descriptions), so that the Amazon axes may be dated there to MN Ib-IVA.

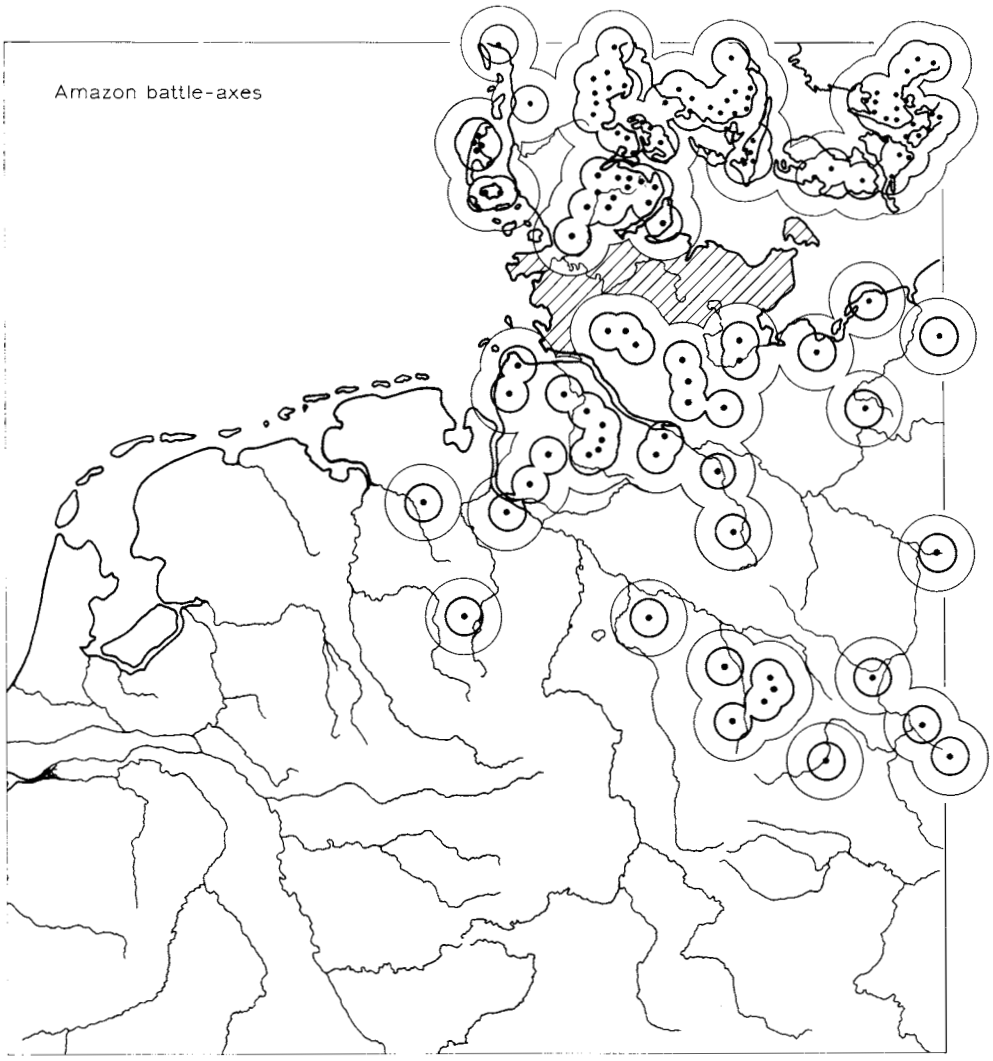


FIG. 52 Distribution of Amazon axes, according to Brandt, Herfert, Nilius and (for Denmark) Ebbesen. Hatched area not surveyed.

Collars occur fairly frequently on Amazon battle-axes in Schleswig-Holstein and occur twice in Lower Saxony (Brandt 1967, note 268). This underlines the geographical closeness and the relationship with Hanover battle-axes and the 'Dutch' knob-butted axes (5.6.3), which also show a strong tendency towards collars.

A close connection has often been drawn between the Amazon-axe-shaped amber beads and these axes. No amber beads of this type occur west of the Ems, and only one between the Ems and the Weser (T-shaped passage grave of DÖTLINGEN. Jacob-Friesen 1959, fig. 68h).

5.6.2.5 *Fan-butted battle-axes* (Brandt-C = Ebbesen-D = Åberg-D where an oval shaft-hole is present, fig. 48g). These axes have a distribution area in Lower Saxony which is similar in shape to that of the Amazon axes, but which does not extend as far to the west (fig. 53). Ebbesen's map (1975, fig. 153) shows that the uninterrupted area of concentration of these axes is virtually limited to a bulging triangle between the mouths of the rivers Elbe, Saale and Vistula. Outside this area, they are relatively rare. There is a concentration in Mecklenburg, especially on Rügen.

They are ascribed to the Globular Amphora culture (KAK). A fan-butted battle-axe was found in SARGSTEDT, in the southern DDR, which was associated with a small, undecorated KAK/Bernburg pot (Herfert 1962, p. 1103). Another fan-butted battle-axe was excavated from a KAK grave in VEŠIČE in Bohemia (Herfert, l.c.). Fan-butted battle-axes only occur in the west of the enormous distribution area of the KAK. The use of battle-axes may have been derived from the TRB culture by the KAK, but Ebbesen considers the fan-butted axe as a

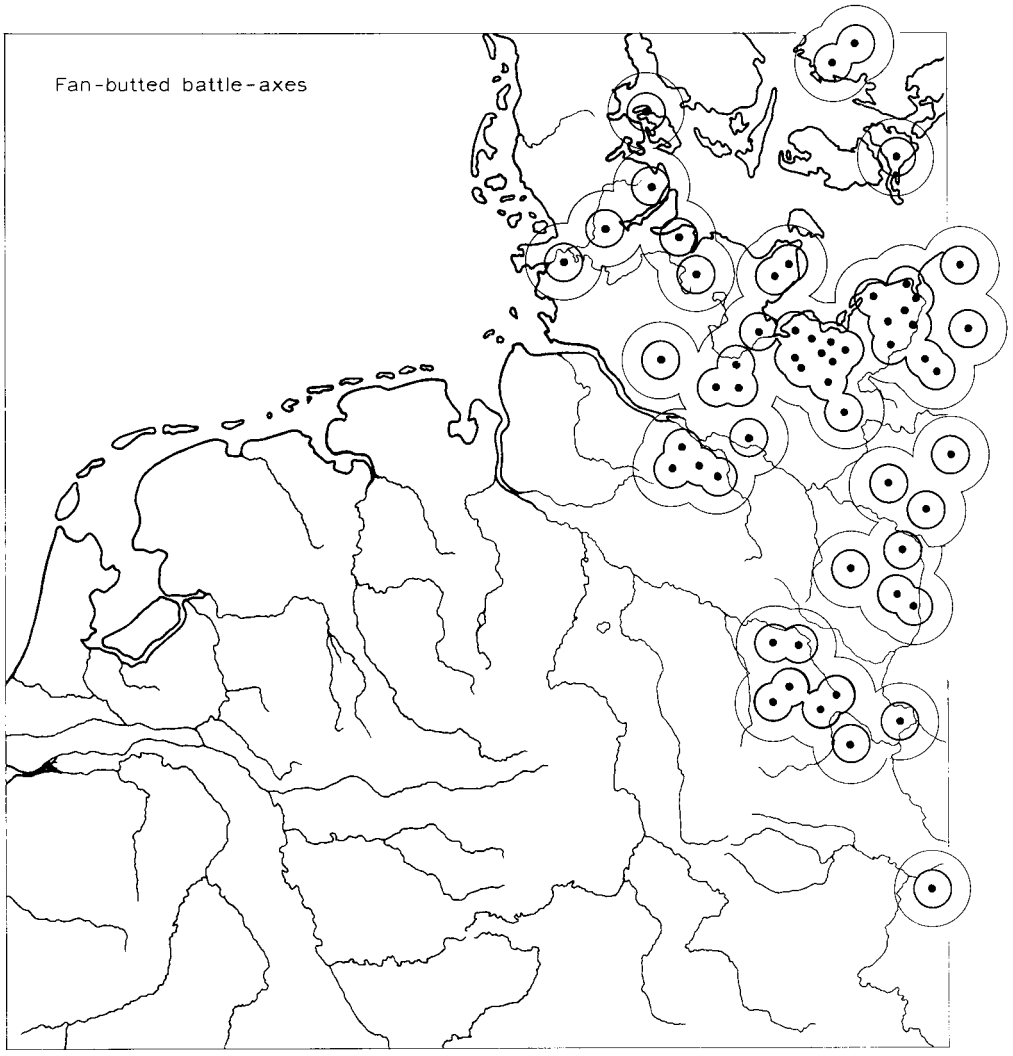


FIG. 53 Distribution of Fan-butted battle-axes according to Ebbesen (1975, fig. 153) and Brandt.

KAK product which was imported by the TRB population of Denmark. The fan would have stimulated the development of the Ebbesen C Amazon axes, so that, according to Ebbesen, the fan-butted axes should have originated slightly earlier. He dates the latter to the MN IVA-V. Perhaps they remained current in the KAK even after the end of the MN V TRB phase.

5.6.3 Knob-butted battle-axes (fig. 48h)

More than half a century ago, during his exploratory journey through Netherland and northwest Germany, Åberg found three specimens of a kind of knob-butted battle-axe with local characteristics, including a preference for collars (Åberg 1916a, b; 1918; 1937). Brandt (1967) mapped eight specimens in the extreme northwest of Germany. D. Hoof (1970) mapped two of them in Netherland, south of the Rhine. M. Addink-Samplonius' cataloguing of the Beaker battle-axes in the Dutch provinces of Utrecht and Gelderland in 1966-67 produced eight knob-butted battle-axes, a very important by-product (Addink-Samplonius 1968) which proved that the centre of the distribution area of the western cluster was in Netherland.[28] Complementary research revealed an equally large concentration in the four northeastern Dutch provinces (Bakker 1973). A recent study by K. Tackenberg (1974) and some other supplementary data have led in the meantime to small changes in the map (fig. 54) and the catalogue.[29]

The distribution map (fig. 54) shows a pronounced concentration in northern Netherland and the adjoining part of Germany up to the Hunte and the Hase. Moreover, there is an enigmatic cluster near the border between Netherland and Belgium. One specimen came from as far away as the Belgian-

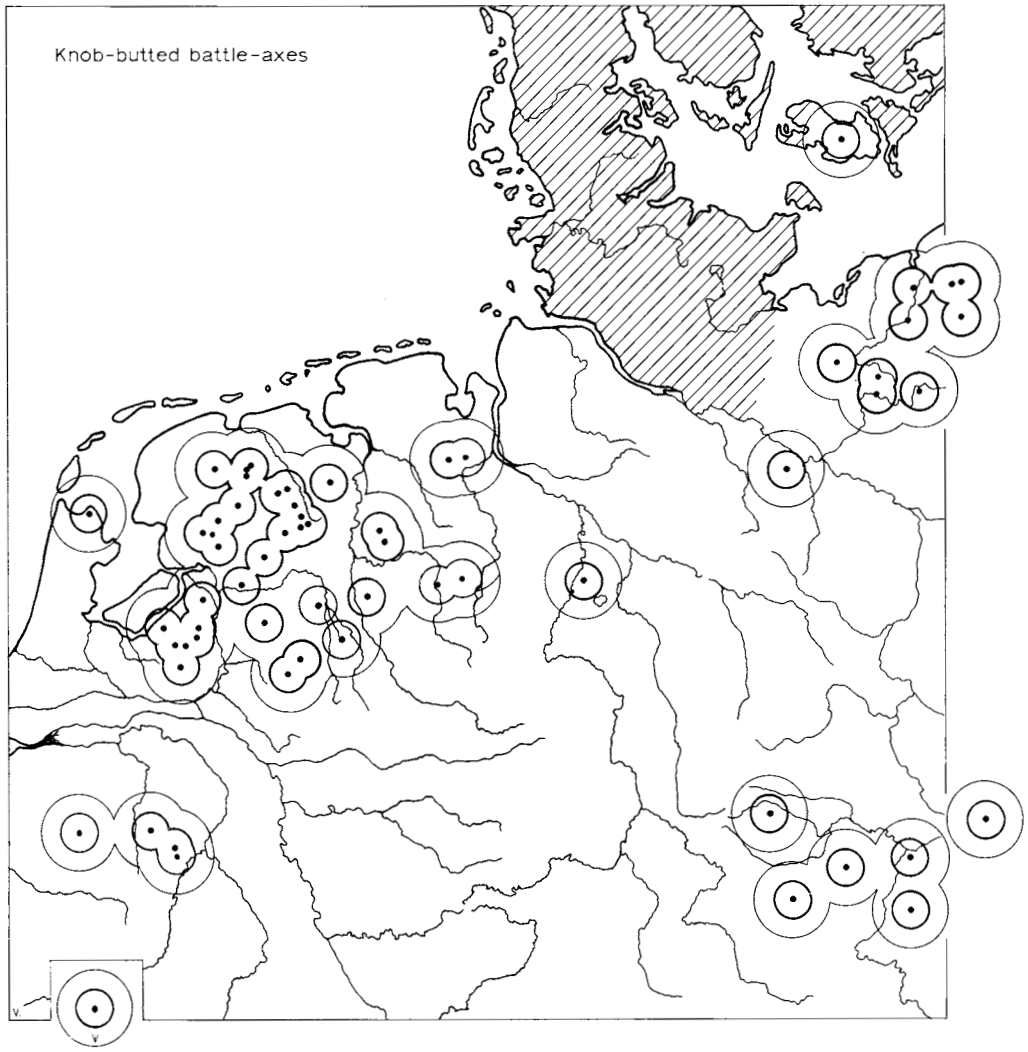


FIG. 54 Distribution of Knob-butted battle-axes according to Brandt, Herfert, Nilius and the text. The hatched area has not been surveyed.

French border. East of this area, there is an empty zone, hundreds of kilometres wide, up to the cluster in southern Scandinavia and Mecklenburg, which starts beyond the Elbe, and a cluster in the southern DDR.

In the western concentration area, certain local characteristics developed, which justify regarding the axes concerned as an independent type. I shall call it the 'Dutch Type'. It is a polythetic type (Clarke 1968, citing Sokal & Sneath) with a regional basis.

It is characteristic that – in contrast to most of the knob-butted battle-axes elsewhere – the 'Dutch' axes were made from a narrow, rectangular block of stone with an almost square cross-section. The knob and cutting edges were defined by the narrow surfaces of the original block; parts of these surfaces remain as the flat surfaces of the circular 'cheeks' projecting on both sides of the shaft-hole, and on the collars around the hole on the upper and lower side of the axe. The cross-section of the finished specimens is round to rounded-rectangular.

There is a wide variety within the type; perhaps it is possible to distinguish a number of variants, as Tackenberg (1974) tried to do. Occasionally certain features point to a relationship with the Flat battle-axes, the Troldebjerg-Fredsgårde battle-axes and the Hanover battle-axes.

List of 'Dutch' knob-butted battle-axes to the west of the Weser

Lower Saxony, West Germany

(1) Kreis BERSENBRÜCK
Fragment, c. 9 cm long, consisting of a toadstool-shaped knob, knob-shaft and half of the shaft-hole (with collars). Find-spot indicated as 'Kr. Bersenbrück'.
Bersenbrück museum 79 (plaster copy after the original in Römer Museum, Hildesheim).

(2) BENTHEIM, Kr. Grafschaft Bentheim
Shaft-hole and butt section, with round cheeks, collars and knob. The cutting part had been ground off at some time in the past (cf. 22, below).
Previously in the Münster museum, 29:1835, now disappeared. Brandt 1967, plate 4:6, p. 171, Tackenberg 1974, p. 27 (doubt about type not justified).

(3) ESTORF, Kr. Nienburg
Complete specimen, with reduced cutting edge due to resharpening, circular 'cheeks', collars and knob with hemispherical to triangular profile. Found in 1867, four feet deep, alongside pot sherds (Brandt concluded: earth grave).
Brunswick museum AIa200. Åberg 1916b, p. 89, fig. 7; Åberg 1937, fig. 83; Brandt 1967, plate 4:2, p. 28-29, 171; Tackenberg 1974, plate 10:2, p. 27.

(4) GRAPPERHAUSEN-FLADDERLOHAUSEN, Kr. Vechta
Complete, well-preserved specimen with collars, knob, and possibly 'cheeks'. The cutting section, which shows scarcely any expansion, with midribs on the upper and lower faces, is a feature of the Hanover battle-axes (Brandt).
Oldenburg museum 6955-I. Åberg 1937, fig. 85 (photograph). Brandt 1967, plate 4:3, p. 31, 171 (Åberg's illustration is more correct than Brandt's). Tackenberg, 1974, p. 59.

(5) GROSSENKNETEN, Kr. Oldenburg
Butt section with collars, flat 'cheeks', and dome-shaped knob which is separated from the shaft-hole section by a cylindrical shaft.
Tackenberg 1974, plate 10:1, p. 27, 59 (based on a photograph from the Münster museum).

(6) LOY, Kr. Ammerland (= 'RASTEDE' (Tackenberg))
Toadstool-shaped knob, broken off in the shaft connecting it with the central section.
Oldenburg museum 717. Tackenberg 1974, p. 27, 59 and additional information H. Zoller.

(7) MUNDERSUM, Kr. Lingen
Butt-section with collars; found on the Osterkamp (II) in a plot which had contained two barrows, from which (?) two EGK beakers originated. From this plot, too, came several fragments of axes and battle-axes, and numerous small flint implements. Brandt saw this situation as an argument in favour of his assigning the knob-butted battle-axes to the EGK.
Lingen museum 18. Brandt 1967, p. 29, 171.

(8) OSTENWALDE, Kr. Aschendorf-Hümmling, from passage grave Ostenwalde-3
Butt-section with knob and collars. Longitudinal grooves, no cheeks. Part of the pottery from this tomb was illustrated by Schlicht and Brandt. The passage grave had eight capstones.
Emsland museum 151. Schlicht 1950, p. 172-173, plate 12:1a-b; Brandt 1967, p. 28-29, 171, plate 28:1.

(9) SPAHN, Kr. Aschendorf-Hümmling
Complete, atypical specimen, without collars or cheeks, and without any hint of a constriction except for a groove in front of the knob (cf. Jażdżewski 1936, fig. 946). The T-shaped passage grave in the Herrenholz next to which it was found in 1890 has 16 capstones and an oval peristalith.
Private collection. Schlicht 1950, p. 174-175, fig. 1:4a-c. Brandt 1967, p. 28-29, 171, plate 4:8; Tackenberg 1974, p. 59.

(10) WESTERHOLTSFELDE-NORD, Kr. Ammerland
Complete specimen with expanding cutting-section, flat cheeks, but (according to the drawings) without collars, so that the rims of the shaft-hole are well within the tangents to cutting-edge and knob. Longitudinal herring-bone ornamentation on the sides, on which the areas of short diagonal stripes are separated by longitudinal lines. The knob has short, radial lines, too.
Property of J. Kuepker. Åberg 1937, p. 52, fig. 84 (good photograph); Brandt 1967, p. 28, 30, 171, plate 4:1 (after Åberg); Tackenberg 1974, p. 59; communication H. Zoller.

Province of Groningen, Netherland

(11) OPENDE, gem. Grotegast
Complete slim specimen, with slight indications of knob and collars. Amphibolite. Found in 1907 during dredging of the Dobbe (pingo) near the Wilhelminahoeve (11E:208/574).
Leeuwarden museum 100-1, photographs E40235/3-6.

(12) ONSTWEDDE, gem. Onstwedde
Badly weathered, complete specimen with expanding cutting section, and with collars, cheeks and knob. Found at a depth of 1 metre.
Groningen museum 1910/6.9.

Province of Drente

(13) ANLO, gem. Anlo
Knob fragment, broken off behind central section. Transverse ridge on shaft between knob and central section. Diabase. Surface find from the excavation by Waterbolk (1957-58) of prehistoric settlements and graves, including a settlement of the E-phase of the TRB culture.
Assen museum. Waterbolk 1960, p. 88, fig. 41:Q-9; Addink 1968, p. 240; Appendix B2.

(14) DROUWEN, gem. Borger
(= 'BORGER' (Åberg))
Unfinished specimen. Shape well-defined but plump. Square flat areas in the position of the collars. Shaft-hole perforation begun from both sides, but not finished. Similarly, indications of beginnings of cheeks. Found on the heath near Drouwen.
Assen museum 1883/3.1; IPP-photographs 76-678-22/26. Åberg 1916a, fig. 33, p. 65 (3).

(15) Between EEXT and ANNEN, gem. Anlo
(= 'GIETEN' (Åberg, Tackenberg))
Unfinished specimen. General shape formed to some extent. Collars and knob indicated, cheeks not yet formed. Shaft-hole perforation begun from both sides, but not finished. Found during digging for stones, 2 m below the surface.
Assen museum 1897/8.2; IPP-photographs 76-680-8/14. Åberg 1916a, p. 65 (4); Tackenberg 1974, p. 59 (6a-5).

(16) EKELBERG, gem. Zuidwolde (= 'EKELENBERG' (Van Giffen), 'KERKENBOSCH' (Knöll))
Asymmetrical and badly shaped, atypical complete specimen. Indications of cheeks and of one collar. A large fragment from the cutting-edge broke off during its manufacture, and the axis of the cutting-section was then shifted. Diabase. From grave a of a TRB cemetery (fig. B16a), along with E-pottery.
Assen museum 1934/3.3d. Van Giffen 1937a, fig. 2; Appendix B6.

(17) EXLO, gem. Odoorn
Weathered, complete specimen with cutting-section, collars, cheeks and knob. From the area around Exlo.
Property of M. Meelker, Exlo (documentation G. de Leeuw, Assen museum).

(18) ODOORN-1, gem. Odoorn
Butt-section with collars, circular cheeks and scarcely discernible knob on cylindrical shaft. Found in or near barrows at Odoorn.
Assen museum 1878/4.4; IPP-photographs 76-680-30/36, 681-3/9. Åberg 1916a, fig. 32, p. 66 (14).

(19) ODOORN-2
Complete specimen whose cutting-section was greatly reduced by resharpening. No cheeks. Vague indications of collars. Damage to upper face of knob 'invisibly' repaired, leaving, however, the impression of a slant in the knob. It is not a *Nackengebogene Axt,* however. Found in urnfield 'Driest', near the Eppiesbergje. There is also other neolithic material from this site.
Assen museum 1937/6.87; IPP-photographs 76-679-36, 680-4/6.

(20) RODEN-1, gem. Roden
Unfinished specimen. Only the knob and the general shape were formed to any extent. Diabase. Found 'near Kymmell's Bosch'.
Assen museum 1882/7.2; IPP-photographs 76-679-29/35.

(21) RODEN-2
Unfinished specimen. Only the knob and the general shape were formed to any extent. Most of the upper and lower faces of the block from which the weapon was to be made have been preserved. Diabase. Found during sand quarrying near Mensinge House, c. 1 metre below the surface.
Assen museum 1896/10.6; IPP-photographs 76-679-3/10.

(22) SLEEN, gem. Sleen
A very weathered specimen, whose whole cutting section was long ago ground flush with the central section. Otherwise complete. Collars. No discernible cheeks. Resembles (2) from BENTHEIM (Brandt 1967, plate 4:6). Found in the neighbourhood of Sleen.
Assen museum 1936/7.37; IPP-photographs 76-679-24/31.

(22a) ASSEN MUSEUM, find-spot unknown
Unfinished specimen. Knob, cheeks, collars and general shape indicated. Drilling of shaft-hole was started from both sides. Diabase (?). Very similar to no. 14. The inventory number overlaps with that of another object. Other relevant documentation has not yet been traced (1977).
Assen museum 1910/11.2 (incorrect number); IPP-photographs 76-678-30/36, 679-2.

Province of Friesland

(23) DONKERBROEK, gem. Ooststellingwerf
Complete specimen with a hexagonal cross-section (facets somewhat concave), knob, collars, no cheeks. Damage to the cutting-edge was corrected by reshaping it asymmetrically. Diabase. Found in the river Tjonger, N.N.W. of Oosterwolde.
Leeuwarden museum 1-12 (1928), photographs E40235/1-2, 7-8.

(24) STEGGERDA, gem. Weststellingwerf
Complete, knob damaged. Knob, cheeks, collars. Exceptional in that the non-expanding cutting-section has concave upper and lower faces. Find-spot (16E:c. 203.00/451.50) was a secondary one because the finder could remember that the axe had previously been in use as a hammer, later still as a weight for sweeping the chimney of the nearby farm. Property of H. de Boer, Steggerda (documentation G. Elzinga, Leeuwarden museum).

Province of Overijssel

(25) BRECKLENKAMP, gem. Denekamp
Butt-section of a specimen which was broken off in front of the central section. Apart from this, little weathering or damage. Knob, cheeks and collars clearly defined. Diabase. (29A: c. 263.5/496.5).
Enschede museum 585. IPP-photographs 72-194E-13/19.

(26) DIJKERHOEK, gem. Holten
Complete specimen with extremely worn cutting-edge, and with collars, cheeks(?), cylindrical butt-shaft and flattened knob. Found c. 1956 during ploughing in the Dijkermaten near Maneschijn, at a maximum depth of 35 cm (28C: c. 221.96/477.68).
Enschede museum 313. IPP-photographs 72-194E-20/25.

(27) OSSENZIJL, gem. Oldemarkt
Complete specimen (corners of cutting-edge and knob broken off) with collars, cheeks and knob. Found during peat digging.
Plaster copy in Schokland museum Z 1955/XI.6, original lost.

(28) RUTBEEK, gem. Enschede
A complete specimen, but so weathered, that only the hardest parts of the stone allow partial reconstruction of the original surface. Expanding cutting-edge, knob and collars present, cheeks presumably also present originally. Diabase. The weathering appears to have been produced by running water: the artefact was therefore possibly recovered from the stream, the Rutbeek, near the hamlet of the same name (34F: c. 252/467).
Enschede museum 382, IPP-photographs 72-194E-26/31.

(29) STEENWIJK-1, gem. Steenwijk
Complete specimen (cutting-edge slightly damaged) with knob and cheeks. Slight indications of a collar on the lower face, and on the upper face the collar continues in a flat ogival terrace up to the cutting edge.
Schokland museum, with no number or documentation.

(30) STEENWIJK-2
Complete specimen with toadstool-shaped knob and robust collars. The cutting-edge was greatly shortened by resharpening. On the front, the cheeks now merge into the cutting-edge as a result of resharpening (or is the plaster copy not correct?). Crystalline rock. Found near Steenwijk.
Leiden museum d. 1940/12.1 (plaster copy after the original of J. Volkers); IPP-photographs 76-681-12/17.

(31) WELSUM, gem. Dalfsen
Cutting-section only, of which the cutting-edge is also missing. Presumably the cutting-section originally expanded; collars and oval cheeks sharply defined. Diabase. Found in loose soil during an excavation by W.A. van Es (BAI) 1960; (21H:216.8/504.0), named 'DALFSEN I' by Van Beek and Van Es, 1964, p. 13. Under settlement layers from the Roman period, this find-site yielded settlement layers from the Early Iron Age (excavation by J.J. Butler 1967), but no TRB pottery (which does occur nearby).
Zwolle museum POM 5697; IPP-photographs 72-205-0/10a.

Province of Gelderland

(32) BEEKHUIZERZAND, gem. Harderwijk
Unfinished(?) specimen with complete perforation, although not yet widened to the required diameter. Cutting-section with collars and circular cheeks. Cutting-edge does not expand. Diabase. Excavated in 1964 by Modderman and Verwers from the fill of an unlined well from the Late Bronze Age. This well had been dug through layers of a small stream which contained much refuse from an adjoining TRB E2-settlement. See Modderman, Bakker & Heidinga

(1976), the discussion below and Appendix B3.
Arnhem museum; Modderman et al. 1976, fig. 15:2; Addink 1968, p. 214, 240.

(33) GORTEL-1, gem. Epe
Complete specimen, rather plump. Cutting section scarcely expanding; cheeks, collars and knob present. Burned? Diabase (De Buissonjé). Found 1909.
Zutphen museum V163; IPP-photographs 66-510-14A/18A. Documentation Addink no. 60; Addink 1968, p. 214.

(34) GORTEL-2, gem. Epe
Complete, beautifully finished specimen, without a knob. Butt-end is a cylindrical shaft. Cheeks and collars. Central ridges run longitudinally across the upper face and the sides. Diabase (De Buissonjé).
Leiden museum e. 1919/2.1 (not 1911); IPP-photographs 66-554-7A/11A. Documentation Addink no. 90; Addink 1968, p. 214.

(35) LEUVENUM, gem. Ermelo
Complete specimen, cheeks present but no collars. Except between the knob and the hole, nothing was removed from the upper and lower surfaces of the bar from which the artefact was made, if it was not necessary for the shaping of the sides. In profile, the central section and the non-expanding cutting section thus appear as an unbroken entity, without any waist and of constant height. Crystalline rock (De Buissonjé). Until recently, the find-spot of this specimen was forgotten. On 9.6.1978, however, the former forester Van de Hoorn at Hierden told W.J. Manssen, Keeper of the Barneveld museum, that it was found north of the Zandmolen (26H: c. 177.1/480.9) during forest work in 1946, and that he had given it to the Harderwijk museum.
Harderwijk museum, no inventory number; IPP-photographs 66-544-28/32; documentation Addink no. 93; Addink 1968, p. 214.

(36) NIJMEGEN MUSEUM, no find-spot reported.
Complete, unweathered, beautifully finished specimen which was made from a slender oblong bar. Remains of the original surface of this bar are revealed by flat areas on the upper, lower and side faces of the butt, as well as on the circular cheeks and the collars. The cutting-section does not expand. Layered quartzite (De Buissonjé; Hoof).
Nijmegen museum 140; IPP-photographs 66-482-35, 486-9/12; documentation Addink no. 25; Addink 1968, p. 214; Hoof 1970, plate 21:184 (too asymmetrical) and p. 344 (92).

(37) REKKEN, gem. Eibergen (wrongly named: 'GORSSEL' (Pleyte; Addink); 'OVERIJSSEL?' Åberg)).
Complete specimen with knob and collars. Cutting-section does not expand. The find-spot (34G: 246.60 ± 1.00/455.75 ± 1.00) was identified by P.J. Woltering, in 1970, on the basis of the 1834 report of its discovery (Zwolle museum) by Dr. A. Brants, who donated the specimen to the Zwolle museum (22.10.1848): '... Purchased from Groot Huurneman at Rekken near Eibergen. It had been found by Gr.H. himself 20 years ago in the hamlet of Rekken, 1/4 hour away from his house, on the Landeweer [a dyke], which runs from Oldenkotte to Pothaar via Dieters, Röskeslat and Langekamp ...' About 1814, the central section which 'used to have the thread of a screw' had been smoothed as much as possible by the owner, so as to enable him to fix a handle in it, but the hole still had 'some irregularities'. The presentation letter of the same date was quoted by Hijszeler (1961, p. 82).
Zwolle museum POM 91/2289; Pleyte 1889, p. 7, plate I:7; Åberg 1916a, 1916b; Addink 1968, p. 213.

(38) SPEULDE, gem. Ermelo
Cutting section. Cheeks and collars. Diabase (De Buissonjé). From Bezaan's collection and reported to have been found near a barrow containing a Bell Beaker of the Veluwe type (e. 1946/1.58; Van der Waals & Glasbergen 1955, plate 13:41); near 26E 177.30/475/75 (Modderman 1963, p. 16; however, the documentation of Bezaan's find-spots by the Leiden museum is not always reliable).
Leiden museum e. 1940/1.59; IPP-photographs 66-542-34, 534-3; documentation Addink no. 81; Addink 1968, p. 213.

(39) UDDELERMEER, gem. Apeldoorn
Butt-section, with knob, cheeks and collars (the last-mentioned are not clear). Finely grained crystalline rock.
Excavated in 1908 by Holwerda from the *'temenos'* within the Hunneschans; this was an Early Bronze Age barrow, according to Glasbergen (1954 (2), p. 47), built on a settlement layer of the TRB E2-settlement there (Appendix B); other remains of Neolithic and Bronze Age or Iron Age cultures were also found there.
Leiden museum e. 1909/9.132; IPP-photographs 76-681-34/36, 682-1/2. Holwerda 1909, p. 41, plate XIX a; Addink 1968, p. 213 *('Flache Hammeraxt')*.

(40) WAPENVELD, gem. Heerde (fig. 5.8h)
Complete specimen with knob, cheeks, collars and non-expanding cutting-edge. A ridge along the length axis from cutting-edge to central section on the side faces. Porphyric diabase (De Buissonjé). The finder lived near the Suikerbrug, not 'Sinkenberg' (Addink).
Leiden museum e. 1923/12.1; IPP-photographs 66-544-19A/23, 559-17; Holwerda 1925, p. 49, fig. 20:1; documentation Addink no. 92; Addink 1968, p. 213.

(41) WEKEROM, gem. Ede
Weathered fragment of the central section, with numerous ridges but no cheeks or collars. Comparable to some extent with specimen 8 from OSTENWALDE (Brandt, plate 28:1) but the collars are missing. Strictly speaking, it cannot be proved that this fragment belongs to this group of battle-axes. Granular granite rich in felspar (De Buissonjé).
Leiden museum W.I.3 (donated by O.G. Heldring 1841); IPP-photographs 66-509-13/17A; documentation Addink no. 55; Addink 1968, p. 214 (*'Flache Hammeraxt'*).

Province of North Holland

(42) STROE, former island of Wieringen
Unfinished specimen. Cutting-edge broken off. Length 11.2 cm, originally c. 17 cm. Knob already separated from the fragment by a channel. Drilling of shaft-hole (with a massive bore) started from both upper and lower faces. Porphyric diabase (Boekschoten). Found among stones in Pleistocene sand.
Hoorn museum N 1969/IXa; IPP-photographs 69-853-11a/19a; Bakker & De Weerd 1969, p. 113.

Province of North Brabant

(43) BLADEL, gem. Bladel
Butt-half with knob, collars, and cheeks. Diabase (J. Hoeve). Found in 1972 on a sand hillock Krieke Schoor near the Dalems Stroomke.
Property of N. Roymans (Bladel). ROB-photographs H 1906-1/3. Beex 1973; Slofstra 1973. Information J. Slofstra.

(44) LEENDER HEIDE, gem. Leende
Complete specimen, slightly weathered and damaged, with cheeks, collars and knob. Cutting-edge does not expand. As far as measurements are concerned, this eccentrically found specimen is completely indistinguishable from the others. Diabase (Boekschoten).
Property of Van den Lokkant (Leende); IPP-photographs 71-85-5/19. Information G. Beex; Slofstra 1975, fig. 3.

Province of Limburg

(45) NEERITTER, gem. Hunsel
Butt-half. Knob, collars, cheeks, cylindrical butt-shaft. Black rock. Found on the land of M. Corsten, Thulkenshof, near border-post 143, in or before 1956.
Property of T.H. Bouth (Herten); Bouth's letter in BAI, dated 31.5.1956, with drawing (information J.N. Lanting) and drawing by Hendrikx (information S.H. Achterop).

(46) ITTERVOORT, gem. Hunsel
Butt-half with hemispherical knob, cylindrical butt-shaft, collars and circular cheeks. Black rock. Leiden museum GL 53, purchased in 1890 from the collection of C. Guillon (Roermond); Hoof 1970, plate 21:183, p. 280 (NL 150), 92.

Netherland, find-spot unknown

(47) LEIDEN MUSEUM, no find-spot indicated.
Fine, undamaged, unweathered specimen, with knob, collars, cheeks, everything sharply defined.
Leiden museum U. 1931/2.32 ('purchase Oegstgeest, legacy Gildemeester'); IPP-photographs 76-681-19/23.

Province of Luxembourg, Belgium

(48) SAINTE CÉCILE
Complete knob-butted battle-axe with knob, collars, cheeks and expanding cutting-edge of crystalline rock, which is in no respect different from the other specimens. The find-spot was stated on an old label (c. 1900). There is no other documentation.
Arlon museum; information L. Lefèbvre, Keeper.

Table I gives a survey of the characteristics and measurements of the 49 specimens discussed. The measurements are not always exact, since they are based partly on drawings and sketches of varying quality. Besides, resharpening, damage and weathering have had an effect, even on the specimens reported as complete. Moreover, the unfinished specimens had not yet attained their final dimensions. The length, F, varies from 11 to 18.5 cm, but if one excludes specimens clearly shortened by resharpening, it varies from 12.5 to 18.5 cm. The distance from knob-end to centre of shaft-hole, G, is between 4 and 8.5 cm. The maximum width or height, H, is between 3.5 and 6.5 cm.
In spite of its great variety, the group as a whole displays a remarkable tendency for characteristics A-E. Leaving the atypical specimens 9, 11, 16 and 41 out of consideration, a knob (A) is found 40 times (including the hardly indicated one of 18) out of the 41 available observations (98%). For B, collars, these figures are 37:39 (95%); for C, flat cheeks, 32:35 (91%), though weathering and the quality of some illustrations had a negative effect; for D, the rectangular block shape, 41:41 (100%); for E, the cylindrical shaft between knob and central section, 29:41 (71%).

TABLE I List of Knob-butted battle-axes of Dutch Type.

A = knob
B = collar(s)
C = flat cheeks
D = rectangular block shape
E = cylindrical shaft between knob and central section
F = length
G = distance from end of knob to centre of shaft-hole
H = maximal width or height

no = absent
x = present
(x) = scarcely discernible
— = broken off or not yet shaped
? = no data available
measurements in centimetres

		A	B	C	D	E	F	G	H
1	Bentheim	x	x	x	x	x	—	5.7	3.7
2	Bersenbrück	x	x	—	x	x	—	?	?
3	Estorf	x	x	x	x	x	14.8	8.0	5.6
4	Grapperhausen	x	x	?	x	x	16.9	7.6	4.9
5	Grossenkneten	x	x	x	x	x	—	6	4
6	Loy	x	—	—	—	x	—	—	—
7	Mundersum	?	?	?	?	?	?	?	?
8	Ostenwalde	x	x	no	x	x	—	8.5	4.9
9	Spahn	x	no	no	no	no	16.6	8.3	4.8
10	Westerholtsfelde	x	no	x	x	x	17.4	8.0	5.9
11	Opende	no	x	no	x	no	13.4	4.7	3.7
12	Onstwedde	x	x	x	x	no	11.9	4.8	4.2
13	Anlo	x	—	—	—	x	—	—	—
14	Drouwen	x	x	x	x	no	17.3	6.4	6.7
15	Eext-Annen	x	x	—	x	no	14	4.5	5.7
16	Ekelberg	no	x	x	no	no	13.8	5.7	5.7
17	Exlo	x	x	x	x	x	17.1	7.1	5.4
18	Odoorn-1	(x)	x	x	x	x	—	6.8	5.4
19	Odoorn-2	x	x	no	x	x	13	7.1	5.6
20	Roden-1	x	—	—	x	x	17	—	5.5
21	Roden-2	x	—	x	x	no	17	—	6
22	Sleen	x	x	—	x	x	—	7.7	3.7
22a	Assen museum	x	x	x	x	no	17.7	7	7
23	Donkerbroek	x	x	no	x	no	13	5.7	5.7
24	Steggerda	x	x	x	x	no	15.6	5.6	6.0
25	Brecklenkamp	x	x	x	x	x	—	7.3	5.5
26	Dijkerhoek	x	x	x	x	x	11	6.4	5.1
27	Ossenzijl	x	x	x	x	no	13.2	5.2	5.4
28	Rutbeek	x	x	x	x	x	17	6.7	5
29	Steenwijk-1	x	x	x	x	no	—	5	5.8
30	Steenwijk-2	x	x	x	x	x	12.2	7.1	6.5
31	Welsum	—	x	x	—	—	—	—	4.8
32	Beekhuizer Zand	—	x	x	x	—	—	—	5.5
33	Gortel-1	x	x	x	x	no	13.9	5.4	4.9
34	Gortel-2	no	x	x	x	x	14.3	4.2	5.2
35	Leuvenum	x	no	x	x	no	13.8	5.7	5.5
36	Nijmegen museum	x	x	x	x	x	14.1	5.9	4.5
37	Rekken	x	x	x	x	x	14.8	5.5	5.6
38	Speulde	—	x	x	x	—	—	—	5.5
39	Uddelermeer	x	x	—	x	no	—	4.2	—
40	Wapenveld	x	x	x	x	x	18.6	8.2	5.6
41	Wekerom	—	no	—	—	—	—	—	6.4
42	Stroe	x	—	—	x	x	—	5.4	3.7
43	Bladel	x	x	x	x	x	—	6.3	5
44	Leender Heide	x	x	x	x	x	12.5	5.5	4.5
45	Neeritter	x	x	x	x	x	—	7.9	5.3
46	Ittervoort	x	x	x	x	x	—	7	5.4
47	Leiden museum	x	x	x	x	x	14.2	5.6	5.5
48	Ste Cécile	x	x	x	x	x	14	?	4.5

Of the 31 typical specimens for which all the data concerning A-D are available,

25 specimens have A+B+C+D (81%)
3 specimens have A+B+D (10%)
2 specimens have A+C+D (6%)
1 specimen has B+C+D (3%)

Nowhere *east of the Weser* do we find clusters of knob-butted battle-axes with Dutch characteristics. Characteristic D, the block shape, is fairly general in DDR, Poland and Schleswig-Holstein, but characteristics B, the collars, and C, the flat cheeks, are extremely rare, or completely absent, there. Among the comparable specimens, I could find, on the basis of the illustrations, the following examples of combinations of at least three of the characteristics A-D:

A+B+C+D:
(a) UPOST, Kr. Demmin, Mecklenburg
Unfinished specimen, 'vaguely hexagonal in cross-section'. Six longitudinal facets (gullies) all round between knob and central section. Diabase. Nilius called this specimen unique for Mecklenburg. Nilius 1971, plate 51i. Mecklenburg collection (Schloss) 4730.

A+B+D:
(b) MILDENITZ, Kr. Strasburg, Mecklenburg
With lengthwise channel on sides and on upper and lower faces. This specimen bears some superficial resemblance to (23) from DONKERBROEK, which has no channels, but has, in profile, 4 facets and one median ridge, and no ridges on upper and lower faces. Sprockhoff 1938, pl. 22:4; Nilius 1971, p. 129.

A+B+D, but with pointed cheeks:
(c) 'SCHLESWIG-HOLSTEIN'
This axe appears to have a vaguely defined hexagonal profile. The most frequently illustrated knob-butted battle-axe from Schleswig-Holstein, but certainly not characteristic for this area. Åberg 1916b, fig. 8; 1937, fig. 82; Sprockhoff 1938, pl. 22:4; Kersten 1951, fig. 20: Schwantes 1939, fig. 180; 1958, pl. 15c; etc.

(d) GRÜTTOW, Kr. Anklam, Mecklenburg
Unfinished specimen. Nilius 1971, plate 51k.

A+B+D, without data on the shape of the cheeks:
(e) 'SCHLESWIG-HOLSTEIN'
Butt-section, broken off behind the cheeks, if they existed, with parallel, longitudinal ridges. On this point, comparable to some extent with the specimens from UPOST (a), OSTENWALDE (8) and WEKEROM (41). Åberg 1916b, fig. 9; 1937, fig. 80.

A+D, but with pointed cheeks:
(f) LOLLAND, Denmark
Complete specimen with ridges like (e), but with pointed cheeks. Åberg 1937, fig. 81.

Perhaps collars and flat cheeks occur more frequently east of the Weser than we at present realise, but they were certainly not particularly popular there. I do not regard the unfinished specimen from UPOST as one imported from the West, but as one which developed there out of an accidental, rare combination of characteristics which were not particularly current there. In the Baltic area, it appears that of possible combinations of the characteristics A-D, A+D occurs most frequently, A+B+D infrequently, and A+B+C+D hardly ever. These ratios are exactly the reverse of those in the Dutch group!

Culture group and dating of the Dutch knob-butted battle-axes. Before I published the small number of not entirely impeccable contexts of these battle-axes in Netherland (Bakker 1973), no associated finds were known and this was the cause of contradictory cultural and chronological interpretations. Åberg (1916a, b; 1918; 1937), Sprockhoff (1938, plate 22) and Schlicht (1950) were convinced that the Dutch knob-butted battle-axes, just like all the other knob-butted battle-axes elsewhere, should be assigned to the TRB culture.[30]
Like most other TRB battle-axes, the Dutch knob-butted battle-axes possess a vertical symmetry, and the collars are a link with other types of TRB battle-axe, especially west of the Elbe. Typologically, however, there is also a confusingly strong similarity to the battle-axes of the Bronze Age and the Iron Age in the same region, for which reason Sprockhoff (1938, plate 27:1-4, 6, 8) and Schlicht (1950) erroneously assigned the latter to the TRB culture.
Flat cheeks, collars, rod-shaped butts and strong similarities in the proportions in some of these Bronze-Iron Age battle-axes do indeed make it extra ordinarily difficult to distinguish some fragments from those of Dutch knob-butted battle axes. In the *Nackengebogene Äxte* (Åberg 1916c), however, which most strongly resemble the Dutch knob-butted battle axes, the angled long axis from cutting-edge to the butt (which never is a knob) is a valid criterion. Another is that the Dutch knob-butted axes usually have an hour-glass-shaped shaft-hole, whereas the *Nackengebogene* and related axes, according to S.H. Achterop, nearly always have a conical hole (Modderman et al. 1976, p. 61).
Meanwhile, P.V. Glob (1938), S.H. Achterop (1961b), K.H. Brandt (1973) and K. Tackenberg (1974) have given the Bronze-Iron Age battle-axes their proper dating on the basis of a large number of closed finds. But Tackenberg now also transfers the Dutch knob-butted battle-axes to the end of the Neolithic and to the Bronze Age, so that there would be no chronological interval between the two groups of battle-axes. In this, he is partly motivated by Brandt's argument (1967) that the Dutch knob-butted battle-axes should be classified in the EGK instead of the TRB culture.

Only few convincing arguments, apart from the striking and puzzling typological similarities, can be advanced for a dating of the Dutch knob-butted battle-axes in the Bronze-Iron Age. Tackenberg (1974, p. 28) did not know of a single closed find that would date them in this period. The axe from BEEKHUIZERZAND could plead now in favour of Tackenberg's theory. The hour-glass-shaped hole and the continuous long axis show, however, that the fragment is not a Bronze or Iron Age type. It was found in an unlined well which is dated by its pottery to the Late Bronze Age. Yet, the well had been dug into stream fill layers full of E2 TRB pottery, from which the axe could easily have gotten into the well (Modderman et al. 1976, p. 59-61). The axes from UDDELERMEER, WELSUM and ANLO also come from places with pottery of the Bronze or Iron Age. Like BEEKHUIZERZAND, Uddelermeer and Anlo yielded, however, far more TRB pottery – all of E2 type. The Bronze or Iron Age pottery from Welsum may have been similar to that from Beekhuizerzand, but that from Uddelermeer (which is quite close by Beekhuizerzand) is different, and so is the pottery from Anlo.

Brandt used the fact that specimen 10 from WESTERHOLTSFELDE (Brandt 1967, plate 4:1) has herring-bone ornamentation as an argument in favour of assigning the knob-butted battle-axes to the EGK. But EGK battle-axes rarely have this type of ornamentation, and it is also known in TRB battle-axes, including a Hanover battle-axe which was found 40 km from Westerholtsfelde (Brandt 1967, plate 4:4; Jażdżewski 1936, fig. 959). The circumstances in which the specimens from MUNDERSUM (7), ANLO (13), SPEULDE (38) and UDDELERMEER (39) were found, viz. that EGK graves were found in the immediate neighbourhood, are not convincing as an argument in favour of the proposition, since no knob-butted battle-axe is presently known to have come *from* an EGK grave, in spite of the EGK predilection for putting battle-axes in graves. Moreover, the EGK pottery of the four sites belongs to different types and phases.

From genuine TRB sites come the axes from BEEKHUIZERZAND (predominantly E2 pottery), ANLO and UDDELERMEER (both also from settlement sites of the E2 facies). The atypical axe 16 (fig. B16:a) came from a TRB grave from phase E (1+2) at EKELBERG. Specimen 8 from OSTENWALDE came from a T-shaped passage grave with eight capstones (illustrated pottery included funnel beakers (D or earlier) and an E1-amphora, but most of the grave-pottery must have remained unreported). The atypical battle-axe 9 from SPAHN was found next to an extremely long T-shaped passage grave (phase D-E?, cf. Chapter 7).[31]

All this is an unexpected, strong argument in favour of an assignment of the Dutch knob-butted battle-axe to the TRB culture; it seems that they are characteristic of the E-horizon, and – also according to distribution maps figs. 39, 69-70 – especially of the E2 facies. In agreement with this are the numerous instances of their occurrence in central Netherland in areas where phases A-D are not, or only very rarely, found (maps figs. 37-38).
There are typologial similarities with indisputable TRB battle-axes: in the first place with the knob-butted battle-axes elsewhere, which partly belong to the main group of Flat battle-axes (cf. Herfert 1962; Jażdżewski 1936). Some specimens of the Dutch group display similarities (atypical for this group) with other types of TRB battle-axes. The channels in the specimens from OSTENWALDE (8), DONKERBROEK (23) and WEKEROM (41) recall the specimens from 'SCHLESWIG-HOLSTEIN' (e) and LOLLAND (f), of which (f) already has the pointed cheeks of the Scandinavian TRB knob-butted battle-axes. The hexagonal cross-section of the specimens from DONKERBROEK (23) and OPENDE (11) recalls more easterly TRB battle-axes (cf. Jażdżewski 1936). The rectangular cross-section with midribs of the cutting-section of the battle-axes from GRAPPERHAUSEN (4) and GORTEL-2 (34) recalls Hanover battle-axes. The cross-section of the cutting-section of the specimen from STEGGERDA (24) is trapezium-shaped, with convex sides and concave upper and lower faces, as is often the case with Flat battle-axes and Pan-European Double battle-axes. The cutting-section of the specimen from EXLO (17) seems to widen as abruptly from the body of the axe as that of some Hanover battle-axes.

Admittedly, this approach does not enable me to give a satisfactory explanation for the knob-butted battle-axes in the southern part of the Benelux countries, since no TRB pottery occurs there. It might even appear that classification in the EGK culture would offer a slightly better explanation, since 1d and AOO beakers frequently occur in northern Belgium near the southern Dutch cluster. I do not know of distribution maps of groups from the Bronze-Iron Age which coincide with those of the knob-butted battle-axes.
If we do not allow ourselves to be sidetracked, the clusters of these battle-axes south of the Rhine and the Meuse must be interpreted as extraordinarily interesting signs of cross-cultural contact. Here we might think of gifts to trading partners such as chiefs of the villages where TRB people obtained their merchandise, such as, for example, the axes of Meuse flint.
But it is remarkable that the knob-butted battle-axes were found in the southern part of the Benelux countries along east-west routes and not along north-south routes. This holds not only for the specimens from southern Netherland, but also for the battle-axe (48) from SAINTE CÉCILE, in the narrow valley of the Semois, a tributary of the Meuse on the southwest side of the Ardennes. Was it here perhaps a matter of complicated exchange systems (cf. Sahlins 1972, Chapter 6), in which the flint zone people

	EGK	Bronze/Iron	TRB	Phase
distribution map	XX	X	X	
herring-bone	(X)	•	(X)	
shape	X	XX	XXX	
hour-glass hole	XXX	•	XXX	
associations:				
(16) Ekelberg	•	•	XXX	→ E1 + E2
(32) Beekhuizerzand	•	XXX	XX	→ E2
(39) Uddelermeer	X	X	XX	→ E2
(13) Anlo	X	X	XX	→ E2
(8) Ostenwalde	X	•	XX	
(9) Spahn	X	•	X	
(38) Speulde	X	•	•	
(7) Mundersum	X	•	•	
(31) Welsum	•	X	•	

FIG. 55 The relative weight of the arguments in favour of the belonging of the Dutch Knob-butted battle-axes to the EGK, Bronze/Iron Age or the TRB culture.

resold these artefacts elsewhere? (But would an archaeological mapping of the non-perishable commodities of the Kula-ring reflect finds only in the area of production and in the final marketing area, and not in the area of the middle-men?).[32] Whatever the truth here may be, the specimens from BLADEL (43) and LEENDERHEIDE (44) were made of diabase, like most of those from northern Netherland. This indicates importing from northern Netherland, since diabase is unknown in the area of the southern cluster.
Fig. 55 summarizes the weight of the most important arguments discussed in favour of assigning the Dutch knob-butted battle-axes to one of the cultures or periods mentioned.

A good impression of the *method of manufacture* can be obtained from six of the unfinished Dutch specimens in particular. Successive stages of completion can be seen from RODEN-1 (20), RODEN-2 (21), STROE (42), EEXT-ANNEN (15), DROUWEN (14) and BEEKHUIZERZAND (32). The preferred material was diabase, ideally suitable rock for 'pecking and grinding' (Semenov 1964). It could be dug up – just like other erratics – from the North European glacigenous plain, especially from the boulder clay[33] or could be collected at the foot of sea cliffs along the North Sea and lakes or the erosion sides of rivers in this boulder clay; it is, however, absent in the Rhine and Meuse basins south of the moraines.

Shortly after Dr. G. J. Boekschoten (Geological Institute, Groningen University) had alerted me to the importance of sea cliffs, I learned of the unfinished specimen of STROE on Wieringen, a former island of boulder clay where there were, until recently, such sea cliffs. In the TRB period, Wieringen was much larger and was perhaps joined to that part of the island of Texel which also consists of boulder clay. There must have been sea cliffs in many other parts of the North Sea coastal area, too. They cannot have been much higher than 10 metres, i.e. less than some cliffs on the Baltic coasts.

In the manufacture of battle-axes, the starting point was a stone which had been shaped by the glaciers, and from it, an oblong block was first made by pecking and grinding; this block had flat, parallel, straight sides and a square or rectangular cross-section (the specimen from STROE is an exception in that it was made from a somewhat tapering block with straight sides). The first four unfinished specimens mentioned still reveal substantial remains of the smoothly ground upper and lower faces. In numerous finished specimens the original surface has been retained in the flat cheeks next to the shaft-hole, and the outer surface on the rims of both collars. The latter, and the two planes through the cheeks, determine the maximum dimensions of the knob, central section and cutting-edge. In the quartzitic sandstone specimen in the NIJMEGEN MUSEUM (36), the round knob actually has flat areas on the upper, lower and side faces, which represent these outer surfaces. The specimen is so beautifully finished that it would appear that a master craftsman experienced slight technical problems when he used quartzite instead of diabase.

The next step was that the profile of the battle-axe was roughly outlined in the side faces, mainly by pecking and grinding. The upper and lower faces were then rounded off somewhat along the tangent with the new side profile. The knob was shaped all around (the stage of RODEN-1, 2).
In the unfinished specimen from STROE, which had not been shaped much more than those from RODEN, the drilling of the hole had been started. This was done with a solid drill, which initially gave the hole the profile of a normal curve. Drilling was done alternately from the upper and lower faces. Incompletely perforated specimens are those from STROE, EEXT-ANNEN and DROUWEN. Presumably it was desirable to carry out the troublesome initial phase of the drilling before further finishing of the shape of the battle-axe (during which the artefact became more fragile); subsequently the hole was deepened from both sides only so far as to enable the collars to be shaped without undue risk.
Perhaps the drilling was occasionally continued a bit further, but the specimens from DROUWEN and BEEKHUIZERZAND demonstrate that the removal of the last separation between the two drilled hollows and the final finishing of the shaft-hole were postponed to the very end. With the specimen from EEXT-ANNEN, further work was done on the shaping of the body of the battle-axe after the initial stage of the drilling of the hole. The shaping of the upper and lower faces of the cutting section was further advanced, the central section remaining as a remnant of the block-shape. The work on the DROUWEN specimen was so far advanced that, at first glance, it seems there remained only the final perforation of the hole. But it is a very plump specimen, and the fact that the collars and the beginnings of the flat cheeks had not been finished, suggests that the final shape envisaged by the craftsman was

much more elegant. The unfinished specimen from BEEKHUIZERZAND had been perforated, but the wall of the shaft-hole had not yet been smoothed. Perhaps it was the drilling which caused the weapon to break. The surviving part demonstrates that the cheeks and the collars had nearly been given their final shape during the penultimate stage.
Malmer (1962, p. 607-610) described how the shaft-holes of the Swedish Boat-axe culture battle-axes were often given a final polish on the inside with a vertical grinding movement. He supposed that this was done with a small stone, and that, in view of the deep scratches, sand was also used (id. fig. 108:1). Such deep vertical scratches also appear on the wall of the hole of the battle-axe from WELSUM (31). When I read this particular passage in Malmer, I had already concluded the collection of my material, so that I am unable to report on the number of battle-axes with this characteristic.
According to the report quoted in the description of the battle-axe from REKKEN (37), the 19th century user found it necessary to smoothen the hole somewhat by means of a file. The prehistoric polishing of the wall of the hole took place at about the same time as the last shaping of corners, ridges and grooves (with a so-called strike-a-light (see 5.1)?) and the careful polishing of all the details of the surface which made it not only smooth but hard as well.[34]

Whereas the splitting off of the cutting-edge of the specimen from STROE, and the fracture along the hole in the specimen from BEEKHUIZERZAND might be the reasons for the finishing work having been stopped, no reason is evident with the other unfinished specimens as to why they were not completed. A few finished specimens show that splinters sometimes broke off from the battle-axes, presumably during their manufacture. In the specimen from DONKERBROEK (23), this caused the pronounced asymmetry of the cutting-section although all other traces of this damage were removed. This must have happened with the atypical specimen from EKELBERG (16), as well.
In the specimen from ODOORN-2 (19), damage to the knob was patched up in this way. It cannot be proved that for the specimen from GORTEL-2 (34) the missing knob had broken off, and that the stump was subsequently reshaped, even if a knob would be within the limits of the normal proportions. The cutting edges of several specimens were reduced by resharpening, as appears also from the broken lines of the profiles (e.g. ESTORF (3), ODOORN-2 (19) and STEENWIJK-2 (30)).

In the very similar specimens from BENTHEIM (1) (Brandt, plate 4:6) and SLEEN (22), the whole of the cutting-sections was removed, and the last remains of them were ground smooth. In this way there remained unusual hammers with shafts – in both cases the head of the hammer is convex and not unsuitable for working copper or leather.

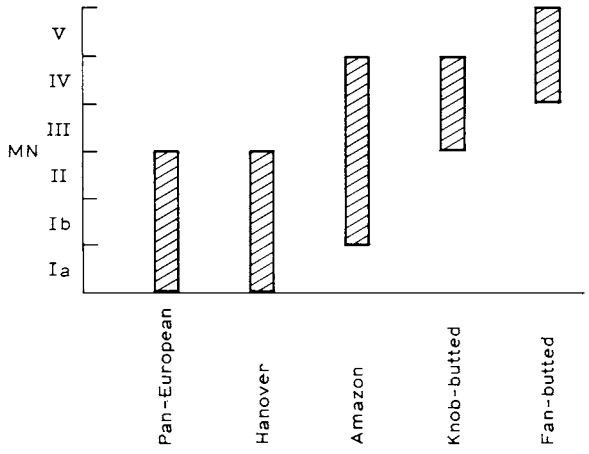


FIG. 56 Periods of currency of several types of TRB battle-axes in the MN.

5.6.4 *Comparison of the geographical and chronological distribution of some of the types of battle-axe discussed*

Fig. 56 summarises what has previously been said concerning the dating of the most important MN battle-axes of the TRB West Group. Fig. 4 gives a combined projection of their separate distribution pictures. Fig. 57 illustrates the same, but is restricted to showing, in the shaded areas, the separate 'closed distribution areas'.[35] A striking feature is the 'corridor' Bremen-Cloppenburg (along the Post Road of a later period) which is also clear on the maps of figs. 2-3 (Bakker 1976). Fig. 51 and 57 illustrate the fact that the Hanover battle-axes are a connecting link between the West Group and the North Group.
There were evidently intensive contacts, as is also clear from the strong similarity between the pottery phases A-C of the West Group and the synchronous phases of the North Group. These distributions contrast strikingly with the distribution pictures of the Dutch knob-butted battle-axe and the Amazon battle-axe, which evidently reflect a division in the West Group between a western part with Early Havelte pottery (E) and an eastern part. Åberg (1916a) had already pointed this development out (section 2.3).
In view of the strong similarities, although especially in negative characteristics such as the absence of ornamentation, in the last TRB pottery phase (MN V) in the West Group, in Schleswig-Holstein and Jutland, the Danish islands and, perhaps, Mecklenburg, it is rather surprising that we find during this period no uniform type of TRB battle-axe in the North Group and the West Group west of the Elbe; the fan-butted battle-axe is restricted to those areas where KAK and late Bernburg pottery was found.
There is another striking point. Nearly all the histograms in fig. 58 show a decline towards the west. This effect would also have been evident in fig. 4, had it not been compensated in the west by the

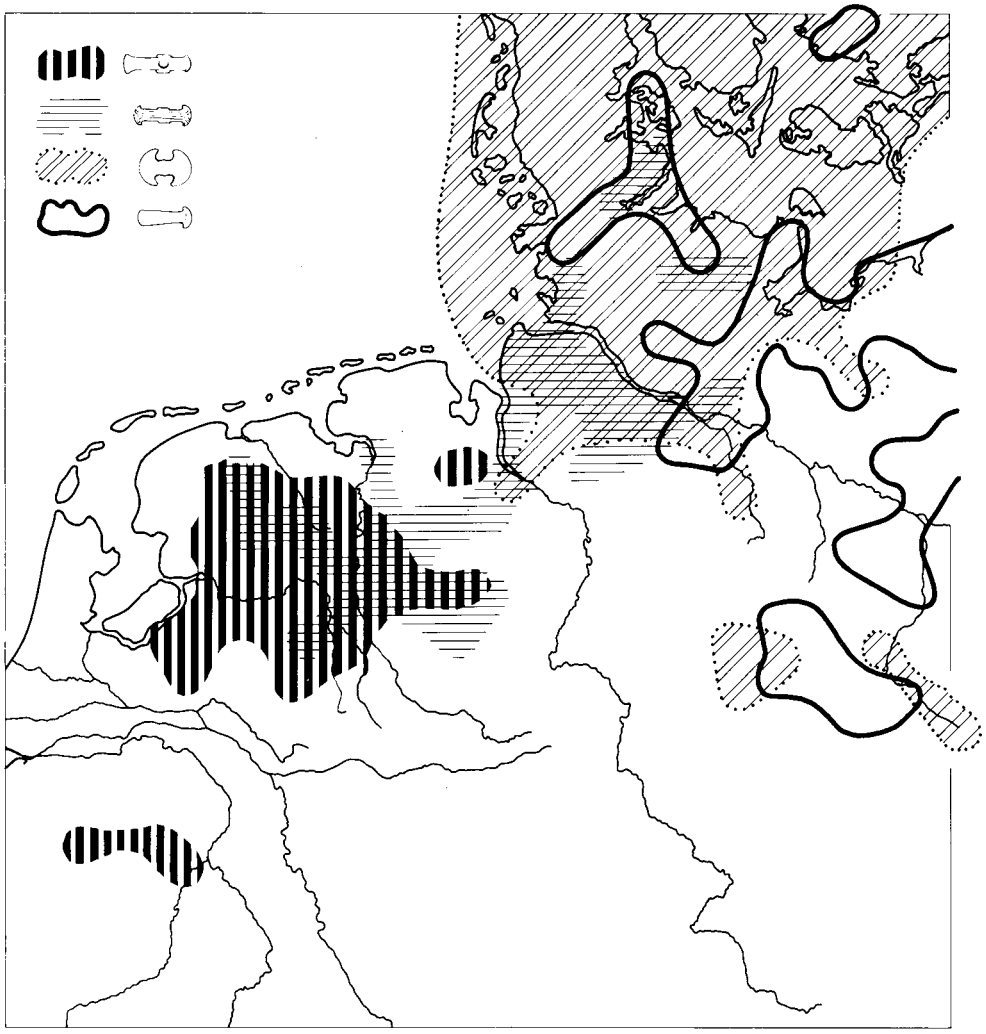


FIG. 57 'Closed distribution areas' (see note 5:26) of TRB battle axes: Dutch Knob-butted, Hanover, Amazon and Fan-butted. Compiled from figs. 51-54.

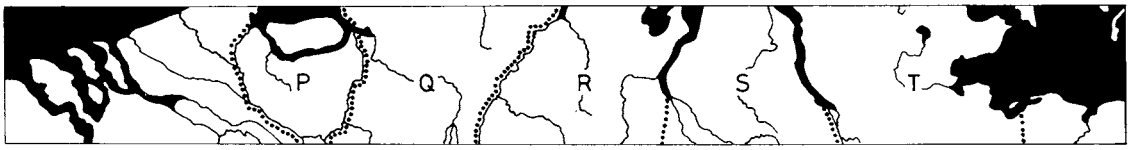
Dutch knob-butted axe. There is no satisfactory explanation for this decline (difference in mentality, in the ostentatiousness of the authorities or in martial spirit?).[36]

Finally, some tentative remarks concerning the function of these battle-axes in former times. In comparison with the large number of burials and pots, their number is remarkably small. Of both the Hanover battle-axes and the Dutch knob-butted battle-axes fewer than sixty have come to light! While mapping the Hanover battle-axes, I received the impression that the find-spots were often c. 10 km distant from each other, with a certain preference for the main routes. Could this be an indication that they were attributes of important village chiefs? But then one would expect a completely different situation to be revealed in the distribution of the Dutch knob-butted battle-axes. Had the local population then settled down into farming communities with provincial attitudes towards foreign influences?

5.7 A FEW OF THE ARTEFACTS WHICH HAVE NOT YET BEEN DEALT WITH

Axe-hammers (Arbeitsäxte), the plump, perforated axes which might have been used for heavy work, are still very poorly documented (cf. section 5.6.2.1). In the West Group I have found scarcely any finds which could be used for their dating.

The fragment of stone 6646 from GELLENERDEICH (Pätzold 1955, fig. 2d) presumably originates from a '*hohe durchlochte Schuhleistenkeil*' or a '*Plättbolze*' ('flat-iron') (cf. Brandt 1967, p. 10ff). The rock is bluish black, finely grained, with glistening pin-points and scarcely layered. The shaft-hole was precisely cylindrical and 2.5 cm in diameter. A quarter of a circle in cross-section of the evenly polished surface has survived near the hole. If the artefact was symmetrical horizontally, the original width must have been 8.5 cm; in the case of a circular cross-section, the height must have been c. 7.5 cm (less if it came from a *Plättbolze*). These implements



	P	Q	R	S	T
Fan-butted	-	-	-	1	16
Amazon	-	-	2	11	10+?
Knob-butted	7	15	5	-	-+?
Hanover	-	8	12	17	3
Troldebj.-Fredsg.	-+?	1+?	5	4	3+?
Total	7+?	24+?	24	33	32+?

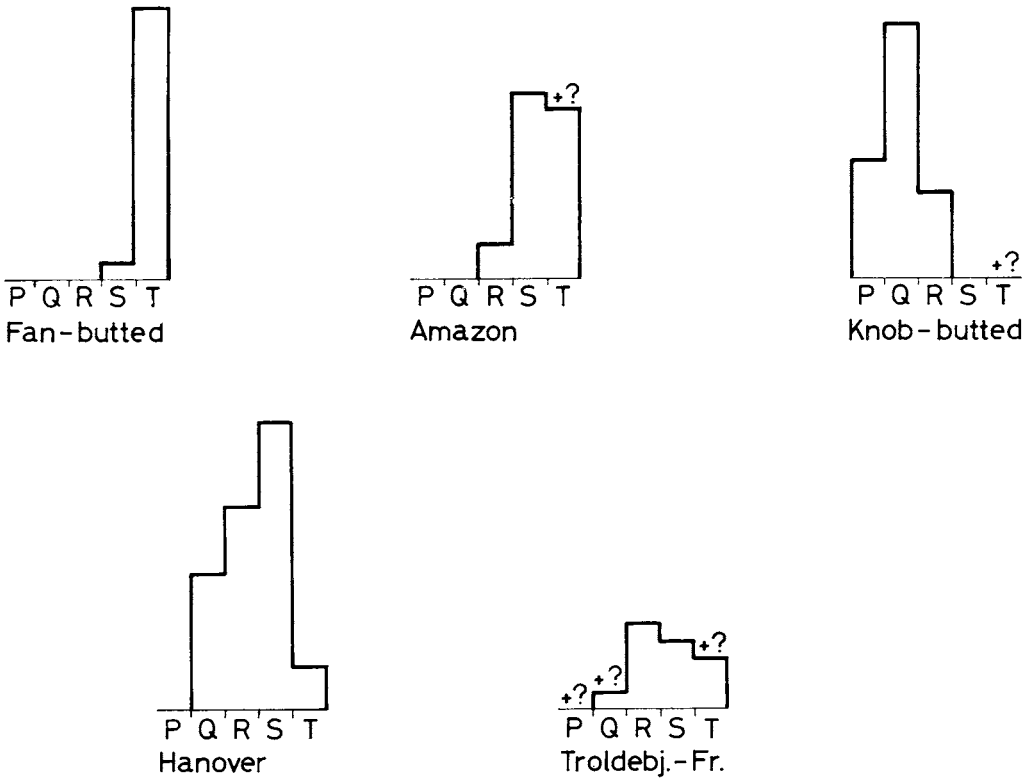


FIG. 58 The number of battle-axes in the areas P-T between Utrecht and Lübeck (upper), in a table and in histograms. Compiled from figs. 50-54.

occur in Rössen and early TRB (EN) contexts (Brandt 1967, Schwabedissen 1967, Lomborg 1962, Van der Waals 1972) all over the North European Plain, but we do not exactly know just how long they remained in use.
Strictly speaking, the find on the river dune of GELLENERDEICH offers no further clues about this point, as this site must have been accessible for centuries before it was overgrown with peat in the Bronze Age. The pottery which can be identified belonged to the Western TRB culture (C, D, E?, G pottery), to the EGK and Barbed Wire Beakers (Bakker & Van der Waals 1973). No Rössen or EN TRB pottery was established.

Mace-heads were known to Knöll (1959) from hunebed D53 at HAVELTE (Van Giffen 1927, plate 154:69) and from the settlement DÜMMER-M (Michaelsen 1938, fig. 2:17). Brandt (1967, p. 105, plate 29:17) illustrated one from a megalithic grave in LAVENSTEDT.
The first record of the mace-head from HAVELTE having been found c. 1830-50 in hunebed D53 dates only from c. 1918 (Van Giffen 1927, p. 135-136), so that one need not accept this find-context unquestioningly. Brandt also has his doubts about whether the find-site of the mace-head from LAVENSTEDT was a megalithic grave. The mace-head which was recovered from the TRB settlement in Lake DÜMMER is equally inconclusive, because some artefacts of other culture periods also came to light. The TRB sherds are the oldest artefacts of diagnostic value from this site.
In Denmark mace-heads of similar shapes to the Havelte and Dümmer-M specimens, and also with hour-glass-shaped holes, are a regular feature of the EGK (e.g. Jørgensen 1977, p. 201). Perhaps both western parallels are also EGK artefacts. The Lavenstedt mace-head, however, is, by its thinness and its cylindrical hole, of (North) TRB type.

Marbles of markasite, quartz etc. from a few megalithic tombs (Knöll 1959, p. 35), a stone cist (fig. B3:17) and from the settlement of DÜMMER-S (Deichmüller 1969a, p. 33) are perhaps the only objects of the West Group with any similarity to the inventories of Irish-Scottish megalithic graves (Herity 1974, p. 136).

Fossils occur a few times in TRB contexts: in LAREN (section B11) two flint sea-urchins, with no sign of having been reshaped by man, and in hunebeds EMMEN-D43 (Holwerda 1914, fig. 5) and EMMELN-2 (Schlicht 1968, fig. 960) parts of a petrified ammonite which had been perforated for use as a hanger. The tip of the EMMEN specimen was painted with red ochre (information J.A. Brongers).
In passing, I would like to mention beads of amber (cf. 5.6.2.4), jet or quartz, the golden bracelet of HIMMELPFORTEN (Cassau 1933, 1936), and copper *ornaments*. The copper artefacts of the West and the North Groups are discussed in the context of their metal group in section 6.5b. For the remaining ornaments, the reader is referred to Knöll (1959), Schlicht (1968) and Van Giffen (1927, 1943b).
For *artefacts of organic material* from DÜMMER-N and DÜMMER-S (it is not yet clear if these can be assigned to the TRB culture) the reader is referred to the publications of Reinerth (1939), Jacob-Friesen (1959) and Deichmüller (1969a).

CHAPTER 6

Chronological and typological problems

This chapter deals with questions which arise in connection with the previously presented chronological framework for the Western Tiefstich pottery. The discussion of the typological value of the ZEIJEN finds, which appears in Appendix B17, could have been included in this chapter, as it is also elementary for the reliability of the pottery sequence developed here.

6.1 WHEN DID THE DROUWEN STYLE BEGIN? (KAELAS'(1955)ARTICLE RECONSIDERED)

Innovations, technological improvements, changes in fashion and state of mind spread from their starting-points with varying speeds and in various directions. These starting-points can be situated in different places. In a 3-dimensional diagram, where the vertical axis represents time and the horizontal axes the surface of the earth, the expansion of an innovation will be represented as a cone (Deetz 1967, fig. 10), where the top angle of the cone is dependent on the rate of the expansion (and the scale of measurement). Superimposed cones of substituting innovations determine when the previous innovation goes out of use. In actual practice, the cone will be badly distorted for many reasons, and on closer inspection, the spread of an innovation wave across the earth will display a strong similarity to the spread of a pine forest by seedlings across a Dutch heath-land that is no longer grazed, cut or burned (cf. Clarke 1968, fig. 89, after Hägerstrand). As a result of these factors, the 'typochronological horizons', in which identical objects, whatever their distance from each other, are regarded as synchronous, are anything but flat and horizontal in the 3-dimensional diagram mentioned; but whether this phenomenon strikes the researcher or not depends on the chronological and geographical scale which he employs. In this connection, we can speak of a Doppler Distortion Effect (Clarke 1968, fig. 80, after Deetz & Dethlefsen 1965).
It appears from telesynchronisations in the TRB culture of Netherland and Scandinavia that this distortion is not a negligible factor: the 'horizon' of the beginning of the T-shaped passage graves cross-cuts the pottery 'horizons'. Forssander's principle was accepted therefore: date the graves according to the pottery and not the other way about (cf. section 2.13). In the Danish pottery, retardations in the spread of new styles were assumed over quite short distances (section 2.18). In this chapter, we shall meet pottery horizons which intersect.
For the time being, however, the pottery horizon system will have to remain in use as a dating system, however 'elastic' it is, since no dendrochronological dates exist, and C14 data are not available in sufficient quantities to do more than check the main lines of the argument at most. Moreover, 'short-term', sharply defined import horizons are unknown.
Consequently, the answer to the question posed in the title can only be given in terms of pottery horizons – no different, therefore, from the terms used by L. Kaelas (1955) when she was occupied with this problem. Her answer was: 'in the EN C', since the earliest pottery from the megalithic graves west of the Weser could be compared with pottery from the North Group of this period.
According to Kaelas, the *collared flasks* of the West Group proved that the Drouwen style could not have begun after the end of the EN C, since, in the North Group, they had completely disappeared by the beginning of the MN. The *funnel beakers* offered her no conclusive evidence. She thought that a horizon from the beginning of Drouwen could be found in the *biberons,* a point which was refuted in section 3.4.3.
Two pots from hunebed DROUWEN-D19 (Kaelas 1955, fig. 20; K11:10:, K12:8) were recognisable, in Kaelas's opinion, as *lugged beakers* (*) of the EN C type. The first specimen is undecorated, and, in my opinion, lacks a significant profile. Our knowledge of undecorated pottery from the West is only superficial, but thick lug handles, as of this specimen, are found in settlements which are much later than EN C (LAREN, ELSPEET, ANGELSLO). The second specimen, which is decorated, can, in my opinion, easily be placed in phase E2, on the basis of technique and pattern of ornamentation and profile.

Kaelas mistakenly considered the fragment from VALTHE (K11:5) to be a *lugged flask* (*). Knöll

(1959) was undoubtedly correct with his identification of it as a lugged beaker, since the ornamentation of the belly is continued (staggered) on the neck. The specimen is one of the best parallels of the famous lugged beaker from NEUMÜNSTER-GADELAND in Holstein (Struve 1939), which was unanimously dated in the MN Ia.

This brings us to the evidence which requires a more extensive discussion. As far as decorated pottery is concerned, there are two *jugs* (*):
(1) a jug from hunebed D21 in BRONNEGER (fig. 28:3, K1:1) and
(2) a jug, found in isolation, 'possibly in a flat grave', in DÖSE, near Cuxhaven (fig. 28:1; D13:1). They are very similar, but the ornamentation of jug 1 consists of a strictly rhythmical succession of ladder-strips and jug 2 is more playfully decorated with an arhythmical series of ladders, zippers and a pin-pricked zone. Jug 2 affords no stratigraphical or associative indications for its dating. Jug 1 was found as scattered sherds 'just below pavement B' in hunebed D21 at BRONNEGER (Van Giffen 1927, p. 376; Knöll 1959, p. 42, n. 61). Since the intermediate pavement C was missing below these sherds they may have lain originally on the primary pavement D, but have been brought upwards by later animal or human action. Cf. note 2:24 for the stratigraphy of this chamber. The other pottery belongs to stages A-E.
(3) A somewhat comparable jug was found in DÖHREN, Kr. Hanover (K11:13), but because it is an incidental find from a gravel pit (Dehnke 1940) the circumstances of the find provide no further dating.
(4) This is also the case with a large belly-sherd from a comparable jug from KYŠKOVICE (Province of Roudnice, on the Elbe halfway between Prague and the German border), evidently an import from the Tiefstich pottery area (Zápotocký 1960, plate 262; indicated by A.E. Lanting).
(5) I. Gabriel found a remarkable jug fragment in the easterly chamber of two T-shaped passage graves in TANNENHAUSEN, which I am publishing here with his special permission (fig. 28:7). I noticed no other early jugs during a perusal of the sherd material in 1968. Typologically the oldest pottery in both the TANNENHAUSEN hunebeds are, besides, the famous B jug (K1:16) and B dishes and pails with rim ornamentation of type T and lower ornamentation consisting of long strips, bordered by drawn lines (zippers, ladders, a few M's on top of the other, inverted V's and strips with crossed diagonal hatching). Between each of the strips there are from two to five single vertical lines. Pierced lugs and knobs are still in the rim zone, not on its border with the lower ornamentation. Thus, these dishes and pails strike one as somewhat more old-fashioned than a pail such as that (fig. 29:2; K25:1) from the above-mentioned hunebed in BRONNEGER, and they more closely resemble dishes such as K14:8 and K14:2 from the hunebeds in BRONNEGER and EXLO respectively. As a consequence, the Tannenhausen dishes and pails should be placed early in B. It is possible, however, that there were also A-dishes which were not recognised as such.
(6-7) Jug 5, which in view of its context might belong to Drouwen B, seems to me, on the basis of its typology, to be an import from more easterly regions. The ornamentation is strange for the extreme West, but it has a good counterpart in jug 6 from HAASSEL, Kr. Uelzen, on Lüneburg Heath (fig. 28:5, K1:3, D13:5). This jug, along with jug 7 (K1:6) and a sherd from an undecorated shoulder pot with a handle (D20:6), was found in the stone chamber of peristalithic Long Barrow I (a *Hünenbett,* cf. Appendix A2e); the excavator thought that all other objects had been recently removed.
Jug 7 apparently has a rather individualistic style of ornamentation, but belongs typologically to the other jugs discussed here. The undecorated sherd affords no hints for its dating. The shape of the burial chamber, a dolmen (*), cannot be regarded as a dolmen of the earliest type (Aner 1963, 1968), since the extraordinary dimensions of this grave are characteristic of retardation, in spite of the fact that it is a so-called *Parallellieger* (a characteristic of early graves: the long axis of the dolmen lies in or parallel with the long axis of the Long Barrow). According to Aner, the earliest the burial chamber could have been built is the later EN C or the MN I.[1] The soil of which Long Barrows I and II of HAASSEL were constructed yielded sherds of what Dehnke (1940) named the 'Haassel style' (fig. 59). This, along with the material from TOSTERGLOPE in the same neighbourhood which will be discussed below, is the only material of this style which has been excavated west of the Elbe (Dehnke 1940, very detailed description and illustration; cf. figs. 59-60). Becker (1947) supposed that the soil for the barrow had been taken from a place with refuse from an old Haassel settlement. Jugs 6 and 7 would be of a somewhat later date than the Haassel sherds. This interpretation is typologically acceptable.
(8) The jug from TOSTERGLOPE (figs. 28:6; 59b; D13:4) was found, along with a number of sherds, in a rectangular discolouration of 3.5 by 1.35 m in a peristalithic Long Barrow *(Hünenbett)* with a length of 80 m. This discolouration was considered by Schuchhardt (who excavated it in 1908) to be the traces of a wooden burial chamber, but a description of the burial chamber by Wächter (1841) appears to indicate that there had previously been a stone burial chamber there (Dehnke 1940, p. 68). The sherds from the chamber were not kept separate from those which were found in the barrow during the same excavation (D3:8-11, 13-14; 12:8). All ornamented sherds belong to the Haassel style. If Schuchhardt's report is correct, the burial chamber would thus have contained Haassel pottery; but if we are here concerned with a filled-in pit of a dismantled megalith chamber, which was not recognised as such by him, it would not be surprising if sherds from the barrow had found their way into this

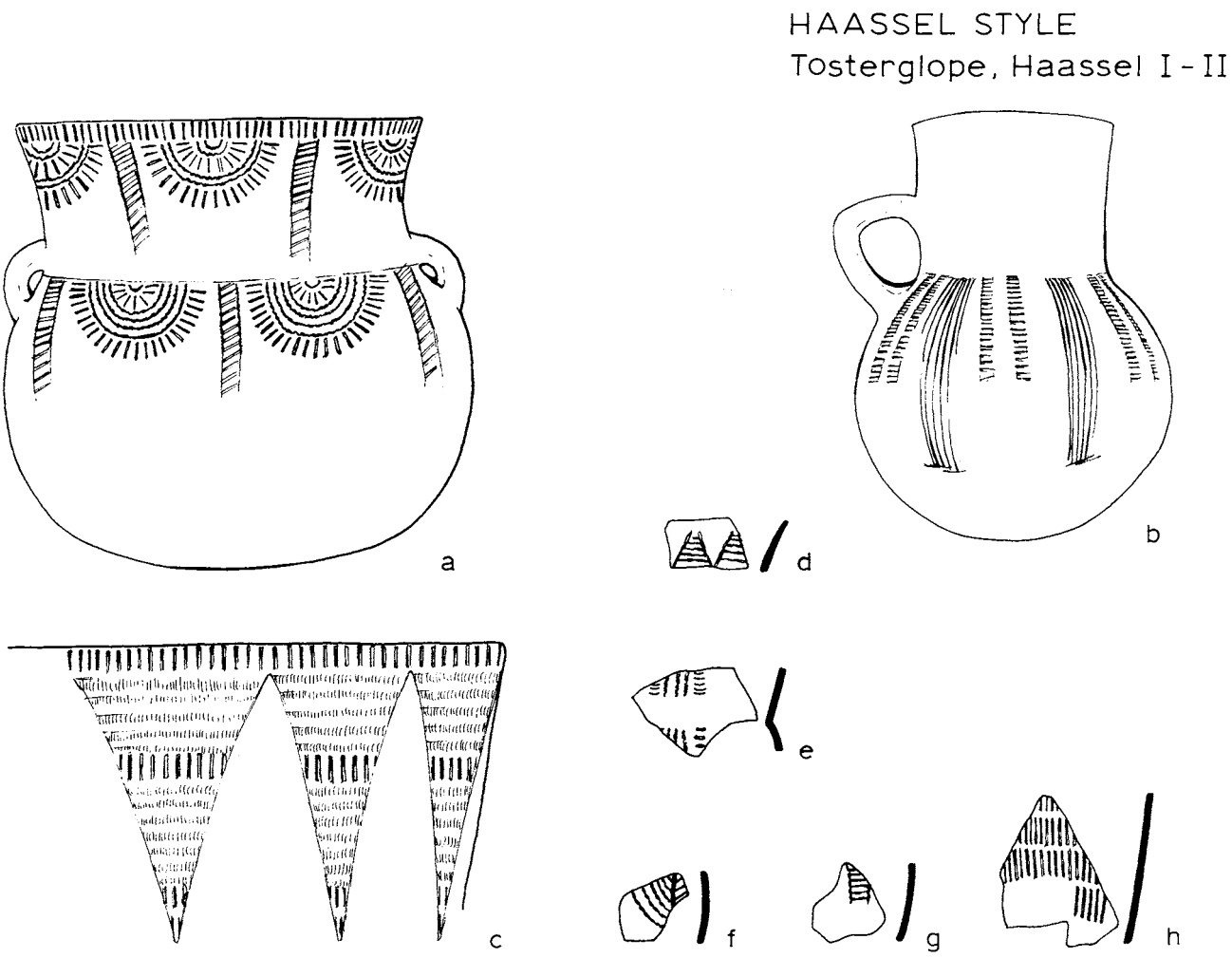


FIG. 59 Haassel style pottery from HAASSEL I and II and from TOSTERGLOPE, according to Dehnke (1940). (a) and (c) are reconstruction sketches according to the data in the publication, not the originals.

filling when this chamber was dismantled, for this barrow, too, contained an abundance of sherds of the Haassel style (excavation Krüger 1924, D3:12, 16-23).

But it is actually of no great significance for the argument whether there was other Haassel pottery in the burial chamber or not, for jug 8 belongs (according to Dehnke 1940 and Schwabedissen 1953) to this style by virtue of its type of ornamentation (the vertical rows of horizontal 'screwdriver stamps' (*), cf. Sprockhoff's *Gittermuster)*. If so, the jug can presumably be regarded as the first example of funerary pottery of the Haassel style in a stone or wooden burial chamber of an unknown type, possibly an extremely large dolmen in view of its dimensions.

This concludes the discussion of the most important decorated jugs from west of the Elbe. Knöll placed them all at the beginning of his phase 1. In agreement with this, I have placed them in phase A. But only jugs 1 and 2 appear to be typical of the Drouwen style. Jug 8 belongs to the Haassel style.

Whether jugs 6 and 5, too, can be included in the Haassel style, considering the as yet vague ideas about that style, is still a matter of personal preference. I do not include them there. These jugs display such a strong similarity with the later Altmark pottery which was also generally present in the area of Haassel-Tosterglope, that I classify them with this style. Of fundamental importance is the fact that the jugs, or, rather, both styles as a whole, suggest a smooth transition from the Haassel style to Altmark pottery (Schwabedissen 1953, note 103).

It seems that the Altmark characteristics are present in the Haassel style in a rudimentary form, viz. triangles along the rim (D3:24), ladders (a column of horizontal screwdriver stamps, occasionally bracketed by *cord* impressions, D3:28, D4:19-20; this might be considered as the origin of the Drouwen and Troldebjerg ladders, too) and also the horizontal rows of vertical screwdriver stamps which occur in Haassel like this or as horizontal ladders (D4:10, 12).

The stratigraphical relationship between the two pottery styles in the graves of TOSTERGLOPE and HAASSEL indicates that the Haassel style is earlier than the Altmark style, and that the transition from the earlier to the later style took place at about the

time of the building of the first megalithic graves in the area; these were peristalithic Long Barrows with a stone or wooden dolmen parallel to the long axis of the Long Barrow. The dolmen, because of its extremely large size, cannot be considered early.
Across the Elbe, the Haassel style continued far into Denmark (fig. 60). Since no more sherd material of the Haassel style has been excavated in the Lüneburg area since 1932, 'Haassel-Fuchsberg style' or 'Fuchsberg style' are the preferred terms in Schleswig-Holstein, FUCHSBERG being a settlement there which was excavated by Schwabedissen (1958b, 1967, 1968).
Hoika (1973) regards this style as the product of a non-megalithic population group of the EN C. Becker (1947) had identified both megalithic groups, which constructed megalithic graves, and non-megalithic groups in the EN C. Hoika's interpretation of Fuchsberg, which agrees with Becker's views, is more satisfactory than that of Schwabedissen (1967, 1968) whose chronology of the EN in Schleswig-Holstein deviated widely from that of Becker for Denmark. In the North Group, Haassel-Fuchsberg was followed by the Troldebjerg phase (MN Ia) which was megalithic. Non-megalithic groups no longer occurred.[2] West of the Elbe, Altmark and perhaps also Drouwen A followed Haassel-Fuchsberg (Schwabedissen 1953, note 103).

How are the other jugs from west of the Elbe now to be dated in terms of the Danish research? First of all, we must note that the distribution area of the jugs is limited to the southern fringe of the area of the northern Tiefstich group, i.e. to Schleswig-Holstein and Mecklenburg. They are absent from the 'typochronological standard area' of Langeland and its surroundings. This implies that a date for the beginning of Drouwen in Danish terms on the basis of a few jugs can only be derived by intermediate links, which increases the margin of error.
Becker (1947) classified nearly all the North Group jugs of the type described in the EN C, on the basis of their similarity with the profile of the lugged flasks which mostly belong to the EN C. The ornamentation was thus for him of secondary importance; Kaelas (1955) did not deviate from this view and dated jugs 1 and 2 from BRONNEGER and DÖSE in the EN C, in spite of their Troldebjerg-like ladders.
Diametrically opposed to these ideas is Nilius' interpretation (1971), whereby all the jugs, including that of TOSTERGLOPE, are classified in the MN I. She demonstrated that the lugged flask from GINGST (S40:1; N16c; D17:1) had the same profile as the jugs, as well as an indisputably MN I ornamentation. Therefore, the lugged flask did not die out in the region of the jugs by the beginning of the MN, and the reason for forcing the jugs into the EN C because of their profile has disappeared. Previously, Jażdżewski (1932) and Sprockhoff (1938) had also dated the same jugs in the Early Passage Grave Period (i.e. MN I). In 1968, the lugged flask from GINGST had led Hoika, completely independently of Nilius, to exactly the same opinion concerning the jugs from BRONNEGER and DÖSE. The development of my own ideas was significantly influenced by a discussion with him.

But I am not entirely in agreement with Nilius' dating of the jugs. In contrast to her view, I consider the jugs such as those from HELM (N16e), TREUEN (N16f), STRALENDORF (Schuldt 1965, fig. 8) and TOSTERGLOPE to be early, rather than late specimens of their type. I do not think that open spacing of Troldebjerg strips is a late characteristic. Continuously linked strips are rare in the West Group and may be a local feature of the North Group. Open spacing is common to North Group EN C lugged flasks (e.g. L13a = S34:4). The WWW lines on the angle between neck and belly of the jug from HELM (no longer visible, see Nilius, p. 42) are not necessarily a late characteristic. In the Haassel style and the Wiórek style, lines like this were appearing along the rims of funnel beakers by the EN C. Unchambered Long Barrows developed in the areas east of the Elbe in the EN A/B and were presumably superseded by other types of graves during the MN I (Bakker, Vogel & Wiślanski 1969). Therefore, the fact that the jugs from Stralendorf and Helm were found in an Unchambered Long Barrow is another indication that they should be placed very early in the MN I. The Stralendorf jug is virtually identical with that of Tosterglope. Whereas the screwdriver ornament of the latter jug was reason to include it in the Haassel style, the absence of this ornament might suggest that the Stralendorf jug is slightly later.
Finally, I think that dating *all* the jugs of type N23-24 in the MN II, as Nilius does, is too late. Although some of these jugs may have occurred in the MN II, the type must have originated in the course of the MN I. Its close relative in the West Group (fig. 29:1) was completely replaced by the tureen with shoulder triangles during or before the MN II. Although it would appear that such tureens are rare in Mecklenburg (N25e), so that Nilius had no particular chronological difficulties, we should remember that sherds of such a tureen were found in the type-site for the MN Ib on Langeland (Berg 1951). This sherd collection is considered as unmixed (but see 6.4).

Returning to Kaelas' (1955) discussion, we see that her dating of the decorated jugs from west of the Elbe was based on Becker's, and we see, too, that this would appear to be no longer tenable. Consequently, of the arguments in Kaelas's discussion, only the one on the undecorated pottery shapes has not yet been eliminated as possible evidence for the start of Drouwen A in the EN C; it is not very convincing. Now that it has proved to be better to place the oldest decorated pots with an EN C profile in the MN I, on the basis of their MN I ornamenta-

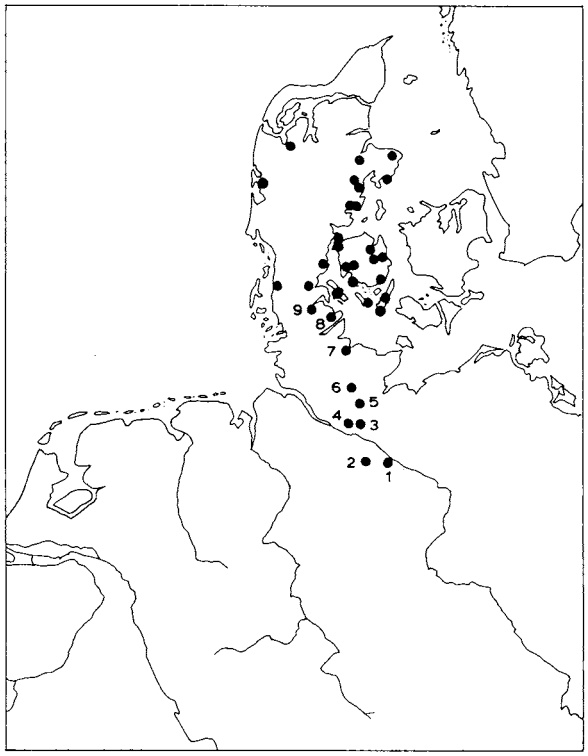


FIG. 60 Findspots of Haassel-Fuchsberg style. (1) TOSTERGLOPE, Kr. Lüneburg; (2) HAASSEL, Kr. Uelzen; (3) SACHSENWALD, Kr. Lauenburg; (4) SACHSENWALDAU, Kr. Stormarn; (5) OLDESLOE-WOLKENWEHE, Kr. Stormarn; (6) SCHWISSEL, Kr. Segeberg; (7) KIEL-HAMBURGER BAUM; (8) FUCHSBERG, Kr. Flensburg; (9) FLENSBURG (data from Dehnke 1940; Schwabedissen 1967, 1968; Behrends 1971; Hoika 1973). The twenty-five Danish find-spots according to Andersen & Madsen (1977, fig. 1).

tion, rather than the other way about, we are no longer forced to date identically shaped but undecorated pottery in the no less decorative EN.

This fact applies particularly to one of the two new Drente pots which were not yet available in 1955, but which otherwise would have been grist to Kaelas' mill. An undecorated lugged flask could, with reasonable certainty, be reconstructed from a very small number of sherds in the HOOGHALEN assemblage (fig. B4:5), although the neck may have been longer. The flask looks early, but in agreement with Nilius' conclusions concerning e.g. the lugged jar N16c from GINGST, I consider the specimen to be a MN reminiscence of the EN C. The pottery which was associated with it is typical of Drouwen B+C. Only one poorly preserved pot might, perhaps, belong to Drouwen A (fig. B5:14).
The second specimen is a sherd of a lugged jar (?) from an incompletely preserved grave inventory from ANGELSLO-HEEMINGESLAG (fig. B1). A Drouwen A pail was associated with it. As far as this is concerned, my arguments run along analogous lines, but this find group demonstrates more clearly than most of the other specimens discussed here, that Drouwen A originated in a period when not all of the EN C pilot shapes had died out.
The lugged flask from KLEINENKNETEN (Kaelas 1955, fig. 21) permits a dating not only in the EN C phase but also in the MN I (cf. the discussion above on the lugged flask from GINGST, N16c).
Kaelas compared the undecorated pot from megalithic grave II at OLDENDORF (fig. 64:a) with Baalberge pottery. But the specimen would not be displaced in a Salzmünde context either (cf. Preuss 1966, plate 57:5). Sprockhoff compared the pot with Baden pottery, a dating which would also fit the other vessels from the grave, which have the appearance of being chronologically fairly homogeneous (MN Ib-II). There are a few other undecorated pots which Kaelas used as evidence. In my opinion they are unconvincing and I shall not discuss them further.

Summarising, we can say that Kaelas' dating of the earliest Drouwen pottery in the EN C was based on Becker's placing most of the round-bellied, one-handled jugs in this period. This dating does not appear to be convincing. To my mind, Drouwen A should be placed in the MN I. We can deduce that it began in the initial phase of this period by the presence of collared flasks and a few other rudimentary EN C characteristics. Just as with Altmark, Drouwen began when Haassel-Fuchsberg (EN C) finished.

This, of course, by no means explains how these processes actually took place. It is to be hoped that in the near future C14 datings will enable us to establish whether the transition EN C/MN I discussed here can be pin-pointed everywhere in the same century and from which area this innovation wave originated.

The question as to *how* Drouwen A came into being, and how a hunebed-building population suddenly arrived west of the Weser, cannot be answered yet: section 6.2 will comment on the circumstance that a Pre-Drouwen TRB horizon has not been demonstrated in Drente, and as long as the neolithic population which preceded Drouwen A in these regions remains as little known as it still is (section 6.3), a term like 'acculturation' remains, unfortunately, no more than an empty phrase.

6.2. WAS THERE A 'PRE-DROUWEN PHASE' IN DRENTE?

Find group P. When Van Giffen and Glasbergen (1964) thought that they had discovered a pottery group (fig. 61P) which was stratigraphically older than hunebed D20 in DROUWEN and which presumably preceded the Drouwen style and would then be pre-megalithic, I suggested the name 'Pre-

Drouwen phase' to them. After studying the find-situation and the typology of the find group, however, I later began to have my doubts about the correctness of the interpretation of this find with its far-reaching implications. The fact that Becker and Schwabedissen did not accept these finds as EN A/B after an examination in 1964,[3] contributed significantly to my doubts.

Find-situation. In 1961-62, preceding his restoration of the peristalith of hunebed D20 at Drouwen – the interior of which Holwerda had excavated in 1912 – Van Giffen excavated a considerable number of deep trenches all round the grave. In trench III, outside the hunebed and its peristalith, three undecorated little pots were unearthed, 2.5 m from the nearest stone of the peristalith. They were stacked together in the western part of a rectangular-oval, WNW-ESE lying pit. This was the 'Pre-Drouwen' pottery group, P.

At the level of the pots, the surface area of the pit was c. 1.5 by 0.8 m. They were standing upright, 0-10 cm above the bottom of the pit which lay 1.3 m below the present-day surface. In two cross-sections of the pit, its soil contrasted sharply with the hard, horizontally layered Older Cover Sand and/or Later Cover Sand I, which extended to 90 cm under the present-day surface. The Later Cover Sand II on top of this permitted only an extremely indistinct view of the steeply rising pit walls, by colour and moisture differences. At the top of the section, under a 20 cm thick layer of recently worked soil, there was a 30 cm thick layer of brownish soil, which hid the contours of the pit. The several large stones, up to 25 cm in diameter, found at its base, presumably had no direct connection with the depositing of pottery find P, but were part of the scattering of stones which was found in the sections up to 3-4 m away from the peristalith in the lowest regions of the layer of brownish soil.

In the article quoted, Van Giffen described this brownish layer as: 'a thick layer of worked soil, into which the stones of the hunebed appeared to have been set. Although it has not yet been possible to check the full extent of this layer of worked soil, it certainly extends northwards, eastwards and southwards beyond the stones of the peristalith. This layer contained but few pieces of randomly positioned TRB pottery. Under the chamber floor, the lowest parts of this layer could still be identified. To the east side some of the missing stones of the peristalith were found in it.'

This passage reveals the crux of Van Giffen's argument that, on stratigraphical grounds, pottery group P is older than the hunebed: the layer of brownish 'worked soil' was also found under the floor of the hunebed chamber and it seals the pit filling.

If this conclusion was valid, we would expect that the sherds of TRB pottery, of which a 'few' were 'randomly positioned' in the layer, would be typologically older, or at least just as old as the earliest pottery present in the hunebed (that is Drouwen B: Holwerda 1913a, fig. 12:240; cf. also 237 = K17:14). We would also expect that in the lower part of the brownish layer the recovered easterly stones of the peristalith would have been positioned in pits which were later dug into and right through the layer, for they are part of the grave which must have been built after the brownish layer came into being.

Neither of these expectations is fulfilled. The pits into which stones of the peristalith were sunk either do not show up at all in the sections, or at best very vaguely, and the sherds which were collected at a few points in the brownish layer consist partly of (later) Drouwen and Havelte sherds and partly even of Barbed Wire Sherds of the (Dutch) Early Bronze Age.[4] No Drouwen A pottery was identified. Nor could it be established whether the sherds from periods later than Drouwen B-C were in pits which had later been sunk into the brownish layer.

This implies the possibility that pit P was dug *after* the building of the hunebed; apparently the brownish layer was largely the B-layer of a *holtpodzol* (podzol-like *Braunerde,* 'brown podzolic': podzol without a bleached layer), a type of soil that has been quite common in the Drente Cover Sands. During the Atlantic and Subboreal Periods, such a soil must have been rich in soil fauna – which would have homogenised it thoroughly. This explains the 'scattering' of small sherds, partly also from the Bronze Age. In other words: it cannot be proved stratigraphically that find group P is older than the hunebed.

It has unfortunately not been possible to determine which parts of the brownish layer correspond with the base of the hunebed, i.e. theoretically the work-floor on which it was built (the stones which were present up to 4 m outside the grave at the bottom of the brownish layer possibly had a connection with the building period); neither can it be determined which layers within the peristalith are the remains of the hunebed barrow which has disappeared (since the Middle Ages?), nor which layers outside the peristalith are remains of the soil of the barrow which had been deposited there during its erosion. Too little of the old section remained intact to enable these questions to be answered.

Typology. The pots are all undecorated (fig. 61P). The pottery is orange to yellowish-brown with granite tempering. The position of the pots deep in the ground must have contributed to the retention of the orange-ish colour; they were far from the infiltration of humus or bleaching processes, iron migration being the only possible influence.

– (1) This small, spherical pot, without a rim, was, to judge by the lines of fracture, made up out of coiled clay rolls. During its restoration, it was recognised by P.S.A. Kikkert (IPP restorer) as the belly of a (collared) flask, since the upper part of the inside wall remained unpolished, because the neck was too narrow. This characteristic is in the West Group only found in collared flasks (Van Giffen 1927).

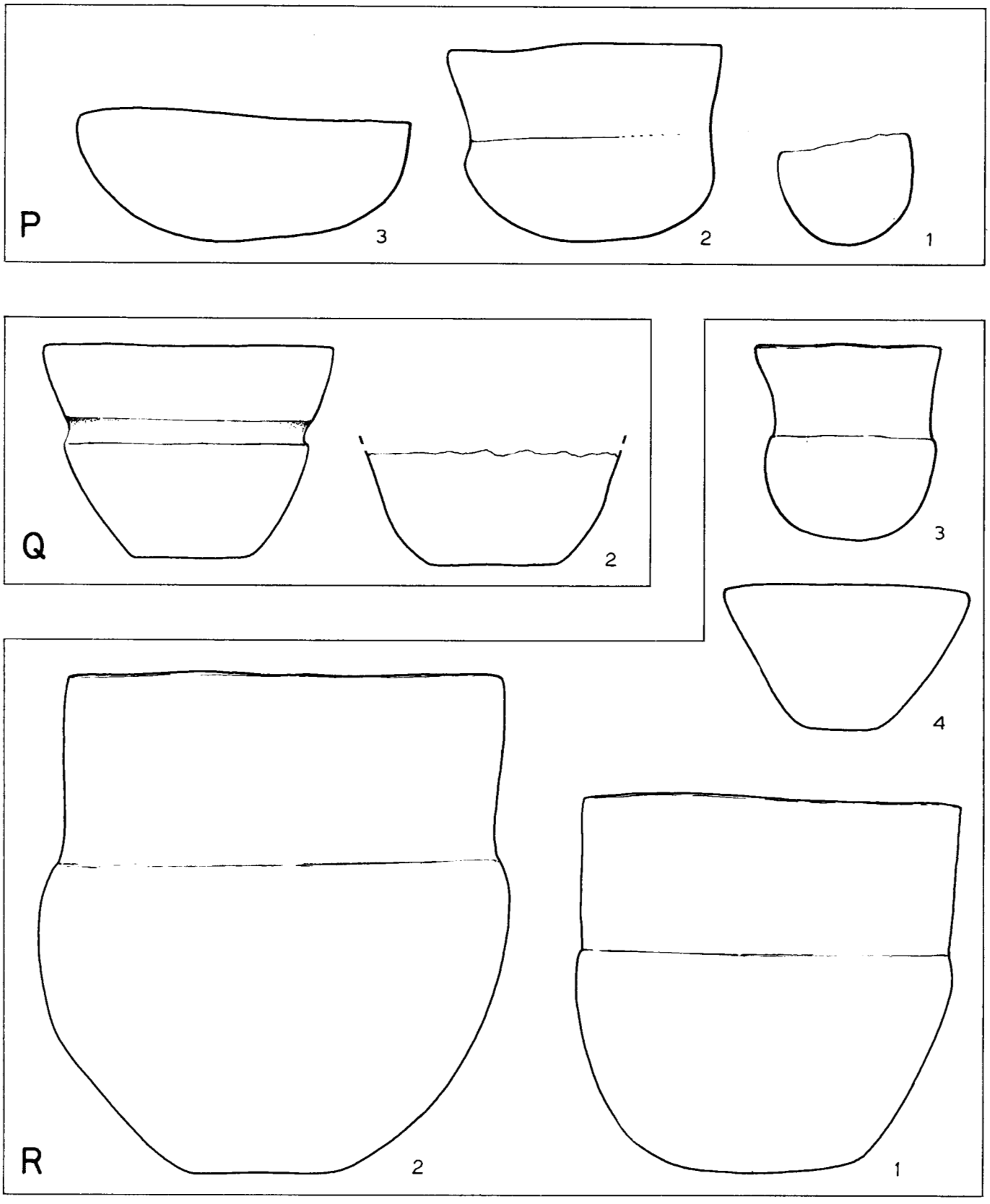


FIG. 61 (P) alleged 'Pre-Drouwen' assemblage found outside the peristalith of hunebed DROUWEN-D20. (Q) another assemblage found outside the same peristalith. (R) pottery assemblage excavated outside the peristalith of megalithic long barrow KLEINENKNETEN I. (P) according to Van Giffen & Glasbergen 1964; (Q) according to drawings by J.E. Musch; (R) after photographs of the Oldenburg museum. (P) is in the Leiden museum, (Q) in the Assen museum, (R) in the Oldenburg museum.

Van Giffen and Glasbergen (1964) accepted this interpretation, although Van Giffen (verbal communications 1967-70) later changed his mind: he thought it was a small bowl of which only a flake was missing from the rim (even though one would have expected the inner surface to have been smoothed). I still consider Kikkert's interpretation to be correct. This, however, implies that this collared flask with a rounded belly (cf. K32:6, 8-10) is of a type probably no older than phase D, or possibly C (section 3.4.2). If Van Giffen's later opinion of pot 1 were correct, viz. that it was a little bowl, we should note that no parallels are to be found in the literature:
– (2) This undecorated funnel beaker is well-smoothed, inside and out, but, on being rotated about its vertical axis, it proves to have an irregular profile. It also has a wobbly base. Illustrations of comparable specimens are virtually non-existent; only S50:8 from hunebed WERLTE-1, Kr. Aschendorf-Hümmling, bears some resemblance to it. This chamber is excessively long (the interior length is 27.50 m, Sprockhoff 1975, p. 94) and can therefore be dated to Drouwen D, or E, cf. Chapter 7. The few pots illustrated from this tomb (Schlicht 1954, plate 13; S43:10) must be such a minority of the original number that their date, Drouwen D or later, has little significance in itself. The low, rounded belly of funnel beaker (2) does look rather early, although it might be a 'late' specimen with a less well-defined and irregular profile, cf. the Late Havelte pot fig. 36:11 which was found with other pottery in grave 2 in ANGELSLO (Bakker & Van der Waals 1973, fig. 5:2).
– (3) This is an undecorated, hemispherical bowl, again with a rounded base, with no footring or footplate: bowls like this have rarely been reconstructed from the masses of sherds in the hunebeds and it is difficult to date it exactly typologically. The best parallels would seem to be bowl fig. 36:14, from the Late Havelte grave 3 in ANGELSLO (Bakker & Van der Waals 1973, fig. 5:3) and bowl (Waterbolk 1960, fig. 39, lowermost) from the Early Havelte site at ANLO.

Two other pottery groups which were buried stacked together are known to me. These pots are also undecorated and were found on the periphery of the peristalith of a megalithic grave.

Find group Q. In 1961 or 1962, J.E. Musch found the weathered remains of two pots (fig. 61Q) in a modern boundary ditch, 10 m southeast of the entrance of the passage of hunebed D20 at DROUWEN. They were stacked together, (1) inside (2), with no earth between them.
– (1) A conical dish with a horizontal gully in the middle of its side and a flat base. Comparable dishes occur in the Store Valby pottery of the North Group (Becker 1954a, fig. 2-6), which was synchronous with Late Havelte (section 6.8). Musch himself (communication 1968) pointed out presumably Late Havelte pots with a gully below the rim in fig. 10:2-3. This characteristic is again found in some of the Store Valby pottery. In the East Group, such gullies are a regular feature in Luboń pottery (Jażdżewski 1936), which was synchronous with Drouwen. In agreement with the Pre-Drouwen dating of Van Giffen and Glasbergen, however, would seem to be the fact that similar undecorated dishes with gullies from SCHÖNERMARK, Kr. Angermünde (near the Lower Oder in the DDR) were dated at c. 3150 BC by the Cologne C14-laboratory (Geisler 1965).
– (2) The lower part of a dish with a flat base. The remains say nothing about the shape higher up: it may have been a dish such as Q1 or a large, wide-mouthed, mainly steep-sided dish, such as was current during the whole of the sequence A-G (figs. B3:25, B4:11, B14:23, B18:8; Bakker & Van der Waals 1973, figs. 5, 8).

Find group R. Knöll (1959, p. 90) described three pots which were found, stacked together, next to the entrance outside the peristalith of Long Barrow I in KLEINENKNETEN. H.G. Steffens, of the Oldenburg museum, has kindly sent me photographs of this find group (inventory numbers 5948.I.1-4), from which my drawings (fig. 61R) were made. These pots are again undecorated and their profile is also irregular. The surface finish is mediocre. The stacking order upwards has been: 2, 1, 4, 3.
– (1-2) two large funnel beakers whose bases are flat to wobbly. I would be inclined to date these 'late', as Knöll did, because of their 'less well-defined' shape. It is not yet known whether they preceded or were synchronous with Late Havelte pilot types (Bakker & Van der Waals 1973, fig. 5:5; Van Giffen 1944b, fig. 7:2k).
– (3) a small funnel beaker of type I.4 (section 3.4.1) with a small base.
– (4) a wide-mouthed dish (perhaps somewhat distorted in the photograph), see the remarks on pot Q2 above.
In my opinion, the earliest possible placing for find group R is in phase D. Knöll (1959) placed it at the end of his phase 2, i.e. in F-G, approximately.

Conclusion. The western TRB custom of burying poorly shaped, undecorated pots with wobbly bases on the periphery of megalithic graves[5] led the archaeologists astray in their interpretations. Little is known about this category of pottery and they are difficult to date (section 3.1), but there is no indication that group P or groups Q-R are of 'pre-Drouwen' age. On the contrary, leaving farfetched parallels elsewhere out of consideration, all the indications derived from the West Group itself point to a dating in the latter half of its pottery sequence.

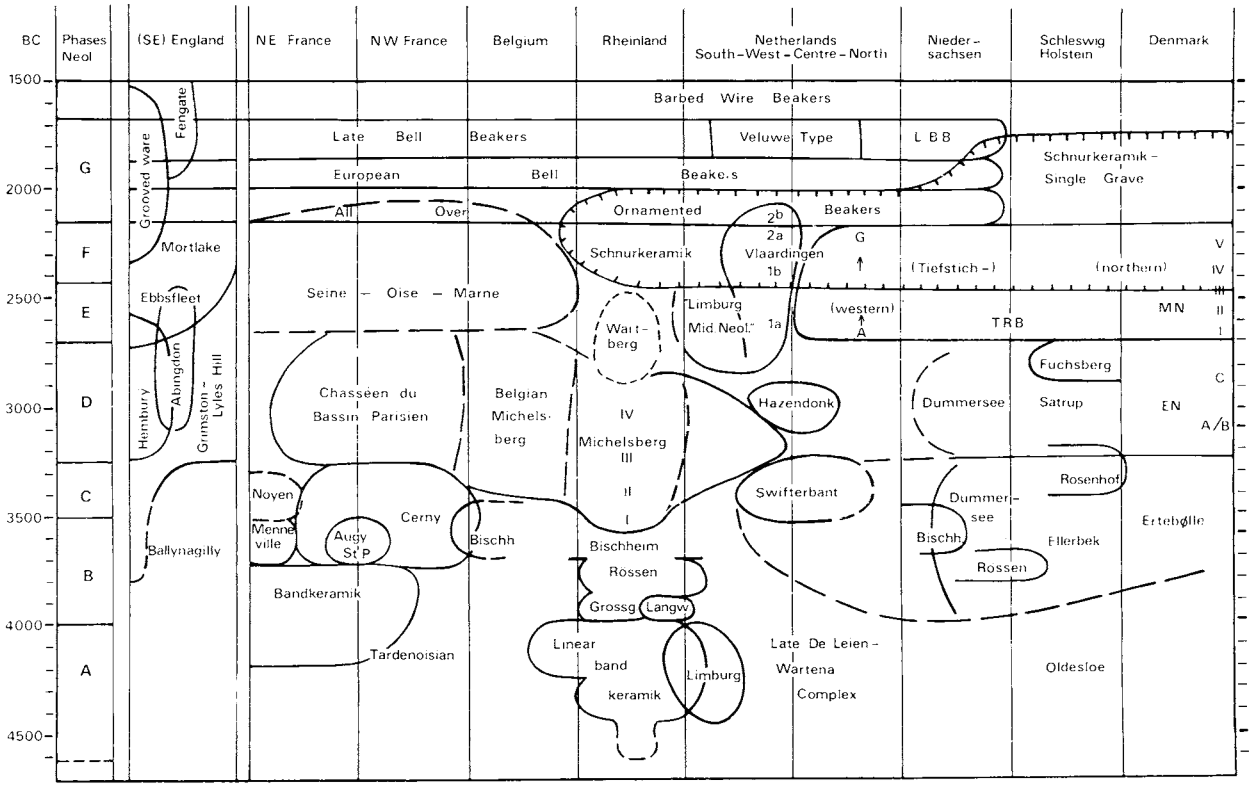


FIG. 62 'Chrono-geographical scheme of the Neolithic in the Lower Rhine District and its surroundings' (Louwe Kooijmans 1976b, fig. 3).

6.3. SOME REMARKS ON POTTERY GROUPS WHICH PRECEDED DROUWEN

With the exception of Haassel-Fuchsberg on the Lüneburg Heath (section 6.1), we still know virtually nothing about pre-Drouwen TRB habitation on the North European Plain west of the Elbe. Evidence that the area was then inhabited includes the distribution of perforated *Rössener Keile,* current as late as Fuchsberg (Schwabedissen 1967, fig. 2a-b; Van der Waals 1972, fig. 62), the distribution of the Flat Battle-axes (section 5.6.1; Brandt 1971, figs. 2-4) and the presence of *Cerealia* pollen in pollen diagrams of the period.
Fig. 62 shows how L.P. Louwe Kooijmans (1976b) pictures the chronological framework of this area at that time, on the basis of published typochronological sequences and C14 data. Apart from the EN A/B TRB culture,[6] the particularly relevant cultures are the Michelsberg culture (MK; Lüning 1967) and the epi-Rössen-Bischheim-horizon in which MK had its roots (Lüning 1967, 1969; Goller 1972), Ertebølle-Ellerbek, Swifterbant (Van der Waals 1972: Louwe Kooijmans 1974), Baalberge (EN C TRB pottery of the Middle and Upper Elbe region, which, according to J. Preuss (1966), might have begun in EN A/B) and Gatersleben, which preceded Baalberge (Behrens 1969a; Kroitzsch 1973). It would appear that Hazendonk pottery was confined to Netherland (Louwe Kooijmans 1974 and verbal communication).

Apart from Hazendonk pottery and that part of the Bischheim pottery which has a very characteristic ornamentation, the majority of the pottery groups mentioned are undecorated. At present, most of the publications on the much-discussed but little-known pottery finds from the period concerned are restricted to a rather superficial comparison of the shape of their profiles with those of better known complexes elsewhere. Temper, potting techniques and surface treatment are hardly considered, and neither are flint and stone artefacts and way of life.[7]

On the basis of their find-situation these pottery finds fall into three categories: a) more or less complete pots, found in a non-informative context, b) collections of pottery from settlements with no stratigraphical sequence, whose association is not entirely certain, and c) collections of pottery from settlements for which a stratigraphical sequence could be established during excavations.
The last-mentioned category concerns a few wet sites on the periphery of the area discussed, the excavation of which or the final reports on which have not yet been concluded: HAZENDONK in the Rhine/Meuse delta (Louwe Kooijmans 1974 and verbal communication), the SWIFTERBANT sites in the centre of the Zuiderzee polders, situated on

natural levees of clay and river dunes along a former course of the river IJssel (Van der Waals 1972 and verbal communications from him and R. Whallon, 1974-1976) and DÜMMER-S on a peaty hillock on the river Hunte (Deichmüller 1963, 1964, 1965a, b, 1969a).

Originally it looked as if the DÜMMER-S settlement would assume a key position for our problem since it included a representative collection of neolithic pottery from the latter half of the fourth millennium: Tiefstich ceramics (Deichmüller 1965a, fig. 2a-b), Bischheim and other epi-Rössen pottery (Lüning 1967; 1969, p. 247; Brandt 1971, p. 72; Deichmüller 1964, fig. 1a-b; 1965b, fig. 3b-d, plate 1:3-5)' Ertebølle-like pots with pointed bases and fingertip impressions below the rim (Deichmüller 1963, plate 1:3), pots with round bases, a Baalberge funnel beaker with a horseshoe-shaped lug (Deichmüller 1965a, plate 23d; Behrens 1966, fig. 3b), TRB sherds with cord impressions (Deichmüller 1965a, fig. 1c, e; 1965b, fig. 3e-f) and maggot impressions (Deichmüller 1965b, figs. 3a, 8g, cf. text: not a screwdriver stamp!).
Haassel-Fuchsberg, however, is conspicuous by its absence among the material illustrated.
Moreover, the stratigraphical position of the finds revealed no chronological sequence since the inhabitants had trampled the objects into the peat to various depths. M.A. Geyh (Hanover C14 laboratory) carried out an extensive series of C14 measurements (quoted by Deichmüller 1969a). They point to habitation phases from 4200-3700 BC, 3700-3180 BC and 2950-2700 BC. Deichmüller (ibid.) placed the Ertebølle pots in the first phase – a conclusion derived from indirect evidence. On the basis of C14 datings of the carbonised material adhering to them and of palynological dating (by R. Schütrumpf) of the peat inside them, the epi-Rössen pots were placed in the second phase. In the third phase were placed funnel beakers with wobbly bases and belly fringing, collared flasks (neither type is illustrated) and the Baalberge funnel beaker (presumably on the basis of evidence). By means of C14 dating of a piece of wood which was immediately above it, a cord-ornamented TRB sherd could also be placed in this phase.
The fact that one of the two Tiefstich ornamented pieces, a Drouwen/Altmark-like bowl (Deichmüller 1965a, fig. 2b), was found in the 'upper layer' was to be expected, but that a one-handled carinated juglet (ibid. fig. 2a) derived from the 'lower layer' of the two layers which were distinguished during the excavation points to its having been deeply trodden in.

The intermittently inhabited sandy hillock of HAZENDONK is surrounded by a peat bog. Layers of rubbish in the peat make stratigraphical and spatial distinctions of the cultural assemblages possible. The research is still in progress (Louwe Kooijmans 1974, 1976b and verbal information 1975-76). Three D or E Tiefstich sherds were found here in Early Vlaardingen context.[8] TRB pottery has not been found in the older assemblages of this site; recently, a number of early MK shapes were recognised in a layer under those containing the oldest Vlaardingen pottery.
The excavations of the many settlements at SWIFTERBANT are also far from being concluded. The pottery consists mainly of Ertebølle-like S-profiled pots with a round or pointed base and smooth surface, sometimes with impressions in the rim or along the rim on the outside or on the inside. There are no folded-out rims, with or without fingertip impressions, lugs and knobs, nor are there any collared flasks or baking plates (Van der Waals 1972; Louwe Kooijmans 1974; additional information from J.D. van der Waals and J.P. de Roever 1976).[9] It would thus seem that no early TRB or MK components are present.

In the interpretation of these finds and of those of the other categories in what is, in fact, a *terra incognita,* we must not exclude the possibility that local culture groups were involved which cannot be exactly equated with better known culture groups elsewhere. For example, in the river dune site of BOBERG 15 (northern bank of the Elbe at Hamburg), not only do TRB EN A/B funnel beakers and lugged flasks, 'megalithic' EN C pottery and Ertebølle-like pots with a pointed base occur, but so does a variety of pointed pots with a very small flat base, rusticated from top to bottom with nail impressions, which cannot be classified among the relevant types of pottery known elsewhere (Schindler 1953, plate VI:1, 4; plate IX:5, 8, a possible comparison is with Comb-pitted Ware).[10]

The fingertip impressions below the rim of a point-bottomed vessel from DÜMMER-S (Deichmüller 1963, plate 1:3, Schwabedissen 1958b, fig. 18a) are absent in the real Ertebølle. A similar pot from STÖBEN, Kr. Apolda, was classified by Behrens (1969b, fig. 7f) among the (early) MK. Beakers with a rounded point are found in Ertebølle as well as among the early MK specimens. We find in the MK, moreover, the various combinations of with/without fingertip impressions along the rim and with/without folded-out rims or attached bands along the rim (cf. Lüning 1967), which are also found in nearly all the TRB groups of fig. 1 (except in the MN in the North Group and the West Group). The concept of a genetic relationship between early Michelsberg and early TRB pottery is relevant in this connection (Becker 1947, p. 261; 1961b; Vogt 1953; Schwabedissen 1958b; Driehaus 1960; Lüning 1967).
In the pots from DEILMISSEN, Kr. Alfeld, and ZWISCHENAHN, Kr. Ammerland (Schwabedissen 1958, fig. 16e; 15d), Lüning (1967, note 358) saw possible links between MK II and TRB A/B. The point-based pot from Zwischenahn, however, reminded Schwabedissen (1967, p. 545) more of Ertebølle. In 1958, he had recognised MK features in the vessels

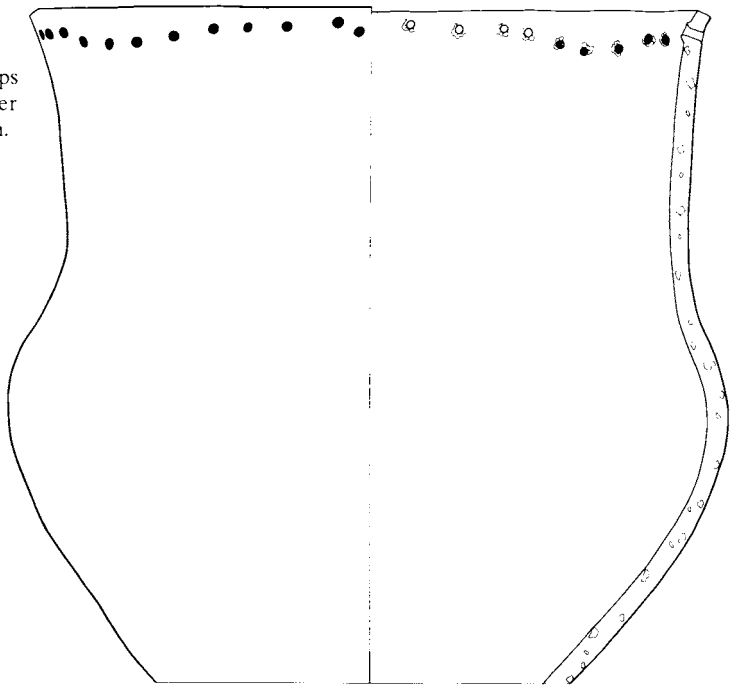


FIG. 63 Pot from NEEDE; not a TRB funnel beaker, perhaps belonging to the Vlaardingen culture. Drawn after the plaster copy in the Leiden museum. Original in Enschede museum.

from Deilmissen and EIME, Kr. Alfeld (1958b, fig. 16g). Behrens, however, saw a connection with Baalberge (1966). Maier (1970, p. 71) was of the opinion that the pots from Deilmissen and Eime were probably not MK pottery to judge from the potting technique, or 'at most from a local MK facies'.

The funnel beaker from LOCCUM, Kr. Nienburg, which was identified by Becker (1947, p. 207) as the only A/B vessel in our regions, has legs – a fact unknown to Becker – (Schuchhardt 1936, plate 13:70). Dehnke (1940, p. 87) describes them, but the legs have been cut away from his plate 14:1. Knöll (1941, 1952d), who noticed this, regarded, wrongly in my opinion, the legs, which would be unique for EN TRB, as no obstacle to retaining the pot as a possible A/B specimen.

A pot from NEEDE, not Eibergen, (fig. 63; Kaelas 1955, p. 73) has perforations below the rim just like that from Loccum. There is no necessity to assume an early TRB origin. It was buried upside down in the sand of the Needse Berg-'Rohaan' as was often the custom here with Pot Beakers and Bell Beakers.[11] As is the case with Vlaardingen pottery, the temper, consisting of coarse (1/2 cm) quartz temper, is quite visible in the surface of the pot.

I have not studied the unlocalised funnel beaker in the Oldenburg museum (Kaelas 1955, p. 73). It would seem to be most improbable that the sherd from BABBENHAUSEN, Kr. Minden (Hoffmann 1935, plate 23:1) also represents an A/B funnel beaker as Knöll assumed (1952d, p. 46). The weathered ornamentation of lines and chevrons on the whole area of the neck points rather to much later pottery.

One beaker from HANOVER-DÖHREN was interpreted by Raddatz (1952, note 6a), Lüning (1967) and Maier (1970) as an A/B funnel beaker.

A beaker which was found in ENGERN, Kr. Schaumburg, at a short distance from ENGERN-BRINKHOF (see below) and which has a row of impressions of a rectangular stamp on the shoulder and along the rim (Erdniss 1961, plate 2) was also regarded as an A/B funnel beaker by Erdniss and Maier (1970). Finally, Maier (1970, note 247) reported a funnel beaker from WERLABURGDORF, Kr. Goslar (no illustration published; in the Brunswick museum) as an A/B possibility.

In the collection of sherds from ENGERN-BRINKHOF (Brandt 1967, p. 24-25, plates 40-41, especially 41:5; cf. also sections 3.4.1 and 3.4.4.), A/B TRB funnel beakers with carved rims were identified by Brandt, an identification endorsed by Davidsen (1973, p. 41) with the words 'certainly correctly'. In the meantime, Brandt (1971, p. 66, 71-72) has altered his interpretation to 'perhaps Bischheim'. In this collection of sherds there also occur folded-out rims with fingertip impressions, a round to pointed base, and baking plates with mat impressions and impressions in the rims. According to Davidsen, mat impressions occur nowhere else in the TRB culture, so that it is natural to assume the existence of a strong MK component in the complex. Similar mat-impressed baking plates together with pointed and flat bases and a Baalberge amphora were present in a collection of sherds from a settlement in GÖTTINGEN-GRONE (Maier 1970, fig. 7).

Actually, the above survey only demonstrates how little can be achieved without extensive, reliable closed find groups. It is to be doubted, however, whether an EN A/B facies in Becker's meaning of the word ever existed west of the Elbe, although it is reasonably comprehensively represented in BOBERG 15 on the eastern bank of the Elbe (see

above). This doubt exists because the A/B lugged flask, which does not occur in this form in the MK (Lüning 1967), and which Becker (1947) found east of the Elbe three times as often as the A/B funnel beaker, is still missing from the list of A/B possibilities west of the Elbe. Consequently, there is considerable doubt as to whether the S-profiled pots discussed above can indeed be interpreted as A/B funnel beakers, since they are also found in other prehistoric assemblages.

In this connection, it is also very remarkable that the TRB West Group had such little contact with the MK during the MN (cf. Lüning 1967, p. 161). The megalithic tradition, the delight in lavish decoration on pottery, baking plates with holes, etc., were not followed in the MK. Apart from a single pot from EMMEN (section 3.4.1, fig. 23), there are no possible MK beakers with turned-over and fingertip impressed rims in the MN TRB West Group,[12] and with the exception of the axes of Meuse flint (section 5.4; partly later than the MK), no other MK-impulses can be identified in the West Group.

Apart from the lack of ornamentation on the MK pottery – unlike Tiefstich pottery, MK demonstrably has its roots in Rössen, which even exceeds Tiefstich in ornamentation! – there is a remarkable contrast in the choice of land between the two distantly related and adjacent groups. In Drente, the Western TRB Group showed a definite preference for the stoneless, non-loamy cover sands and proglacial sands of the North European Plain. In Münsterland the TRB population shunned the loamy loess soils, but confined itself to sandy soils nearly as far as the diffuse 'loess-boundary'. The MK preferred loess and disliked sandy soils and especially in its later stages sought strategically advantageous, elevated positions (Lüning 1967, p. 112). For the MK, there are exceptions to this rule, since the most northwesterly MK settlements, in OSTERWICK, Kr. Coesfeld, are on sandy soils (Wilhelmi 1971). Did the TRB West Group shun the loess-loams because they lacked the formula to support their agrarian way of life there in contrast to most of the other TRB groups, or did other population groups have prior rights there? We may think here of the Gallery Grave and Wartberg Group and still unknown population groups, as well as the MK, but the distribution maps here are still rather bare (Schwabedissen 1967, fig. 23).

6.4 CONCERNING THE HORIZON OF TUREENS WITH PENDANT TRIANGLES ON THE SHOULDER

Of all the pottery horizons that can be distinguished in Tiefstich pottery, none would seem to be clearer and more widely distributed than that which is characterised by the one-handled tureen(*) with an angular profile and hatched triangles on the shoulder. Next to the handle, these triangles are replaced by vertical lines or ladders. This tureen is a pilot type for Drouwen C (fig. 30:6). This type frequently occurs in an almost identical form throughout the entire area of the West and North Groups although it appears to be either rare or absent in South Sweden and East Mecklenburg.
In both Drente and Schleswig-Holstein, it seems to have developed from roundbellied pots (figs. 28:1, 3), via carinated jugs with convex shoulder (figs. 29:1, 3, 5, cf. figs. B4:1-4); in the West, the sequence K-L-M is characteristic for phases Drouwen A, B and C respectively (cf. Chapter 4). But further research is desirable – also to enable us to reach a better understanding of the origin and the nature of a pottery horizon in general: were the scarce typological transitional forms between L and M precursors of a gradually developing M, or were they hybrids between L and M which was suddenly invented without any preliminaries? Did the typological development proceed by fits and starts or completely smoothly? Do we see here a mutant which apparently suited the spirit of the period (the *Zeitgeist)* of which it was an expression so well that it was unanimously adopted everywhere? In any case, the most conspicuous feature of the ornamentation, the hatched triangles on the shoulder, seems to have appeared out of the blue, since it is unknown in this position on older pottery.
In Altmark pottery (*), the shoulder-triangle tureen seems to appear as a foreign intrusion with no earlier hybrids or precursors. Tureens like this occur in the Altmark pottery assemblage from a pit in DÜSEDAU, Kr. Osterburg which apart from this seems exceedingly traditional (Hoffmann 1970; Behrens 1973b, fig. 38), and in assemblage A from the cemetery in ISSENDORF, Kr. Stade (fig. 65). There is no difference between these and the ones from anywhere else. The Altmark pottery apparently originated at the beginning of the MN Ia, from the Haassel style (section 6.1) and it continued, unchanged, up to and including the horizon discussed here (MN Ib-II).[13] Curiously enough, the Walternienburg Group developed simultaneously, in the south of the Altmark Group's distribution area, with a preference for the sharply carinated tureen.

While the process of the development of this horizon of tureens with triangle-ornamentation is still a problem, its occurrence allows us to consider briefly the following two points.
First, Altmark pottery combines the generous use of the tvaerstik line (*), both horizontal and vertical, with shapes and patterns of ornamentation which correspond with Drouwen A. In the assemblages from DÜSEDAU and ISSENDORF, the C-tureens are evidence that Altmark pottery continued to be current, in an unchanged form, at least as late as horizon C. (I have previously pointed out the conservative taste of the Altmark Group, not only in its pottery style, but also in its battle-axes).
The assemblages from DÜSEDAU and ISSENDORF were probably synchronous with the Drente pottery from HOOGHALEN (figs. B4-5) and ZEIJEN (figs.

FIG. 64 Grave goods from megalithic grave OLDENDORF II, according to Jacob-Friesen 1959, fig. 107.

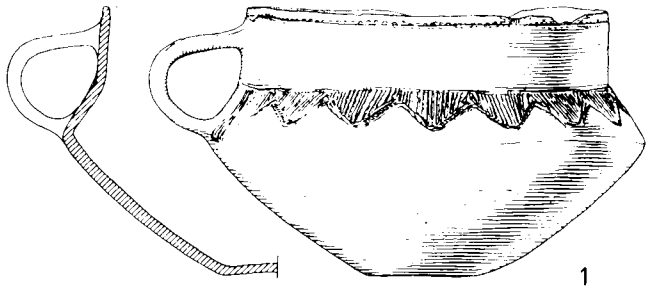
B11-B15), and also with the pottery from the MN Ib pit-filling at KLINTEBAKKE on Langeland, and from the MN Ib temple in TUSTRUP in Djursland. If the pit-filling in Klintebakke (Berg 1951) is representative of a short, uninterrupted period, which is the opinion of the Danish archaeologists, and not of a longer period when only a small quantity of rubbish was deposited (the typological variation is fairly wide), then it would seem that, on Langeland, the tvaerstik line was introduced *at the same time as* the pendant-triangle tureens. Neither of these two elements was present in the preceding MN Ia, and both occur in the pit in Klintebakke, including one sherd which contains them both (Berg 1951, plate IV:8). During the MN II, the tvaerstik line was very popular on Langeland.

In Djursland (northeast of Århus), however, the pendant-triangle tureen appears to have arrived *before* the tvaerstik line, since the former is present at Tustrup, but the latter is not (illustrations by Kjaerum 1955; 1967). That in the West Group the pendant-triangle tureen also arrived *before* the tvaerstik line is shown by assemblages like those from ZEIJEN and HOOGHALEN. This point has been discussed in Chapters 3 and 4, where this succession was taken as a principle for the typochronology of the West Group.

Fig. 66 summarises these points. Without dating methods independent of typochronology and a better understanding of the sequence of the Altmark pottery it cannot be proved that the horizon of the pendant-triangle tureen was less subject to Doppler distortion than, for example, the tvaerstik line, although this seems probable to me.

The second point which arises here is the significance of a tureen from OLDENDORF-II, Kr. Lüneburg, to which Sprockhoff devoted an inspired article (1952a; fig. 64d). This tureen is unmistakably an imitation of a vase made of gold, electrum or silver, as is shown by several details in the decoration. It can be deduced, for instance, that the prototype had

ISSENDORF A



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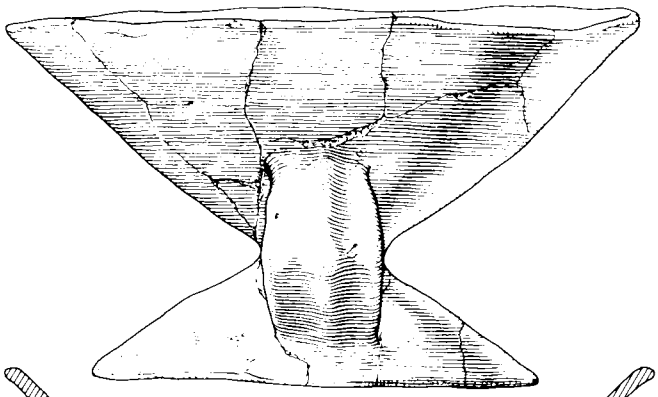

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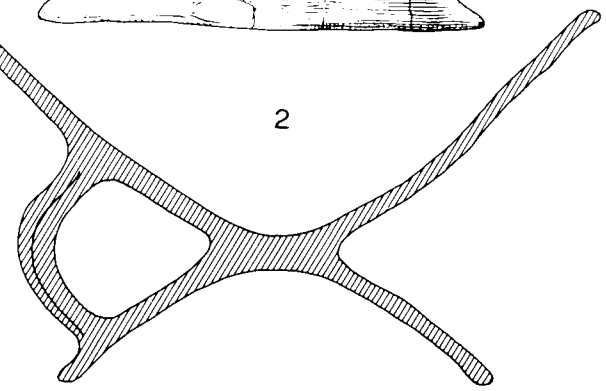

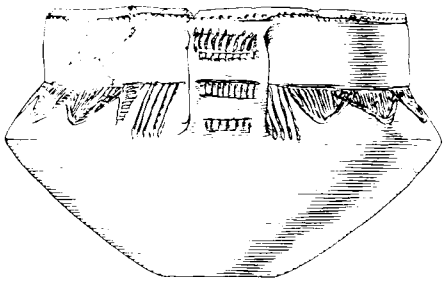

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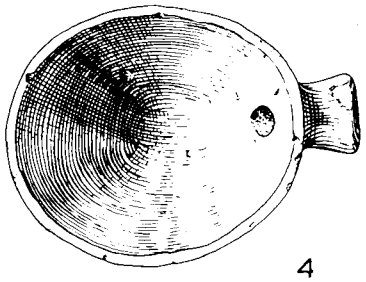

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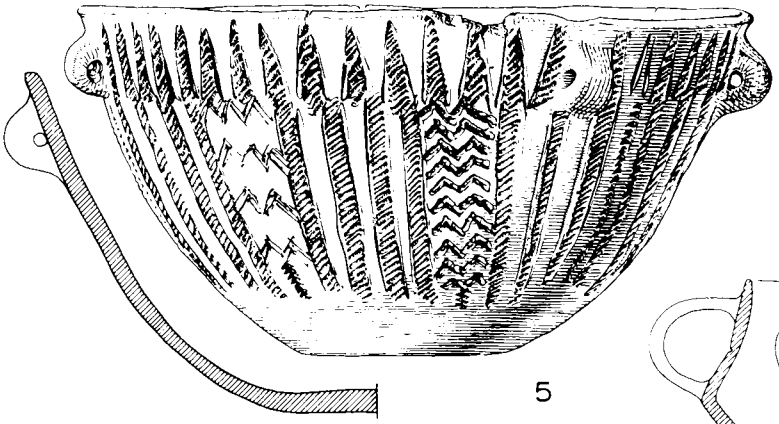

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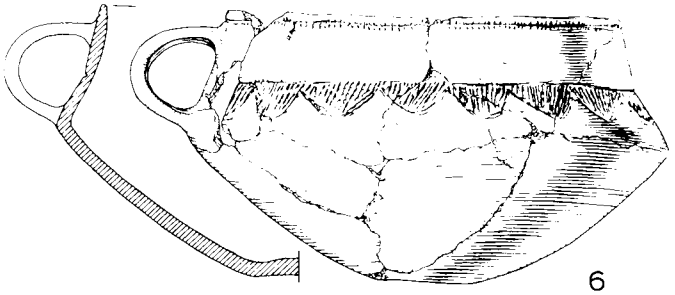

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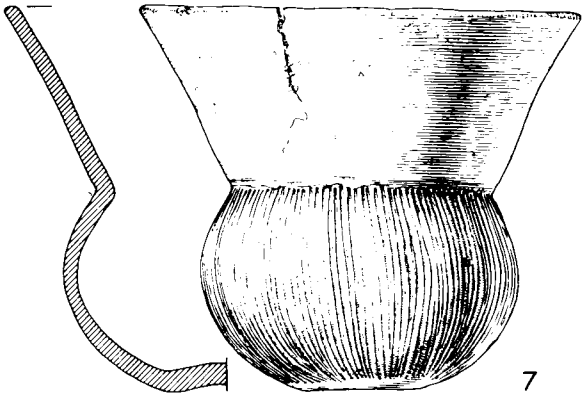

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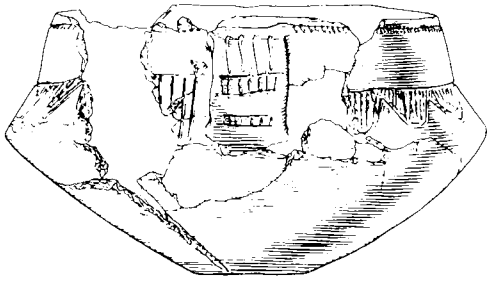


◂ FIG. 65 Pottery from grave A at ISSENDORF (Tempel 1972, figs. 4-6).

an I-shaped strap handle, the mid-top of which had been fixed with a conspicuous rivet to a lip which jutted out from the rim, and whose two horizontal sections had been fixed with tiny rivets to neck and shoulder. The pointillé ornamentation on the strap handle is unique in a TRB context as far as technique and configuration are concerned, as is the shape, the rectangular cross-section of the handle and the exceptionally fine 'smooth as leather' texture of the pottery which reminded Sprockhoff of Minyan Ware. But the metal tureen cannot just have been an import from the eastern Mediterranean area or from the Carpathian basin, because the style horizon of the Tiefstich pottery tureens with pendant triangles on the shoulder did not penetrate as far as that, nor do we know of any vessels there, pottery or precious metal ones, which show a similarity with these.

Apparently a goldsmith came from the southeast – where golden copies of ceramic pots were a fairly general feature – to the Tiefstich pottery area to produce a golden vase as requested by the local population. The fact that he was rather unfamiliar with local tastes is evident from the unique method of hatching the triangles on the shoulder, and from the pattern of the ornamentation on a strange-looking handle – I shall return to this – which was later copied on the pottery after the metal example.

The precious metal vase was probably the pride of a religious centre in Oldendorf, or its immediate neighbourhood, because some of the characteristics of the pottery copy, which were derived from the metal vase, were also found on other pots of the pendant-triangle horizon in the immediate vicinity, but nowhere else. These are, first of all, the omphalos base which also occurs on a sparingly decorated tureen (the handle is missing now) from the same megalithic grave, Oldendorf-II (fig. 64c), and on an otherwise little remarkable tureen from megalithic grave IV in the immediate vicinity (Laux 1971, fig. 1). The pointillé decoration below the rim of the first described tureen from Oldendorf-II also occurs on the vessel from Oldendorf-IV and on a tureen of the normal type from a pit adjacent to the megalithic grave of RAVEN, Kr. Harburg, situated at an hour's walking distance from Oldendorf (Wegewitz 1964). A similarly ornamented tureen was found at KLEIN BÜNSTORF, Kr. Uelzen (D5:21 = K2:2), at 27 km distance.

The limited distribution of such characteristics excludes the possibility that the Golden Vase from Oldendorf was itself the initiator of the development of such a widespread horizon as that of the pendant-triangles tureens in general. Rather, the masterpiece from Oldendorf reflects a unique 'historical' incident, which is so rare in the prehistorian's experience and contrasts with the general processes with which he is usually concerned.

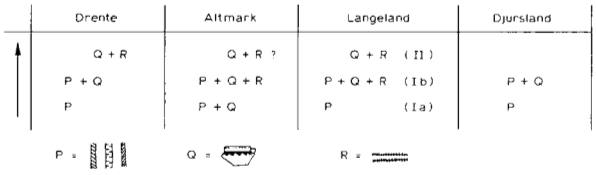


FIG. 66 Sketch of the differing succession of typological features from place to place. (P) narrow vertical strips decoration; (Q) hatched triangles on the shoulder; (R) horizontal tvaerstik lines.

No less interesting is the question of the source and the dating of the foreign elements in the golden TRB pot, or what could have been the cultural background of the goldsmith. The answer must here be sought in the southeast.

The approximate, conventional C14 dates between c. 2550-2450 BC which may be assigned to the tureen horizon and the Oldendorf masterpiece correspond, according to the tree-ring calibrations, with a real age in the region of 3300-3200 BC. For parallels we have to look in the Cernavoda-Ezero-Sitagroi IV-end of Kum Tepe horizon (but before the start of Troy I), or about the Final Neolithic/Early Bronze Age transition in the Aegean (Renfrew 1971; 1972, p. 221).

In various regions of the Balkans and the Aegean, handles extending to far above the edge of the pot occur in those periods. A first example is the Baden culture, part of which is also synchronous with this horizon. This was undoubtedly the birth-place of the famous high-drawn handles which occasionally occur on the TRB tureens with shoulder triangles. Several have been found east of the Weser, from Magdeburg to Schleswig: at SCHUBY, Kr. Schleswig; MOLTZOW, Kr. Waren; KÖTZLIN, Kr. Ostprignitz; BARSKAMP, Kr. Bleckede; RAVEN, Kr. Harburg; OLDENDORF-IV, Kr. Lüneburg and BURG, Kr. Magdeburg (illustrated by Dehnke 1939, 1940; Langenheim 1935; Laux 1971; Nilius 1971; Sprockhoff 1938; Wegewitz 1967).[14]

However, this more general type can be distinguished by a broader ribbon-shape from the handle of Oldendorf-II which has a concave upper side and an almost square cross-section (this applies to the complete specimen; the fragment may also have had one). Moreover, the Oldendorf-II handle describes a far bolder curve than any of the other specimens I know from the TRB culture. This loop-shape, too, has pottery counterparts in the Baden culture, including the *rhytons* or 'dippers' (Banner 1956, plate 113, lower) with pointed bases which are found as far as southern Poland and Czechoslovakia, i.e. not too far from the Tiefstich pottery area.[15]

But similar handles would not seem to be out of place in other parts of the Cernavoda-etc. horizon, either, if one takes the handles which have been illustrated into consideration. But my knowledge of this material is not extensive enough to pin-point more exactly where the relevant pottery shapes and

indications of gold-working overlap. The fact that gold circulated in the Tiefstich provinces was proved by the bracelets from HIMMELPFORTEN, Kr. Stade, and SCHWESING, Kr. Husum (Cassau 1933, 1936; Schwabedissen 1953), although their design is not particularly remarkable.

6.5 THE 'SEESTE VASE' AND THE 'COPPER HORIZON'

E. Schlicht's (1968) discussion includes two arguments which could be used against the chronological sequence defended here, if they were applied more rigorously than they were by her. Although these points were fairly extensively dealt with in a book review (Bakker 1971), some points will be summarised and supplemented with new evidence below.

6.5.1 *The 'Seeste Vase'*

In the opinion of Van Giffen (1927), Knöll (1959) and myself, this pot (fig. 67), from the early 19th century collection of Count Münster, belongs in what I call phase E, that of the Early Havelte Style. The German literature of the first half of this century, however, preferred to regard it as the obvious result of contact between Tiefstich pottery and Rössen. Reinecke (1900) thought it showed a Rössen influence on the TRB culture. According to Götze (1901), Bremer (1913) and many others, it was the other way around. Bremer had the Seeste footed vase developing from the bowls of the Tiefstich pottery, after which the footed vase would have been transferred, in its finished state, to the Rössen culture – a rather strained construction.

About 1938, the chronological perspective was so far refined, that a return to Reinecke's view was necessary if one insisted on retaining this old idea, because the western Tiefstich pottery must have come into existence later than the Rössen footed vase, so that a Rössen influence on the Tiefstich pottery was the only conceivable one (Buttler 1938). Another consequence of retaining this pet theory about the Seeste Vase was that the vase had to be placed early in the Tiefstich sequence, since, according to Buttler, only a very short period of contact between Rössen and Tiefstich pottery was possible at best.

In accordance with this, H. Hoffmann (1938) placed the Vase in the Dolmen period; Sprockhoff (1938) put it in a phase which followed immediately after the immigration of Danish-North German people of the Dolmen period into the northwest German Plain which bordered the area of the Rössen culture. It might have seemed that the old theory concerning the Seeste Vase had been definitely discredited by the publication of Knöll's book (1959), and by a growing awareness – due to C14 chronology – that contact between Rössen or Epi-Rössen (Bischheim) and the Early Havelte Seeste Vase could be excluded (figs. 62, 73).[15a]

FIG. 67 The 'Seeste Vase' dug up by Count Münster from a hunebed near SEESTE (Jacob-Friesen 1934, fig. 5).

However, this *revenant* reappeared in Schlicht's publication (1968), although more indirectly than was previously the case. Like Sprockhoff (1938), Schlicht wanted to derive certain pottery of the E-horizon (Schlicht's Group C) from (Epi-)Rössen pottery. This would actually imply that the E-horizon, either partly or completely, should be dated before the Drouwen A-horizon, i.e. in the EN C. Since a superficial consideration of both the round E-shapes[16] and their association with stone knob-butted battle-axes (section 5.6.3) might also argue for an EN C date, a defence of the sequence suggested by Van Giffen, Knöll and myself will not be superfluous: the E-horizon belonged to c. the MN III-IV, and not to the EN C.

The main points of my argument are as follows:

1 Early Havelte lies between Late Havelte and Drouwen in the typological sequence. There are transitional shapes between Early Havelte and both these style groups. Unless De Laet's suggestion (1958, see section 2.20) of two, fairly independent traditions running concurrently is accepted, placing Early Havelte at the beginning of the Tiefstich sequence, as a consequence of the proved great antiquity of Epi-Rössen, would lead to an 'impossible' distortion of the picture.

2 The stratigraphy in the chamber of hunebed D21 at BRONNEGER (note 2:24) shows that Early Havelte is later than early Drouwen and later than, or simultaneous with, later Drouwen.

3 The available C14 data support the sequence given here, and not the possible alternatives.

4 All the types of Tiefstich pottery discussed here as 'phases' were found, without exception, in such large quantities in western hunebeds that there can be no possibility of the synchronous existence of megalithic and non-megalithic groups in Becker's sense (1947). The frequent occurrence of all the phases concerned in Drente, plus the purity of style of the pottery refuse of the Early Havelte settlement in ANLO in the centre of that area (only two or three sherds have tvaerstik, there are no further indications of other phases) provide more evidence against the idea of synchronous groups with differ-

ent pottery styles. These, moreover, would have buried their dead in the same graves.

5 Although the rounded-off Early Havelte shapes resemble the Danish EN C pottery, closer inspection also reveals a rather close similarity with the pottery from the Ferslev-Bundsø horizon (cf. the photographs of Marseen 1960 and Kjaerum 1967). The profile of the vase is somewhat diffferent, but the rounded-off, elegant shapes, the presence of the ornamentation only on the neck and the shoulders, and the blocks of vertical lines suspended from it are found there too. It is not surprising that there are striking differences between Drente and northern Jutland, one reason being the fact that the Walternienburg style exerted, from the southeast, a different influence on the style of the intermediate region (cf. Dehnke's figures, 1940).

The further east we go from the Veluwe, the stronger becomes the predilection for a neck which approaches the rim conically, instead of the cylindrical to funnel-shaped neck found on the Veluwe and in western Drente; the extremes, which sometimes dropped the transition between neck and shoulder altogether, are to be found in the Walternienburg style. Moving from the latter to the north, the double cone gradually becomes less dominant and gives ground to the Ferslev shapes.

This line of argument now leads us too far afield, but I would like to point out that the picture was, in fact, more complicated. First, the trend towards the double-cone established itself in Denmark after the Ferslev Horizon (Lindø), so that we may be dealing with a hybridisation between two horizons. Second, a lively and fascinating spectrum developed as a result of the cultural exchange and mutual cross-fertilisation which took place along the trade routes. This would have to be analysed proportionately per find-group or find-area, as will be partially carried out in section 6.6. for two facies of the Early Havelte style. For example, there may have been Early Havelte influence on some pots in the hinterland of Hamburg along the route to Jutland from the Early Havelte area west of the Weser (SCHÖNNINGSTEDT: Hingst 1959, plate 20:22, 14; Langenheim 1935, plate 2; GROSS FLOTTBEK: Schindler 1960, plate 83:12).

6.5.2. *The 'Copper Horizon'*

This concept was developed in the 1930's by P. Reinecke and J.E. Forssander. The copper ornaments and axes in the hoards and graves of the TRB North Group (BYGHOLM) are virtually or completely identical typologically to part of those of the Jordansmühl/Jordanów Group of the Lengyel culture and Hungarian finds, and they appeared to point to an export horizon from the Carpathian region to (among others) the TRB North Group, which was bounded chronologically by fairly narrow limits.

Until now, new finds kept interest in this horizon alive since they generally fitted into this picture very nicely (Jażdżewski 1936; Becker 1947; Driehaus 1960; Lomberg 1962; Randsborg 1970). There is already quite a long list of finds from the region of the North Group (Randsborg 1970, Lorenzen 1965) and there is a tendency to date everything in the EN C, or perhaps in the MN I (Lomborg 1962). Schlicht (1968) included in the same horizon the copper ornaments from hunebed EMMELN-2, and also the not particularly rare copper finds in other hunebeds, and concluded that these graves must 'therefore' be interpreted as belonging to the EN C. This invites a few comments.

To begin with, several clues have emerged in the meantime which suggest that the conception of one metal horizon right across Europe, and stemming from one export area, has outlived its usefulness, however stimulating it was in the days of an expanding chronological perspective preceding the application of the C14 method. When C14 data proved that the dates of everything were even further separated in time, and when the establishment of detailed pottery sequences backed up by C14 data was undertaken everywhere, the once very neat horizon began to seem too unwieldy and forced for the future.

The find of copper discs which typologically belong to this horizon in the Tripolje A/Pre-Cucuteni and Cucuteni A3/Tripolje B1 hoards at KARBUNA and HĂBĂŞEŞTI, made it clear that these were current there c. 3600 and 3380 BC (conventional C14 dates; *Radiocarbon* 14, 1972, p. 71), which is centuries before the start of the EN C.

Thus, the 'Copper Horizon' separates into an early part near the Black Sea and a later part (EN C + ? MN I) in the TRB region along the Baltic Sea (Randsborg 1970).

In this connection, it is interesting that at SARNOWO in Kujavia, Gabałówna (1970, p. 89) found a copper-like substance – not enough for metal analysis or typology – under Long Barrow 8 in a layer with TRB EN A/B pottery, i.e. in the layer with a C14 date of 3620 ± 60 BC (GrN-5035; the charcoal sample, however, was not ideal: Bakker, Vogel & Wiślański 1969, fig. 2).

In the meantime, *spectral analyses* of the composition of the copper of this horizon introduced a number of new elements into the discussion. On the basis of 1375 analyses – which revealed the presence of both arsenical and non-arsenical copper in different regions within the importing area – Otto and Witter (1952) had expressed their scepticism concerning the idea of one exporting region and one export horizon. At first this argument was mentioned only very rarely in archaeological literature, presumably because of a certain uneasiness vis à vis this new approach.

Subsequently Junghans, Sangmeister and Schröder (1960) ('JSS') started a very extensive and ambitious programme of metal analyses. Their classification of the metal groups, however, became the sub-

ject of much discussion after the publication by Waterbolk and Butler (1965) of an ingenious, graphical method for representing the nature of archaeologically and metallurgically homogeneous analysis groups. It turned out that the border-lines of the JSS classification sometimes cut right across the neat, homogeneous groups which emerged now. This implied that many of the opinions of JSS which were based on their own group classification would have to be re-interpreted in the light of the Waterbolk-Butler graphs.

My comments here will be limited to some remarks on 58 metal analyses of copper artefacts belonging to the TRB North Group, the TRB West Group, the Gallery Grave Group and TRB groups from the southern DDR and Poland. A few directly comparable finds from elsewhere were also included (fig. 68, Table II).

The analyses indicate that this copper can be divided into arsenical copper and non-arsenical copper groups. I subdivide the former here into Group I, to which all the copper of the TRB North Group belongs, and Group II, which comprises the rest of the arsenical copper of the table. The non-arsenical copper, which is absent in the TRB North Group, is included in Group III.
According to Table II, in six cases more than one analysis of a single artefact was carried out. This applies to a small tube and a disc of non-arsenical copper from hunebed EMMELN-2, and a flat axe with a spiral ring and a spiral cylinder with a flat axe from the arsenical copper hoards of BYGHOLM and RIESEBUSCH, respectively. In the following cases, it seems that, as a result of segregation during smelting, a wider variation exists than that between two adjacent columns. Differences in the lowest measurement limits among the different writers have been taken into consideration.

With Pb:	columns 1+2+7 (Riesebusch axe); columns 1 or 2 and 7 (Riesebusch spiral cylinder).
With Ag:	columns 1+2+7 (Emmeln disc).
With Ni:	columns 1+7+11+12 (Emmeln disc); 2+7+9 (Riesebusch axe), 2 and 7 (Bygholm axe).
With Bi:	columns 1+2+5 (Riesebusch axe).
With Fe:	columns 2 or 1 and 8 (Riesebusch spiral cylinder).[17]

With Ni, the difference between the results of several analyses of one artefact corresponds with the variation of all the analyses within the metal group of fig. 68. Furthermore, the variations over columns 7-1 with Pb and Ag and over columns 5-1 with Bi correspond with the greater part of the total variations within the metal group concerned. Only the lower values of these trace elements are involved here, but Slater and Charles (1970) established a variation for Pb over columns 11-15 in a bronze artefact.

These results clearly argue in favour of grouping the results of metal analyses according to the graphical method of Waterbolk and Butler and not within the rigid limits of JSS (cf. also Slater and Charles).
The knowledge that a considerable part of the total range of the trace elements of a metal group can be found in a single artefact (not necessarily always the case: cf. 21199+21200) can be a further starting point for the identification of such groups, especially if only a few specimens are available.
The repeated occurrence of the same range, both in a single representative of the group and within (almost) the entire group, is an argument supporting the correctness of the identification of such a group. Also supported are consistency of the method of production and consistency of the ore used. The list of analyses T1-14 of arsenical copper prepared from ore from HELIGOLAND (Lorenzen 1965) reveals a range that is at least as wide as that of the copper from the North TRB Group. But it contains a completely different type of arsenical copper from that of Group I (Butler & Van der Waals 1967) with different values for Pb (columns 2-14, maximum in 10-11); Ag (columns 8-14, maximum in 13); Ni (two maxima: column 1 and columns 8-10, highest peak in 10). This lode could therefore not have been the source of the copper (Group I) for the TRB North Group.[18]
Selective corrosion does not give a satisfactory alternative explanation for the variation of the analyses of one object. The EMMELN disc was badly corroded but the results of the analysis were no different from those of the rest of Group III. In this group other badly corroded sheet metal specimens occur (e.g. ALTENDORF), but these are virtually absent in the copper of the TRB North Group (Group I), and the variation appears there too.
There are no indications of fundamental differences in the analyses of the three laboratories concerned (fig. 68).

Group I. The copper artefacts of the TRB North Group are made of the same arsenical copper as the 26 Altheim axes in Waterbolk and Butler's Graph 3 (1965; cf. Butler & Van der Waals 1967). The 26 Altheim axes were reported by JSS (1960, p. 148) as such in their lists. However, six of the analyses are now in my Group I and JSS themselves have pointed out the slight differences in shape between the North TRB axes and the Altheim axes proper. A typological analysis such as that carried out by Case (1967) and a drawing of a new graph of the copper of the 'Altheim' axes with the inclusion of the analyses newly published by JSS would therefore be desirable.
The North TRB copper artefacts constitute, archaeologically too, a homogeneous group, a horizon, if we want to use the word, but definitely more chronologically diffuse than the pottery horizons of the North Group (Lomborg 1962). It was possibly even more diffuse than Lomborg assumed and it continued further into the MN. Copper was recov-

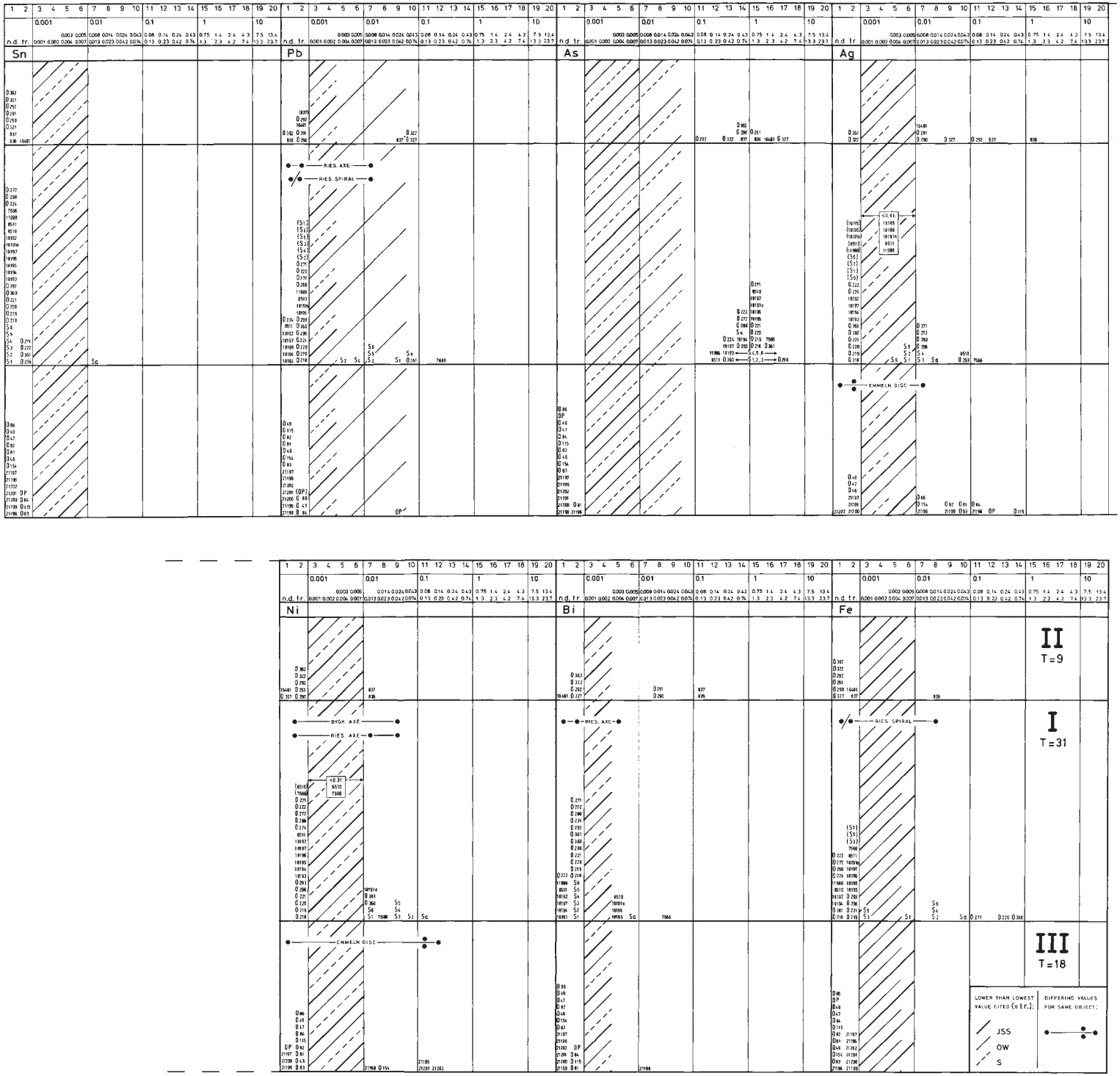


FIG. 68 'Work sheet' according to Waterbolk & Butler (1965), slightly changed. The columns are numbered. The ranges which are not covered by the spectral analyses are shaded. Measurements 'belonging to that area' are placed in column 2 ('trace'). Those percentages which could be exactly established within the shaded area are indicated there, but also, in brackets, in column 2. The sample numbers correspond to those in Table II. Dots and heavy lines indicate differing determinations from the same object.

ered from the refuse pit at KLINTEBAKKE, the type-locality for the MN Ib phase, although these were only meagre remains (Berg 1951, p. 7). Furthermore, amber pendants imitative of these copper axes (BYGHOLM, RIESEBUSCH) were found in passage graves of the North Group dating from the MN Ib at the earliest (illustrations Glob 1952, 300; Berg 1973, 241). This indicates that the copper axes were still current at that time.

One may well wonder if, indeed, the North Group ceased to use copper after it had lost the rite of putting copper in graves, or of conserving it in a hoard for use in the hereafter. No one actually believes this. Malmer's suggestion (1962) – in a different context – that such rites were suspended when the expensive copper had come into general use and had become indispensible would seem to be relevant here. Perhaps there is also an analogy with Gabalówna's conclusion (1966) that the much older copper finds in BRZEŚĆ KUJAWSKI date mainly from the initial period of the settlement and cemetery, and not from a later phase.
The conclusion to be drawn from all this may well be that some of the isolated, arsenical copper finds of Group I date from after the MN I. Randsborg (1970, p. 189) argued for this too. He found a remarkable conglomeration of EN C – possibly MN I – copper finds in non-megalithic graves and hoards in central eastern Jutland and a fairly even distribution of stray-finds throughout Denmark (partly of a later date?). The flat axes found singly in HUSUM and KIEHOLM in Schleswig-Holstein also belong to Group I. This is also the case with the copper axe and the knob-butted copper battle-axe in the hoard from ŚMIERDNICA, one of the flat axes from the hoard of four specimens and a team of copper oxen from BYTYŃ (both in western Poland), and the copper knob-butted battle-axe from 'SCANIA'. Since there is no longer any necessity to date all the stone knob-butted battle-axes from the territority of the TRB North Group in the EN C (Brandt 1967), one wonders if their copper counterparts would not yet partly reflect the MN use of copper. I leave here unanswered the question of whether the above-mentioned western Polish finds originated with the East TRB Group (or the North Group?) or with Brześć Kujawski or another Lengyel group.

The metal of *Group II* appears to have the same composition as that of Group I, although the number of 'deviants' is relatively somewhat larger. These 'deviants' (Waterbolk and Butler 1965) still constitute one of the greatest problems in the interpretation of Western copper implements, partly due to the fact that the number of analyses is still small. It is here not so much a matter of purging Group II of 'deviants', as of the resulting necessity to assign these deviants to another place among the arsenical copper of Europe. Moreover, the possibility of measurement errors in the laboratories cannot be ruled out.

We have already stated that a comprehensive identification of the arsenical copper groups in Europe is very far from being completed. Consequently, any attempt to classify notorious 'deviants' such as analyses 836 and 837 of the two BUINEN spiral cylinders is bound to remain unsatisfactory (Butler & Van der Waals 1967, p. 76). All the archaeological evidence indicates that the two spirals are of the same age and that they were put in hunebed D28 by the TRB culture. One would confidently expect that since they are identical in shape, and since they do not seem to have many direct counterparts (Schrickel 1966), they would belong to the same metal group.

Now that it appears that 836 corresponds fairly well – though not perfectly – with the *Ösenring*-arsenical copper (Waterbolk & Butler, Graph 7), but 837 is completely different (Butler & Van der Waals 1967), the archaeological discussion can develop in several different directions. Is there an as yet unidentified 'Buinen arsenical copper group'? Has a laboratory error or a defect in its manufacture played a part? When did *Ösenring* copper first appear?
It could be pointed out that *Ösenring* existed as early as the MN. The only thing is that the *Ösenring* from the Baden grave of LEOBERSDORF and the possibly equally old grave of LICHTENWÖRTH (Willvonseder 1937) were made not of *Ösenring* copper or of another arsenical copper, but of non-arsenical copper (JSS 1968: 3730, 3731, 4636-4639), not unlike our Group III. The *Ösenringe* from the Tripolye B hoard of HORODNICA (Sulimirski 1961; JSS 1968, 5685-5686) also consist of non-*Ösenring* copper.

Group III. This non-arsenical copper has a fairly homogeneous composition in the Waterbolk-Butler graphs (fig. 68). We saw above that it is possible to identify several comparable types of copper from the same period in Central Europe, e.g. in LEOBERSDORF and LICHTENWÖRTH. A spiral cylinder from the well-known hoard of the 'Copper Horizon' in STOLLHOF, which is situated on the edge of the Vienna Basin as well, also consists of this copper. To facilitate comparison, this analysis was included in the graph. The above-mentioned Tripolye B hoard of HORODNICA, which can be dated around 3300 BC on the conventional C14 scale, consists of two or three types of copper, viz. non-arsenical copper and arsenical copper, in which latter group the two *Ösenringe* can be distinguished by their As-content in column 11, which is exceptionally low for our Group I.
Non-arsenical copper was also found in the grave at PREUSSLITZ, in a Baalberge context corresponding chronologically with the EN C (Preuss 1966), i.e. synchronous with the majority of the Northern TRB arsenical copper artefacts.

In summary: during the EN C, arsenical copper apparently found its way to the TRB North Group; this applies not only to the axes which were harder and more efficient than those of non-arsenical copper, but also to the ornaments. At the same time, non-arsenical copper reached west of the Elbe at least PREUSSLITZ, via parallel SE-NW routes(?). It would seem that in the MN the North Group retained a strong preference for arsenical copper. In this period, arsenical copper occurred in the West TRB Group alongside non-arsenical, sometimes even in the same assemblage.

Several of the copper finds of Group II or Group III in table II must be dated fairly late in the MN. In connection with Schrickel's detailed typological study on the dating of Western copper (1966) I would like to point out here that a considerable quantity of the pottery which was associated with the copper in megalithic graves west of the Elbe must be placed in an advanced stage of the MN at the earliest. The earliest sherds from these copper-containing graves belong to Drouwen C, whereas the majority of the pottery originated in phases D and/or E. In a gallery grave such as that of BECKUM, what little datable Tiefstich pottery there was consisted of a pot from Phase D and another pot possibly from E. Consequently, the copper ornaments in the West Group were presumably placed in the megalithic graves during pottery phases D and E particularly. Furthermore, the fact that, in hunebed EMMELN-2 the two copper discs were found inside a D-E bowl (Schlicht 1968, fig. 312) need not necessarily be explained by a later coincidence, but may represent the original situation.
The non-arsenical nature of the Emmeln ornaments was in itself, of course, sufficient reason to invalidate a direct comparison with the Northern TRB specimens of arsenical copper, even though the dating of the non-arsenical ornaments from PREUSSLITZ indicates that a dating in the EN C cannot definitely be ruled out.[19,20]

TABLE II List of spectral-analysed copper finds (TRB and other).
Abbreviated references in column 4 (see base of table), code numbers in column 5.

GROUP I				
Bygholm, Hatting h.	EN C hoard (Lomborg 1962)	flat axe B63	O&W	O 218
Bygholm, Hatting h.	EN C hoard (Lomborg 1962)	flat axe B64	O&W	O 219
Bygholm, Hatting h.	EN C hoard (Lomborg 1962)	'flat axe'	S&S	S 3
Bygholm, Hatting h.	EN C hoard (Lomborg 1962)	flat axe B65	O&W	O 220
Bygholm, Hatting h.	EN C hoard (Lomborg 1962)	flat axe B66	O&W	O 221
Bygholm, Hatting h.	EN C hoard (Lomborg 1962)	dagger B67	O&W	O 296
Bygholm, Hatting h.	EN C hoard (Lomborg 1962)	spiral ring B68	O&W	O 360
Bygholm, Hatting h.	EN C hoard (Lomborg 1962)	spiral ring B69	O&W	O 361
Bygholm, Hatting h.	EN C hoard (Lomborg 1962)	spiral ring B70	O&W	O 293
Bygholm, Hatting h.	EN C hoard (Lomborg 1962)	'spiral ring'	S&S	S 4
Årupgård, Nim h.	EN C/MN I hoard (Lomborg 1962)	big spiral cylinder	S&S	S 1
Årupgård, Nim h.	EN C/MN I hoard (Lomborg 1962)	small spiral cylinder	S&S	S 2
Søby Hede, Fjends h.	hoard (Broholm 1938)	flat axe B6984	L;JSS	8510
Søby Hede, Fjends h.	hoard (Broholm 1938)	spiral ring B6985	JSS	8511
Mygdal, Venneberg h.	flat axe, spiral ring (Broholm 1938)	flat axe	L(JSS)	11988
Salten, Skanderborg a.	EN C grave (Becker 1947)	disc	B;O&W, p. 69	Sa
'Scania'	stray find	knob-butted battle-axe 2138	L; JSS	7666
Bytyń, pow. Szamotuly	hoard of 4 flat axes, team of oxen figurines (Jażdżewski '65, pl. 9)	4th flat axe	O&W	O 224
Śmierdnica/Mühlenbeck, pow. Gryfino	hoard	knob-butted battle-axe PS 2701a	O&W	O 288
Śmierdnica/Mühlenbeck, pow. Gryfino	hoard	flat axe PS 2701b	O&W	O 272
Kieholm, Kr. Flensburg	stray find	flat axe KS 9753	O&W	O 222
Husum, Kr. Husum	stray find	flat axe KS 11168	O&W	O 271
Riesebusch, Kr. Eutin	hoard	spiral cylinder 1	L(JSS)	18193
Riesebusch, Kr. Eutin	hoard	spiral cylinder 2	L(JSS)	18194
Riesebusch, Kr. Eutin	hoard	spiral cylinder 3	L(JSS)	18195
Riesebusch, Kr. Eutin	hoard	'spiral cylinder'	S&S	S 6
Riesebusch, Kr. Eutin	hoard	spiral cylinder 4	L(JSS)	18196
Riesebusch, Kr. Eutin	hoard	spiral cylinder 5	L(JSS)	18197
Riesebusch, Kr. Eutin	hoard	flat axe (butt)	L(JSS)	18191a
Riesebusch, Kr. Eutin	hoard	flat axe (cutting edge)	L(JSS)	18192
Riesebusch, Kr. Eutin	hoard	flat axe	S&S	S 5
GROUP II				
Buinen, gem. Borger	hunebed D28 (Van Giffen 1943b)	spiral cylinder 324	JSS	836
Buinen, gem. Borger	hunebed D28 (Van Giffen 1943b)	spiral cylinder 325	JSS	837

Gretesch, Kr. Osnabrück	hunebed Sundermannsteine	band 6228	O&W	O 327
Wechte, Kr. Tecklenburg	hybrid hunebed/gallery grave 2	band Ia	O&W	O 290
Beckum, Kr. Beckum	gallery grave	band (?)	O&W	O 291
Niedertiefenbach, Oberlahnkreis	gallery grave	spiral cylinder 4	A(JSS)	16481
Drosa, Kr. Köthen	hunebed Teufelskeller (Wa II +Be I-III) Niklasson 1925	tube	O&W	O 292
Wallendorf, Kr. Merseburg	pit 103, Salzmü/MK, Hutberg (Benesch 1941, p. 35, Lüning 1968, Preuss 1968)	small ring	O&W	O 322
Merseburg	grave(?), undecorated drum, Salzmü, Wa-Be, Tiefst. or Schönfeld (cf. Fischer 1951)	one of both rings	O&W	O 362
GROUP III				
Emmeln, Kr. Lingen	hunebed 2	spiral cylinder 1857a	S(JSS)	21198
Emmeln, Kr. Lingen	hunebed 2	tube 1857b	S(JSS)	21199
Emmeln, Kr. Lingen	hunebed 2	tube 1857b	S(JSS)	21200
Emmeln, Kr. Lingen	hunebed 2	disc 1857c	S(JSS)	21201
Emmeln, Kr. Lingen	hunebed 2	disc 1857c	S(JSS)	21202
Emmeln, Kr. Lingen	hunebed 2	disc 1857c	S(JSS)	21196
Emmeln, Kr. Lingen	hunebed 2	disc 1857c	S(JSS)	21197
Westerkappeln, Kr. Tecklenbg	hunebed Schloopsteene	tube II	O&W	O 83
Kleinenkneten, Kr. Oldenburg	hunebed II/3	disc	O&W	O 154
Wechte, Kr. Tecklenburg	hybrid hunebed/gallery grave 1	tube Ic	O&W	O 46
Wechte, Kr. Tecklenburg	hybrid hunebed/gallery grave 1	tube Ib	O&W	O 81
Wechte, Kr. Tecklenburg	hybrid hunebed/gallery grave 1	tube Id	O&W	O 82
Altendorf, Kr. Wolfhagen	gallery grave	ring	O&W	O 115
Burg, Kr. Jerichow I	cemetery (Molkenberg ? cf. Fischer 1956)	ring A1a7	O&W	O 84
Schortewitz, Kr. Köthen	megalithic grave (Rampenkammer Wa II, Niklasson 1925, Fischer '56)	tube	O&W	O 47
Nordhausen, Harz	double flat grave Wa I-II (Fischer 1956)	spiral cylinder	O&W	O 49
Preusslitz, Kr. Bernburg	Baalberge flat grave (Preuss 1966)	necklace of spiral cylinders and pendants	Pr.	OP
Stollhof near Wienerneustadt	hoard 'Copper Horizon'	spiral cylinder	O&W	O 86

Typological terms mainly according to Ottoway 1973b. Schlicht (1973) published a few more spectral analyses than those in this table and in fig. 68. Explanation of abbreviated references in column 4: O&W = Otto & Witter (1952); S&S = Sylvest & Sylvest (1960); L = Lorenzen (1965); JSS = Junghans, Sangmeister, Schröder (1968, 1960); B = Becker (1947); A = Ankel (1963); Pr. = Preus (1966, n. 41); S(JSS) = Schlicht 1968 (anal. JSS).

TABLE III Ratios of decorated E2 pots to decorated E1 pots in 15 finds.

Nr.	T_E	T_{E2}	%E2	T_{E1}	%E1	type of find	locality	reference
1	c. 20	id.	100%	—	0%	sff	Uddelermeer	Appendix B15
2	c. 30	id.	100%	—	0%	s	Beekhuizerzand	Appendix B3
3	c. 10	id.	(100%)	—	(0%)	s	Ugchelen-3	provisional impression
4	26	id.	100%	—	0%	h	D6e/f, Tinaarlo	Van Giffen 1944a
5	15-20	id.	100%	—	0%	s	Anlo	Waterbolk 1960; Van der Waals 1964a
6	52-53	52	100-98%	0- 1?	0- 2%	h	D52a, Wapse	Van Giffen 1946
7	118-122	111	94-91%	7-11	6- 9%	h	D53, Havelte	Kat-van Hulten c. 1950
8	9-10	8-9	(88-89%)	1	(11-12%)	h	Leer-Westerhammrich	Bakker (in preparation)
9	213	162	76%	51	24%	h	Emmeln 2	Schlicht 1968
10	c. 18	10	(56%)	8	(44%)	h	Gross Berssen 7	Schlicht 1972
11	8	5	(62%)	3	(37%)	f	Mesum	Appendix B12
12	5	3	(60%)	2	(40%)	fff	Ekelberg	Appendix B6
13	9	5	(55%)	4	(45%)	h	D28, Buinen	Van Giffen 1943b
14	4	2	(50%)	2	(50%)	fff	Baalderes	own documentation
15	10	4	(40%)	6	(60%)	h	D43, Emmen	Boomert, Brandt & Woltering 1970, 1971

s = settlement; f = flat grave; h = hunebed

6.6. DIFFERENCES WITHIN THE POTTERY OF THE E-HORIZON WEST OF THE WESER

Between the Amstel and the Weser, pottery of the Early Havelte phase occurs in a single closed area (figs. 39, 69-70) which is larger than the distribution areas of any other phase.
The catalogued find groups to which I have had access are unequally scattered over this distribution area, since they are restricted to the extreme western part of it (table III; fig. 69). Unfortunately, there appears to be a virtual absence of finds of settlement refuse and flat graves of the E-horizon in southwestern Lower Saxony. As a result of this, the argument below is possibly rather strained.

In the extreme west, an 'Uddel facies' (E2, fig. 34) occured virtually exclusively, which was decorated with point stamp lines and narrow Tiefstich lines, whereas there is a complete absence of tvaerstik, heart stamp, hollow stamp, double-toothed stamp (*) etc., i.e. the techniques characteristic for a facies contiguous to E2 in the east (combined here as 'E1').
A little further to the east, the E2 techniques of ornamentation declined in favour of the E1 techniques, by which more than 50% of the pottery of the total E phase may be decorated here (fig. 33). E2-like ware, though, occurs nearly everywhere (figs. 39; 69-71). Besides, E1 and E2 ornamentation techniques were not applied in equal proportions to amphorae and bowls respectively. The difficulty of E1 identification is also an important factor. Whereas it is easy in Netherland to distinguish E2 ornamentation from Drouwen D and even older pottery, the borderline between E1 and Drouwen D is generally less distinct. The decision is sometimes extremely difficult, especially with sherds.
Table III and fig. 71 give the numbers of E1 and E2 pottery in 15 find groups. Taking into consideration that in western Westphalia and occasionally on the Hümmling and in Oldenburg, E2 or E2-like pottery seems to be more numerous than E1, I suggest that the cradle of E1 lay between the upper reaches of the Ems, the Hase and the Hunte, and that the E2 area proper enclosed it in the west and north like a half moon, with a buffer zone in between, where E2 declined as E1 increased.

These tentative remarks are highly impressionistic. A more objective definition and a subdivision of E1 would be very desirable, utilising, for example, statistical methods and a computer (cf. Whallon 1972). The material from WECHTE would then be a better starting point than the marginal Dutch E1 material. But the hundreds of illustrations of pots from hunebed EMMELN-2 (Schlicht 1968) could also serve as such, in spite of the slightly more marginal location of this hunebed. The ratio E1:E2 here is 1:4.[21]
With regard to the relationship between D, E1 and E2 pottery west of the Weser, we can offer the

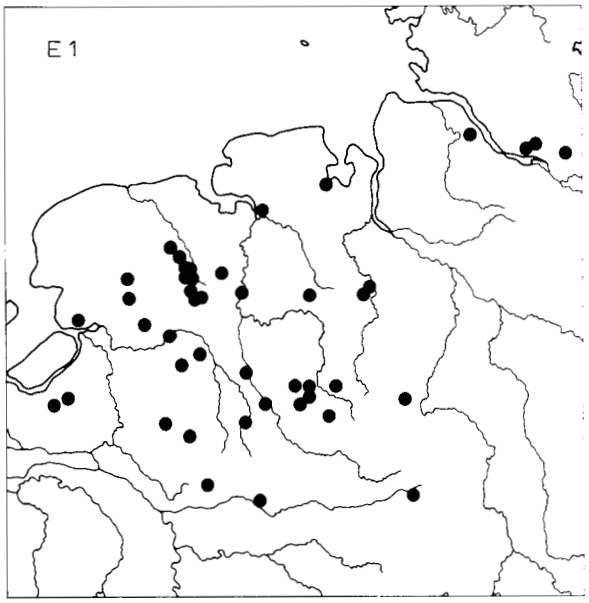


FIG. 69 Distribution of E1 pottery. Note that the two westernmost finds only concern one piece of E1 pottery, by far in the minority of the associated E2 pottery (cf. fig. 71).

Findspots of E pottery (figs. 39, 69-70)
/ = Uddel (E2) facies, or very similar (without tvaerstik)
+ = E1 (tvaerstik) facies
The list for Germany was compiled by me from Knöll's documentation (Kassel, January, 1970), with later additions (e.g. from Schlicht 1968). The list is more complete for E2 than for E1, which is less recognisable. Locality numbers after Knöll (1959).
2(+) – 5(+) – 8(/+) – 9(/) – 10a(/) – 11(/) – 12(/) – 14(/+) – 16(?) – 20(+) – 21(/+) – 23(/+) – 24(/+) – 25(/+) – 26(+) – 27(/+) – 29 – 30(/+) – 34(/) – 43(?) – 47(/) – 53(?) – 54(/) – 56(/) – 59(/+) – 62 – 66(/+) – 73(/) – 77(/) – 81(/) – 83(/) – 96(+) – 108(+) – 109(/) – 114 – 115 – 119(+) – 120 – 122(/) – 128(+) – 137(/) – 169(/+) – 212 – 377(/+) – 380(/+) – 383(/+). Besides, LEER-WESTERHAMMRICH (/+); EMMELN 2, Kr. Meppen (/+); GETELO, Kr. Uelsen (/+); KÖCKELWICK, Kr. Ahaus (/, +?); ESPEL, Kr. Tecklenburg (/+).
The (incomplete) list for Netherland was compiled from my catalogue of finds: LAGE VUURSCHE (/) – EDE (/) – HARSKAMP (/) – BOESCHOTEN (+) – WELTEVREDEN (/) – MOTTENKUIL (/) – UGCHELEN 1-3 (/) – UDDELERMEER (/+) – STAVERDEN – ELSPEET (/) – BEEKHUIZERZAND (/) – NIERSSEN – KISVELD (/) – NEEDE (+) – MANDER (/) – HAARLE (+) – ENGELANDSBOS (+?) – BAALDERES (/+) – ARRIËN (/) – SPOOLDE (/) – DE EESE (/) – STEENWIJKERWOLD (/) – SCHOKLAND (+?) – STEENBERGEN-D1 (/) – ANNERTOL (/) – MIDLAREN-D3/4 (/) – TINAARLO-D6e/f – SCHIPBORG (/+) – ANNEN (/?) – ANLO (/) – EEXT (/+) – ROLDE – LOON-D15 (/) – DROUWEN-D19 (/+) – BORGER (/+) – BRONNEGER-D23 (/+) – BUINEN-D28 (/+) – VALTHERVELD (/) – EMMEN-D43 (/+) – SCHOONOORD-D49 (/+) – SLEEN (+) – EKELBERG (/+) – WAPSE-D52a (/+) – HAVELTE-D53 (/+) – HANKAMPS VELD (+?).

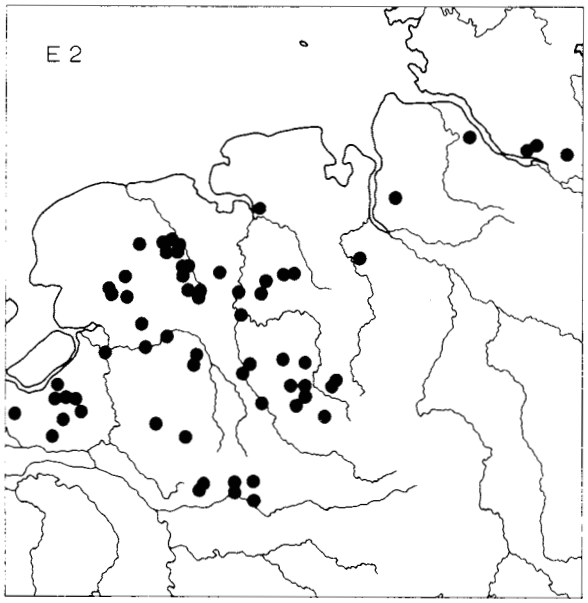


FIG. 70 Distribution of E2 pottery (Uddel facies). See caption of fig. 69.

following, very tentative and inadequate remarks.
a Although it may be assumed that the pottery trade facilitated the spread of pottery variants, the gradual decline in E1 in the direction of northwest Drente and the Veluwe cannot be explained simply as a consequence of a decrease in the export of E1 pottery with increasing distance. For, if we assume that the fine pottery was worth purchasing elsewhere, and not the shoddy specimens, then the well-finished E2 pottery of the cemetery of EKELBERG in central southern Drente would have been imported there and not the appallingly finished E1 pots (figs. B16-17).
b The discovery at VISBEK-Hogenbögen and at KLEINENKNETEN of two identical bowls, with a strong local flavour, six kilometres apart, indicates that E2-like pottery was locally produced in this neighbourhood (Sprockhoff 1938, plate 44:1; Steffens 1970, fig. 3:8).
c In the E1+E2 area, no closed finds are known of E2 pottery without E1 contaminations. Although this fact is not completely convincing – there are hardly any of the desirable flat grave or settlement finds of E2 pottery either – it could indicate that E2 did not exist as an independent facies in that area, either before, or after E1.
d D pottery has never been found in closed finds with E2 pottery without E1 pottery also being present. Non-chronological factors are also involved: in one of the two best-known areas where E2 occurs without E1, viz. the Veluwe, B and C are the only Drouwen phases known, represented mainly in the unusually large settlement of ELSPEET, figs. B8-9, with hardly any trace of D. (There are virtually no occurrences of the tvaerstik line west of the IJssel.) This fact in itself strongly reduces the chances of contact-finds between D and E2 (without E1).
In northern and western Drente, whose abundant E2 pottery is well-documented, the situation is different. The hunebeds here in which E2 pottery occurred also contained D pottery, but nevertheless, the settlement at ANLO produced exclusively E2 of the most pure type, and the two or three unpublished sherds with tvaerstik found there are undoubtedly accidental, older 'impurities' of the site. We have already seen (fig. 71) that E1 pottery is either absent or very rare in these hunebeds.
e If D pottery occurs in closed finds together with E1 or E1+E2 pottery, then it is D2 and not the D1 pottery, that still shows a strong affinity with C pottery. Knöll was therefore convinced that E1 had gradually evolved from D. It is, however, understandable that the Dutch have emphasised the stylistic difference between D and E ('Drouwen Style' and 'Early Havelte Style'), since, stylistically, there is more of a contrast than a similarity between E2 and D (e.g. the contrasting shapes of pots of the same volume). The crucial question is whether this implies an abrupt change in style or a gradual sequence in which gaps appear for some reason or other. The point must also be made that the D pottery has been little studied in Netherland, although D is the most common type in Drente.

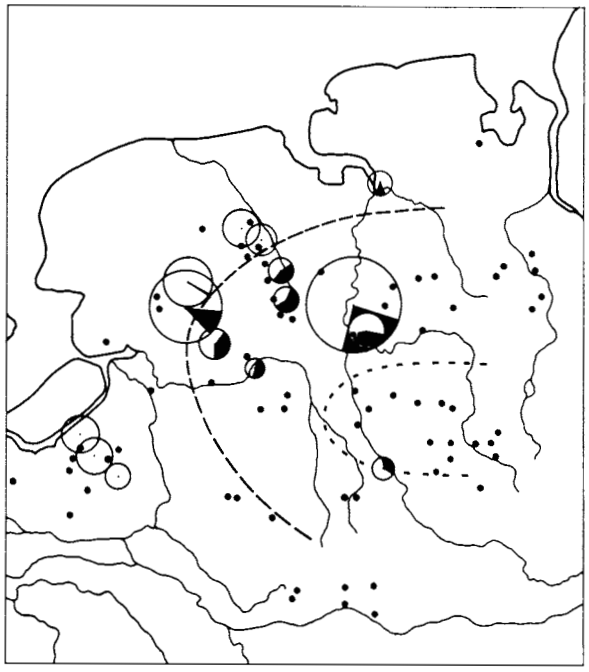


FIG. 71 Pie chart of the ratio of E2 pottery to E1 pottery (black) in hunebed inventories and other assemblages. The dimensions of the circles indicate the number of pots concerned. Dots indicate other findspots of E pottery. The heavy dashed line excludes the area where E1 does not surpass 15% of T_E. The thin dashed line indicates the region where a domination of E1 over E2 is supposed.

f If we are to interpret the facts as they are presented above, we may proceed from either one of two hypotheses:

1 E1 gradually developed from D2 in a normal way. E2 originated from E1 and is its synchronous neighbour.

2 Throughout the Tiefstich pottery area, the spirit of the age created the style-phases which compose the Early Havelte-Ferslev horizon.

Both hypotheses presuppose a difference in mentality between the populations in the E1 and E2 regions which was expressed in the pottery. The E1 area especially was the scene of the flowering of the D style, the still little-known local variants of which were grouped by Sprockhoff (1938) under the term 'Emsland Style' (section 2.12). Although this style was also current in a large part of the later E2 area, it does not appear to have reached the Veluwe, so that in the D period there must have been either a depopulation there, or a retarded C style with a very abrupt change in style at the end of it. (Or has it just so happened that archaeological activity there has failed to reveal any D settlements? I find that possibility difficult to accept.)

Hypothesis 1 might lead us to infer a certain 'frontier mentality', the mentality of colonisers or emigrants, which was expressed in the pottery. Such population groups which are detached from their homeland often tend to accomplish things in their new country that, due to adverse forces, had remained unrealised in their native country (Groenman 1953; Kaelas 1967, p. 319). We do know that a fairly independent pottery style, E2, developed, but is it possible that, outside the Veluwe too, new blood revitalized the population, or that some revival or other resulted in a desire to be different from the makers of the (E1 + E2) pottery? And that this resulted in an expression in E2 of trends still slumbering in (E1 + E2)?

There is no evidence of a demographic change in northern and western Drente, for there is an abundance of D pottery there. Neither is there evidence of a fundamental contrast between the (E1 + E2) and the E2 areas, from, for example, the distribution of the knob-butted battle-axes or from the degree of relationship between E2 and E1 (which is far stronger than the contrasts).

For this reason the picture outlined above is presumably too black and white and the half-moon-shaped area of E2 breaks up into several diffuse groups which merge into one another, and this will also be the case with (E1 + E2). Knöll (1959) drew, for instance, attention to the so-called 'Wechte tureens', E1 shoulder pots (fig. 33:5, 8) which were amply represented in WECHTE 1 and 2, but scarcely anywhere else.

In its more general application, hypothesis 2 would seem to be more satisfactory for the time being. We should note that apparently there was a different response to impulses of 'the new era'. Perhaps in the later E2 distribution area the Emsland Style had become so little compatible with the spirit of the population that E could immediately develop faster. In the Emsland Style area proper, people submitted less rapidly, or at least there was a preference for regarding the new as a supplement to the old, so that all sorts of transitional shapes evolved.

It will be clear how many indispensible data are still missing before anything can be said with reasonable certainty on this sort of question. Only additional catalogueing can help to refine the rigid sequence model (which I had to take in this book as a starting point) to arrive at a diachronous geography of pottery dialects and an assessment of the intercommunication from the extent of pottery trade. What has complicated the issue up to now – the differing ratios E1:E2 which have been established for amphorae on the one hand and bowls on the other – could have been caused by, among other things, a selective production of the pottery types for sale.

We have not really progressed very much beyond the points reached by Van Giffen (1927) (cf. section 2.8).

6.7 INFLUENCES OF THE GLOBULAR AMPHORA CULTURE ON E-POTTERY?

Åberg (1916), Van Giffen (1927) and I (1967) have pointed out the strong similarity between the amphora of the Uddel facies (E2) (e.g. figs 34:1-2; figs. B16-20) and the tall, flat-bottomed 'Kujavian Amphora' of the Globular Amphora culture (KAK). Kujavian Amphorae are known from the entire KAK area (Wiślański 1966, plate II, maps 5-6), and there is little chronological evidence against this construction. Since the KAK is closely related to, perhaps largely rooted in, the TRB culture – Becker (1961a) even included the KAK in the TRB family – there are sometimes striking similarities in shape, pattern of ornamentation etc. between the two amphorae and other pots as well. But the KAK, like the eastern TRB pottery has screw-driver impressions and no stab-and-drag, or tvaerstik, as in the Tiefstich pottery. And the rope impressions of the KAK are not present on the western TRB pottery. There are other differences. Moreover, a KAK specimen which strongly resembles Uddel is frequently associated with totally different-looking specimens. There is, therefore, no reason at all to interpret the E2 facies as the pottery of KAK settlers, and nobody has suggested this. This is not to deny that the interpretations presented in the preceding section of the structure of the E-horizon necessitates a reorientation of our views concerning the idea of KAK influences.

Still impressed by the sometimes strikingly strong similarity between KAK and E pottery, I would like to suggest a tentative solution.

Whenever a certain art-style develops, it tends to absorb elements from other styles, from other areas and other periods, but only in so far as they suit the current vogue. To a slight extent, the character of the current style is altered by this process.

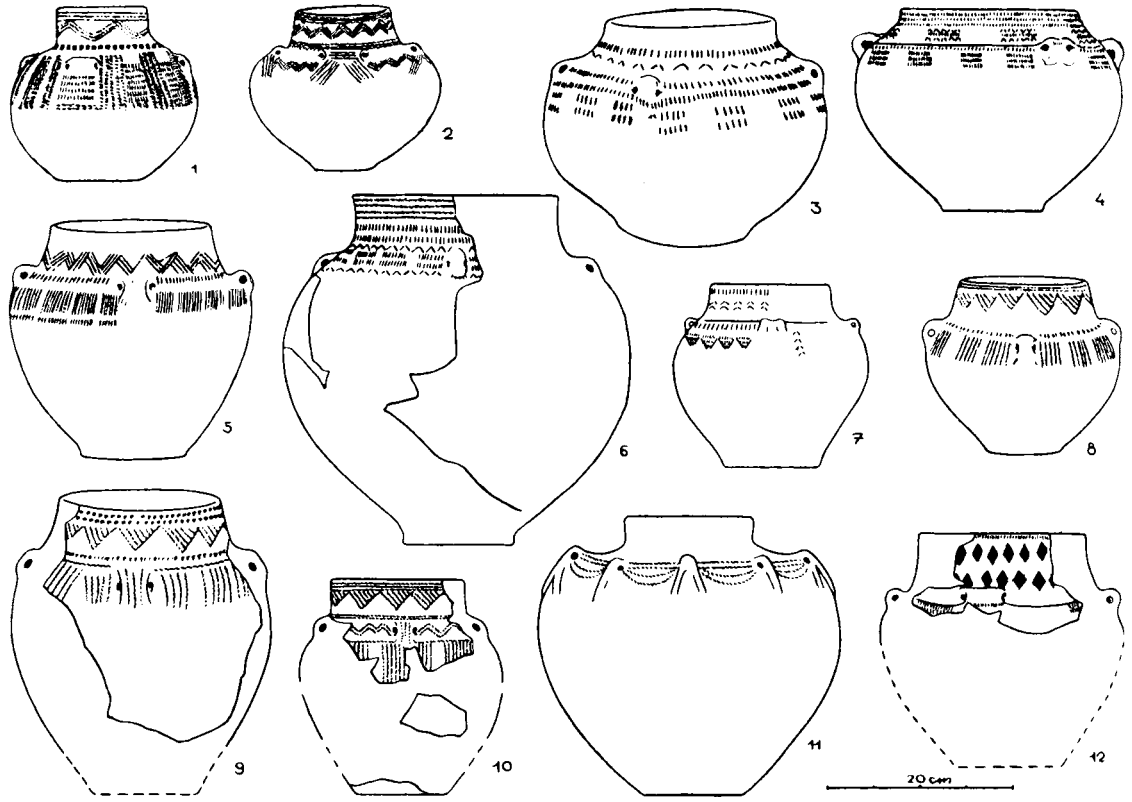


FIG. 72 Some Polish 'Kuyavian' amphorae of the Globular Amphora Culture, according to Nosek (1967, plate 4). Scale 1:8.

It is quite possible that at some time a few KAK pots of the Kujavian amphora type happened to reach the West. These could then have been a factor in the development of the Uddel and other E pottery. The patterns of the ornamentation could then have been partially adopted from the KAK to the extent that they were compatible with the local sense of style which had been determined by tradition and contemporary taste. In this process, the KAK ornamentations were translated into the local techniques of ornamentation.

The possibility of the reverse having been the case would seem less likely in view of the fact that the KAK distribution area is many times greater than that of the E facies.

In summary, it seems extremely unlikely that pure coincidence could account for two synchronous types of pot being so similar. I would accept that this implies the supposition of a diffusion of artefacts over hundreds of kilometres. Perhaps some people would like to maintain that contemporary taste could entirely account for it, but in view of the differing ways in which the contemporary style was applied to the related synchronous Ferslev and late Walternienburg pottery, I am of the opinion that some imported Kujavian amphorae did provide an impulse to the E style. It will probably never be possible, however, to advance archaeological proof for this idea.

6.8. MIDDLE HAVELTE (F), LATE HAVELTE (G), EGK AND THEIR CHRONOLOGICAL RELATIONSHIP TO THE DANISH TRB SEQUENCE

During the time when the writing of this book was in progress, I also collaborated with J.D. van der Waals on an article on these subjects (Bakker & Van der Waals 1969; 1973 (text dates from 1971)). The reader is referred to this article, and also to the relevant material on phases F and G in Chapters 3-4. With the assemblages of DENEKAMP and ANGELSLO, grave 14 (Appendix B1 and B4, fig. B21) as a starting point, the archaeological inventory of Late Havelte and its typochronological position in the Danish dating system was discussed.

Continuing from Knöll's observations, it was possible to discover assemblages of phase G in northwest Germany, such as LEER-WESTERHAMMRICH,[22] GELLENERDEICH and DÜMMER-N (for Dümmer-N, cf. Bakker & Van der Waals 1973, n. 42).

In Holstein, a typical Late Havelte pot in a local MN V context at WOLKENWEHE provided the anticipated geographical link with the MN V pottery of southern Scandinavia.[23]

Late Havelte is represented in the Drente hunebeds and flat graves, as well as in the settlement at ANGELSLO (description in Bakker & Van der Waals 1973) as a very characteristic style-group, with a wealth of specimens and types (including collared flasks!).

The synchronisation of Late Havelte-Store Valby (MN V), defended earlier on typological grounds (Bakker 1962; Van der Waals 1964a), was con-

firmed in 1971 with the publication of Danish C14 dates for the MN V, which agreed with the Dutch C14 datings for Late Havelte (Tauber 1970; cf. 6.9).

In Chapters 2-4, we have already discussed the arguments which led to our distinguishing a Middle Havelte phase (F) as a pottery group occupying a mid-way position between Early and Late Havelte. It is found in many Drente hunebeds, although in small numbers, which could be due to the absence of an accurate knowledge of this part of the TRB sequence and of good criteria for the identification of Middle Havelte. The custom of cremating the dead which was recognised by Van der Waals (1964a) as a general feature of the Late Havelte phase can also be observed in Middle Havelte, as was shown by the find from WESTRUPER HEIDE (Knöll 1959, K41: 14-16). The pottery from this site, however, bears more resemblance to Early Havelte than the material generally included in Middle Havelte.

Van der Waals (in Bakker & Van der Waals 1969, 1973); J.N. Lanting, W.G. Mook & J.D. van der Waals (1973); Lanting (1973a) and Lanting & Van der Waals (1976) contributed important Dutch data towards an improvement in C.J. Becker's chronological scheme for the MN in Denmark and neighbouring areas (fig. 13).
Lanting, Mook and Van der Waals first placed the C14 dated EGK and LN assemblages from Netherland in chronotypological order on the basis of the assumed sequences of beakers and battle-axes, after which the accompanying C14 datings were presented graphically. The resulting typological sequences look plausible, and cannot be shrugged away even by those who abhor C14 datings as an aid. Certain trends in burial rites reinforce the argument.
Moreover, the initial stages (up to the arrival of 21a Bell Beakers of maritime type) of the typological sequence: Protruding Foot Beaker (PFB) 1a → 1e → Zigzag (ZZ) Beakers → All Over Ornamented (AOO) Beakers → 'true' Bell Beakers (BB) 21a → 21f → Barbed Wire Beakers (BWB) are largely confirmed by the stratigraphy of the shell middens at AARTSWOUD, gem. Hoogwoud (information W. Glasbergen; the excavation of these middens with PFB, ZZ and AOO beakers is still in progress).
Flint daggers imported from LE GRAND PRESSIGNY (Central France) are known from 17 assemblages containing 1d or 1e PFB's, ZZ beakers, or AOO beakers, but not the preceding 1a-1c PFB's or the succeeding true Bell Beakers (Lanting & Van der Waals 1976).
In graves containing Grand-Pressigny daggers and 1d PFB's or ZZ beakers, H battle-axes or a related local type of battle-axe occur, but not in graves with 21Ib AOO beakers. The earlier types, A1, A3, B, C and D, of Glob's battle-axe series (1944) are associated in the West with 1a and 1d PFB's. The later K battle-axes are associated exclusively with true Bell Beakers.

Among the flint daggers imported from Denmark, type I (Lomborg 1973) was found several times in late BB contexts in Netherland and Germany, and 'type I or II' once. In Lomborg's opinion, type I is characteristic of the LN A and type II of the LN B. There was one case of a Barbed Wire Beaker being found with a dagger of type II (Lanting & Van der Waals 1976; Lanting 1973a).
Without the use of C14 data, Lanting and Van der Waals (1976) have synchronised the information from Netherland and West Germany with that from Denmark. They applied Glob's chronological system (1944) 'on a more generalising level, and rather to give an approximation of the relative date of groups of phenomena and not of individual objects'. I refer the reader to their painstaking arguments and state only some of their conclusions here (cf. fig. 73):
1 PFB is synchronous with the Under Grave and Ground Grave Periods.
2 AOO beakers and Grand-Pressigny daggers are synchronous with the Ground Grave Period,
3 the maritime type of Bell Beaker (21a) appeared late in the Ground Grave Period,
4 late Bell Beakers continued into the Late Neolithic A and probably the beginning of the LN B,
5 Barbed Wire beakers, which succeeded the late Bell Beakers in the West, started in the LN B.

With regard to the chronological position of these beaker sequences in relation to the TRB sequences, the occurrence of a sherd of a 1a PFB in TRB grave 14 at ANGELSLO is significant (fig. B21). The grave contained not only a complete collared flask but also several sherds of Middle Havelte and Late Havelte pottery (fig. B21:4-7). What apparently happened was that some older sherds which belonged to the TRB phases G and F and to one 1a PFB ended up in a cremation grave of phase G containing a collared flask as a burial gift. Some branches were burned during the burial, the carbonized remains of which were found in a fairly well-preserved state. The C14 dating (GrN-5070), 2150 ± 30 BC, is the latest C14 dating for the West Group of the TRB culture. This is, relatively speaking, strong evidence, since it was a branch or narrow beam that was dated, not a thick trunk with centuries-old wood at the centre. If this dating is compared with the C14 datings of Beaker assemblages published by Lanting and Van der Waals (1976) and Davidsen (1974, fig. 3), then the end of the TRB culture in Netherland would appear to have come just before or at about the time of the transition between the Under Grave and Ground Grave Periods.
As far as the beginning of the Beaker series is concerned, a considerable number of C14 datings have become available in Netherland for 1a PFB's and A battle-axes; the earliest among them are c. 2450 BC. It appears that the 1a PFB remained in use for a long time alongside later PFB types. This is indicated not only by the C14 datings but also by the occurrence of the 1a PFB sherd in TRB G grave 14 at AN-

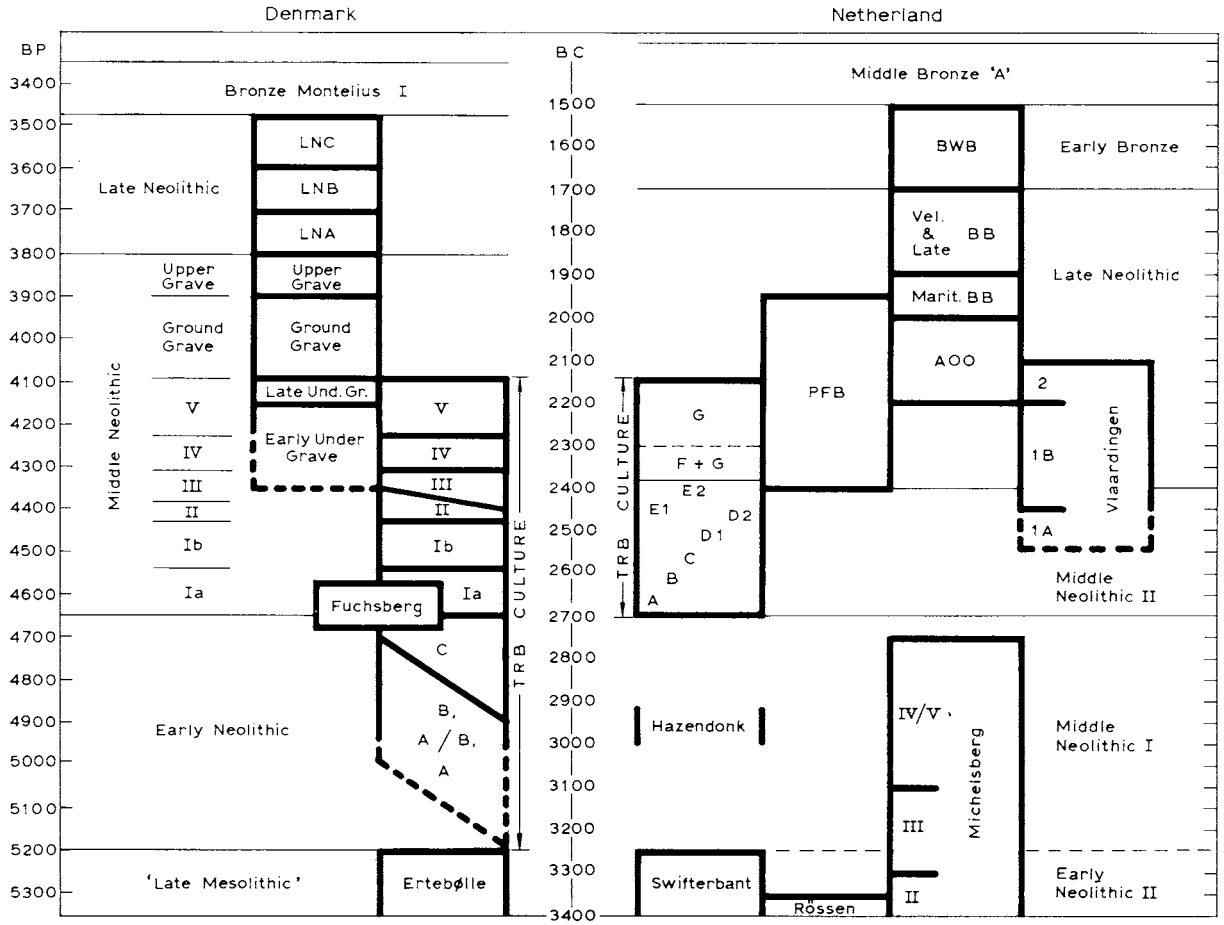


FIG. 73 Conventional C14 chronology table for TRB and EGK periods in Denmark and Netherland. Some other prehistoric cultures are also given. The left and right hand columns indicate the local subdivisions of the period. Note that only the Danish Early, Middle and Late Neolithic are applied in this book. The E2/F+G boundary has been situated somewhat later than fig. 75 would suggest in order to allow for the typochronological synchronisation of E with MN III.
The diagram is based mainly on sections 6.8-9, fig. 75 and Lanting & Mook 1977. The periodisation for Netherland in the diagram is a variant of the one given by Lanting. The EN/MN boundary for Netherland is shifted from c. 5300 BP (Lanting) to c. 5200 BP. Besides, the EN could be subdivided into EN I (c. 6400–c. 6000 BP, including the Linear Bandkeramik) and EN II (c. 6000 BP – c. 5200 BP, including Grossgartach, Rössen, Epi-Rössen, Swifterbant, Michelsberg I-II and Ertebølle). The Dutch MN was subdivided into MN I and II, with the boundary c. 4650 BP, at the supposed start of Drouwen A, synchronous to the start of the Danish MN Ia.

Some other observations can be made. (1) Whereas prehistorians have stressed the necessity to date prehistoric periods by the first appearance of new cultures, phases, etc. (e.g. De periodisering van de Nederlandse prehistorie, *Berichten ROB* 1965-66, p. 7-11), it is often easier to collect a sufficient number of reliable C14 dates for the last occurrence of such features than for their start (cf. schemes by Lanting & Mook 1977). (2) By sketching the archaeological cross-datings discussed in section 6.9 in the above diagram it can easily be shown that this chronological framework is still rather shaky. (3) These uncertainties are, however, very small in comparison with those of a quarter of a century ago.

GELSLO. The C14 datings of the TRB culture (section 6.9) available from Denmark and Netherland do not contradict Becker's hypothesis that the earliest Beakers (earliest EGK) should be dated in the MN III.
Becker's chronological scheme (fig. 13) can be provisionally altered accordingly (fig. 73). Between TRB MN V (Store Valby) and the LN A yawns a chasm of something like three centuries. A chronological subdivision of the MN into the TRB MN I-V, followed by the EGK Ground Grave and Upper Grave periods would seem to be necessary. On the basis of the flint daggers, the Danish LN can be subdivided after Lomborg (1973) into LN A-C, after which the Bronze Age Period Montelius I follows.

Independent of the studies by Van der Waals c.s., two conflicting views on this question developed in Denmark. On the basis of Copenhagen C14 data, H. Tauber (1970, 1972) concluded that the end of the TRB culture had been long before the end of the

MN. Influenced apparently by the fact that he had no C14 datings of the typologically earliest EGK assemblages at his disposal, he also concluded that the periods of the EGK and late TRB did not overlap in time. The Dutch and Danish series of C14 datings are calibrated in the same way and are also perfectly comparable on archaeological-typological grounds. As was mentioned above, the Dutch data do indicate an overlap between late TRB and early EGK. The earliest EGK C14 datings in Netherland are about two centuries older than the earliest known from Denmark.
E. Lomborg's attitude (verbal communication 1972) to Bakker and Van der Waals' Moesgård paper (1969) was initially extremely sceptical, but his own research (Lomborg 1973) later made him come to the conclusion that the TRB MN V must have ended a long time before the start of the LN, in which he found strong EGK traditions but no TRB traditions. The regional groups of the LN corresponded with those of the EGK, not with the TRB groups in Denmark.

Diametrically opposed to this is the opinion of K. Ebbesen (1975), and, with some reservations, that of C. J. Becker (1973a, n. 109). Both ignore C14 datings in their arguments. Ebbesen came to the conclusion that Knöll's entire sequence took place in the MN Ia-III. Ebbesen's knowledge of phase G apparently derived mainly from the literature references mentioned by E. Schlicht (1968, p. 45), from which list Kat-van Hulten (1947) and Van der Waals (1964a) are missing. The fact that he mentioned (p. 256, n. 38) undecorated pottery from the E2-settlement at ANLO in this connection, suggests that he was unaware of the existence of the F+G settlement near ANGELSLO and the G earth graves there and elsewhere (Van der Waals 1964a).
Together with the incorrect selection of undecorated pottery placed by Knöll at the end of phase 2 (section 3.1), Ebbesen dismissed the genuine Late Havelte pottery; according to him, a synchronisation of Late Havelte and Store Valby 'is based on a mistaken idea of what really constitutes the special character of the MN V pottery'.
Ebbesen also defended Becker's opinion that the MN V continued up to the LN. He disputed Lomborg's counter-arguments in a post-script; although no closed finds were known of EGK assemblages of the Upper Grave Period and Store Valby, the contact finds of the Pitted Ware and the Globular Amphora cultures in southern Scandinavia necessitated such a synchronisation. Unlike Lomborg, he did see TRB traditions in the secondary use of TRB megalithic graves during the LN. He disputed Lomborg's chronological arguments.
Although Ebbesen made no mention of ANGELSLO-grave 14, its assemblage could have provided a nice confirmation of his ideas ('Late Havelte = early EGK = MN III') and it is understandable that the C14 datings, which argue for a synchronisation Late Havelte = MN V and a gap between MN V and LN, were not considered to conform with this picture. Although a lack of detailed knowledge prevents me from contesting the arguments of Lomborg and Ebbesen concerning older traditions in the Danish LN (to me, Ebbesen's argument about the LN secondary interments in passage graves does not appear to hold water), it is my opinion that the Dutch arguments presented above are quite convincing, even if C14 datings are left out of consideration. I see no necessity to derive the LN pottery, which lacks any great variety of shapes (Ebbesen 1975, fig. 201), from TRB shapes: the EGK could have produced them as well, if these primitive shapes did not develop independently.
Late Havelte – an extensive pottery group, with a rich variety of shapes – does display a characteristic style in Drente and the surrounding area, which is not identical with Store Valby on the Danish islands. But several of the features which are, according to Ebbesen, characteristic of the latter group can be traced to the former (e.g. Ebbesen 1973, fig. 86:5 without carved rim; preference for *Trichterschalen;* lip-handles; lack of ornamentation).
When Ebbesen (1975, p. 256-257) correlated Knölls phase 2 (1959) with the MN III, he meant primarily Early Havelte (E), and this correlation agrees with mine (MN III-IV). The present book should make it difficult to deny that Late Havelte (G) succeeded E as an independent phase. They should thus be placed in the MN IV-V. The incertainties remaining about typological horizons (cf. introduction of 6.1) do not contradict the fact that, in the West, G belonged to the same 'style of the age' (*Zeitstil)* as the Store Valby style and similar styles in Schleswig-Holstein and, perhaps, Mecklenburg.
In a discussion of Lomborg's 1973 book, Lomborg's views about a chronological gap between the end of the TRB culture and the end of the MN were not contested by a number of colleagues, but Ebbesen attacked them extremely vigorously (Lomborg et al. 1975).

As mentioned above, the C14 datings in Denmark and Netherland confirm the existence of a chasm between the end of the TRB MN V and the beginning of the LN. K. Davidsen (1974) reached the same conclusion, independent of Dutch research, for Denmark. Recently (1977), Davidsen compared the relevant data in both countries. Although he finds too little similarity for a synchronisation of Late Havelte and Store Valby on typological grounds, the C14 data confirm, also in his opinion, that both style horizons were mainly simultaneous. Seven Jutish stratigraphies prove that the EGK is, essentially, later than the Valby phase. Davidsen supposes an overlap of the EGK Under Grave Period with the TRB MN V only and dismisses the possibility of a pre-MN V EGK in Denmark, where the earliest C14 datings for the EGK Under Grave Period begin c. 2230 BC (ENGEDAL, average of 2190 ± 85 BC (K-2500) and 2290 ± 90 BC (K-

2501); Jørgensen 1977, p. 243). Davidsen (1977, p. 73) considers the much earlier Dutch datings for 1a PFB assemblages (Lanting & Van der Waals 1976, Table III) as 'anomalous'.
Yet, one cannot reason the latter datings so easily away. The A battle-axe and the Corded Ware amphora from VLAARDINGEN derive from the occupation layer of the Vlaardingen culture. This layer, which was firmly dated between c. 2460 (t.p.q.) and c. 2240 BC (see Lanting & Van der Waals 1976; Altena et al. 1962 and Groenman-van Waateringe & Jansma 1969 for detailed data) also contained the Vlaardingen collared flasks and the (two-)holed clay discs described above (section 3.4.4). There are no indications of another settlement on this spot until the arrival of maritime Bell Beaker people (c. 1940 BC), who built here a hut in a totally different landscape. The fragments of the battle-axe were found upon the natural levee (where the Vlaardingen, the intermediate 'sterile' and the Bell Beaker layers converged), but part of the sherds of the amphora derive from the Vlaardingen layer deep in the creek bed, where they are safely separated from later deposits.
So, the Vlaardingen data indicate an arrival of the Corded Ware not after c. 2240 BC, and probably around 2350, where the main habitation falls according to most of the datings. Whereas the ANLO and HIJKEN I datings (c. 2545 and 2470 BC, see Lanting & Van der Waals 1976, table III) may be several decades too old because the charcoal samples may have been taken from ancient parts of the burnt wood, this is not so for the VLAARDINGEN series of C14 datings, where the greater part of the dated samples were taken from the outermost ten (or less) year-rings of wooden posts or trunks.
Taking all C14 evidence together, the arrival of the Corded Ware in Netherland can be dated c. 2400 BC. As soon as more samples from the Early Under Grave Period have become available, similarly early datings can be expected from Denmark!

6.9 FURTHER SYNCHRONISATION OF THE SEQUENCE OF THE WEST GROUP WITH THE NORTH GROUP AND WITH SOME OTHER CULTURES

Fig. 74 gives a sketch of the *similarity of the ceramic features* of the West and the North Group Pottery sequences.[24] Apart from the possible imperfections in both the sequences and an increasing divergence between them in their second halves, there is yet another reason for the vagueness of this sketch: *a 'phase' means two different things in the two systems.* Whereas a pilot type can occur in more than one phase in the Danish system, it is characteristic of only one particular phase in the Western system. In the latter, two 'phases' (pilot-type horizons) are frequently represented in one closed find (fig. 18). The vagueness of fig. 74 could probably be largely clarified by representing phases A-G as overlapping each other.

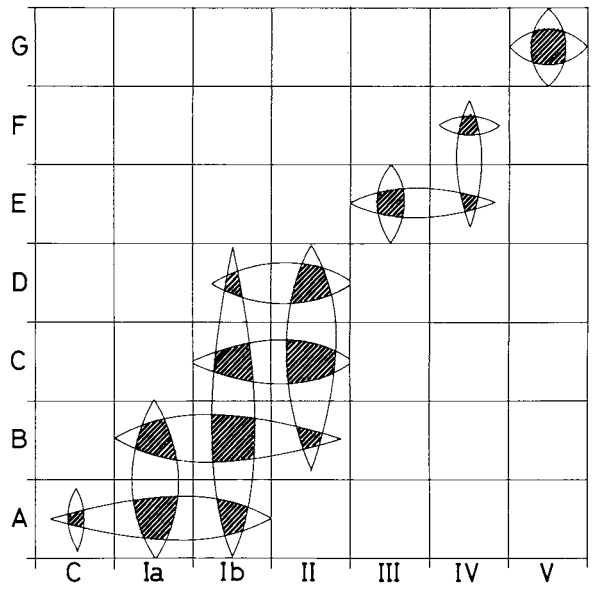


FIG. 74 Sketch (1973) of the similarities between the phases A-G of the West Group and those of the North Group. The drawing is very 'impressionistic', but the diffuseness is also due to the different principles of both sequences (see text).

Cross-dating by means of imported specimens found in closed finds of the West Group and deriving from other TRB Groups or other cultures, or by means of clear typological similarities, is far too rarely possible to be a means of overcoming the objections still attached to style horizons:

1 The jug (fig. 28:7) from TANNENHAUSEN, which appears to originate in the Altmark Group (Chapter 4) does not offer much illumination since so little is known about the typochronology of the Altmark Group, and because the inventory of the megalithic grave concerned includes a series of pottery phases of the West Group (starting with B).

2 An MN richly ornamented lugged beaker from the same pair of megalithic graves is, in my opinion (Bakker 1970), an import from Schleswig-Holstein (HUSUM area), since the long impressions of whipped cord are characteristic of that area (cf. Schwabedissen 1953, plate 1g) but unique in the West Group. Here, too, its context makes the specimen useless for cross-dating.

3 The shape of the pedestalled bowl from HAINMÜHLEN II (fig. 25:18) found in Drouwen D1-2 context is characteristic for the Langeland MN II (section 3.4.5). It has D tvaerstik-line ornamentation. It is impossible to say whether the specimen was made locally or imported, but this is not a crucial objection since the temple in which it was found would also appear to indicate direct contacts with the North Group.

4 Danish 'Old Type' thin-butted thick-bladed flint axes with rectangular cross-section occur fairly regularly in the West in A(?), B and B+C contexts. In Denmark they were made during the EN B-C and the MN Ia-II (section 5.3.1).

5 If it is possible to interpret the thick-bladed flint axe with rectangular cross-section from Grave II at OLDENDORF (fig. 64) as an imported Bundsø axe (section 5.3.2), this would bridge the chronological gap between phase C at Oldendorf and the very earliest occurrence of the Bundsø axe in Denmark (MN III, perhaps sporadically as early as the MN II: Becker 1973, p. 127; see section 5.3.2).

6 Strangely enough, something similar is the case with the Lindø-type flint axe (fig. B15:25) which was found in LANDERSUM in a D2 context. The pottery style here, too, seems to point to an earlier date than the currency period of this type of axe in Denmark (MN IV-V) (section 5.3.3).

7 The Viervitz axlet (fig. B13:6) in grave 'a' at ZEIJEN is not very helpful since the period in which these axes were manufactured in the Meuse area (not to mention any other location) was of long duration and our present knowledge about it is not very precise (section 5.4.3).

8 The same situation exists for the 'Vlaardingen axe' (fig. B21:4) from the phase G grave in DENEKAMP, which was imported from the Meuse area (section 5.4.2).

9 The high-drawn handles of several C tureens east of the Weser have derived from the Baden culture, phase Neustupný C (1973; note 6:15).

10 One is tempted to interpret the analogies in shape and decoration of the amphorae of the E2 facies and of the Globular Amphora culture (section 6.7) as an indication of simultaneousness.

11 The remains of a pot with folded-out, finger-impressed rim in the megalithic grave EMMEN-D43 (fig. 23, sections 3.4.1 and 6.3) might be ascribed to the Michelsberg culture. Similar rims are a normal feature in that culture during phases II-V of Lüning (1967, folded plate 5). The EMMEN-D43 monument was constructed in the Drouwen B period, i.e. in the MN I. It remained in use during the following style phases, up to and including the E phase, c. MN III (fig. 19; Chapter 7). Lüning's chronological table (1967, p. 175) has Michelsberg IV and V coinciding with MN I and II, respectively, and does not, therefore, conflict with this teleconnection. This point needs further consideration, because there are no acceptable Michelsberg C14 dates known after c. 2750 BC (Lanting & Mook 1977), which is rather early for Drouwen. Besides, the distance from the known distribution area of MK IV-V to Emmen is considerable. No other suitable culture has, however, presented itself, in the present state of research.

12 The sherd of a 1a corded Protruding Foot Beaker in a phase G grave containing also an admixture of sherds of phases F and G, at ANGELSLO (fig. B21), is important enough (Bakker & Van der Waals 1973; this volume, Appendix B1 and section 6.8). If we dismiss the possibility that the beaker sherd is a later intrusion into this assemblage by some animal burrow, as there is nothing to indicate this (Van der Waals, loc. cit.), this assemblage proves that the 1a PFB is earlier than the end of phase G and that it probably is contemporary with the early stage of phase G when F pottery was still in fashion. The assemblage is definitely later than the E2 phase, at the end of which F pottery had developed. There is, on the other hand, nothing to suggest that the 1a PFB from this grave had been one of the first EGK beakers made in this country; the first 1a PFB's may have been made during the E2 stage, as a few C14 datings seem to suggest (see below).

13 One of the clay discs from a destroyed dolmen in the BOGNAESGÅRD, at Herslev in Zealand (Ebbesen 1975, fig. 253:2) has been a subject of bold telesynchronisations. E. Šturms (1956) saw influences in it from KAK amber discs. Ebbesen (1975, p. 230) added that such amber discs are also found in Złota contexts and accepted Šturms' theory. J.J. Butler (1963), followed by P.V. Glob (1965), compared the disc to very similar golden discs from County WEXFORD, Ireland, which have two depressions in the centre, like the Bognaesgård disc. Davidsen (1973, p. 34-36) saw in this feature just a variant of the single depression or the group of more than two depressions in the centre of North Group MN I-II TRB baking plates. Ebbesen (l.c.) opposed this by citing the fine workmanship of the Bognaesgård disc, which was according to him exceptional for TRB discs.
Butler (private communication 1976) sees in the two central depressions of the Bognaesgård disc reason enough to stick to his original theory. He dated the Wexford discs, which were found without associations, to the Bell Beaker period according to the 'gold button caps' in the grave assemblage of MERE DOWN, Wiltshire (Clarke 1970, fig. 130). The beaker from this grave was assigned by Lanting and Van der Waals (1972, fig. 3) to Step 2 (c. 1950-1850 BC) of their British Bell Beaker series. This clearly is too late for a TRB connection. In my view, this telesynchronisation is too far-fetched in both meanings of the word, even if one argues that the Wexford discs were one or two centuries older as gold button caps were also found in a grave at FARLEIGH WICK, Wiltshire. This grave contained a beaker not unlike a Dutch 1d PF beaker (Clarke 1970, p. 94-95, fig. 259). If one is prepared to accept this (no other PFB's are known from Britain!), one could force a date just early enough for the gold button

caps to be simultaneous with the latest Danish TRB phase (MN V). But the ornament of the Farleigh Wick button caps is different from that of the Wexford and Bognaesgård discs.

Radiocarbon dating. For the North Group, a large number of C14 datings are now available from Scandinavia (Table IV, fig. 75). I owe several very essential, not yet published dates to N.H. Andersen and K. Davidsen. The datings show the possibilities and the limitations of the method. The degree of overlap between the data for the subsequent periods is just what can be expected if the average time differences between those periods are smaller than the standard deviations of the datings.
Still, one observes that the datings for the MN I spread much less than those for the EN and the MN V.
For the latter period, the datings for VESTER ÅRUP and DOROTHEALUND pose insolvable problems (Davidsen 1974). In each site several samples from one pit with only Store Valby pottery have been dated. For V. Årup the (mean values of the) datings span no less than 350 years (tree-ring calibration would extend this to 490 years according to Clark 1975, table 8). The oldest sample consisted of a mixture of charcoal from poplar, alder and oak and it can hardly have been so much older than the bones from which the two youngest datings derive. The suggestion of systematic differences between the measurements of charcoal and bone samples which this instance may imply is not affirmed by the other datings in the table (bone samples give 'normal' results). The time range of the other associated samples is less than 190 years in thirteen cases. In seven cases it is even less than 100 years. Two datings for pit N at DOROTHEALUND have a mutual age difference of 10 years, but they are 3-400 years too old for the associated pottery. Davidsen assumes, in his English summary, that a very old oak tree (or beam) was burned, but is much less confident of this in his Danish text.[25]
The spread and overlap of the datings for EN A-C are considerable. Skaarup (1974) who has discussed these datings recently (cf. note 6) left open the possibility of partly erroneous typological criteria, or of synchronous functional or cultural differences, but added that this problem is still poorly understood. Prof. Schwabedissen's many unpublished data from his EN research in ROSENHOF and elsewhere in Schleswig-Holstein can perhaps shed light upon this problem (lecture Walternienburg-Bernburg symposium Halle 1977).
Lomborg (1975) has shown that the mean values of the Danish C14 datings of Table IV 'make up a nice numerical sequence (. .), the earlier datings always being followed-up by the later datings'. Ottaway's quartile method (1973c) can also be applied to demonstrate this effect. But it does little to help us see exactly where the boundary lines between subsequent periods have to be drawn. The 'too old' datings for the MN V, for instance, force the interquartile range for that period too far back.
There is no standard procedure to construct the boundary lines; it is done haphazardly. For the following I have given most credit to the youngest dates from a group of associated datings (cf. Waterbolk 1971). In fig. 75 the estimated boundary lines of the different periods are given. Because I have neglected the statistical uncertainty in these estimations, the ranges of the subsequent periods often overlap to a certain degree; but it is worth considering that regional differences in the introduction of the new pottery styles may also have been a factor (N.H. Andersen, letter 10.11.1977). Another factor may be slight differences in typological interpretation between the experts.

My estimations for the different periods in South Scandinavia are:

(Ceramic Ertebølle: begin c. 37/3600, end c. 32/3100 BC according to S.H. Andersen 1974, p. 106.)

EN A, B, A/B: begin c. 3250 or c. 3060 BC, end c. 2760 BC.

EN C: c. 3010(?) to c. 2700 or 2670 BC.

Fuchsberg: c. 2740(?) to c. 2630 BC. The date for FUCHSBERG itself (39) seems too old. Because reliable MN Ia dates are lacking, the turn of EN to MN can best be defined by the end date of EN C. Danish Fuchsberg belongs then, at least partly, to the beginning MN, which is also the opinion of T. Madsen, N.H. Andersen and K. Davidsen, but contradicts the date of final EN C given in the previous pages to the Haassel-Fuchsberg style.

MN I: The FOULUM (or Fovlum) cult house could not be more precisely dated than to MN I on the basis of two funnel beakers (Becker 1973b, p. 78). The pottery from the HERRUP cult house comprised clear MN Ib pottery such as an angular tureen with pendant hatched triangles on the shoulder (Becker 1969). One shoulder pot was, however, recognised by Becker (1973b, fig. 4, p. 78) as representing an earlier stylistic tradition. He suggested a MN Ia date for it and remarked that it was found, together with the sherds of another pot, among the packing stones of a roof post and might therefore represent the oldest specimen of the assemblage. The other pot was not illustrated or described.
When Jørgensen (1977) found similar early looking pottery among the grave goods and offerings in and at the entrance of the HAGEBROGÅRD passage grave (1977, figs. 26:167/172, 167/168, 144/146) he included this into a Hagebrogård style. Several other pots from the grave display similar features, but a tureen with pendant hatched triangles on the shoulder (Jørgensen 1977, fig. 26:172) dates from MN Ib according to traditional typological standards. Part

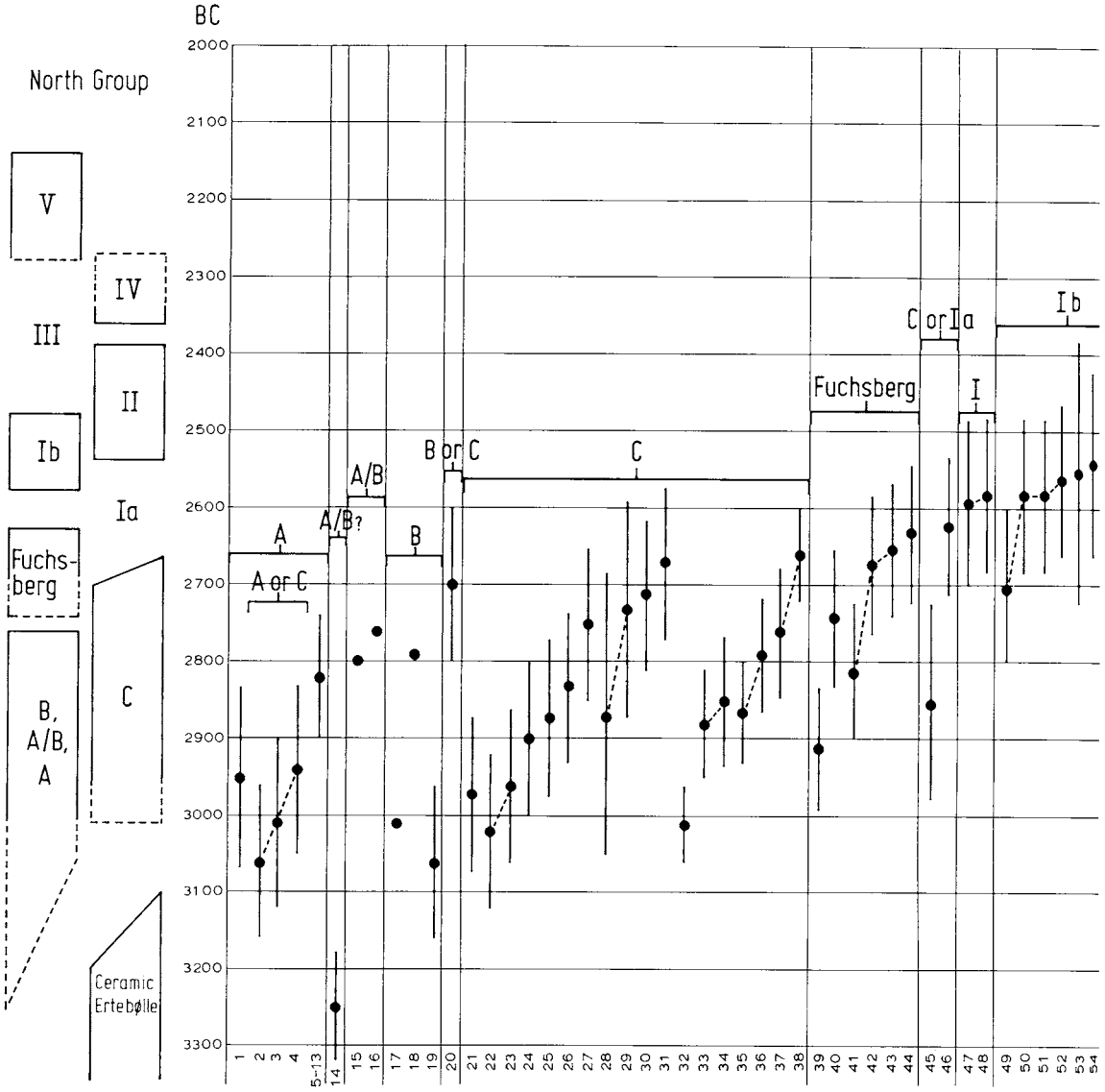


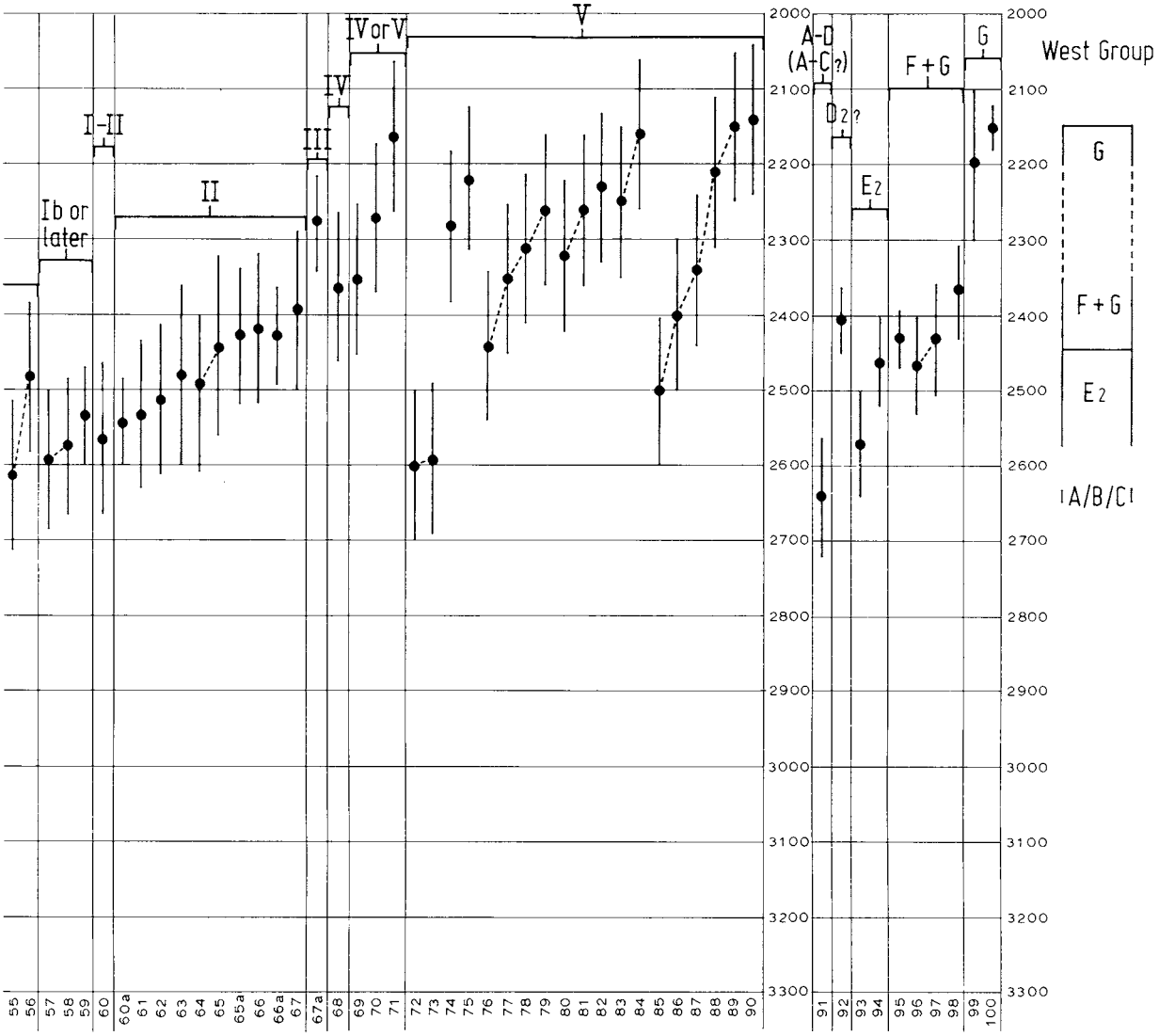
FIG. 75 Conventional C14 datings of the TRB North Group in southern Scandinavia and Schleswig-Holstein (Table IV) and of the West Group in Netherland (text). The range of the datings for the subsequent phases has been sketched in the left and right hand columns.

of the other pottery might also be dated to this period (cf. Berg's discussion (1951) of the KLINTEBAKKE, SKOVTOFTE and MYREBJERG assemblages), for instance the angular jugs and tureens (figs. 27:150, 174, 150, 176, 177). One tureen (fig. 27:150) reminds one of West Group pottery like figs. 29:1, B4:2, B13:33 and B14:20a. The famous Hagebrogård vessel itself (Jørgensen 1977, fig. 26:25) also belongs to this category.

Jørgensen (p. 204) concluded, however, that the Hagebrogård passage grave was used only for about three interments at the beginning of period MN I (i.e. in MN Ia) and all the pottery would be as early as that. The idea that pendant triangle tureens with angular shoulders occurred already in MN Ia would unsettle the accepted MN Ia and Ib typology completely.

Acceptance of Becker's MN Ia dating of the HERRUP-HAGEBROGÅRD shoulder pots while rejecting Jørgensen's MN Ia dating for the triangle-tureens would, however, also have far-reaching consequences. The Hagebrogård passage grave – and the STENDIS passage grave with its similar pot (section 5.6.2.2) – would then belong to the MN Ia, thus rejecting the axiom developed in the 1950's (e.g. Kaelas 1967 and accepted elsewhere in this volume) that the earliest passage graves date from MN Ib. The Herrup-Hagebrogård-Stendis shoulder pots indeed give an 'early' impression and it will be interesting to see if this view will be accepted by the other North Group specialists. (The Limfjord area often showed new developments in megalithic grave architecture according to Aner 1963).

On the other hand, one could, in my opinion, reverse the argument to say that the Hagebrogård shoulder pots were typologically retarded as com-



pared to Langeland typochronology, and an MN Ib prelude to Ferslev shapes.

Relevant here is also the discussion of the date of the earliest FERSLEV and TUSTRUP cult house pottery. Kjaerum (1967) dated the former group to the MN Ib, but shifted this date later (1969, note 24) to MN II. Davidsen (1977, note 34) went further along this line and proposed to date the whole Tustrup assemblage to MN II instead of Ib.

Evidently there is a need for well-established typological criteria for the Jutish early MN ceramics. Of course, the results of this typological discussion have their implications for the assignment of the MN I-II radiocarbon datings to either of the periods. The rather arbitrary arrangement in Table IV shows a compact group (49-59) for MN Ib from c. 2560 to c. 2480 BC. The range of c. 2700 to 2550 BC is available for MN Ia, because Troldebjerg followed upon EN C in the greater part of Denmark, where Fuchsberg was absent.

MN II: the period would be sandwiched between c. 2540 and c. 2390 BC, according to the, so far unpublished, SARUP datings (61, 67), for 'early' and 'late II' respectively, which N.H. Andersen has very kindly put at my disposal. The still more recently determined dates for Sarup, 65a and 66a, which I also owe to Andersen, confirm this impression. Only the charred grain associated with the late-II pottery of dating 66a gave a date which was 60 years earlier than the bone associated to similar late-II pottery of dating 67. Date 66a is the average of two datings, 2460±90 and 2450±90 BC.

MN III: no datings available, but see below.

MN IV: the ØSTER RISTOFT and VROUE 6 dates (68-69) suggest at least the range of c. 2360 to c. 2350 BC (!). If the Cologne date for DANNAU (67a) is precisely comparable with the Copenhagen dates, the period may have ended c. 2270 BC. But MN IVB pottery was not illustrated from the site (Hoika

TABLE IV C14 datings of the TRB North Group in southern Scandinavia and Schleswig-Holstein. The subsequent columns present:
a serial number, cf. fig. 73
b locality and sample name
c material of sample: 1 wood, 2 moss, 3 oak wood, no sap wood, 4 charred grain, 5 bark, 6 bone, 7 hazelnuts, 8 sea shells. Otherwise charcoal.
d laboratory code
e conventional age BC
f references
g typochronological age of associated finds.
R means *Radiocarbon*. Braces comprise more datings of samples from one pit, construction, thin settlement layer, etc.

a	b	c	d	e	f	g
1	Värby V22		KN-103	2950±120	Salomonsson 1970	A
2	Praestelyngen	1	K-1473	3060±100	R5, 1973, p. 96	A (or C)
3	Praestelyngen	1	K-1650	3010±110	R5, 1973, p. 96	A (or C)
4	Praestelyngen	2	K-1651	2940±110	R5, 1973, p. 96	A (or C) (t.a.q.)
5	Muldbjerg		K-123	2730±120	Tauber 1956, Skaarup 1975	t.p.q. for A
6	Muldbjerg		K-129	2990±160	Tauber 1956, Skaarup 1975	A
7	Muldbjerg		K-128	2960±160	Tauber 1956, Skaarup 1975	A
8	Muldbjerg		K-126	2930±170	Tauber 1956, Skaarup 1975	A
9	Muldbjerg		K-125	2890±170	Tauber 1956, Skaarup 1975	A
10	Muldbjerg		K-132	2710±150	Tauber 1956, Skaarup 1975	A
11	Muldbjerg		K-131	2660±150	Tauber 1956, Skaarup 1975	A
12	Muldbjerg		K-124	2650±170	Tauber 1956, Skaarup 1975	A
13	Muldbjerg		K-127	2900±120	Tauber 1956, Skaarup 1975	t.a.q. for A
14	Rosenhof		KN-	3250± 70	Schwabedissen 1972	A/B?
15	Norsminde		K-	2800	Skaarup 1975	A/B
16	Norsminde		K-	2760	Skaarup 1975	A/B
17	Norsminde		K-	3010	Skaarup 1975	B
18	Norsminde		K-	2790	Skaarup 1975	B
19	Lindebjerg		K-1695	3060±100	R15, 1973, p. 96	B
20	Sølager II		K-1724	2700±100	Skaarup 1973	B or C
21	Rustrup II		K-2255	2970±100	Fischer 1975	C
22	Rustrup I		K-2254	3020±100	Fischer 1975	C
23	Rustrup I		K-2253	2960±100	Fischer 1975	C
24	Konens Høj		K-919	2900±100	R10, 1968, p. 304	C
25	Värby 65		Lu-10	2870±100	R10, 1968, p. 46	C
26	Svenstorp		Lu-12	2830±100	R10, 1968, p. 47	C
27	Hagestad 98: 1A		Lu-1349	2750± 65	Hulthén 1977, p. 81	C
28	Vätteryd 2		U-47	2870±180	R1, 1959, p. 97	C
29	Vätteryd 1		U-46	2730±140	R1, 1959, p. 97	C
30	Vroue 2		K-2424	2710±100	Jørgensen 1977	C
31	Lohals		K-	2670±100	Skaarup 1975, n. 204a	C
32	Südensee-Damm		Y-472	3010± 50	Lanting & Mook 1977	C
33	Südensee-Damm	1	KN-667	2880± 70	Lanting & Mook 1977	C
34	Südensee-Damm	1	GrN-6592	2850± 85	Lanting & Mook 1977	C
35	Südensee-Damm	1	GrN-6589	2865± 65	Lanting & Mook 1977	C
36	Südensee-Damm	1	KN-138	2790± 75	Lanting & Mook 1977	C
37	Südensee-Damm	1	GrN-6591	2760± 85	Lanting & Mook 1977	C
38	Südensee-Damm	1	KN-666	2660± 60	Lanting & Mook 1977	C
39	Fuchsberg		KN-	2910± 80	Lanting & Mook 1977	Fuchsberg
40	Sarup A310		K-2629	2740± 90	letter N.H. Andersen 10.11.1977	Fuchsberg
41	Sarup A307	3	K-2632	2810± 90	letter N.H. Andersen 10.11.1977	Fuchsberg
42	Sarup A307	3	K-2631	2670± 90	letter N.H. Andersen 10.11.1977	Fuchsberg
43	Sarup A307	3	K-2630	2650± 90	letter N.H. Andersen 10.11.1977	Fuchsberg
44	Sarup A212	4	K-2628	2630± 70	Andersen 1976	Fuchsberg
45	Heberg		St-3310	2050±130	Strömberg 1968, p. 203	C or Ia
46	Vroue 3		K-1566	2620±100	Jørgensen 1977	C or Ia
47	Foulum		K-1601	2590±110	R15, 1973, p. 98	I
48	Foulum		K-1602	2580±100	R15, 1973, p. 98	I
49	Herrup XXVI		K-1766	2700±100	R15, 1973, p. 98-99, Becker 1969, 1973	Ib
50	Herrup XXVI		K-1768	2580±100	R15, 1973, p. 98-99, Becker 1969, 1973	Ib
51	Herrup XXVI	5	K-1769	2580±100	R15, 1973, p. 98-99, Becker 1969, 1973	Ib
52	Herrup XXVI		K-1767	2560±100	R15, 1973, p. 98-99, Becker 1969, 1973	Ib
53	Jörlanda (Lindesbjerg)		St-1838	2550±170	R9, 1967, p. 418	Ib
54	Katbjerg (Jordhøj)	5	K-978	2540±120	R8, 1966, p. 228	Ib

55	Vroue 5		K-1568	2610±100	Jørgensen 1977	Ib
56	Vroue 4		K-1567	2480±100	Jørgensen 1977	Ib
57	Ramshög	6	Lu-257	2590± 90	R12, 1970, p. 551, Strömberg 1968, p. 203	Ib or later
58	Ramshög	6	Lu-276	2570± 90	R12, 1970, p. 551, Strömberg 1968, p. 203	Ib or later
59	Ramshög	6	Lu-278	2530± 65	R12, 1970, p. 551, Strömberg 1968, p. 203	Ib or later
60	Lånum II		K-1771	2560±100	R15, 1973, p. 99	I-II
60a	Sütel		H-922-1283	2540± 60	Hoika 1971	II
61	Sarup A617	7	K-2767	2530± 90	letter N.H. Andersen 10.11.1977	II (early)
62	Vindinge C		K-2127	2510±100	Lund Hansen 1972, letter K. Davidsen 9.7.1977	II
63	Ferslev		K-717	2480±120	R6, 1964, p. 218, Kjaerum 1969, note 24	II
64	Tustrup		K-727	2490±120	R6, 1964, p. 218, Davidsen 1973, note 34	II
65	Tustrup		K-718	2440±120	R6, 1964, p. 218, Davidsen 1973, note 34	II
65a	Sarup A1019	4	K-2910	2450± 90	letter N.H. Andersen 10.4.1978	II
66	Vindinge 1		K-2128	2440±100	(see 62)	II
66a	Sarup A856	4	K-2911	2450± 65	letter N.H. Andersen 10.4.1978	II (late)
67	Sarup A80	6	K-2766	2390±105	letter N.H. Andersen 10.11.1977	II (late)
67a	Dannau		KN-506	2270± 60	Hoika 1971	III-IV
68	Ø. Ristoft XIV		K-1789	2360±100	Davidsen 1974	IV
69	Vroue 6		K-1571	2350±100	Jørgensen 1977	IV or V
70	Vroue 9		K-2426	2270±100	Jørgensen 1977	V or IV
71	Vroue 10		K-2427	2160±100	Jørgensen 1977	V or IV
72	Dorothealund N		K-2432	2600±100	Davidsen 1974	V
73	Dorothealund N		K-2430	2590±100	Davidsen 1974	V
74	Vroue 7		K-1572	2280±100	Jørgensen 1977	V
75	Dorothealund E		K-2429	2270±100	Davidsen 1974	V
76	Lidsø		K-2270	2440±100	Davidsen 1974	V
77	Lidsø		K-2272	2350±100	Davidsen 1974	V
78	Lidsø		K-2269	2310±100	Davidsen 1974	V
79	Lidsø		K-2271	2260±100	Davidsen 1974	V
80	Vroue 11		K-1573	2320±100	Jørgensen 1977	V
81	Vroue 12		K-1574	2260±100	Jørgensen 1977	V
82	Vroue 8		K-2425	2230±100	Jørgensen 1977	V
83	Dorothealund C		K-2275	2250±100	Davidsen 1974	V
84	Dorothealund C		K-2273	2160±100	Davidsen 1974	V
85	V. Årup		K-1982	2500±100	Davidsen 1974	V
86	V. Årup	8	K-1931	2400±100	Davidsen 1974	V
87	V. Årup	8	K-1930	2340±100	Davidsen 1974	V
88	V. Årup	6	K-1983	2210±100	Davidsen 1974	V
89	V. Årup	6	K-1932	2150±100	Davidsen 1974	V
90	Kornerup	6	K-2115	2140±100	Davidsen 1974	V

NB the typochronological arrangement of the datings is according to very different sources and the sequence may, therefore, not be consistent with any of the present – often conflicting – expert opinions!

RINGKLOSTER, uppermost layer, K-1654 (Skaarup 1975, n. 269; R15, 1973, p. 94) does not concern 'TRB EN A and B (+ Ertebølle?)', but Ceramic Ertebølle only (S.H. Andersen 1974, p. 82 and passim).

1971), although it is found in the surroundings (Ebbesen 1975, p. 134, notes 526-527).

MN V: end date c. 2140 BC, beginning c. 2280 (?) BC.

More measurements will show a further precision of these dates.[26] Most probably the so far neglected effect of statistical uncertainty upon the period boundary lines estimated above may then be compensated by averageing the overlapping datings for subsequent periods. But geographical differences will also have to be taken into account.

As was discussed in section 6.8, the oldest known date for the EGK in Denmark is c. 2230 BC (therefore within MN V), but several Dutch datings suggest, also for Jutland, a beginning of the Corded Ware/EGK about 2400 BC. This coincides with the 'unknown' stretch of the Danish TRB C14 datings, corresponding to the MN III-IV. Becker suggested in 1954, on quite different grounds, that the EGK started in Denmark in the MN III (fig. 13), and this may turn out to be sustained by radiocarbon datings.

Only a very short list of C14 datings is available for the West Group:[27]

(91) ODOORN-D32, GrN-2226: 2640 ± 80 BC; charcoal found by Van Giffen 'in and above' a grave or a sacrificial pit in front of the entrance to hunebed D32. According to Van Giffen (1961a), the pit was intersected by the foundation pit of the side stone Z3'. However, the distance from this stone to the C14-dated pit can not have been so large. There is a possibility that there have been two passage side stones, P1 and P1', and the foundation of P1' may

just have cut through the C14-dated pit. The latter interpretation is 'at least debatable and in our opinion even incorrect', according to Lanting & Mook (1977). The published illustrations suggest that 18-19th century stone-robbers' holes have disturbed the stratigraphy for the greater part. The C14-dated pit contained two funnel beakers of different size. Their shapes (I.1/2 and I.2) were current during the Drouwen phases A-D, but the fact that the shapes I.3 and I.4 are not represented might suggest a dating to phases A-C. *Radiocarbon* 5, 1963, p. 177; Van Giffen 1961a; Lanting & Mook 1977.

(92) ANGELSLO, GrN-5103: 2405 ± 45 BC; scattered charcoal (find nr. 455) from the filling of the horse-shoe shaped pit of an uprooted tree (cf. Kooi 1974) in which TRB sherds also occurred. Nearby horse-shoe shaped pits also contained TRB sherds (nrs. 453, 454 and 456). The whole forms a homogeneous pottery collection, belonging to phase D2, but Lanting & Mook (1977) concluded that it is by no means certain that the charcoal belongs really to the TRB assemblage. *Radiocarbon* 14, 1972, p. 84 (the C14 date given in *Helinium* 1969, p. 233(52) is wrong); Lanting & Mook (1977).

(93) BEEKHUIZERZAND, GrN-7746: 2570 ± 70 BC; charcoal fragments from a layer of a stream bed containing exclusively E2 pottery sherds from the nearby settlement. 80 cm below present-day surface. Appendix B3; Modderman et al. 1976, p. 73; Lanting & Mook 1977.

(94) ANLO, GrN-1824: 2460 ± 60 BC; charcoal in settlement pit with many E2 sherds. Bakker & Van der Waals 1973, p. 43 (correction of error in *Radiocarbon* 5, 1963, p. 180); Appendix B2; Waterbolk 1960; Lanting & Mook 1977.

(95) GLIMMEN-G2, GrN-6156: 2430 ± 40 BC; small charcoal fragments forming a circle within a subrectangular pit at the foot of the former mound of the destroyed hunebed G2. Charcoal apparently from structural feature belonging to the pit. The pit (a grave or a pit for an offering) contained two pots, one of which can be assigned to phase F (fig. 35:2). The other pot is typical for phase G (but may also have occurred in phase F, which is insufficiently known). Bakker & Van der Waals 1973, fig. 11; Lanting 1975, figs. 2-3; Lanting & Mook 1977.

(96-97) ANGELSLO, settlement pit 5, GrN-4200: 2465 ± 65 BC and GrN-4201: 2430 ± 75 BC. Independent measurements of charcoal from pit with pottery fragments and flints (Bakker & Van der Waals 1973, fig. 6, above). The complete bowl (fig. 36:15) is typical for phase G. No indented foot-rings like the pot base also present in this pit are, however, known from phase G assemblages. They are typical of phases E and F. As phase E is not represented at this site, and because no contact find of phases E and G has ever been recorded, the foot ring must belong to phase F in this case, and the assemblage as a whole to phases F+G. Lanting & Mook 1977.

(98) ANGELSLO, settlement pit 7, GrN-5767: 2365 ± 60 BC; the filling of this pit was dark with evenly spread, fine charcoal, the sizeable fragments of which were dated. The probability of association of charcoal and artefacts in the pit was rated 'high' (Lanting & Van der Waals 1976, p. 39). The artefacts (Bakker & Van der Waals 1973, fig. 7) can be assigned to phase G, although the pair of lug-handles from an unornamented pail-like pot are unknown from G assemblages and may, perhaps, be assigned to phase F. Lanting & Mook 1977.

(99) ANGELSLO, flat grave 3, GrN-2370: 2195 ± 100 BC. Small fragments of charcoal from the filling of a grave with a cremation and the vessels figs. 36:6 and 14 and an unornamented necked bowl (Bakker & Van der Waals 1973, fig. 5), all typical for phase G. Bakker & Van der Waals 1973; Lanting & Mook 1977.

(100) ANGELSLO, flat grave 14, GrN-5070: 2150 ± 30 BC. Charred sticks or narrow beams in a pit with cremations and pottery (fig. B21). This assemblage is discussed in Appendix B1 and above in this section. The only complete pot from the pit, a burned collared flask, is certainly associated to the charcoal which was dated. This charcoal may derive from any part of the charred beams (if they were not sticks) and the date may therefore eventually be a few decennia earlier than the date of the interment. The sherds in the grave (phases F + G + one 1a PFB sherd) are earlier than the date of the interment and the fire, and probably also earlier than the age of the C14 dating.

These datings are too few in number to allow a detailed comparison with the North Group.
The ODOORN dating corroborates the typological synchronisation of Drouwen A-C with MN I.
The ANGELSLO date (92) seems too late for D2.
The GLIMMEN and ANGELSLO dates (95-97) suggest that E2 has ended c. 2440 BC. As comparative typology and cross-datings indicate a contemporaneity of MN III and phase E, this would imply that MN III was well in existence before this date. Although no MN III dates are available from Scandinavia (table IV and fig. 75), the known MN Ib and MN II datings would suggest, however, a somewhat later date for MN III. One can think now of the following solutions for this problem: a) our estimate of the position of period III in fig. 75 is imperfect because we neglected the standard deviations, or because III datings are lacking; b) P. Kjaerum (1967) has suggested that III (Ferslev) pottery has succeeded Ib pottery immediately in N. Jutland, i.e. just there where many of the Ib radiocarbon samples derive from; c) there may be slight systematic differences between the age measurements of the

Groningen and Copenhagen C14 laboratories, d) there may be 'wiggles in the calibration curve' (see below) just here. For this moment it is difficult to decide from what combination of factors this slight difficulty has resulted.
The datings associated with G pottery indicate an end c. 2150 BC for the TRB culture, which agrees perfectly well with the Danish datings for the MN V. Curiously enough, they seem to display the same tendency of 'starting too early' as the Danish MN V datings. The C14 dates and the little that is known about the typology of the F pottery suggest that the E period was followed by a period in which F+G pottery occurred together and which was succeeded (c. 2300 BC?) by a period with G pottery only.

Fig. 73 is a revision of part of Becker's scheme (1954a, 1959) of the chronological relations in Neolithic Denmark. Contemporaneous TRB and EGK phases west of the Elbe have been added. The diagram is based upon the above-mentioned data (typological and C14) and upon the cited studies by Lomborg (1975), Lanting (1973a), Lanting & Van der Waals (1976) and Lanting & Mook (1977). The C14 dates given are approximate and do *not* show the absolute lengths of the different periods.

This brings us to *the problem of dendrochronological calibration of conventional radiocarbon dates to calendar years*. Since the precise form of the calibration curve has not yet been explored (and probably will not be for another five years), and since calibrated C14 dates will automatically have a larger standard deviation than the conventional ones, I have used the conventional, uncalibrated dates (as published in *Radiocarbon)* throughout this book. They provide the best readily available implement to ascertain the age of prehistoric phenomena relative to each other, and the time tables for large areas based upon them are independent from style horizons (which may not be horizontal).
Thus, for instance, the following purely archaeological synchronisations could be controlled: the Wiórek/Lubon boundary is synchronous to the EN/MN boundary (just as expected by Jażdżewski), but the pottery of the S.E. Group starts in the EN and not in the MN II as expected by the same author. One is now also able to state that the Pfyn Group is synchronous to the Danish EN (C) (Bakker, Vogel & Wiślański 1969).
So, I would like to suggest exactly the opposite of U. Fischer's exclamation that 'C14 is the end of archaeology' (Walternienburg-Bernburg Symposium, Halle 1977). C14 dating may then be 'a slightly blunt instrument, while calibration (. .) in fact blunts it further' (Snodgrass 1975), but it is an instrument. Fischer meant, of course, that the short-term fluctuations in the calibration curves – especially in Suess' curve which was drawn with 'cosmic Schwung' – seem to indicate that C14 datings often do *not* give the correct relative sequence of things. This would be a very serious draw-back indeed, however, it is a short-term problem and the main order of the datings is not affected.
The present controversies about such 'wiggles' or 'kinks' are inherent to the uncertainty about the precise shape of the curve. Waterbolk (1973) could only fit the NIEDERWIL C14 datings (Pfyn Group) to Munaut's floating tree-ring calendar for this site by using Suess' calibration curve (including one wiggle). In the 1973 version of this book I have also tried to explain the configuration of the then known C14 datings of fig. 75 by a comparison to the Suess curve.
When seen by itself only, the spacing of the C14 datings in fig. 75 strongly suggests indeed that 'wiggles in the calibration curve' (in reality: fluctuations in the original C14 content in living matter) have caused a compression of the C14 calendar around 2400 BC and an extension of it before and after that period. But an argument against this may be the rather compact group of C14 datings from VLAARDINGEN which was discussed in the preceding section. These datings (c. 2460-2240 BC) are situated on a stretch of possible extension of the C14 calendar, but their time range is not obviously much longer than the habitation period one would expect for this site on impressionistic archaeological grounds (repeatedly rebuilding of houses etc.).
McKerrel (1975) recognised several of Suess' wiggles after having averaged all available tree-ring C14 correction dates across fifty-year intervals, but Clark (1976) found after another detailed analysis of the calibration curve (1975) 'that either the true calibration curve contains no genuine kinks, or that any such kinks are swamped by the measurement errors', so that there is, 'at present, insufficient evidence to properly specify even the location of such kinks, let alone their magnitude'. J.N. Lanting and Van der Waals (verbal communications 1975-77) did not, in fact, find indications of disturbance in the sequence of Beaker C14 datings (seriated according to beaker and battle-axe typologies) on those places where the Suess curve shows short-term fluctuations. The fact that the C14 dates for the PF Beakers fluctuate over a considerable amount of time (c. 2450-1950 BC) was interpreted by the same authors (1976, p. 36) as owing to 'a considerable overlap in time and restricted sequence dating value' of the PFB types.[28]

CHAPTER 7

Dating the megalithic architecture of the West Group against the pottery sequence

'The oldest form of the passage graves, which consisted of a rectangular chamber with three capstones and a short passage, signals the general arrival in the Ems area of the megalithic culture from Holstein. (. .) Within a short time, presumably, these short chambers no longer fulfilled the requirements of their builders, and so the chambers were made continuously longer and longer.'

This supposition of Sprockhoff's (1938, p. 32; 1930) will concern us in this chapter. It was later defended by Aner (1968; 1951). Presumably it had been developed by generations of researchers before Sprockhoff, since it agrees with Montelius' and Müller's chronological sequences of types of megalithic graves of the North Group, and Van Giffen (1927), too, has worked on the problem.
Several elements were combined in the hypothesis:

i In the whole area of the West Group, and also in the southern periphery of the North Group (Schleswig-Holstein and parts of Mecklenburg), we find the same T-shaped plan, with a short passage (0-2 pairs of side stones) and a 3-8 metre long rectangular chamber with 2-6 pairs of side stones. The fact that the passage is always so short, together with the predominant rectangularity of the chamber, are fundamental differences with the passage graves in the rest of the North Group, which have a long passage and a tendency towards an elliptically-shaped chamber (Nordman 1935, p. 83).

ii West of the Weser, much longer chambers are found alongside the short ones. The length of the passage does not increase, but the chamber sometimes reaches the extreme length of 27 or 28 m, with c. 16 pairs of side stones (Sprockhoff 1938, figs. 50-51). In order of chamber length, they apparently form a regular series from small to large, so that the notion of a gradual development is a plausible one.
We saw however (section 2.8) that, in spite of all his efforts, Van Giffen (1927, p. 454-455) was not able to prove this from the pottery which was found in the Drente hunebeds. In this connection, he tried in vain to demonstrate a contrast between Drouwen (A-D) and Havelte (E-G) in the grave inventories of the short and long chambers.
Whereas, at least as far as Drente is concerned, the short chambers were situated in round or oval barrows without a peristalith (*) or in a peristalithic long barrow, the longer chambers were often provided with a kidney-shaped peristalith around the barrow. This peristalith was not circular as was the case in the North, where the passage is often very long. The difference is based, not only on the short passage, but also on the omission of the semi-circle of the barrow behind the chamber which, in the case of the northern *jaettestuer* (*), contains 'nothing'.

iii The Dani-fugal theories on the expansion of the TRB Tiefstich pottery culture are compatible with the spread of the short passage graves from Schleswig-Holstein to the West, a theory which was supported by Sprockhoff and Aner. In this connection, we already noted that the oldest artefacts from the western hunebeds strongly resemble those of the MN I in Schleswig-Holstein and southern Denmark.

iv Nordman (1935, p. 86), however, advanced the theory of a simultaneous development of the short hunebeds in the West and the Northern jaettestuer from impulses from the Atlantic megalithic area which 'attacked the Dutch-German-Danish megalithic areas on a broad front, from Holland to the northern point of Jutland.' We have already seen that Kaelas (1955) showed that the earliest pottery from the western hunebeds is typochronologically older than that from the North Group jaettestuer. Now that her dating has had to be brought forward from the EN C to the MN Ia (section 6.1), the difference with the MN Ib dating of the oldest Scandinavian T-shaped passage graves[1] has become somewhat less pronounced.
One could maintain, not altogether without reason, that the difference in style of pottery horizons between the West and North Groups still does not necessarily imply a time gap, or else, that the difference in time between Troldebjerg and Klintebakke is partly open to dispute. There are still insufficient C14 datings available for the West Group for additional objective support, although it is clear that

there is absolutely no non-megalith-typological support for the theory preferred by Sprockhoff and Aner of the seniority of the 'Holstein chambers'. However, their theory is not necessarily wrong; the expansion might have developed so rapidly that it is impossible for us to measure it, so that the correctness of Nordman's view would also remain impossible to prove. But the cradle of the innovation of the western passage graves might have been situated elsewhere, either within its own distribution area or outside it (one should consider the possible existence of wooden connecting links which are now difficult to demonstrate).

v The lengthening of the western TRB burial chambers west of the Weser was taken by Nordman (1935, p. 86), Sprockhoff (1938, p. 34), Schrickel (1966) and most other authorities as evidence of contact with the gallery graves in the German Mittelgebirge and France, which in Westphalia-Hessen are adjacent to the area of the hunebeds; there certainly was intensive contact in this area.
Evidence for this, for example, is the presence of Tiefstich pottery in certain gallery graves. The 35-45 metre long(!) chambers of WECHTE 1 and 2 can best be seen as hybrids of the two types of grave since the entrance appears not to have been in the southern long side, but in a short side, as in the gallery graves (Stieren 1929). But the chambers were built, like the hunebeds, of large, erratic boulders and they contained exclusively Tiefstich pottery. We find TRB impulses in the adjacent gallery graves: imported pottery and sometimes a short passage in the northern long side (once with a porthole: Sprockhoff 1938, figs. 74-75).
Pottery does not give us an immediate, clear confirmation of this theory which is plausible in the light of architectural typology. It is not easy to prove that the gallery graves of the Westphalian-Hessian border area are of the same age as the oldest hunebeds, although the C14 age of 2830 ± 60 BC (GrN-4831) for the grave in STEIN (Modderman 1964; a proto-gallery grave with partly wooden construction?) may even suggest some seniority.
Moreover, the oldest TRB pottery in gallery graves cannot be dated very early, viz. Drouwen D. This is the pottery from the phase during which the hunebed builders in Westphalia had moved up as far as the gallery grave area (fig. 38, cf. Knöll 1961); previously, the distance separating them had been greater. Only the gallery grave of SORSUM, Kr. Hildesheim (Schrickel 1966) contained Drouwen C pottery. It is 16 m in length and the entrance is in the long northern wall.

vi The famous *sépultures mégalithiques à entrée latérale* of Brittany (l'Helgouach 1965) offer a less convincing explanation. Taxonomically these are just as much of a problem as the Westphalian-Hessian gallery graves with side entrance and the hunebeds themselves, and they are similar in some respects to the former, in other respects to the latter group. But neither their dating – l'Helgouach estimated 2400-2100 BC – nor their small numbers support the probability of an early impulse for the lengthening of the chambers of the Western hunebeds from this distant corner.

It would appear – and this is quite plausible from a general human point of view – that we are here concerned with processes which are more complicated than would allow description in a simple outline. There was presumably a multiplicity of impulses, so that an either-or discussion does not help us very much. Our knowledge of the succession of events with respect to location and time must be considerably refined before any progress can be made.

PROPORTIONS AND POTTERY DATING OF WESTERN HUNEBEDS

Aner has given a metrical-statistical survey of the Holstein Chambers (1968). This was based on Sprockhoff's *Atlas der Megalithgräber Deutschlands*, Part I (1966) for Schleswig-Holstein and Mecklenburg. Van Giffen's atlas of *De hunebedden in Nederland* (I, 1925) enabled me to give a similar survey of the proportions of the Drente hunebeds and to test this chronologically against the oldest pottery of the hunebed inventories which have been recovered. Drente contains an exceptionally well-preserved sample of megalithic graves which were accurately measured by Van Giffen in 1918 (1925), and earlier, in part, by W.C. Lukis and H. Dryden (1878, drawings with the Society of Antiquaries in London, and in the Assen museum). Furthermore, during the last twenty five years, Van Giffen also established the location of the stones missing from these graves. Moreover, an exceptionally large number of complete hunebed inventories were recovered by himself, Holwerda and a few others. There are, in addition, hunebeds in Drente, Groningen, Friesland and Overijssel which were dismantled in the past, but whose plan can often still be reconstructed.
When the following section was written in 1972, Part III, for Lower Saxony and Westphalia, of Sprockhoff's *Atlas* (1975) was not yet available; the statistical survey for Drente could now be extended by the data for that area from the *Atlas* and by those given by Krause and Schoetensack (1893) for the Altmark.

STATISTICS OF THE PROPORTIONS OF DUTCH HUNEBEDS

Table V and fig. 76 arrange nearly sixty Dutch hunebeds according to internal length and number of pairs of chamber side stones, whether a kidney-shaped peristalith has been established or not, and number of pairs of passage side stones. The two

TABLE V The Dutch hunebeds arranged according to numbers of pairs of side stones and chamber lengths.

First column:
Van Giffen's serial numbers (D's in Drente, G's in Groningen, F in Friesland, O's in Overijssel).
Second column:
chamber length or (*) floor length.
Third column:
N = without peristalith.
P = with peristalith.
Q = peristalithic long barrow (D43).
0, 1, 2 = numbers of pairs of passage side stones.
Fourth column:
references, see Bibliography. For those sources for which the year of publication is given in brackets: see base of Table.

1 pair of side stones: 0			
2 pairs of side stones: 4			
G3	c. 3.2*	No	Lanting 1975
D22	c. 3.2	No	Van Giffen 1925, 1927
D40	3.4	N1	Van Giffen 1925, 1927
D54c	c. 3.7*	No	Van Giffen (1947)
3 pairs of side stones: 4			
D39	3.2	No	Van Giffen 1925, (1966)
D13	3.3	No	Van Giffen 1925, 1943a
D43A	3.4	Q1	Van Giffen 1925, 1962
D6	c. 3.9	N1	Van Giffen 1925
4 pairs of side stones: 14			
D6e	4.8*	No	Van Giffen 1944a
D41	4.5	No	Van Giffen 1925, 1961a
D10	5.0	No	Van Giffen 1925
D24	5.6	N1	Van Giffen 1925, (1966)
D8	5.7	N1	Van Giffen 1925
D25	5.8	No	Van Giffen 1925
D28	5.8	N1	Van Giffen 1925, 1943b
D30	5.9	N1	Van Giffen 1925, 1927
D2	c. 6.0	N1	Van Giffen 1925
D23	c. 6.0	No	Van Giffen 1925, (1966)
D5	6.1	No	Van Giffen 1925
D21	6.1	N1	Van Giffen 1925, 1927
D29	6.3	N1	Van Giffen 1925, (1966)
D7	7.2	N1	Van Giffen 1925
5 pairs of side stones: 15			
F1	4.3*	No	Van Giffen 1927
O1	5.7*	No	Van Giffen 1927
D54b	c. 6.1*	No	Van Giffen (1947)
D47	6.1	No	Van Giffen 1925
D32	6.3	No/1	Van Giffen 1925, 1961a, (1966)
D43B	6.5	Q1	Van Giffen 1925, 1962
D38	6.6	No	Van Giffen 1925, (1966)
D35	6.9	No	Van Giffen 1925
D34	7.1	N1	Van Giffen 1925
D46	7.4	No	Van Giffen 1925
G1	7.6*	N2	Van Giffen 1925, (1957)
D11	7.6	No/1	Van Giffen 1925
D36	7.9	N1	Van Giffen 1925
D54a	c. 8.0*	No	Van Giffen (1949)
D15	8.0	P2	Van Giffen 1925, (1966)
6 pairs of side stones: 7			
D3	9.1	N1	Van Giffen 1925
D37	9.6	No	Van Giffen 1925
D26	9.9	P2	Van Giffen 1925, (1968), (1970)
D20	10.0	P2	Van Giffen 1925, (1966)
D49	10.2	P0	Van Giffen 1925, 1961b
D1	c. 10.3	N1	Van Giffen 1925
G2	c. 12.0*	No?	Lanting 1975
7 pairs of side stones: 5			
D18	10.5	N1	Van Giffen 1925, (1966)
D54	10.7	No	Van Giffen 1925
D51	11.2	N2	Van Giffen 1925, (1966)
D4	12.6	N1	Van Giffen 1925, (1966)
D52	12.7	N1	Van Giffen (1953-54)
8 pairs of side stones: 3			
D17	12.0	N1	Van Giffen 1925, (1966)
D52a	15.3*	N2	Van Giffen 1946
D50	15.6	P2	Van Giffen 1925, (1966)
9 pairs of side stones: 5			
D16	13.8	N1	Van Giffen 1925, (1966)
D19	13.9	N2	Van Giffen 1925, (1966)
D45	15.4	P1/2	Van Giffen 1925, (1966)
D14	15.9	P2	Van Giffen 1925, (1966)
D27	20.0	N2	Van Giffen 1925, (1966)
10 pairs of side stones: 2			
D42	15.8	N2	Van Giffen 1925, 1960
D53	17.0	P2	Van Giffen 1925, 1927

Unpublished sources:
Van Giffen (1947), (1949), (1953-54): Excavation plans Van Giffen in BAI.
Van Giffen (1957): Excavation plan Van Giffen et al. in IPP.
Van Giffen (1966): Plans by C. van Duyn & R. Lutter (ROB) in IPP (copies), made after restorations Van Giffen.
Van Giffen (1968, 1970): Excavation plans by Van Giffen, Bakker & Glasbergen in IPP.
Later addition: According to an unpublished report by Van Giffen to the Minister of CRM dated 27.8.1966, the now much destroyed D42 was once unique for Drente in having a passage of 3 pairs of side stones. Their extraction holes were discovered in 1965. Holes of a removed peristalith – if present – were not mentioned. His other 1966 remark, that D42 was at one time the longest hunebed of Drente, is incorrect (cf. D27, D53, D14).

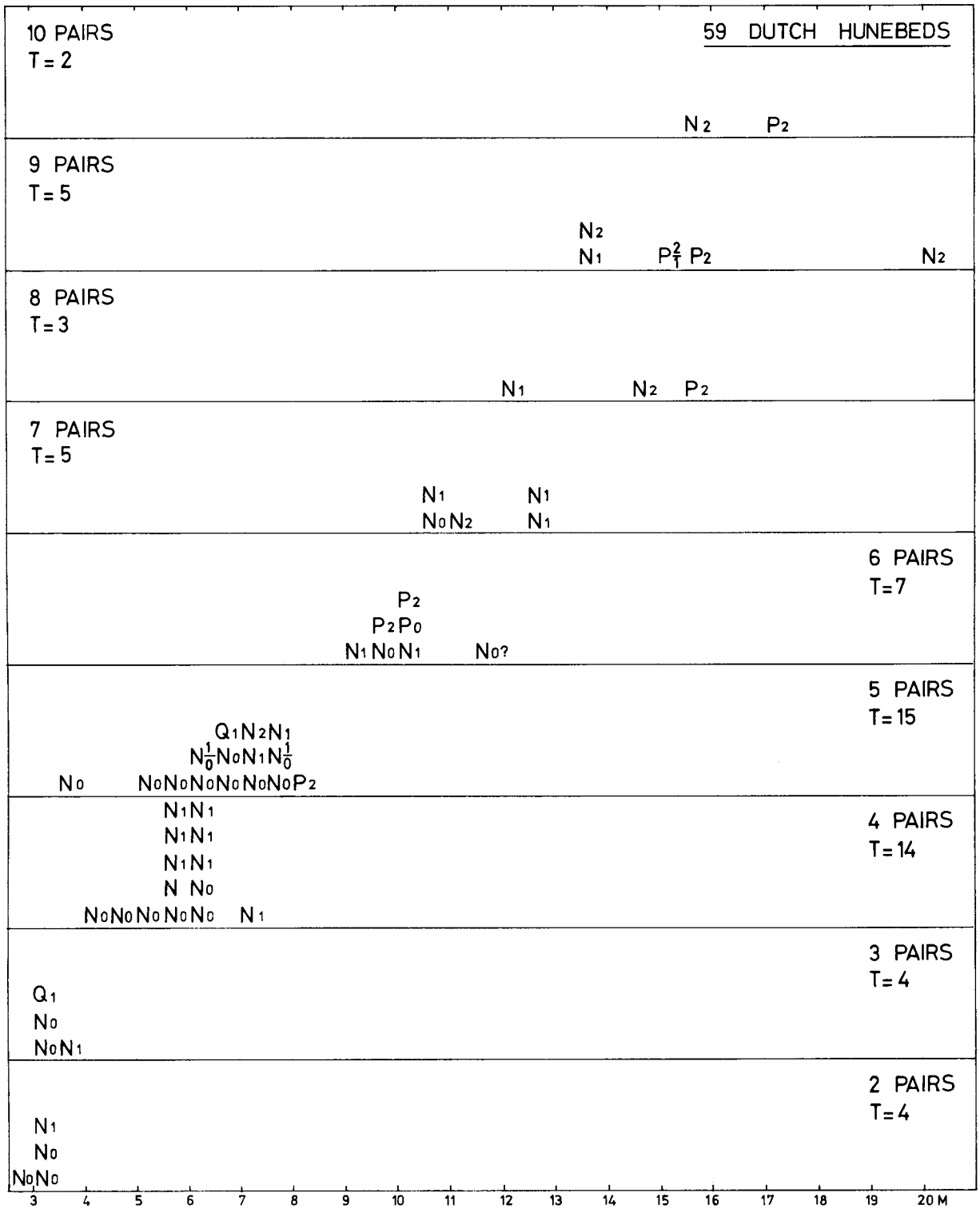


FIG. 76 The Dutch hunebeds ordered according to chamber lengths and number of pairs of side stones.

chambers of the peristalithic long barrow D43 are also included.
The following correction has been introduced in the graph. The chamber length was measured by Van Giffen (1925) at the level of the surface of the soil with which the chamber was filled. Since the end stones of the chamber were usually tilted to the inside, this measurement is rather arbitrary. The floor length would be approximately up to 0.6 m longer. The floor lengths of dismantled hunebeds established by excavation are indicated by asterisks in the table. To enable us to compare these measurements with the chamber lengths, the measurements with asterisk were moved one division to the left in the graph (shortened by a maximum of 50 cm).
Earlier destruction may have resulted in a more or less systematic distortion of the original picture, since the smaller stones of passages and peristaliths could be removed more easily than the large cap and chamber stones. This may have resulted in P2, P1, N2 and N1 having been changed into P1, N2, N1 or N0 (cf. caption of Table V for this code).
During the restorations, Van Giffen reconstructed the old situation as best as he could, and the restored situation has generally been entered in the third column of the table. But if soil erosion had made it impossible to identify positively the extraction holes of some of the missing stones, these were interpolated by Van Giffen. Since I have not been able to read his detailed restoration reports, it may occasionally be possible that the number of passage stones in column 3 is greater than was actually the case.
I would like to mention the following doubtful points as well. No extraction holes of passage stones could be found in PAPELOZE KERK-D49 (Van Giffen 1961b, fig. 8), but the presence of a peristalith makes the probability of their existence very high. For this reason, Van Giffen introduced two pairs of passage stones in his reconstruction. It was equally impossible to conclusively establish the original number of pairs of passage stones in EMMERDENNEN-D45. ODOORN-D32 was regarded by Van Giffen himself as N0, but according to the published drawing of the excavation (Van Giffen 1961a) could perhaps have been N1 (cf. the discussion of C14 date (91) in section 6.9). No extraction holes of passage stones were found in GLIMMEN-G2, but J.N. Lanting (1975) suggested that a soil discolouration indicated the position of one of a pair of passage side stones. It is also difficult to prove the original absence of a peristalith if the periphery of a hunebed has not been completely excavated. There was certainly no peristalith around G2, but this is not certain with WAPSE-D52a (Van Giffen 1946, fig. 1). In his 1961-62 excavations, Van Giffen was able to establish that DROUWEN-D19 had never had a peristalith (Van Giffen & Glasbergen 1964, note 4), contrary to what had been assumed since Holwerda's excavation (Holwerda 1913a, b).[2]

Figs. 76-77 reveal a fairly consistent picture. Understandably there were fewer very large hunebeds built than small ones. We should also bear in mind that the smallest chambers were presumably dismantled to a greater extent than the bigger ones.
Clear confirmation has been obtained for Van Giffen's observation (1925, p. 147) that there is a correlation between long chambers constructed of many stones, kidney-shaped peristaliths and two pairs of passage stones (Group II). The short chambers with no peristalith and with or without one pair of passage side stones also constitute a fairly compact group (I). Here we might also wonder whether the specimens of Group I whose chamber length is longer than 8 m do not represent mutilated specimens of Group II.
There are some indications that the chambers with one pair of passage side stones are, on the average, longer than those with none (which is plausible also because of the somewhat larger barrows of the longer chambers). Without similar graphs for the Lower Saxon hunebeds it is impossible to say whether the chambers which are shorter than 4.5 m represent another separate group.
It will be obvious that Group I can very well be compared with the Holstein Chambers. However, there are slight differences. Aner (1968) pointed out that the 58 specimens from Schleswig-Holstein are 3-8.5 m in length and that 2/3 of them are shorter than 5.5 m. Moreover, some of the Holstein Chambers have two pairs of passage side stones and a peristalith.
The fact that the Holstein Chambers in eastern Holstein are often found in peristalithic long barrows accords well with what the graph shows about our EMMEN-D43. The two chambers of D43 are the only representatives of Group III. As far as chamber length and number of one pair of passage side stones are concerned, they are entirely compatible with Group I.
The graph does suggest that the builders of the hunebeds themselves did not mean to express a rigorous classification by the chamber lengths: the transitions are smooth.

POTTERY DATING (fig. 78)

More or less complete grave inventories from the West Group present indications concerning the building date of the grave. Convincing evidence for prehistoric clearing of the chamber is absent. This, and the large number of funeral gifts in the chamber, as well as the absence of indubitable offerings near the entrance are often fundamental differences between the northern *jaettestuer* and the western hunebeds (P. Kjaerum pointed this out to me).
Another preliminary remark should be made. In his article 'Zur Einheitlichkeit der Hünenbetten' (On the unity or homogeneity of the TRB chambered peristalithic long barrows), Van Giffen (1956) argued that graves of Group III had been composed in

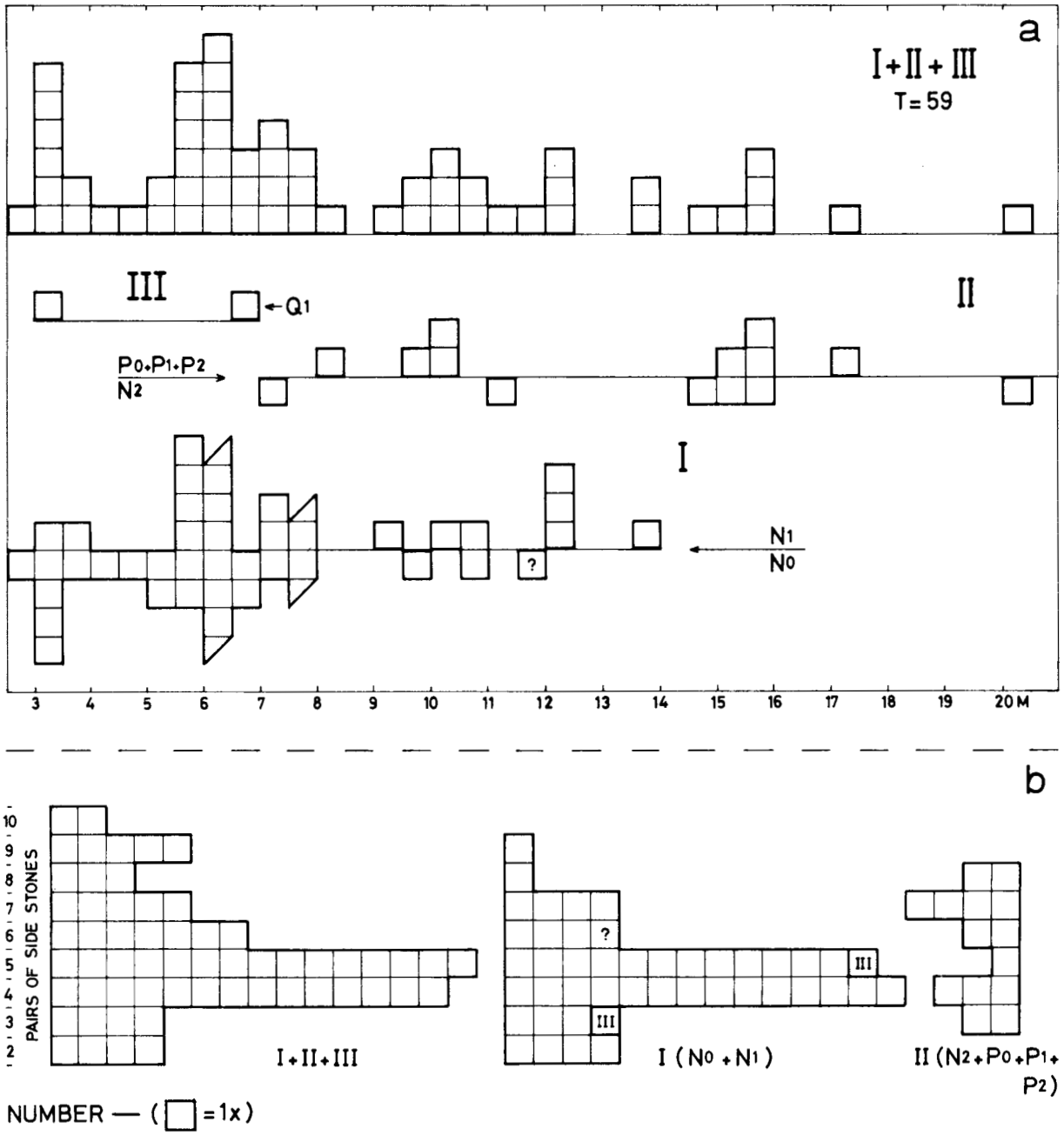


FIG. 77 The hunebeds of fig. 76 arranged according to (a) the chamber length and (b) the number of pairs of side stones. Type groups I-III as taken together and separately.

various stages in the course of many years. There are several arguments in favour of this. D. Liversage (1970) established a complicated multi-phased construction for the oldest known long barrow, at LINDEBJERG in Zealand (EN B), and examples of various other graves in this group were presented by Van Giffen and other authors. It would even appear to be possible that a passage grave was later built into such a barrow.

For EMMEN-D43, Van Giffen showed that the barrow had probably been lengthened later by approximately 6 metres, and one might wonder if the two chambers are indeed equally old. This question, however, will have to remain unanswered since the pottery from the chambers was mixed up. But the orientation of the two chambers is exactly the same, of course, and their orientation is different from that of any other Drente hunebed (Van Giffen 1925, *Atlas,* plate 119): the unique SSW-NNE direction of the long axis, which cannot readily be explained from the local topography, points to a building plan that was different from its inception, and this is precisely what can be dated from the oldest sherds. There are no indications that the long hunebed chambers were originally short chambers which were later lengthened. It would be necessary to

demonstrate the old extraction holes of the end stones under the hunebed pavement. But Van Giffen rarely or never excavated under the pavement (verbal communication 1968. I do not know if this stems from any earlier experiments with negative results). During the excavation of DROUWENERVELD-D26, a not particularly long chamber of Group II, the pavement was taken up and the sub-soil was inspected for older sherds and ground-traces (1970). However, apart from a pit of PFB age (?) cutting through, nothing was found. Besides, practical difficulties may have prevented the elongation of a chamber, which would have required propping up the capstone lying on the end stone and shifting the generally extremely bulky end stone. Although it has not been proved that some long chambers are not lengthened short chambers, I do not think it is likely. For problems like these it is, of course, important to consider the exact position of the pottery finds in the chamber and the barrow (which I have not).
For the present, the following data – which were supplemented by some information from Germany, west of the Weser[3] – proceed from the idea of a single building phase of the chamber.

Drouwen A pottery was found in the following megalithic graves:

(A1) RIJS-F1, floor length c. 4.3 m, 5 pairs of side stones, No, Group I, includes sherds, Van Giffen 1927, plate 152:2a, and also some sherds not illustrated which Van Giffen found during a later excavation (Leeuwarden museum).

(A2) EXLO-D30, chamber length 5.9 m, 4 pairs of side stones, N1, Group I, includes pots figs. 28:2 = K14:1 and K14:2.

(A3) BRONNEGER-D21, chamber length 6.1 m, 4 pairs of side stones, N1, Group I, includes pots fig. 28:3-4.

(A4) BRONNEGER-D23, chamber length c. 6 m, 4 pairs of side stones, No, Group I, in which Lukis and Dryden found a large fragment of a jug of phase A (British Museum). This recent rediscovery (1976) is not taken into consideration elsewhere in this book.

(A5) TANNENHAUSEN II (Spr. 817-II), floor length 11.2 m, 6 pairs of side stones, No, Group I, in the entrance of which jug fig. 28:7 was found (cf. section 6.1). This hunebed (Gabriel 1966) contained B pottery, as did its immediate neighbour to the west (11-13 m long, 6-8 pairs of side stones). Between the chamber side stones were found the holes of massive, vertical posts which must have been part of the chamber construction (cf. similar finds in TINAARLO-D6e and NOORDLAREN-G1, section 1.2f). The passage had no side stones (No) but wooden walls. It was exceptionally long for the West Group and because of this is reminiscent of Scandinavian jaettestuer. The same can be said of the two pairs of end stones of the chamber. This phenomenon had been established only once in Netherland (HAVELTE-D53). Under the barrow Gabriel found holes which he regards as the holes of vanished *menhirs indicateur*. There are too few holes for a peristalith.

Drouwen B pottery was the earliest found in:

(B1) HOOGHALEN-D54c, floor length c. 3.7 m, 2 pairs of side stones, No, Group I (examination of material excavated in 1947 by Van Giffen in BAI).

(B2-3) EMMEN-D43, Group III, two chambers Q1, D43A has 3 pairs of side stones and is 3.4 m long, D43B has 5 pairs of side stones and is 6.5 m long. In a pit between the chambers and within the peristalith sherds were found of two B-jugs and of a burned thin-butted 'Old' Danish flint axe. Some B pottery was also found in the chambers (Boomert, Brandt & Woltering 1970, 1971; sections 3.3, 5.3.1 and Appendix B8.

(B4) TINAARLO-D6e, floor length 4.8 m, 4 pairs of side stones, No, Group I. In actual fact, the B-sherd (Van Giffen 1944, fig. 4:45) was found in the destroyed hunebed D6f, its immediate neighbour. There cannot have been much difference between its plan which did not survive and that found next to it. The earliest sherds from D6e and the earliest (but one) pot from D6f belonged to Drouwen C.

(B5) HOOGHALEN-D54b, floor length c. 6.1 m, 5 pairs of side stones, No, Group I (examination of material excavated in 1947 by Van Giffen in BAI).

(B6) WEERDINGE-D37a, the hole left by the stone robbers (Van Giffen 1927, text fig. 13) indicates a floor length of 5.5-6.5 m, 4 ± 1 pairs of side stones, Group I. The pottery illustrated, 8 fragments, came from at least three pots, a funnel beaker, a bowl/pail of type Drouwen B and one of type Drouwen C. This grave could, of course, equally well have been built in phase A as in B.

(B7) NOORDLAREN-G1, floor length 7.6 m, 5 pairs of stones, presumably N2, Group II. A small minority is B, the rest is C or later (Bakker, in preparation).

(B8) SPIER-D54a, floor length c. 8.0 m, 5 pairs of side stones, No, Group I (examination of material excavated in 1949 by Van Giffen in BAI).

(B8a, a later addition) OSTENWALDE I (Spr. 835), chamber length c. 8.7 m, 6 pairs of side stones, Group II. No passage or peristalith stones left, due to destruction. According to the excavator, who found extraction holes of one peristalith, there may

have been a double peristalith, but there is too little evidence for this, in my opinion (Tempel 1978). The 90° vertical angle of the side stones of the reconstructed hunebed near its original site is incorrect (cf. note 7). Contrary to Fansa's statement that Knöll 1 pottery is lacking, his Plates 6:8, 7:186(?); 8:9, 46, 130; 10:60, and possibly also 12:45 and 13:21 show bowls/pails of Drouwen B (Fansa 1978).

(B9) DROUWENERVELD-D26, chamber length 9.9 m, 6 pairs of side stones, P2, Group II. Excavation by Bakker and Glasbergen 1968, 1970. B pottery is less abundant than C and D.

(B10) DROUWEN-D20, chamber length 10 m, 6 pairs of side stones, P2, Group II. There is at least one B bowl (Holwerda 1913b, fig. 12:240, cf. 12:237 = K17:14).

(B11) EMMELN 2, floor length c. 10.5-11.5 m,[4] estimated 7 ± 1 pairs of chamber side stones, N, Group I. The B pottery includes Schlicht 1968, figs. 17-19.

(B12) GLIMMEN-G2, floor length c. 12.0 m, chamber length c. 11.5 m, 6 pairs of side stones, No, Group I, contains B, C, D1, D2, E2, F and G pottery (Lanting 1975 and examination of the finds in BAI).

(B13) DROUWEN-D19, chamber length 13.9 m, 9 pairs of side stones, N2, Group II. The B pottery includes Holwerda 1913b, figs. 6:32, 44 (= K14:13; 15:5).

(B14) GIETEN-D14, floor length 15.9 m, 9 pairs of side stones, P2, Group II, contains very little B and C pottery, but much D1-2, E2, F and G pottery (preliminary examination of the material excavated in 1927 by Van Giffen in BAI).

Drouwen C pottery was the earliest found in:

(C1) EEXT-D13a, a 'stone cist' which was dismantled in 1923 (Van Giffen 1927, 1944b; Kaelas 1955). Can not be regarded as a stone cist in the sense of a stone grave in which only one or more burials took place simultaneously, or, at the most, within a short time of each other, for the pottery spans widely separated phases, just like that from the hunebeds. The oldest pottery appears to be from phase C, possibly B (Van Giffen 1944b, fig. 7:2d-e, j). But pots 2f and 2k (both with stem handles) belong to Late Havelte (G). The dimensions of this grave are unknown. We do know that ten cartloads of stones (diameter less than 50 cm) were removed from it. These stones were found at a depth of up to 40 cm into the ground (cf. also Bakker 1970). It is perhaps the remains of a hunebed which had already been dismantled long before 1923.

(C2) BUINEN-D28, chamber length 5.8 m, 4 pairs of side stones, No, Group I. There is a C pot (Van Giffen 1943b, fig. 28:35). The rest is D or later. The absence of A or B pottery in this early-looking hunebed cannot just be a coincidence. The hunebed has been preserved in very good condition, and so, relatively speaking, have the contents which were studied comprehensively and minutely by Kat-van Hulten.

(C3) GROSS BERSSEN 7 (Spr. 861), chamber length c. 8.2 m, 10 pairs of side stones, N1, Group I, contains some C and also D and E pottery (Schlicht 1972).

(C4) MANDER-O2, from which all the large stones had been removed, was discovered and excavated by C.C.W.J. Hijszeler and A. Bruijn in 1957. Summarising the available information,[5] I would estimate an original floor length of at least ½ m more than was observed, viz. a chamber length of 12.5-13 m. Consequently, O2 is – by Drente standards – one of the largest examples of type No and Group I. On inspection of the (very small) sherds, C appeared to be probably the oldest pottery phase.

(C5) DIEVER-D52, chamber length 12.7 m, 7 pairs of side stones, N1, Group I. In 1932 and 1953-54, Van Giffen found C pottery and especially D1-2, E2, F and G (examination of this material in BAI).

(C6) WAPSE-D52a, floor length 15.4 m, 8 pairs of side stones, N2, Group II. Van Giffen (1946) described the (too) small quantity of pottery recovered, which is not necessarily representative. Pot Van Giffen 1946, fig. 2e:41 appears to be the oldest, is probably Drouwen C.

(C7) HAVELTE-D53, chamber length 17 m, with 10 pairs of side stones, P2, Group II. Although Van Giffen (1927) complained about radically destructive early diggings, the quantity of pottery which was recovered was greater than that from the other Dutch hunebeds (more than 660 pots were identified). Of those, only two can be diagnosed as Drouwen C (Kat-van Hulten, c. 1950, nos. 151, 160). There was far more pottery of Drouwen D1 and D2 and of the Havelte phases E-G. This hunebed was therefore undoubtedly built towards the end of phase C.

(C8) DÖTLINGEN (Spr. 944), chamber length 18.5 m, 10 pairs of side stones (Pätzold 1961). Although no excavating was done outside the hunebed chamber, it does not seem that a peristalith has been present. Whether there were 2, 1 or no pairs of passage stones has, however, not been established, so that it is not certain whether Group II (N2) or Group I is involved. Pätzold's illustrations of a selection of the pottery (1957, 1961) included a C bowl as the oldest (1961, fig. 2:38). It is not certain that C

is the earliest pottery phase represented. D and E pottery were also illustrated.

Drouwen C or D pottery was the earliest found in:

GLIMMEN-G3, floor length c. 3.2 m, 2 pairs of side stones (No, Group I) (Lanting 1975), the shortest hunebed known from Drente;[6] only very few sherds were left – the majority of the pottery which was originally present was lost. There were a few G pottery sherds among the mostly undecorated sherds. Sherds from funnel beakers with belly ornamentation point to a construction date before phase E. A pierced lug with vertical Tiefstich lines indicates a minimum age of C or D. Furthermore, among the pottery recovered from outside the grave, there was one decorated bowl (Lanting 1975, plate 3: bottom) of C or D1 age. It is quite conceivable, however, that the hunebed was built earlier and that the generally scarce earlier pottery had disappeared.

Drouwen D pottery is presumed to be the earliest found in:

(D1) HEIDEN-DÜWELSTEENE (Spr. 985), chamber length 11.5 m, 9 pairs of side stones, No, by Dutch standards a very long representative of Group I (cf. Table IV, G2), has been repeatedly subject to excavation since Nunningh (1713). Finally, the grave was completely excavated in the 1930's. The results were not published. Part of the finds was lost during World War II. However, Knöll had previously documented photographically the sherds. According to his lists 127-128 (1959) the oldest pottery is from Phase 1/2, which, in this case, must correspond with phase D.

(D2) WECHTE 1, more than 40 m long gallery grave/hunebed hybrid, with entrance in the narrow side, without a peristalith. Knöll's lists and figures of the most important pottery (1959) indicate that the oldest pottery dates from phase D1. The possibility that K17:2 is older (C?) cannot be entirely excluded.

(D3) WECHTE 2, at least 35 m long, more than 20 pairs of side stones, badly damaged, presumably of the same shape as the preceding one (Stieren 1929). Knöll's scarce illustrations and lists 127-128 (1959) indicate that the oldest pottery is D2, certainly not older than C.

It still must be confirmed in detail that none of the hunebeds in Westphalia contained any pottery older than Drouwen D, and whether megalithic graves were constructed there as late as the period of the Early Havelte style. The former would seem probable, in view of the transition-C/D1 age of the long hunebeds HAVELTE-D53 in Drente and DÖTLINGEN in Oldenburg. Knöll (1959) reported that all the hunebeds in Westphalia were 'excessively long'. The pottery distribution maps (figs. 37-39) reveal a slow-moving occupation of this area from north to south by the Tiefstich pottery people. This expansion occurred mainly in the Knöll 1/2 and 2 periods, i.e. after the beginning of Drouwen C. But Drouwen C is itself extremely rare, and even D1 occurs only sporadically in the north of Westphalia (Chapter 4), so that the area near the Lippe must have been colonised particularly during phases D2 and E.
If these settlers showed a preference for excessively long hunebeds, one wonders if the building of shorter hunebeds had already come to an end in the 'old country' of the West Group.
I think we can exclude the possibility that hunebeds were still being constructed during the Middle and Late Havelte phases F and G. In Drente, the existing hunebeds were still used intensively for burials, but no investigated hunebed appears to have contained exclusively F or G pottery so that the exertion of building new megalithic tombs seems to have come to an end. (Whether this had anything to do with the new cremation ritual is a matter of speculation.) In Germany west of the Weser, the same situation seems to have existed. The scarce G pottery finds in hunebeds are at least equally spread over the area. This scarcity can well have been caused by the practical difficulty in recognising these sherds.

When we look at these data, arranged in fig. 78 according to (c) groups I-III, (a) chamber length and (b) number of pairs of chamber side stones, then we can inderstand only too well that even Van Giffen despaired.
From these figures, a process of development does seem to emerge, but it is very diffuse – construction of the old types not ceasing immediately after the introduction of the new ones – and in Drente it seems to have taken place mainly during the Drouwen pottery style (A-D). Since it was not yet possible for Van Giffen to subdivide Drouwen properly, it was indeed a hopeless task for him. Now, the dating system is not yet perfect, but the trend of the development is emerging to some extent.
In fig. 78 this trend might be strengthened by shifting the smallest known hunebed, GLIMMEN-G3 from D/C to B or A since, so little pottery of diagnostic value having been preserved, it seems extremely likely that the oldest and rarest pottery has completely vanished from the chamber.
Hunebeds with kidney-shaped peristaliths apparently originated at some time during the Drouwen B phase, the hunebeds themselves being as yet fairly short. It is not surprising that the peristalithic long barrow EMMEN-D43 was also built in this period in view of the very great antiquity of similar long barrows elsewhere and the occurrence, as early as Drouwen A, of such short chambers as those of D43. From the graphs it would appear that short chambers were built no later than Drouwen C, but further confirmation is necessary on this point since

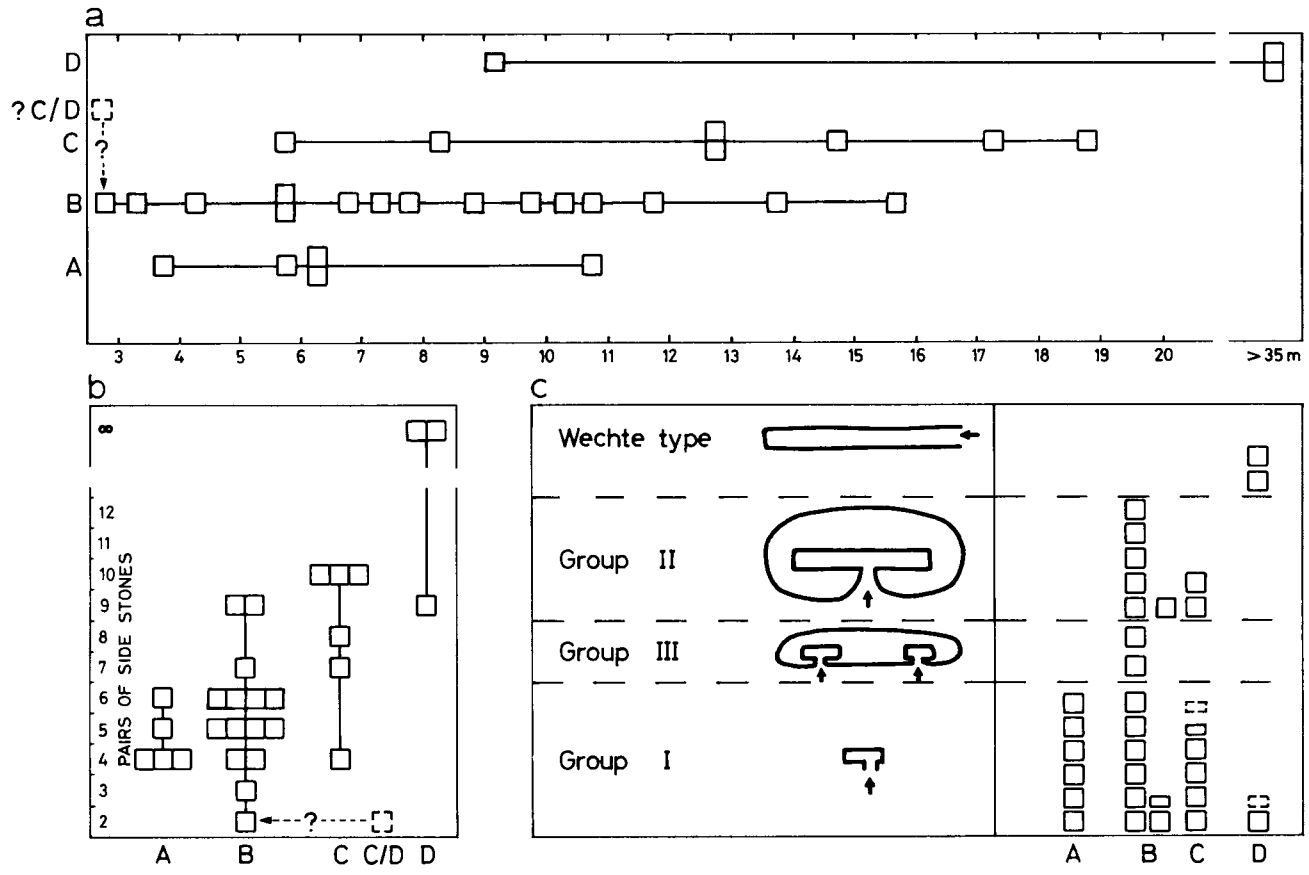


FIG. 78 Dutch and N.W. German hunebeds arranged according to the oldest pottery (A-D) found in them and according to (a) chamber length, (b) number of pairs of side stones and (c) hunebed type.

the data on the subsequent periods are still so scarce.
Strictly speaking, it is equally uncertain whether hunebeds even larger than that at TANNENHAUSEN had not been built as early as during phases A and B.

If an impulse from the gallery graves was responsible for the predeliction for chamber lengthening in the TRB West Group, then this would still be difficult to prove chronologically. The lengthening process occurred at an early date, not far from the North Sea and at some distance from the gallery graves.
The oldest datable proof for TRB-gallery grave contacts we found was in SORSUM in phase Drouwen C. As was generally the case later as well, this was rather an influence from north to south than vice versa; this is apparent not only from the pottery export, but also from the hunebed-like entrance of the gallery grave SORSUM itself.

But why should the taste for chamber lengthening not have developed independently in the Western TRB group itself?

Finally, a remark on *the weight of the stones* of the megalithic graves of the West Group. The capstones and endstones, which are generally the heaviest, usually weigh 5-10 metric tons, sometimes more than 20 tons (Jacob-Friesen 1959, p. 116). One of the capstones from KLEINENKNETEN I was reported to weigh as much as 25 tons (Steffens in Peters 1975, p. 102). Krause and Schoetensack (1893) have estimated the weight of the stones of the megalithic graves in the Altmark at normally 2.5 to 10 tons. One capstone (at STÖCKHEIM, KS 130) weighed more than 22 tons. Dragging these stones a distance of several hundred metres to the building-site, on a sledge made of a forked tree and pulled by ropes, must have required a minimum of 15 to 20 men per ton weight (Coles 1973, p. 84-89), so that 75 to 100 men must have been employed for each 5-ton stone – and at least 375-500 men for transporting the Kleinenkneten capstone.
This gives an impression of the degree of motivation of the TRB society in investing so much energy in building thousands of megalithic graves within a few centuries. But it also gives us a glimpse of the system of social organisation, the economic potential and, to some extent, the population density as well.
Traction by teams of oxen (with yokes tied to their horns) does not appear to have been practicable, for on Egyptian and Mesopotamian illustrations of transport of far more colossal stones, only manpower is shown.

Jacob-Friesen (1959, p. 106) has drawn attention to the enormous reduction of friction and labor which a frozen ground can give. During World War I, the transport of one piece of artillery across heather and peatbogs took four weeks with modern equipment in summer, but over a frozen ground the same distance took only three days when a heavy, but simple sledge and four horses were used. Besides, there is the theory of the farmer Grumfeld which was recorded before 1864 (Pörtner 1961, p. 194). In his view, the large capstones could have been positioned atop the prop stones by means of frozen snow embankments.[7] Jacob-Friesen also remarked that snow and ice would have made wooden rollers superfluous. Winter would have been the best season for hunebed building anyway, as far as the farm work was concerned. Concrete information about the number of men necessary for transport of one ton weight over frozen ground is lacking. Experiments would again be very useful as any reduction of the (too?) high estimates of the number of men employed for the transport of the largest capstones would also reduce other theoretical difficulties involved.

Notes

CHAPTER 1

1:1 '(*)' means: see GLOSSARY, Appendix A2. ABBREVIATIONS are given in Appendix A1.
NOTE ON GEOGRAPHICAL NAMES. Most sites of the West Group may be found on Knöll's map and site list (1959), otherwise indexed road atlasses 1:200,000 or 1:300,000 may be of help. The very recent reformation of the Lower Saxon Kreise has not been incorporated. There is not one official orthography for Dutch place names, but there are at least five. In the 1930's-1950's simplification was the trend, but now the 'Vijff Vlieghen' style is gaining ground.
I have preferred 'Netherland' to its long-winded plural form. Since the early 19th century, the singular form *Nederland* is used almost exclusively in Dutch for the present State, while the plural refers to the former Habsburg lands, the Low Countries, or the Benelux. The plural form in the name of the Kingdom is a relict from the period 1815-1830 when Belgium was also part of it. Also in foreign languages the singular would be much more handy than the plural plus article, and often inflexion. The *pars pro toto* name 'Holland' could not be used instead, to avoid confusion with the provinces of Noord- and Zuid-Holland, and their northern, southern, parts etc.

1:2 Unless otherwise indicated, this book applies 'conventional' C14 datings (half-life 5568), in spite of the fact that we now know that conventional C14 datings for the TRB period have to be increased by some seven hundred years on an average to make them directly comparable to the 'genuine', 'historical', time-scale. Since the conversion scale required (based on C14 measurements of slices of wood from tree-ring calendars of a known historical age) is still only very roughly known, the Groningen C14 laboratory (W.G. Mook) and Dutch archaeologists consider it premature to proceed already with recalibration. Moreover, recalibrated C14 datings have considerably increased standard deviations so that they are less precise (Waterbolk 1971). The number of C14 datings which is available for the West Group of the TRB culture is still distressingly small. See further section 6.9.

1:3 See Glossary, Appendix A2a s.v. 'chronological system'.

1:4 That shifting slash-and-burn cultivation *(swidden)* was the normal type of agriculture would tally with the short duration of most settlements of the West Group. Its existence might also be concluded, but not necessarily, from J. Iversen's studies on landnam in S. Denmark (1973). There is a growing evidence of the use of the ard scratch-plough and K. Randsborg has pointed out (in discussion, 1976) that ploughing and the tree stumps and roots left over by the swidden system contradict each other. E.R. Wolf (1966) seems to consider swidden and ploughing among recent farmers as being mutually exclusive on the same fields. W. Groenman-van Waateringe (1977, in discussion) thinks, however, that the roots and stumps were no real obstacles to the ard because it was rather manoeuvrable and scratched the soil at a higher level than the tree roots of a deciduous forest.

1:5 See Appendix A2e for the meaning of the word 'hunebed' in this book, and the confusingly different ways the word 'Hünenbett' is used in archaeological publications for different parts of Germany.

1:6 Bakker 1959, note 5, mentions the first three finds. A publication about all four is in preparation.

1:7 Brongers and Woltering (1973) thought that lined wells were only constructed for the first time in the Iron Age in Netherland, due to 'a fundamental change in the fresh water-supply'. The KARLSQUELLE wells, for instance, counter this. In my 'normative' opinion, lined wells must have been a normal feature in the West Group.

1:8 Boulders were, of course, a necessity for the construction of megalithic graves. In Drente, these stones were taken from the periglacially eroded margins of the 'boulder clay'. The hunebeds themselves were, however, positioned on dry, boulder-free sands in the immediate vicinity (Wieringa 1968).

1:9 The number of phases might even be nine, if the reality of D1, D2, E2 and E2 as separate, successive phases could be substantiated (Chapters 3-4 and section 6.6).

CHAPTER 2

2:1 In writing section 2.1, I was guided, as far as Netherland is concerned, by Van Giffen's almost complete bibliography on hunebeds from 1547 to 1921 (Van Giffen 1925, p. 212-227, 243-244; 1927, p. 526) and also by his summaries of the reports of excavations in hunebeds before 1912 (1927, p. 3-78). For Germany, I mainly followed the lead of Gummel (1938), Stemmermann (1934) and Knöll (1959, Chapter B). I am unavoidably less conversant with the older German publications because they are less easily accessible in our libraries.
Biographies of German pre-war archaeologists are given by Gummel (1938). Those of Dutch archaeologists will be published by J.A. Brongers, in the near future. The works which I consulted in connection with the history of the study of prehistory in general here and elsewhere in Europe include: Bibby (1956), Boule (1923), Brunsting (1947), Cartailhac (1889), Clarke (1968), Daniel (1960, 1967), Eggers (1958), Heizer (1959, 1962), Klindt-Jensen (1966, 1975), Mötefindt (1910), Müller (1897) and Roche (1969).

As far as the developments since 1908 are concerned, I had to restrict myself to printed sources (and there can be large discrepances between written sources and actual fact!) where again Knöll (l.c.) was the guide in my literature search. For Netherland, I was able to use, in addition, some verbally-given background information from Van Giffen and Glasbergen. The studies on which I based my work for the research in Scandinavia included those of Bagge (1950) and Becker (1968). A review of the publications on the TRB pottery in Sweden and Norway was, however, omitted, because these regions of the North Group are situated behind the type localities of the Danish isles, as seen from the West Group, so that the pottery typologies there are less relevant to the latter Group.
The quotations in English are translated from the original Latin, German or Dutch. The same applies for the titles of publications given in English. The original form of the latter can be found in the bibliography. In this bibliography, only works which I myself have read are recorded.

2:2 During the Dutch Golden Age, the hunebeds received remarkably little attention from the Dutch scholars and publishers. Drente was of no economic or political significance before 1814, and the Dutch landscape painters, for example, depicted very few hunebeds.
One painting by Jacob van Ruisdael (1628/29-1682) shows a hunebed in the back-ground of a landscape which was inspired – to judge from the half-timbered houses – by Bentheim or Westphalia (Bonn museum). A studio composition by his pupil Meindert Hobbema (1638-1709) combines a hunebed in the background with scenic elements from Holland and more mountainous regions (Rotterdam museum).
Not one of the topographical print books which were so popular in the 18th century shows a hunebed among the countless castles, ruins, town and village views and country estates. Ludolf Smids' 1711 print (by J. Schijnvoet) of hunebed D27 at BORGER under excavation by Titia Brongersma (see below) might seem to be an exception (Smids 1711, copied by Keysler 1720, fig. II; cf. Van Giffen 1927, p. 8-9). Titia, as Sappho, in classical dress, is being presented with a Roman oil lamp by a gentleman in modern clothes. The hunebed was, however, copied from an anonymous engraving in Picardt's book (1660, fol. 23) which is merely drawn from imagination, with a curious construction as a result.
Yet, the gifted topographical draughtsman Cornelis Pronk drew hunebed D53 at HAVELTE on 1 July, 1732 (?) (Rijksprentenkabinet) and on 16 September, 1737 (Assen museum) and hunebeds D3-4 at MIDLAREN on 30 July, 1754 (Groningen museum 1964/236). But no prints were published. After him, Van Lier (1760) published good prints of D13 at EEXT. In 1778, Egbert van Drielst depicted the NOORDLAREN-G1 hunebed in reverse and oversized, as a romanticised frontispice of an album with Drente landscapes. It is the only time that this gifted and productive Drente artist ever depicted a hunebed! (Niemeijer 1977).
In 1768-69 and 1781 Professor Petrus Camper made accurate drawings of a number of hunebeds (Camper archives, Amsterdam University Library; poorly reproduced by the Prince de Radzivil (1789)). In the 19th century, the numbers of drawings increased simultaneously with the interest of scientists and laymen. Romanticism now also attracted painters. Around 1870 the first photographs were made (Pleyte archives, Leiden museum).

2:3 Knappert (1894, 1900, 1904) analyses language and sources of this major work of this talented scholar and writer, and adds bibliographical notes.

2:4 It is, though, not quite clear whose joke it is. The remarks are part of a learned treatise, *De origine et sedibus Francorum, de Chamavis, Bructeris, Tencteris, aliisque* (. . .), written on 20 December 1547 in a Bruges monastery, in the form of a letter,

and addressed to a Cornelius Gualterus. The remarks on the Rolde hunebed were first printed by Hadrianus Junius (1588; 1652², p. 485) and Cornelis Kempius (1588, *De origine, situ* (. . .), the complete treatise (and a sequel of 5 October 1549 with the same address) by Matthaeus (1738², part I, p. 37-44, the sequel p. 45-47).

In summary, the passage, which is the oldest known on Dutch hunebeds, runs as follows: 'The Columns of Hercules can be seen at Rolde. The lack of roads and ships and the lack of stones in this marshy area let suspect that these large stones have been brought there by devils, who are being worshipped there under the name of Hercules. Altar stones lie upon the columns. Here, the inhabitants sacrificed people alive, preferably strangers, whom they forced to crawl through the narrow passage under the altar stones, threw manure at them while they crawled there before they were slaughtered. At present this is still done, especially when people from Brabant are concerned, and often it results in murder. This passage is called here by the ignominious name of *'s Duvels Kut*, which means Devil's Cunt. But Boniface put an end to these offerings.'

The word *kut* could just as well have been mispronounced *kot* (Pelinck 1902; Sinninghe 1944, p. 11), and the name *Duvelskot* (Devil's Cot) would seem much more normal in comparison with the German hunebed names. (Practically no other names are known from Drente.)

Nothing else is known about a habit of having aliens run the gauntlet in Rolde, but the curious addition 'especially Brabanders' could be an allusion to situations during the war (1522-1536) when Emperor Charles V had taken Drente from Charles of Guelders, and in which Brabant troops may have ransacked the area. Was the narrative told to Schonhovius (or his Brabantian (?) spokesman) by an imaginative Drentian story-teller who also tried to explain the ill-understood name of the hunebed? Or is the insertion 'Brabanders' a note of Schonhovius himself and a hint to tensions between Drente, Holland and Brabant, viz. lands which had only recently been united into the Netherlands by Charles V? Schonhovius was a monk from Holland, living in Flanders. Was Gualterus living in Brussels in Brabant, the administrative centre of the Netherlands?

2:5 This engraving has been reproduced many times, e.g. by Cartailhac (1889, fig. 61, erroneously dating Mercator in the 17th century), Daniel (1960, pl. Ia, citing Cartailhac's errors), Roche (1969, p. 14) and by Daniel & Kjaerum (1973, cover). The habit of engraving one's name in the cap-stone, which is mentioned by Rabelais and portrayed by Braun, and once more in 1699 (Daniel 1960, plate Ib), led Braun or his draughtsman George Hoefnagel, to collect the names of important Flemish and Rhenish colleagues and friends on the stone, like in a sort of *Album amicorum*.

The oldest known engraving of a hunebed of the West Group, in the corner of a map in W. Dilich's Description and Chronicle of Bremen (1604; Gummel 1938, pl. 3), is clearly influenced by Braun's print.

Astonishingly level-headed interpretations of megalithic graves from the early 16th century are those of Nicolaus Marschalk on Mecklenburg tombs (c. 1510; Stemmermann 1934, p. 20-22; Gummel 1938, p. 10) and of Thomas Kantzow in his Chronicle of Pomerania (he died in 1542). Kantzow wrote (Gummel 1938, p. 18-19):

'When someone died, they made him a magnificent grave, usually from nine large boulders. Six boulders were placed in a ring, like a coffin, and three – by far the largest – were placed on top of them. Such graves are still found now and then in the country, on the field. Each boulder is so big that one may wonder how people could have handled such loads; for I assume that part of them are more than one hundred or one and a half hundred hundredweight. In such a grave, they buried the dead man and they always gave to him something which he had liked most in his lifetime; if he were a horseman [knight?] they laid his cuirass in his grave, if he had been a drinker they buried a barrel of beer with him, and so on. Later on, his friends have visited the grave on the thirtiest day and once more on the sixtiest day and after that on the hundredst day, and they have eaten and drunk there, and when they were satisfied, they have placed the portion for the deceased in the grave under the stones, and they have left. The next morning everything had been consumed – maybe by the Devil; people have, however, thought that the departed had eaten it'.

In the area of the West Group, one came to think along such lines only after 1713!

2:6 Referring to Alexander ab Alexandro (III, 12). This passage was omitted by Van Giffen, but it is given by Van der Scheer (1848) who published the ms. in full.

2:7 In 1679, Jacob von Mellen illustrated Walternienburg pottery from the neighbourhood of Halle in his *Urnae sepulchralis in Sarmaticae anno 1674 repertae* (Gummel 1938, p. 26).

2:8 I thank J. Baart (Amsterdam) for his help with the translation of the Latin text.

2:9 See Mulder (1942) about Van Lier as a naturalist.

Stemmermann (1934, Chapters 16-17) described clearly how since the middle of the 17th century the

speculations of classical authors like Hesiod and Lucretius about the succession of Stone, Bronze and Iron Age in man's history formed part of learned thinking in northwestern Europe. Because the archaeological finds did not disprove this idea, its correctness was not questioned. In the course of the 18th century the working hypothesis was proved correct time and again by archaeological observations and it increasingly took the form of a generally accepted general theory. In the early 19th century Thomsen applied this theory successfully in arranging the growing collection of the Copenhagen museum in chronological order. His short *Ledetraad* article (1836) provided a chronological framework which could be filled in and expanded by his own and following generations. In this respect he surpassed Westendorp (see below) who applied the Stone Age concept as a matter of course to date his hunebeds and who certainly was no museum man or field researcher.

2:10 Since 1734 the demolishing of hunebeds was prohibited by a Drentian law, one of the first instances of legal protection of ancient monuments in the world. This law is an example of quick action by the local authorities. Since 1730, *Teredo navalis,* the pile-worm, had become a disastrous plague. All Dutch dikes in salt water were in great danger because the usual wooden surf-fences in front of them had been eaten away.
The States General proclaimed a day of prayer and offered a prize for the best way to adapt the dikes to this new situation (Van Giffen 1925, p. 163, quoting the Schoenmaker ms). In 1733, P. Straat and P. van der Deure won the prize by originating a proto-type of the present-day stone-covered dike (Straat & Van der Deure 1735). This resulted in the large-scale and costly import of boulders from Scandinavia, Germany and the Pleistocene areas of Netherland.
When the Landscape (land) of Drenthe protected its boundary stones legally from removal in 1734, it also included 'the hunebeds, which, everywhere, should be preserved as being imposing monuments and long famous memorials'. There can be little doubt that this so modern opinion was a result of Picardt's book (1660), which was reprinted in 1731 (!) and 1745. Van Giffen (1927, p. 14-15) gives the full text of this Drentian *Resolutie.*
Legal protection was not enacted in other countries until much later and many a megalithic monument there served to protect Netherland from the waves. In 1804 the Duke of Mecklenburg protected megalithic tombs by law (Jacob-Friesen 1928, p. 98) and in 1819 the Duke of Oldenburg did the same for megalithic graves and barrows (Rosenow 1961). Land reclamation and the building of macadam roads (invented by John Loudon McAdam c. 1820) had become a threat, but until the end of the century or even later other German countries lagged behind (Sellschop 1961). Sweden has preceded Drente by its Ancient Monuments Act of 1666/1668 (Stemmermann 1934, p. 75; Klindt-Jensen 1975).

2:11 When in 1812 the application period had closed, the anonymous entries A and B had been sent in. The jury considered A to have merit, but prolonged the period of application until 1815, which would give the author the opportunity to improve it. In 1815 entry A won the prize and the envelope corresponding to the motto of this entry contained Westendorp's name.
Entry B of 1812 did not win a prize and its author's name remained in the closed envelope. In 1972 W. Glasbergen and I saw that entry B (in the Maatschappij archives) contained an earlier description (1809) than the one cited (1837) by Sprockhoff (1966, p. 66) of the megalithic graves near Bergmühle on FEHMARN. Some find descriptions in eastern Schleswig-Holstein might also be of interest. In 1975 J.G. de Bruijn, secretary of the Maatschappij, opened the envelope and produced the author's name and address: 'Georg Wolfgang Ulrich Wedel, Erbherr, auf Freudenholm, bey Preets in Holstein'.

2:12 *Programma's* of the Maatschappij for the years 1808-12, also in the French language in the edition of 1812.

2:13 Westendorp 1815, p. 337 and, in more detail, 1822, p. 197-201. Interest in this passage, where Strabo discusses the presence there of the Pillars of Hercules, was reawakened by Gosselin and De Erro in the *Mémoires de l'Académie Celtique* (I, p. 385; II, p. 307). This is undoubtedly one of the oldest descriptions of megalithic graves or menhirs and their accompanying folklore (the Algarve has several megaliths: Savory 1968). Westendorp was very enthusiastic when he learned about this (see his anonymous letter accompanying his first entry in 1812 in the Maatschappij archives). This passage was to form the foundation of his chronology.
The Greek text is, by the way, less explicit than Westendorp thought, partly because of the Latin translation by Casaubon, which he quotes at length. His translation, 'boulders assembled in threes or fours', may well be archaeologically correct, although it could also refer to small groups of menhirs (see for example: De Rougemont 1866, p. 287). Instead of suggesting a *Pierre-qui-Tourne* legend, however, the original text indicates that 'people who went there regularly turned and moved these stones, according to an ancient tradition, after they had offered a libation'. One can, of course also wonder if Strabo had precisely understood his sources on this

– for him strange – situation. I would like to thank S.M.E. van Lith (IPP) for her help in this matter.

2:14 Westendorp compared what was known in literature of archaeology about each of the European peoples which could be considered in this connection, with the finds in, and the age and the distribution picture of, the hunebeds. After a thorough investigation he rejected (1822, p. 111-155) the following as the builders of the hunebeds: the Romans, the Germans, the Huns, the Vikings, the post-Roman Frisians and Anglo-Saxons, the Slavs, the Thracians, the Scythians, the Finns, the Iberians and the Ligurians. Most of these peoples had at some time been considered in publications as hunebed builders. Apart from a few small tribes which could be rejected immediately, there was only one left in Europe, but he left it unnamed as yet.
Subsequently he discussed the great antiquity of the hunebeds (p. 160-201). The last part of the book (p. 202-317) presents his arguments that only the Celts could have been the builders of the hunebeds. Previously (p. 158-160), Westendorp had already posed the question of whether it was indeed possible to identify these builders. But, he replied, if the answer is no, then the question asked by the Maatschappij would remain unanswered. It appears from the last part of the book that Westendorp himself became completely convinced of the correctness of the proffered arguments that the Celts were the builders. Others, however, were less convinced, including most in Germany.
C.J.C. Reuvens of Leiden (see below), for example, concluded a review with: 'There is a strong probability that most of these monuments are of Celtic origin; I would not dare to assume this with any certainty, however, nor to allow legends (p. 171) to weigh in the very least as proof (. . .). Some of them could originate from other northern peoples, too; and, until we find new facts, the line of demarcation can not be correctly determined'. This review, although ready for the press, remained unpublished (Leiden museum archives CI 24-52). It bears the note: 'Not to be published without further revision. June 1832'. Reuvens kept working on it between c. 1822 and 1832, originally for publication in *Antiquiteiten,* the journal edited by Westendorp and himself. We cannot exclude the possibility of this review having been one of the reasons for the closing down of the publication in 1826.
No remarkable new views were developed in this review about any of the numerous problems broached by Westendorp. Reuvens confined himself to supplementary remarks and detailed constructive criticism of Westendorp's sometimes incorrect quotations from classical and modern writers (due to which some propositions were in fact undermined). Publication of the complete review is worth consideration since, together with Westendorp's book, it gives a good picture of the state of this research in Netherland a hundred and fifty years ago.

The notes (1833-1835) in Reuvens' notebook of his visit to Drente (c. 5th-27th April, 1833) also reveal that Reuvens had a very scanty knowledge of the artefacts from the hunebeds. (In 1973 J.A. Brongers published a facsimile of this notebook, with bilingual (English and Dutch) transcription and comments and with excellent copies of Reuvens' manuscript maps of visible archaeological phenomena in Drente.) Reuvens deviated but little from Westendorp's interpretation of the hunebeds and *grafkelders* (burial chambers) (p. 27-30, 38-39, 42-43).
The notebook does establish that Van Giffen's identifications of the hunebeds which were described in the 'Schultes' reports' of 1818-1819 were correct (1925, p. 169-188), since Reuvens labels the mapped hunebeds with this numbering.

2:15 There is remarkable similarity between the backgrounds of Westendorp's studies (1815, 1822) and those of A. Bertrand (1864: see Daniel 1960 and Cartailhac 1889). Bertrand's publication was also part of a prize-winning entry for a competition (organised in 1862 by the Académie des Inscriptions et Belles-lettres of Paris). Although the text of the Hollandsche Maatschappij competition was also published in French in 1812, that does not necessarily mean that it was a factor in the organising of the Parisian competition.
It is, however, remarkable that both Westendorp (1822) and Bertrand mapped lines to the east beyond which no 'hunebeds' or 'dolmens' respectively were thought to occur. The former gave only a verbal description of his map (fig. 8). The latter added a map, this being, according to Daniel, the first published distribution map of megalithic graves in any country in the world, and possibly the oldest distribution map of any prehistoric object. It is improbable that Bertrand was familiar with the contents of Westendorp's lengthy Dutch book. Presumably this eastern border line had a common older (French?) source. A year later, De Bonstetten (1865) published a distribution map of the megalithic graves of Europe, on which this eastern border does not appear. The line reappears with Fergusson (1872) however.
Maps with lines delimiting present or reconstructed scientific entities are much older. In 1723 the Dutch linguist Lambert ten Kate Hermansz published a map of 'peoples and languages of Europe according to historical sources and to former and present tongues' with a complicated system of boundary-lines.

The realisation that the character of the distribution-picture of the megalithic graves involved a connection with the sea coasts – for which Bertrand was praised by Daniel – was already present in Westendorp's work. Westendorp said that he based his opinion on Caylus (1764), but the latter's passage concerning this subject deals only with the situation in Brittany, not the analogous situation elsewhere.

2:16 According to a manuscript register of all reviewers in the Anzeigen, vols. 1819-1830 (Göttingen University Library, Ac. 20). Dr. H. Steuer (Göttingen) sent me this invaluable information (7.4.1976).

2:17 Dr. J. Kramarek, head archivist of the Archaeological Museum in Wrocław and Dr. W. Wojciechowski, prehistorian attached to the university there, informed me that they had been unable to find any of this correspondence, either in the archives of the museum or in the central municipal Record Office. All the material was burned during World War II (letter from Wojciechowski, 23.7.1973). This is a pity since Seger omitted digressions on questions other than the Three Period System. Other aspects of Westendorp's book, for instance his ethnic interpretations, may have been dealt with in the omitted parts. Büsching's letters of reply in Copenhagen might provide more information about this.

2:18 See note 14.

2:19 Among Janssen's papers (Leiden University Library ms BPL 944) there is a large number of references about the co-occurrence of stone and metal tools. He found enough support for this among most of his German colleagues who were opposing the theories of Thomsen and Lisch (see below).

Later addition: the HILVERSUM finds were exhibited in the Leiden museum as a proof of the continuation of the 'Stone Age' until as late as the Roman period or, in Holwerda's days, even the medieval period (see below). Only in the 1940's H. Brunsting would remove them from the show-cases! When Heinrich Schliemann visited the museum on 3.8.1875, 'the findings in the Hunebedden' attracted his particular attention, but even more the Hilversum finds, which implied 'that there has never been a real stone-age.' (The bronze palstave referred to by him was also found at Hilversum, but kilometres away from the 'Stone Age' site, Janssen 1856, pl. X:1.) See Schliemann's letter to C.T. Newton, of the next day, cited by Bastet (1978, p. 76-82, 220).

2:20 I follow here Gummel (1938).

2:21 Also quoted by Gummel (1938, p. 300). Tischler opposed a lecture in which a Saxon origin had been argued for all German megalithic graves. With few words he made clear that this theory and all other theories requiring a similar recent dating (Oldenhuis Gratama 1886, Fergusson 1872) were impossible due to the Stone Age artefacts found in these graves. He speaks as an expert about the artefacts in the most important collections (including Assen). What a pity that he did not write down all this!

2:22 See concerning Holwerda in this period: Van der Waals 1973; Van Wijngaarden 1951. W.R.K. Perizonius, *Westerheem* 21, 1972, p. 144, published a photograph of Holwerda in 1909.

2:23 A photograph of Van Giffen in these years was published by Nyèssen 1927, pl. 6. See concerning Van Giffen: Waterbolk 1973 and, especially, 1976; Lanting 1973b; Bierma 1973 (bibliography); Van der Waals 1974; several articles in his 1947 Festschrift *(Kwart eeuw);* some of Van Giffen's recollections were tape-recorded (Van Giffen 1972).

2:25 In his very last article, Van Giffen recapitulated this theory and partially adapted it to new architectural discoveries (1973, p. 64-65; Keiteren should read KRELINGEN, cf. Voss 1975).

2:24 Knöll (1959, p. 42-43, pl. 44) summarised the evidence given in Van Giffen's publication (1927) and in correspondence. According to the typochronology developed below, the stratigraphic sequence would be (if the difficultly datable pieces are omitted): below the fallen prop were represented stages A (1 ×), B (0-1 ×), C (3-4 ×), D1 (7 ×) and between the slightly higher 'pavements' C and B stages B (1 ×), D2 (6-7 ×), E1 (4-5 ×), E2 (1 ×). Besides, a Zigzag Beaker and two Pot Beakers (which are several centuries later) were found in this layer. Knöll could not solve all discrepancies in the documentation of the stratigraphic position of the last described TRB finds. In an uppermost layer, between 'pavements' B and A, undecorated TRB and Beaker pottery were found. The latter included a sherd of a Beaker with short-wave moulding which is much older than the Pot Beakers.

2:26 To inventorise the TRB pottery in the BAI under Van Giffen's guidance, Van Hulten was appointed in 1940, on behalf of the Rijksbureau voor het Oudheidkundig Bodemonderzoek in Leiden (cf. Van Es 1972, p. 21-24 on this bureau). In 1945 she was appointed by the BAI. After her marriage in

1947, Van Hulten continued her job at home on a part-time basis until c. 1950.

2:27 D.L. Clarke (1968, p. 423-425) constructed a 'bow-wave model' for an expansion of megalithic graves from the Hamburg area (Haassel?) over Denmark. The Danish dolmens would be a simplified version of the (Hamburg) passage graves (Holstein chambers? See Chapter 7). This model does not fit in with the known facts.

2:28 Van Giffen was director of the BAI (1920-1954), of the ROB (1947-1949), and of the IPP (1951-1956). Cf. Lanting 1973b and Glasbergen 1966.

2:29 Staal and I have worked independently from each other. Modderman's synchronisation of Staal's phases and mine (Staal 1976, note 2) is inaccurate. As far as the selected illustrations go, it should run (Staal's phases are given here in lower type): a = B (+ B/C, fig. 2:1); b = D1; c = D1; d = D2-E1; e = D2-E1; f = E2; g = E2.

CHAPTER 3

3:1 A clear instance are the pots 'from the tidal flats in the neighbourhood of FEDDERWARDERSIEL 1866-67' (Oldenburg museum 3105-3109, cf. Von Alten 1874). They are probably from a TRB cemetery on a now submerged sand ridge. Knöll placed the well-formed, but undecorated pottery (K9:1; K24:5, 22) at the very tail-end, in Q and Z. Yet, the profile of the shoulder pot would fit well into N or O and similar bowls occur in T or V (fig. B4:11) and in later assemblages. Two carefully ornamented, fragmentary bowls belonging to the same assemblage have been overlooked by Knöll. Both represent phase X, so that the whole Fedderwardersiel group may date from phase O+X (or D2, see below).

3:2 Among the finds from ELSPEET, there is one sherd with D ornament (fig. B8:12, see Appendix B7). It is, however of different manufacture and thinner, and strictly speaking, it could also have been derived from elsewhere (collection Mulder). But the horizontal bands of lying V's on other sherds (not illustrated) could, perhaps, also indicate that the settlement continued until after the introduction of the D features elsewhere.

3:3 Voss worked in Netherland and Münsterland in 1973 and 1977. This section was written before 1977, when Voss tabulated the relevant features of the more complete pilot types in both areas for computer analysis.

3:4 When I drew the collared flask 1720 and the funnel beaker 1719 (K30:20) in the Oldenburg museum in 1959, 1720 contained an old note: 'GRÜPPENBÜHREN, Amt Delmenhorst, 1719-1720, Baurat Schmidt'. Colour (orange-brown) and burnish of both (complete) pots are identical so that they may be considered as having come from the same deep interment. A parallel for the funnel beaker with interior lug-handles is given by Pleyte 1882, plate 16:3 (EMMEN).

3:5 Recently a sherd from the neck of a collared flask was discovered among the finds from the E2 settlement in BEEKHUIZERZAND (Modderman, Bakker & Heidinga 1976; Appendix B3).

3:6 Knöll 1959, map 20, list 103. To add 87, 90 (excavation Gabriel), 91 (Knöll 1968, note 76), 253, 280, AALDEN, gem. Zweelo and DROUWENERVELD, gem. Borger.

3:7 Recently, Hulthén (1977) suggested a function as bed-warming tile. This would indeed better explain the careful ornamentation.

3:8 Cf. also a map compiled by W. Wendt (Schwabedissen 1967, fig. 25).

3:9 Counts of the sherds from VLAARDINGEN (Altena et al. 1962, p. 217, note 27). At other sites the ratio does not seem to be much different. In the VL settlements of HAZENDONK, however, baking plates are practically absent (information L.P. Louwe Kooijmans 1976) and in the E2 settlement in BEEKHUIZERZAND (Modderman et al. 1976) the weight percentage of the discs was nearly 8% of the TRB total. Evidently factors like sample size, activity areas, and the economy of the settlement are of influence.

3:10 On the HAZENDONK, fragments of three ornamented TRB pots have been found in 'Vlaardingen Ib' layers. (1) is the globular belly of a collared flask with continuous horizontal Tiefstich lines on the shoulder. (2-3) are two fragments not broader than 4 cm. Their decoration is in rather rough Tiefstich lines; the temper is pounded quartz. (2) (11.097) seems to be from the neck of an amphora with blocks of stacked W's and a horizontal line on the base of the neck. (3) is a wall sherd (18.625) of a small bowl with a curved profile. Its top is bordered by a horizontal line, its left and right sides by originally (at least two) vertical lines. Between these lines, two inverted V's are placed above two horizontal lines which stop before the vertical lines. To assign (2-3) to a phase is difficult. Tvaerstik, most typical for D and E1, is lacking; so are point stamp lines which are so typical for E2. The two horizontal

base lines on (3) are not seen on C-E pottery (Knöll 1959, Schlicht 1968, 1972). Still, D1-E seem the most probable phases for (3), with a preference for E, in which (2) would fit well.
Temper of pounded quartz was so far (1977) thought to occur only locally in TRB ware (e.g. BEEKHUIZERZAND, UDDELERMEER), pounded granite being the normal temper of western TRB pottery. Diatom analysis might be able to demonstrate that the TRB pottery was made on the Hazendonk itself by finding fresh or brackish diatoms in it (Jansma 1977). Was a TRB woman potter part of the VL extended family on this wet site?
The scarcity of baking plates (n. 3:9) might indicate that bread baking and the cultivation of cereals were less important than stock-breeding or fishing and hunting. I thank the excavator, Dr. L.P. Louwe Kooijmans (Leiden museum) for permission to study the finds.
Later addition: Louwe Kooijmans (1976b, p. 286, fig. 23) turns the sherds (2-3) 180° and dates them to C-D1(D2?). The unframed chevron of (2) is, however, not found in C. Neither are stacked V's.

CHAPTER 4

4:1 The chronological position of Drouwen A with respect to B is not completely clear. B is often found without A, which is very rare. It is unknown if A was made in Drente before B. One could also think of an introduction of A and B together, where B outlived A.

4:2 The sherd from GELLENERDEICH, Bakker & Van der Waals 1973, fig. 12:4, was interpreted as a Middle Havelte specimen because of its incised grooves, which are rarely seen in the West Group on earlier pottery. The original shape of the pot and the design could, however, also indicate that a MN II tureen is concerned (or Drouwen C/D1). The isolated position of this dubious Middle Havelte find also urges for caution. The beaker from SCHWARMSTEDT is another dubious type (l.c.).

CHAPTER 5

5:1 Here, as throughout this book, 'stone' is used to indicate all kinds of natural stone except flint. Later addition: see also Stewart 1973, for suggestions about making and function of flint, stone and bone artefacts.

5:2 However, the small flint artefacts from the Nordmoor settlement at OXSTEDT near Cuxhaven (Waller 1935) are, on the average, larger (4 cm or more). This might indicate – contrary to what was said above – that in the West Group flint tools become larger towards Scandinavia due to cultural or geological factors. Waller gave illustrations and descriptions of 100 small flint artefacts. He also mentioned splinters of thin-butted flint axes with rectangular cross-section. He made no mention of artefacts made of any other stone than flint. It would seem that the few pieces of pottery of diagnostic value (ibid. fig. 4; Dehnke 1940, plate I:1-11, p. 26-27) offer parallels with (part of) phases A-C. The settlement finds in the Stade museum (e.g. MARMSTORF) are suitable material for a study of small flint artefacts.

5:3 See Appendix B11 (Laren) for a plausible different interpretation (cooking or boiling stones). Cf. also Stewart 1975.

5:4 Brandt 1967, p. 96, line 2 only makes sense if 10,0 is changed into 15,0.

5:5 20 hoards with flint axes are known from peaty or boggy places in Netherland. No pottery was present in any of them (Bakker 1959; Achterop 1960 (inventory of hoards 1-18); Achterop 1961a (hoard 19); Louwe Kooijmans 1969, fig. 13 (hoard 12); Van der Waals 1964a (most recent, important discussion)). The possible hoard 20 (ANLO) was reported in *Nieuwspapier Drents Museum Assen* I (1), 1976; a complete report will be published in the NDV. In that *Nieuwspapier* there appeared also the illustration of a possible hoard from ELP, consisting of two flint blades and a point-butted axe with oval cross-section, made from quartzite, which is probably earlier than the MN TRB phases.

5:6 The raw material for these axes came from as far away as HOV and BJERRE in Thy, northwest of the Limfjord. There, a great number of mine-shafts were found which yielded evidence of this: in the upper levels of these shafts completely finished and half-finished heavy thin-butted flint axes were found, as well as 'delicately decorated' sherds 'from an early phase of the Neolithic' (Danish chronology!). Becker wrote a lively article on these finds (1966).

5:7 H. Aust (personal information 1972) has found an old description of holes and bumps on the HEMMOOR site possibly indicating prehistoric flint mining. See Deecke 1933, Ahrens 1966 and Gellert 1958 for the flint bearing Witte Klippe on HELIGOLAND. This chalk cliff disappeared in 1771, but its flint could be found on the Heligoland Dune Island until recently.
Fig. 42 was compiled from data given by Becker 1966, 1952 (for S. Scandinavia); Mariën 1952, fig. 87 (Belgium); Nougier 1950, map 15 (France);

Evans 1975, fig. 55 (England); Andree 1922, Deecke 1933 (Germany). Maximum extension of erratics after Bederke and Wunderlich 1968, p. 26. For prehistoric flint mining in general, see Andree 1922, Jahn 1960, Roos et al. 1971, and Engelen 1976.

5:8 DROUWEN: Leiden museum c. 1912/12.3; copy Assen museum 1912/6.1c; illustrations PZ 1913, p. 345; Van Giffen 1927, plate 154:2. It is 20 cm long, has polished broad and narrow sides and a remnant of the cortex on the very narrow butt.
TINAARLO: Assen museum 1928/3.148; Van Giffen 1944a, fig. 4:34. It is 18 cm long and both the long sides are polished. Repeatedly re-sharpened.
ZEIJEN: found during clandestine diggings in 1856-7. Assen museum 1857/1.2; Van Giffen 1927, plate 154:13. Length 17.9 cm. This specimen illustrates the taxonomic difficulties. The narrow butt surface was polished, which does not occur in the thin-butted thick-bladed flint axes, according to Becker and Brandt. Furthermore, the outline of the broad sides is a narrow trapezoid and one might consider the possibility of its being another type. The top (4 cm) is half the width of the cutting edge (8 cm) and this is exactly where Brandt (not our Danish colleagues) draws the line between thin-butted and thick-butted axes (Brandt 1967, p. 109). The latter type is, however, out of the question, since the narrow sides have a completely different outline. The axe from SCHIPBORG, Assen museum 1863/1.1, is a close parallel.
The specimen from hunebed RIJS-F1 (Leeuwarden museum 5/N1. Boeles 1951, plate 2:9; Van Giffen 1927, plate 152:25) has convex, carefully polished sides and a rounded butt, which is also polished. One narrow side is irregularly curved and more superficially polished. Length 15 cm. At 2 cm below the top and at 1/3 length, the top formula is c. 51%, which would indicate a Lindø thick-butted axe (Becker 1973, p. 127), but to my (and Van Giffen's) taste the axe has distinct thin-butted features – it may be a resharpened thin-butted axe (cf. Becker 1973, p. 138-139, fig. 15). Anyway, this piece has little typochronological value. Cf. Knöll (1959, p. 32), who also discussed these axes.
Mr. G. de Leeuw, of the Assen museum, kindly collected measurements of the Assen axes at my request.

5:9 See note 5:5.

5:10 A top fragment of a fairly large flint axe whose polishing recalls a TRB axe is from the TRB E-settlement at ANLO (Waterbolk 1960, fig. 41: K-11). It was a surface find and EGK pottery was also found at this site. It might possibly have been a very long *Flint-Flachbeil,* although also an uncharacteristic imported Danish axe whose available dimensions still fall within the criteria Becker established for the Lindø type. At 2 cm from the butt, the ratio of thickness to width is c. 56% (cf. Becker 1973, p. 160-161).

5:11 See note 5:5.

5:12 A good example of a chisel which was polished in the EGK manner is that from EMMEN-D43 (Appendix B13). Leiden museum c. 1913/12.14. Holwerda 1914, p. 65 bottom left. This is not a battle-axe as stated by Van Giffen 1927, p. 436 and 440 (Knöll 1959, p. 33, note 21).

5:13 Chisel: Leiden museum c. 1939/1.8. Collared flask: Zwolle museum POM 57, illustrated by Kaelas 1959, fig. 19. Both in impeccable condition, apart from the old fracture of the chisel's butt end. They were discovered in 1938 by the antiquities hunter G. Middelveld (Emmen) in the urnfield 'Driest', S.E. of the Eppiesbergje, gem. ODOORN. According to his letter of August, 1971 and his information given on the findspot (13.8.1973), he found the grave below the centre of a 0.6 m high barrow of coarse sand (diam. 2.5 m; 6 urns, 0.5 m deep). 'In the yellow sand with pieces of charcoal' he saw the contours of a grave pit (2 by 0.8 m). At 1.7 m below the old surface, the bottom of the grave was lined with two rows of stones piled upon each other (diam. of each c. 30-35 cm, larger stones 'at the head end'). The collared flask 'was at the right hand side of the body, in the corner', the 'axe' was slightly higher in the grave.
The correspondence of the Leiden museum (F.C. Bursch) with Middelveld (9-19.1.1939) shows that Middelveld tried to sell both finds to the museum, the chisel for Dfl. 6.—, which was accepted, the flask for Dfl. 30.—, while Leiden was not prepared to pay more than Dfl. 10.—. Middelveld told that he had bought both pieces from the finder, probably to force up the price. The flask was 'found at Odoorn at a depth of 2.7 m. The chisel lay next to it. Everything in a grave composed of stones.' The Emmen museum would have offered Dfl. 45.—, but the flask was bought for Dfl. 46.— by G.J. ter Kuile who apparently placed it in the Enschede or Zwolle museum. In the contemporary correspondence between Bursch and Ter Kuile (about the BAALDERES finds) no reference is made to the Odoorn assemblage. A cardboard pedestal for the flask formerly in the Enschede museum and a label in the Zwolle museum, both written by Ter Kuile, indicate another findspot, near Exlo, gemeente Odoorn, along the road to Odoorn.
Although three major discrepancies – depth of the grave, finder and findspot – and the many elapsed years may call for some caution in considering the

1971 report, the essence of it needs not be discredited. The findspot given by Ter Kuile may be due to choosing the wrong road on the topographical map, Driest having an analogous position on the Valthe-Odoorn road. The difference in depth may be due to Middelveld's faulty memory for figures: in 1971 he wrote that Ter Kuile paid 'not Dfl. 46.—, but Dfl. 65.—'.
Knöll's report (1959, p. 33, note 30) of a chisel of this type at ZEIJEN is incorrect.

5:14 See note 5:5.

5:15 The Vlaardingen settlement was excavated by the IPP, 1959-1964. Only preliminary reports have appeared (Altena et al. 1962-63; Groenman-van Waateringe & Jansma 1969).

5:16 Examination of the flint axes in the Brussels museum (1969). For Verheyleweghen's chronology in its general context: cf. De Laet (1972, 1974) and Verheyleweghen's publications cited by him. De Laet (1972) reviews the Michelsberg and Seine-Oise-Marne sites in Belgium. He disagrees with Lüning (1967), who lets SOM succeed Michelsberg, and pleads for a partial chronological overlap of both cultures in Belgium. Besides, De Laet stressed the probability that the flint miners themselves had not produced their own pottery, but bought it from both adjoining cultural groups. On the other hand, Clason's analysis of the animal bones indicated quite normal farm refuse on the spot, and not the *Schleppeffekt* to be expected if the industrial specialisation and/or the living conditions on the plateau had been as described by Verheyleweghen and De Laet.

5:17 The fact that I speak here of the Meuse flint zone does not rule out the possibility of the types mentioned having also been produced in flint quarries or mines in northern and even central France.

5:18 In the future, neutron activation analysis may prove to be a useful tool for distinguishing between some types of flint (De Bruin et al. 1972). It is not to be expected that the process will be able to differentiate between moraine flints and Danish flints, since they share a common origin.

5:19 Leiden museum v.H.v.I. 1. Pleyte 1882, plate 41:3 erroneously illustrated this axe with rounded-off rectangular cross-section (it is elliptical) and wrote that it was found in the tomb. The primary documentation, however, leaves no doubt that it was found adjacent to it.

5:20 Butler & Van der Waals 1967, p. 69-70; figs. 14-15; p. 80-82, fig. 21:8; Butler 1959, p. 134-136, fig. 4.

5:21 To avoid taxonomic confusion, the German terms have, wherever possible, been literally translated into English. German jargon differentiates strictly between *Beil* (axe of types like those described in the preceding sections) and *Axt* (battle-axe in English). The English term axe-hammer has recently been reserved for the perforated axe with hammer-butt of simple form and made for heavy work (*Arbeitsaxt* in German) (Roe 1966). The German term *Hammeraxt* is used for battle-axes with a hammer-like butt. *Flache Hammeraxt* is translated here as Flat battle-axe, since the typical representatives of the type (see Brandt 1967, 1971) are battle-axes, without an obviously different function from that of the other TRB battle-axes or EGK battle-axes. This translation also avoids confusion with the axe-hammers mentioned above. The term Double battle-axe was taken from the German. J.J. Butler's translation of *Axt mit Nackenkamm* as Fan-butted battle-axe was an inspiration. 'Collars' for the rings round shaft-hole openings (German: *Tüllen*) was suggested by C. van Driel-Murray.

5:22 In addition to the specimen from RIJSSEN, the following specimens were found to the west of the area mapped by Brandt and north of the Ardennes: at WICHELEN near Ghent (Nenquin 1963; De Laet 1974, fig. 121; not an EGK battle-axe!), in Kr. GELDERN (Geschwendt 1960, plate 13:7), and at DREVENACK, Kr. Rees (Brandt 1967, notes 128 and 190). The axe labelled by Åberg (1918, fig. 132) as 'ENSCHEDE, Netherland?' comes, according to Brandt, from TELGTE, Kr. Münster. In the present book, I discuss under the Knob-butted axes the axes from WEKEROM and UDDELERMEER (province of Gelderland) which were described by Addink (1968) as 'Flache Hammeraxt, Shape 1 (Brandt)'. In the case of the (small) Wekerom fragment my choice is rather arbitrary.

5:23 The specimen from formerly MADÜSEE, now MIEDWIECKO, site 1, powiat Stargard Szczeciński, Pomerania, nowhere illustrated and now lost, was found in an open site which yielded Wiórek and Luboń sherds of the TRB East Group (Jażdżewski 1932, fig. 47; 1936, p. 371, n. 244; Siuchniński 1969, p. 88, plate VIIa-g) and possibly also a sherd of Corded Ware (Siuchniński 1969, plate VIIId, p. 88). The Luboń phase must have started about 2700 BC (Bakker, Vogel & Wiślański 1969), i.e. about the beginning of the MN for the North and the West Groups (section 6.9).
A recent find is that of DRAGSHOLM, Denmark (Brinch Petersen 1974). There was a broken battle-axe of this type in a grave, associated with, among other things, a pot similar to Becker 1947, fig. 40 (OXIE, Scania), which Becker placed in the

EN B. It would lead us too far afield to discuss here the other burial gifts from this grave and a synchronous grave adjacent to it, and the two conflicting C14 datings for these graves.

5:23a See section 6.9, radiocarbon dating, for a discussion of the typological dating of the STENDIS lugged beaker and of the earliest passage graves.

5:24 See note 5:28.

5:25 Ebbesen (p. 203, note 207) remarked correctly that the dimensions of most Hanover axes are those of Amazon axes. The typologically earliest specimens, like fig. 48d and like Åberg 1916b, figs. 3-4, belong to the Troldebjerg-Fredsgårde type according to Ebbesen's metric definition (Ebbesen, fig. 143). Seen from this angle, the SKØRPING axe and another one from Denmark (Ebbesen, fig. 144:2 and note 50) would also belong to the Hanover axes, or be prototypes.

5:26 In order to distinguish among the scatters of dots on these distribution maps between the core-areas with a dense distribution and the marginal areas with sporadic finds, the following arbitrary method was employed: circles with a radius of c. 10 and c. 20 km were described around every find-spot. A 'closed distribution area' is one containing more than one find-spot within the contour of the 20 km circles thus formed. In fig. 57 these 'closed distribution areas' are indicated by shading. The shaded areas were defined by a flowing line drawn between the 10 km and 20 km lines. The circle method of figs. 2-4 and 50-56 – for which the name 'frog-spawn method' was suggested – is preferable to the alternative of larger symbols (or a smaller scale of map) in that the find spots can still be indicated fairly precisely, even in the core areas.

5:27 See note 25, above.

5:28 Mrs. Addink very generously placed at my disposal her detailed documentation of TRB battle-axes which is part of her inventory of perforated axes in the provinces of Gelderland and Utrecht and in Gooiland. She had already published a list of these TRB battle-axes in her paper on EGK battle-axes (Addink-Samplonius 1968, p. 213-214). Her documentation includes ten knob-butted battle-axes; it is kept in the IPP.
I am also very much obliged to all those who assisted me in collecting the primary data on the other specimens.

5:29 Tackenberg (1974, p. 26-27) is surely correct in rejecting the specimen from HÜLSTEN, Kr. Borken (Brandt 1967; Bakker 1973). From what can be seen on Albrecht's photograph (1938, fig. 38), it is certainly atypical (pointed cheeks, scarcely any knob, no oblong block shape and particularly some features characteristic of Flat battle-axes). On Tackenberg's authority, I have also omitted the specimen from OFFLUM, Kr. Steinfurt, which is said to resemble the above, and the one from DROPE, Kr. Lingen, which would possess atypical proportions. A specimen from ERMERVEEN, gemeente Sleen, Drente, Leiden museum c. 1896/6.1, appears incorrectly in Hoof (1970, plate 23:215) as MAASTRICHT and in Tackenberg (1974, p. 56) not only as Maastricht but also as EMMEN (because it had been read in Leiden as: Emmerveen, i.e. Peat of Emmen). This is not a knob-butted axe but a *Nackengebogene Axt* from the Bronze Age or the Iron Age (also in the opinion of S.H. Achterop). The specimen has collars and vague circular cheeks.

5:30 The dating of TRB knob-butted battle-axes elsewhere was recently checked by Brandt (1967) and Nilius (1971). The few southern Scandinavian find-associations point to a dating in the EN C, the MN I and a 'probably somewhat later' phase. If we were to see the knob of the battle-axes of the Swedish Boat-axe culture (EGK) as a derivative of the TRB knob-butted axes there, it would be necessary to assume a currency period which extended even into the MN III-IV (cf. section 6.8).
The inclusion of the 'Dutch' knob-butted battle-axe from GRAPPERHAUSEN (4) in an illustration of artefacts from the Fuchsberg phase in Schleswig-Holstein (Schwabedissen 1968, fig. 4) was extremely misleading. Schwabedissen had in mind the fragment of the battle-axe from OHE = SACHSENWALDAU = SCHÖNNINGSTEDT (Schwantes 1940, plate 5:26). Brandt (1971, n. 74) identified this as a Flat battle-axe, cf. Åberg 1918, fig. 141. See section 5.6.1.

5:31 This occurrence next to a hunebed might, of course, also point to the EGK, since EGK battle-axes, axes and pottery are regularly found in them. Gabriel (1966) even found a *Nackengebogene Axt* in the passage graves of TANNENHAUSEN.

5:32 This is a good example of 'polarized trade' (Clarke 1968, p. 418-420; Piggott 1965, p. 188, fig. 105) over a relatively short distance in contrast with the polarized trade over very long distances which presupposes a higher level of social organisation (Greek-Celtic trade, Assyrian trade) than was likely for that of the TRB population and its neighbours. I would note in passing that the distribution picture which gave rise to these opinions in 1973 seems to have been confirmed in the meantime: the number of specimens in Noord-Brabant and Limburg has risen from two to four and all lie roughly on an

east-west axis BLADEL-HUNSEL which runs south of Eindhoven, parallel with the Belgian border. Is this an old route south of the large Peel peat bogs? The maps at my disposal do not make clear exactly why it should run along the watershed of the Scheldt and lower Meuse tributaries.
One could assume here a genuine TRB colony, or a population deriving other cultural features from the northern Netherland TRB culture than these battle-axes, but the fact that these derivative features are not obvious, especially in the pottery, argues against this (although admittedly the Neolithic is virtually unknown here). It is true that a few sherds of collared flasks were found in the gemeente HUNSEL (information J.H.F. Bloemers), but the pottery from these sites lacks the Tiefstich ornamentation which would be expected in the Early Havelte period, as do the prehistoric sherds from the relevant part of Noord-Brabant (information J. Slofstra).
Concerning the collared flasks from southeastern Netherland (Van Haaren & Modderman 1973), we can consider either pre-Tiefstich impulses, or impulses from the Gallery Grave Group (to which the sites of southeastern Netherland may themselves possibly have belonged). The Gallery Grave Group is (as is the Vlaardingen culture) a group, situated along the edge of the MN TRB West Group, which adopted eclectically some elements of the TRB culture (from Walternienburg-Bernburg) and the Řivnáč culture, but which shows a gradual transition on the western fringe of the Ardennes into the Seine-Oise-Marne culture of the northeastern Paris Basin (Fischer 1973). No Knob-butted battle-axes have been found in Gallery graves west of the Harz.

5:33 In Denmark, a number of loam quarries of the TRB culture have been found, including those in the settlements of TRELLEBORG (Becker 1956) and KLINTEBAKKE (Berg 1951). Loam was quarried there for a number of purposes, e.g. the wattle-and-daub walls of the houses, for which large quantities were required. The reason why no loam quarries have yet been found in Dutch TRB settlements may be that the glacial loam generally causes a high ground water level on the Drente Plateau if it is situated near the surface. It was avoided by settlements. In this connection, the information that the unfinished specimen from EEXT-ANNEN (15) was found '2 m deep, while clearing the (arable?) field of stones', would seem to be significant, although it also raises some questions. Was TRB refuse dumped in loam pits, or were the battle-axes made there and not in the village?

5:34 Tubular drilling was never employed. Malmer (1962, p. 607-610) believed that this technique is found in Sweden only in the battle-axes of the later Boat-axe culture (EGK), and that it is thus an important chronological indicator. He did not yet use this criterion in developing or checking his chronology.
Jażdżewski (1936, figs. 945, 955), however, illustrated two Polish TRB battle-axes the perforation of which, by tubular drilling, was not completed. One of these unfinished specimens is of a Knob-butted battle-axe, the shape of which is quite closely related to the Dutch type. It was found at BOLĘCIN, Wojewodship Kielce, in the territory of the TRB Southeast Group. Widely-known find-groups such as that of NAŁĘCZÓW (Åberg 1918, fig. 315) prove that it does indeed belong to the Southeastern TRB Group, for which C14 datings between 2900 and 2700 BC are available (Bakker, Vogel & Wiślański 1969, fig. 17). This implies that, on the Polish loess at least, tubular drilling was already known before the MN Ib, several centuries before its application to the late EGK battle-axes in Sweden. Nor should we forget that this drilling technique had already been employed in the manufacture of the Rössen *Keile*.

5:35 See note 5:26.

5:36 M. Zápotocký (1966) put forward a host of arguments to support the theory that the neolithic battle-axes in Europe (which are often perfectly symmetrical and occasionally made of semi-precious types of stone, in 'royal treasures') were the insignia of clan or tribal chiefs and/or the cult symbols of priests (whether or not these were one and the same person). Another argument is provided by the miniature models of pottery, bone etc. which were found with the TRB culture, too. Zápotocký has no doubt that the cult of a personified male thunder, heaven or weather god, whose emblem was the battle-axe, existed since the period of the Corded Ware, if not longer. There is evidence in favour of uninterrupted traditions going forth to the time of Zeus, Thor and Peruń.

CHAPTER 6

6:1 Aner 1963, note 63. The same late dating applies for the dolmen under a round barrow at ROLFSEN, Kr. Winsen (Wegewitz 1964; Sprockhoff 1938, fig. 24), which is the only reasonably well known *Rechteckdolmen* (rectangular dolmen) west of the Elbe. Wegewitz' complete excavation and restoration of the monument yielded no pottery suitable for typochronology. Cf. also Appendix A2e s.v. Stone cist for a recent re-interpretation of the Rolfsen grave.

6:2 Hanging semi-circles of parallel cord impres-

sions similar to the typical EN C ornament occurred again in the MN II-III, but independently from the old tradition, for this decoration is totally lacking during the MN I (Davidsen 1973, p. 45-48). The MN III (or MN II?) tureen from BAKKENDRUP (Becker 1959, p. 61) which has this decoration cannot be interpreted anymore as proof of a MN survival of non-megalithic groups in Denmark.

6:3 Prof. Becker and Prof. Schwabedissen have inspected the pottery at the Second Atlantic Colloquium, Groningen 1964. Both dismissed a Michelsberg or a TRB EN A/B affinity. At the Third Atlantic Colloguium, Moesgård 1969, Prof. Becker suggested (in discussion) an EN C age.

6:4 The finds are in the IPP. Cf. the C14 date of 260 ± 80 BC (GrN-4150, *Radiocarbon* 9, 1967, p. 124) of charcoal from a discolouration below the present surface, formerly the base of the mound, of hunebed D20.

6:5 Cf. also the pots from pits around hunebed GLIMMEN-G2 (Lanting 1975, plates 1, 3) which are badly made and have wobbly bases.

6:6 Becker (1947) discerned a South-Scandinavian EN A pottery with flat bases and an EN B pottery with round bases which succeeded it and was followed itself by EN C pottery. Outside the North Group, A and B could not be discerned from each other and they were named A/B. Skaarup (1975, p. 204-206) gave the present *status questionum* concerning dating and interpretation of A and B. A main problem is that the available Scandinavian C14 datings for EN A, B and C all fall in a period of 300 years, without displaying the expected sequence. Skaarup concluded that A, B and C pottery cannot be seen anymore as representing successive chronological phases, but stressed also that much more information would be necessary for a revision of the old concept.

6:7 Becker and Skaarup (1973, p. 139ff.; 1975, p. 206) dismiss Troels Smith's theory (1953) that the TRB culture originated from Bandkeramik (or Lengyel) impulses to the Ertebølle-Ellerbek culture. The latter epi-mesolithic group would have already experimented with agriculture. Skaarup (1975, l.c.) remarks that no site of the Ertebølle culture has yielded evidence of agriculture. A first exception to this rule was recently published by Schwabedissen (1972) and Schütrumpf (1972), who found *Cerealia* and *Plantago lanceolata* pollen and bones of domesticated cattle in the Ertebølle settlement of ROSENHOF in Schleswig-Holstein. Later excavations (Schwabedissen, lecture Walternienburg-Bernburg symposium Halle, 1977; cf. also Hulthén (1977)) demonstrated, however, that in the upper habitation layers A/B TRB pottery occurred and that indeed a gradual acculturation may have taken place on the spot.

6:8 Cf. note 3:10.

6:9 Cf. the sequence of 'Swifterbant contributions' in *Helinium* 16, 1976 and 17, 1977.

6:10 Müller-Karpe 1974, plates 662-663.

6:11 Findspot and position of the pot in the ground according to newspaper report in the *Lochemsche Courant* of 14.9.1934 and correspondence between J.H. Holwerda and J.J. van Deinse in 1934-35 in the archives of the Leiden museum. Holwerda pointed out that the perforations below the rim and the inverted position of the pot in the ground suggest an affinity to Pot Beakers. One can now also think of the Vlaardingen culture. Cf. also Lanting & Mook 1977, p. 76.

6:12 Lüning's supposition (1967, note 384) that such rims also occur in the West Tiefstich Group cannot be sustained. Neither have the Dutch TRB settlement excavations produced any positive evidence, nor are the instances given by him so typical for the type that they might not belong to the family of the 'coarse beakers with short-wave moulding' – a kind of domestic pottery of the Corded Ware (Becker 1955). During an inventarisation of such domestic beakers in Netherland, no genuine Michelsberg-like rims were found, but the wide variation of types also included similar ones as those mentioned by Lüning (unpublished research by W. Glasbergen and students). In both sites mentioned by Lüning, Corded Ware occurred (DÜMMER-N) or may have occurred (KLEIN BÜNSTORF). Later addition: but see now N.H. Andersen 1976, figs. 3d, 11.

6:13 A conflicting line of thought would be to derive the hanging triangle of the Drouwen C - MN Ib/II horizon from the hanging semi-circles of the Haassel-Fuchsberg style, via the Altmark pottery. But one important and necessary link for this derivation, a round-bellied Altmark jug with hanging triangles, is missing. Only the demonstration (by stratigraphic, C14 or other non-typological evidence) that Altmark tureens with hanging triangles (cf. DÜSEDAU) succeed *immediately* to Haassel (and that the round-bellied Altmark jugs are a by-path) could further sustain such a theory.
One pot from the DÜSEDAU find has been interpreted as a Gatersleben derivation (Behrens 1973b, p. 100; Kroitsch 1973, p. 122, plate 16i). In my view this derivation is unnecessary: the pot shape might fit well into the normal variation of the West Group or of the Walternienburg Group. It may have also been current in the Altmark Group.

I had earlier attempted an explanation of pot 33 from GROSS BERSSEN 7 (Schlicht 1972) as an import from the Altmark Group (Bakker 1974). Undoubtedly, however, Knöll's explanation (1974a) as a normal local specimen (c. D2/E1), is much better.

6:14 The handle of the TINAARLO tureen in fig. B10 is barely drawn above the rim; its distance from the examples in the east and the absence of other examples in the intermediate area plead against a direct typological connection. In E.F. Neustupný's sequence for the Baden culture (1973) jugs with pronouncedly high-drawn handles are normal for phases C-E. The 'more general' type of high-drawn handles of TRB tureens, as just described in the text, can be parallelled with Baden jugs with such handles from phase B or from the turn of B to C.

6:15 Similar rhytons have been excavated by G. Behm-Blancke (private communication 1977) in the Bernburg settlement of GROSSOBRINGEN, Kr. Weimar, DDR (Behrens 1973b, fig. 45f, but the specimens exhibited in the Weimar museum have flat or round bases). Neustupný (1973) placed such rhytons in phases D-E of the Baden culture, of which D would be synchronous to Bernburg (o.c., Table I). Since Bernburg seems to be later than the OLDENDORF II pottery and the C tureens, one would also expect high-drawn handles with a square cross-section in earlier phases of the Baden culture (C or even B).

6:15a Prof. Schwabedissen still used the Seeste Vase theory in his 2nd Atlantic Colloquium paper (Groningen, 1964), but omitted it in his printed article (1967) after having been shown the C14 dated ANLO pottery. At the Arbeitstage Neolithikum 1975 (Würzburg) Prof. Milojčić stated 'nobody believes this anymore' when the old concept of a possible chronological contact between Rössen and Tiefstich was under discussion.

6:16 When shown Early Havelte pottery in the IPP in 1966, E. Lomborg stressed the similarity to EN C shapes.

6:17 A letter (1972) to Sylvest and Sylvest asking which flat axe and what spirals from the BYGHOLM hoard and what spiral from the RIESEBUSCH hoard exactly had been analysed by them remained unanswered.

6:18 Sangmeister (1975) supposed this.

6:19 JSS (1960, p. 151) ascribed four other analyses to the TRB culture, which brought the number of their metal groups from three to seven for this culture. In reality, however, the two analysed objects from the BOBERG II/OHLENBURG hoard, buried in a Barbed Wire decorated Beaker, date from the (Danish) Late Neolithic B/C (section 2.12) and the two rivets in the wooden shaft of a stone *nackengebogene* battle-axe from DÜMMER-M (Michaelsen 1938, illustration 2:18) date from the Bronze or Iron Age (section 5.6.3). In both cases, JSS may have been victim of Sprockhoff's incorrect interpretations (1938, cf. 2.12 and 5.6.3).

6:20 While writing the preceding section (1972), I had overseen the study by Cullberg (1968). He dated the North Group flat axes in the MN I because the so similar Altheim axes dated, according to him, from that period. The available C14 datings for the Pfyn culture, which is related to Altheim, seem, however, to allow for an EN C date for Altheim. Cullberg did not use the Waterbolk-Butler method but the JSS subdivisions. He gave further information on the finding situation of northern metal finds.
In 1973 new studies have appeared which overlap partly with the preceding section. Schlicht (1973) compiled the available data on metal finds in 22 megalithic graves of the West Group. She now abandoned the concept of one single EN C copper import horizon and dated each type of copper ornament separately using comparable objects from elsewhere. She observed that hunebeds with 2 to 3 capstones have not yielded metal finds. Copper discs were found five times in hunebeds with 5 capstones and once (DROUWEN-D19) in one with 9 capstones. The fact that such discs have only been found in EN C contexts in Denmark lets her conclude that such long hunebeds were constructed in the West in the EN C. The dating of the shorter chambers is left open by her.
Comparing this with sections 6.1 and 6.4 and Chapter 7 shows why I cannot agree with this conclusion. Fig. 78 demonstrates that hunebeds with 5 to 9 pairs of side stones (and generally the same number of capstones) were constructed during the pottery phases A-D, i.e. in the MN Ia at the earliest. The fact that the short chambers with 2 to 3 capstones (which are essentially earlier than the longer chambers) seem to have been passed by the stream of copper disc imports, also contradicts the theory of one single copper disc horizon in the North and the West Group.
Ottaway (1973a, b) applied simplified Waterbolk-Butler diagrams to the Neolithic copper finds of N.W. Europe. Both the finds from the West and North Group were still ascribed by her to the EN C. Her studies show the ways new analyses of the data used by Schlicht, me, and herself could follow. A typological subdivision of the trinkets, as Ottaway and Schlicht did, and a further division between the TRB Groups and the megalithic groups of the Mittelgebirge would seem useful. Further exploration

of the JSS lists might also produce some more relevant analyses. Ottaway has divided the high-As coppers into C3 (with low Ag, my Group I) and C1 (with high Ag). From Group II the BUINEN spiral cylinders would belong to C1. The remainder of Group II takes an intermediate position between C1 and C3, with a slightly higher Ag percentage on average than C3/Group I, but yet lower than the average of 0.2 percent of C1.
Later addition: see T. Madsen, *Nordsleswigske Museer* 5, 1978, p. 15-20 for an arsen-copper spiral found in a dolmen at SOED, Haderslev amt, together with a Fuchsberg sherd, and the remains of at least three individuals and of a heavy flint axe.

6.21 Such an investigation would also clarify the typological and genetic relations between Drouwen D and Early Havelte, which are not very clear.
The differences in the typological subdivisions of the E-ceramics from EMMELN-2 by Schlicht and me are only gradations. Schlicht divided the E pottery (her Style C) into groups C1-5. C5 and ornamented funnel beakers have not been included in Table III. On the other hand, I included in E1 some pots which were not assigned by Schlicht to one of her groups. E1 corresponds to C1+C2.
The five pots of C1 which were incorrectly credited by Schlicht with a Rössen pedigree should be included into E2. There is no reason to differentiate between C3 and C4 since representatives of both groups occur in the E2 assemblages on the Veluwe and in Drente. Part of the undecorated C5 pottery is also found in the E2 settlement of BEEKHUIZERZAND. See also my remarks in Modderman et al. 1976, which are summarised in Appendix B3, and Bakker 1971.

6:22 The necked bowl (*) from LEERWESTERHAMMRICH was found 45 m from the destroyed hunebed. It must have been complete in the ground. Together with it were found the remains of a cremation and amber. Documentation of Ostfriesische Landschaft, Aurich. A full report on the neolithic finds from this site is in preparation.

6:23 Prof. Schwabedissen has informed me in a letter (28.06.1971), which arrived too late to be taken account of by Bakker & Van der Waals (1973), that the pot from WOLKENWEHE (Schleswig museum KS 19805d, square (30)8A) was found higher in the section than the layer with Tiefstich pottery, and that, according to him, stratigraphy and association of the pot indicate that it dates from the Bronze Age. The complete publication of the data collected at the site, which is in preparation by Schwabedissen, must be waited for to clarify this point. It seems possible that Late Havelte/Store Valby pottery was not recognised as Tiefstich pottery because it lacked decoration. And this pottery is indeed very similar to a local kind of Bronze Age pottery (cf. Bakker & Van der Waals 1973). It would be interesting to know in what stratigraphic position the Bell Beaker pottery (Schwabedissen 1958a, p. 29) was found.

6:24 Ebbesen's 1975 study has not yet been taken into account.

6:25 The MULDBJERG datings show also a very staggered distribution. The t.a.q. and t.p.q. dates appear in reversed order and most other dates lie outside the mean values of both. These datings are, however, among the very first radiocarbon datings in Europe, and the applied 'solid carbon' method may be responsible for their – quite illogical – spread (Lanting & Mook 1977, p. 72). The Muldbjerg series is therefore represented only by its mean value of 2830 ± 100 BC (R2, p. 7) in fig. 75.

6:26 The seven KN-dates for SÜSSAU (MN III-IV) which were only partly published (Hoika 1971) were left out of further consideration because they have an inexplicable spreading.
I have also omitted six GrN-dates for BÜDELSDORF (GrN-6418/6423) which have remained so far unpublished. The earliest dating, 2555 ± 60 BC, GrN-6420 (Hearth IX/2, 1.25 m below surface), agrees more or less with the MN Ia date provisionally given on typological grounds for the whole site (Hingst 1971), but the other datings are 2130 ± 60 BC (GrN-6422, Hearth X/1) and 4 ranging from 1130 to 845 BC. Datings by the Kiel C14 laboratory gave almost identical results for each sample. These datings suggest that the site was also inhabited during the Bronze Age. I thank W.G. Mook and J.N. Lanting (Groningen), H. Hingst (Schleswig) and W. Bauch (Kiel) for their information.

6:27 Regrettably, practically no well-published radiocarbon datings are available for the West Group in N.W. Germany. As the few published datings seem to be deviants, I restrict myself to the datings from Netherland, all by the Groningen laboratory. Besides the other relevant publications, I have used the one by Lanting & Mook (December, 1977) from which I could not yet profit while writing the main part of this book.

6:28 Mention should also be made of an Egyptian Historical Curve for calibration of conventional C14 dates (600-2100 BC, no wiggles) which is based upon historically dated Egyptian radiocarbon samples, independently of dendrochronology (McKerrel 1975). When applied to the Aegean Late Bronze Age chronology, this curve 'gives results that are very satisfactory in historical terms' (Snodgrass 1975). Also this correction procedure adds a

considerable uncertainty to the standard deviations of the conventional dates.

CHAPTER 7

7:1 Around 1951-1956 Berg, Kjaerum and Kaelas found that the earliest passage graves of the North Group were of MN Ib date. Schwabedissen (1953, p. 44) was of the opinion that passage graves were built already in the MN Ia in Schleswig-Holstein (Schwabedissen 1968, Tabel). His only evidence for this (Barrow 7 at SCHWESING: Hinz 1954, p. 191, 24-25) is, however, not at all conclusive as no extraction holes of side or passage stones were noted during the excavation of this demolished megalithic grave. Bokelmann (1972) came also to this conclusion.
Later addition: cf. section 6.9, *radiocarbon dating*, for a discussion of a proposed MN Ia date of the STENDIS and HAGEBROGÅRD passage graves.

7:2 According to a report on the 1954 excavation of the long ago completely destroyed hunebed VALTHERVELD-D33, Van Giffen found a floor length of 7-7.5 m. Neither the number of pairs of chamber side stones nor the original presence of passage stones could be established. Three small stones and one soil discolouration could indicate a former peristalith, but this is not very probable as the shortest known Drente hunebed-with-peristalith, D15, has a floor which is 1 m longer. After his excavation, Van Giffen 'abolished' this hunebed as a protected monument (report of March 1957 in archives Provinciale Waterstaat Drenthe). Cf. below for the lengths of the dismantled hunebeds WEERDINGE-D37a and MANDER-O2.

7:3 The numbers in Sprockhoff's *Atlas III* have been added as 'Spr. . .'.

7:4 Schlicht's estimate of an (exterior) length of 12.5 m is based on the similar length of the remaining pit (Schlicht 1968, textfig. 3 and p. 18).

7:5 The stone pavement of the chamber was still *in situ* over a length of 12.6 m. A modern ditch cut it off on the west end; on the east end the pavement may also have been longer, but the remains were there unclear. The extraction holes of at least six pairs of chamber side stones have been established, but there is no trace of possible passage side stones. To the southeast of the grave, six irregularly spaced pits were found, but it seemed improbable that they represented a peristalith (Hijszeler, in a letter of 29.1.1973). My estimate of the (interior) chamber length is a minimal one; in a preliminary publication Hijszeler (1957) assessed it at 13 to 14 m.

7:6 The well-known lugged beaker of Drouwen A and MN Ia type from VALTHE, gem. Odoorn (K11:5) was found in 1897 together with a normal funnel beaker (Shape I.2, cf. 3.4.1), a small unornamented bowl (cup), a *Flint-Flachbeil* (5.3.4) and a stone axe (5.5.1) in either a stone cist or a very small hunebed. The rather careless find-report, made on hearsay evidence by the mayor of Exlo, describes the grave as 'made from boulders, c. 2 m long and ½ m wide, covered by a flat stone' (correspondence archives Assen museum). Van Giffen (1927, p. 376-7, and his earlier inventory sheet in Assen museum) speaks, however, of two capstones. On what source he based this is unknown. The fact that the pottery was intact in the grave (there may have been more) suggests that no (repeatedly used) hunebed is involved. The finds could typologically easily belong to one interment.

It might seem that a metrical boundary between 'stone cist' and 'hunebed' was a floor length of about 3.15 m, with a possible overlap of several decimetres. The floor length of the shortest-known Dutch hunebed was c. 3.2 m (GLIMMEN-G3). Regrettably, the descriptions by Harm Tiesing (1898) of 'stone cists' destroyed in east Drente are rather vague, but one wonders if the possibility of a one-capstone-hunebed can be ruled out. The stone cist at DIEVER (Appendix B5, figs. B2-3), which is a miniature hunebed with granite gravel on its pavement, but without capstones, entrance and much of a barrow, has a floor length of 3.1 m (Lanting 1973a) and c. 0.6 m high walls. Other data on the floor lengths of genuine stone cists of the West Group are lacking (cf. Knöll 1959, p. 45ff). The interior length of the stone packed earth grave 'a' at ZEIJEN seems to have been c. 3 m (Appendix B17). The stone packed earth grave at ODOORN was c. 2 m long (note 5:13).

7:7 Van Giffen only once found an embankment of 'a stone-hard mass of boulders, granite grit and iron pan sand' which he considered as the means by which the capstones had been brought to their places (1927, p. 186, EMMEN-D40). Although the destruction of several hunebed mounds by the 'restorations' of the 1870's in Drente may have been a disturbing factor, the fact that in Germany no such embankment has ever been found could corroborate Grumfeld's theory. While excavating hunebed DROUWENERVELD-D26, I observed that the tops of the 14 side and end stones of the chamber fitted exactly into one horizontal plane. Too short stones had been founded more shallowly and the floor pavement rose there accordingly. (Krause & Schoetensack observed this phenomenon much earlier in the Altmark (1893, p. 14).) All flat inner faces of the side stones of D26 had the usual inward inclination of 10°.

Appendix A

A1 ABBREVIATIONS

* = see Glossary, below 2a-e.

References to illustrations in other publications:

K17:23 = Knöll 1959, plate 17, illustration 23
S = Sprockhoff 1938
D = Dehnke 1940
L = Langenheim 1935
N = Nilius 1971.

Abbreviations for literature references: see Bibliography.

Abbreviated names of institutes:

BAI = Biologisch-Archaeologisch Instituut, State University of Groningen
GAS = Gelderse Archaeologische Stichting (Guelders Archaeological Society), Arnhem
IPL = Instituut voor Prehistorie, State University of Leiden
IPP = A.E. van Giffen Instituut voor Praeen Protohistorie, University of Amsterdam
ROB = Rijksdienst voor Oudheidkundig Bodemonderzoek (State Service for Archaeological Investigation in the Netherlands), Amersfoort
Stiboka = Stichting voor Bodemkartering (Soil Survey), Wageningen.

Abbreviations of geographical units:

gem. = *gemeente* (municipality, Netherland)
Kr. = *Kreis* (Germany, cf. note 1:1)
prov. = *provincie* (province, Netherland)

The area of a German *Kreis* is intermediate between a Dutch *gemeente* and a Dutch *provincie,* and usually covers several *Gemeinden.* A *gemeente* may comprise several villages.

Naming of Dutch megalithic graves according to Van Giffen's system (1925, with later additions) with letters for provinces (D = Drente; G = Groningen; F = Friesland; O = Overijssel) and serial numbers.

Abbreviations of cultures, cultural groups, phases and chronological terms:

TRB = Funnel Beaker (culture) (Danish: *Tragtbaeger,* German: *Trichterbecher,* Dutch: *Trechterbeker*)
EGK = Single Grave culture (*) (Danish: *Enkeltgravskultur,* German: *Einzelgrabkultur*)
KAK = Globular Amphora culture (Polish: *Kultura Amphor Kulistych,* German: *Kugelamphorenkultur*)
CW = Corded Ware (*: 2b, Single Grave culture)
PFB = Protruding Foot Beaker (Dutch: *Standvoetbeker,* *: 2b, Single Grave culture)
AOO beaker = All-Over-Ornamented beaker (*: 2b, Single Grave culture)
BB = Bell Beaker (: 2b, Single Grave culture)
MK = Michelsberg culture
VL culture = Vlaardingen culture
EN = Early Neolithic
MN = Middle Neolithic
LN = Late Neolithic
EBA = Early Bronze Age
(EN, MN, LN, EBA: Danish chronological system (*: 2a))
BC = before Christ
AD = Anno Domini
BP = 'before present', i.e. before 1950 AD on the conventional C14 scale (*: 2a).

A2 GLOSSARY

A2a *Chronological system*

Unless otherwise stated, the dating system used is the Danish/southern Scandinavian one, which was based on the TRB phases (Becker 1954a). This system consists of, successively, the Early Neolithic (EN) A, B, C; the Middle Neolithic (MN) Ia (Troldebjerg), Ib (Klintebakke), II (Blandebjerg), III (Bundsø-Ferslev), IV (Lindø), V (Store Valby); and the Late Neolithic (LN). See figs. 13 and 73.
For Schwabedissen's different classification of the EN (into EN I and II), see section 6.1. For a discussion on the chronological position of the EGK (*: 2b SINGLE GRAVE CULTURE) in the MN, see section 6.8.
Unless a departure is indicated, C14 dates conform with those of the journal *Radiocarbon,* with a half-life of 5568 years, without tree-ring calibrations in the ('conventional') C14 calendar. See also note 1.1 and section 6.9.

A2b *Cultural groups*

ALTMARK POTTERY (German: *Altmark Keramik* or *Altmärkische Tiefstichkeramik*) is the name I have used for the Tiefstich pottery group which Dehnke (1940) called ALTTIEFSTICHKERAMIK (Old Tiefstich Pottery) (with the exception of those pots counted as such west of the Weser by Dehnke). Related to the West Group, Altmark formed a local group whose principal distribution area was the Altmark and its surrounding, along the Elbe. Kupka was the first to distinguish this pottery as a separate group.
In my opinion, the term 'Altmark (Tiefstich) pottery' is preferable to *Alttiefstichkeramik,* 'earliest type of Tiefstich pottery', for it is not earlier than Drouwen A-C. Furthermore, towards the end of its currency, Altmark pottery seems so old-fashioned in appearance that it is difficult to distinguish it from the pottery of its earliest period. The Altmark was preceded by the HAASSEL-FUCHSBERG STYLE, from which it presumably developed.
See also sections 3.1, 6.1 and 6.4 for the age of Altmark pottery and section 5.6.2.3 for the old-fashionedness of this population group, as evidenced, for example, in the types of battle-axe used. Altmark pottery is related to Drouwen pottery, but lies off the connecting route between Drente and the southern section of the North Group, and the similarities are not very obvious. An investigation into the nature of the concept of Altmark (there have been many new finds) and a clear distinction between it on the one hand and Drouwen and Walternienburg on the other is a long awaited development, but no progress has been made in the last thirty years.

ALTTIEFSTICHKERAMIK: see ALTMARK POTTERY

BEAKER CULTURES: see SINGLE GRAVE CULTURE

BELL BEAKER CULTURE: see SINGLE GRAVE CULTURE

CORDED WARE: see SINGLE GRAVE CULTURE

FUCHSBERG STYLE, GROUP: see HAASSEL STYLE

HAASSEL STYLE, HAASSEL-FUCHSBERG STYLE, FUCHSBERG STYLE (or GROUP respectively): see section 6.1

PROTRUDING FOOT BEAKER CULTURE: see SINGLE GRAVE CULTURE

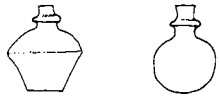
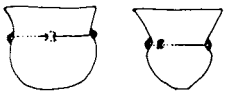
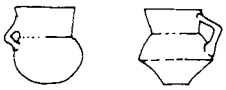
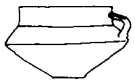
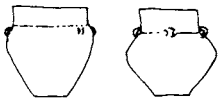
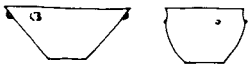
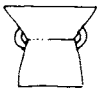
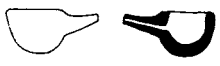
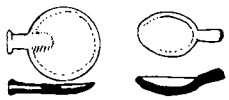
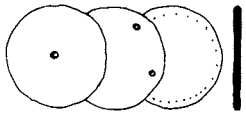
SINGLE GRAVE CULTURE, EGK (Danish: *Enkeltgravskultur,* German: *Einzelgrabkultur*) is the name for the Danish branch of the CORDED WARE (CW) and its local development; during its later period, BELL BEAKER (BB) impulses made their appearance. This name was adopted for the northwest German Beaker cultures (e.g. Brandt 1967). In Netherland, Van der Waals & Glasbergen (1955) made a strict differentiation between the local Corded Ware ('PROTRUDING FOOT BEAKER CULTURE', PFB, *Standvoetbeker cultuur*), the Bell Beaker culture and 'hybrid beakers' (now: All-Over-Ornamented Beakers, AOO Beakers); the last-mentioned beakers being the result of local intermingling of the two cultures.
However, ever since the hybrid beakers had turned out to have been the precursors of the *maritimo* Bell Beakers, Van der Waals c.s. have particularly stressed the elements common to both BEAKER CULTURES. The local sequences in Netherland and Jutland differed very markedly in some phases, whereas it has not yet been made cartographically clear where in Germany the variable border zone between the two traditions was situated.
The chronological relationship between the Dutch/northwest-German and Jutish EGK is discussed in section 6.8.
The name Single Grave culture was coined in Denmark in the 1890's when in particular the contrast was noted between this culture, which buried its dead in single graves in or under tumuli or in 'flat' single graves, and the megalithic collective graves of the TRB culture. It goes without saying that TRB dolmens, earth graves, stone packing graves and stone cists are often single graves.

TIEFSTICH POTTERY is TRB pottery of which the favourite ornamentation was TIEFSTICH (*, 2d). It consists of the pottery of the West Group, the North Group, the ALTMARK pottery and the Walternienburg-Bernburg pottery (fig. 1).

A2c *Pottery shapes of the West Group and some of the North Group* (see Table VI)

For the EN shapes, the Scandinavian-German terminology and Becker's English translation of them

TABLE VI

	English	*Dutch*	*German*	*Danish*
	collared flask	kraagfles	Kragenflasche	kraveflaske
	funnel beaker	trechterbeker	Trichterbecher	tragtbaeger
	lugged flask	oortjesfles	Ösenflasche, Dolmenflasche	øskenflaske, dysseflaske
	lugged jar	oortjeskruik	Ösenkranzbecher (Lüning 1967)	øskenkrukke
	lugged beaker	oortjesbeker, prachtbeker	Ösenbecher, Prunkbecher	øskenbaeger
	jug (one lug, width no greater than height)	kruik	Krug	(hankekrukke)
	tureen (one lug, width greater than height)	terrine (Van Giffen 1927)	Schultertasse	skulderkop
	amphora (no lugs, two or more lugs, but shape is more important)	amfoor	Amphore	(amfor)
jugs tureens amphorae	shoulder pot	schouderpot	Schultergefäss (Knöll 1959)	(skulderkar)
	pail (straight-sided, but angle $\alpha < 115°$, width-height ratio 3:4 to 1:1)	emmer	steilwandiger Becher (Eimer)	(spand)
	bowl (straight or convex walls, not a pail)	schaal, kom	Schale, Kumpf	skål
	pedestalled bowl, fruit dish	voetschaal	Fusschale, Fruchtschale	fodskål
	necked bowl (this term is exclusively used for Late Havelte and MN V ware)	randkom, halskom (Van Giffen 1927)	Halsrillengefäss (Knöll 1959)	—
	biberon (hollow spout handle, the hollow connected with the cup)	biberon, tuitpannetje (Van Giffen 1927)	Tüllennäpfchen, (Biberon)	—
	spoon (solid handle, or with a hollow in it not connected with the bowl)	lepel	Löffel	lerske
	disc, baking plate (Davidsen 1973 discerns finger-wide *holes* from narrow *perforations*)	schijf, bakplaat	Backteller	lerskive

(1947) have been retained. For the MN shapes, I have used the taxonomy which has become accepted in Germany and Netherland (Van Giffen 1927, Knöll 1959 and other authors). A few so far lacking English equivalents are proposed here. The customary southern Scandinavian taxonomy for MN shapes is sometimes essentially different (Becker 1947; Glob 1952; Bagge & Kaelas 1950; Ebbesen 1975). When an equivalent is lacking, a literal translation of a term current elsewhere is given in brackets.
Where several terms are current, an attempt has been made to achieve linguistic uniformity and brevity, but this is sometimes unattainable. For example, the German *Eimer* (pail) can perhaps not be used because this term is particularly connected with *situla*-shapes (e.g. Hallstatt situlae with a shoulder). This holds particularly for West German colleagues; those in the DDR I spoke had no main objections. *Tasse* in the German *Schultertasse* (recently called *skulderkop* in Danish) evokes a tea-cup (*tasse* in French); *Terrine* in Dutch and German (tureen) somehow evokes the soup-tureen. But the German *Terrine* was reserved for the truncated pear shape with a high collar and two to four lugs from the urnfields (if we neglect Knöll's Tiefstich '*Wechter Terrine*', Wechte tureen, figs. 33:5, 8, a term I did not adopt). The derivation does not help us either, in this case; tureen is derivated from the French *pot-en-terre,* earthen pot.
No problems arise when analogous shapes from different periods and contexts bear the same name. For example, there are also funnel beakers of early medieval glass and of later medieval Siegburg pottery.

A2d *Methods of ornamentation*

TIEFSTICH (German, also FURCHENSTICH; Dutch: *diepsteek, groefsteek*) is the method of ornamentation which is described in English as stab-and-drag. As this lenghthy expression does not lend itself easily to repeated use in compound words, I have used the German term in this book. The technique of decoration involved the making of a groove in the surface of the pot, suitable for filling with a white substance (or some other substance, now vanished). By stabbing and dragging with a stick with a flat rectangular top in the unfired clay, a grooved line was formed which was sawtooth-shaped in its lengthwise cross-section.
In a wider sense, this term includes all the decorations on TIEFSTICH POTTERY (*, 2b) which were applied with a stamp (generally held at an angle). Bagge and Kaelas (1950) demonstrated in detail the techniques of decoration of the southern Swedish Tiefstich pottery which is very little different from that of the rest of the North Group in this respect. Excellent photographs of the decoration techniques of the Western Tiefstich Group were reproduced by Schlicht (1968, scale 1:1. Cf. Dehnke's description (1940, p. 3-6)). The western techniques of ornamentation are less varied than the northern ones, lacking, for example, cord impressions, cardium impressions (rim of the cockle (cardium) shell) and comb impressions (with more than 2-3 rectangular points: the cloven spatula does occur in the West Group).
With the exception of MAGGOT IMPRESSIONS, wound stamp impressions proper do not occur in the West Group (see below, TVAERSTIK). Some of the ornamentation techniques of the North and the West Groups also occur in ALTMARK POTTERY (*, 2b) and in the Walternienburg-Bernburg Group.
If the pots of the TRB East, Southeast and South Groups (fig. 1) are decorated, they occasionally display the stab-and-drag line of the North and West Tiefstich Groups. Much more prevalent, however, is the SCREWDRIVER STAMP, which is observed only in the HAASSEL-FUCHSBERG Group (*, 2b) in the West TRB area.
The continuous line, tvaerstik (*) and cord impressions occur regularly, especially in the East Group (illustration by Jażdżewski 1936). The 'Luboń-ornament' occurs nowhere else: i.e. impressions with a three-stranded cord (e.g. Jażdżewski 1936, plate 31).
The normal two-stranded cord impressions are popular with the GLOBULAR AMPHORA CULTURE (*), as are SCREWDRIVER IMPRESSIONS. Another decoration seen there in some regional groups is the fish-scale ornamentation: i.e. closely spaced impressions with a half-moon-shaped stamp (Wiślański 1966; Schuldt 1972b). This technique can also be observed in the Elbe-Havel pottery of approximately the same period.
Of course, Tiefstich decorations also occur elsewhere in Europe, particularly in Neolithic and Bronze Age cultures which had a predeliction for impressed ornamentation. The stab-and-drag line occurs infrequently in southern Netherland, too, on *Kerbschnitt Urnen* from the Bronze Age. For this reason, HERPEN, south of the Meuse, was for some time erroneously considered to be a find-spot of TRB Tiefstich pottery (section 2.20).

BRACE STAMP is the name I have given to those impressions which resemble our brace mark ({), applied with a small stick held at an angle (Schlicht 1968, plate 15:1-3). It strongly resembles (and is, technically, perhaps a variant of) the HEART STAMP.

BARBED WIRE (German: *Stacheldraht,* Dutch: *prikkeldraad*) is incorrectly used in German and Dutch with two contradictory meanings, but these usages appear to be ineradicable:
a TVAERSTIK (e.g. Dehnke 1940; Langenheim 1935). See under this heading, below.
b WOUND STAMP (e. g. Struve 1955). The word was introduced in Britain with this meaning (Smith 1955, p. 34). But there are also examples of its use with meaning (a) (Savory 1968, description plate 47 on p. 216).
The origin of the confusion lies in the excellent

description – the earliest known to me – of those two techniques of decoration, and of the MAGGOT IMPRESSIONS by Sophus Müller (1913, 1918), in whose opinion (a) derived from (b). Although this may be valid for Denmark, it is not, in the present state of our knowledge, a plausible interpretation for the West Group.
Knöll was, I believe, the first to point out (1959) that there is a complete absence of indigenous, genuine wound stamp impressions (except the maggots) in Western Tiefstich pottery. Earlier authors in Netherland, such as Van Giffen and Kat-van Hulten, previously described the tvaerstik line sometimes incorrectly as *wikkeldraadlijn* (wound stamp line). Van Giffen (1927) was of the opinion that he could support his use of this term with plasticine impressions, but, in my view, he was wrong on this point and Knöll was correct (see also WOUND STAMP).
This is not just a matter of quibbling, but has important chronological consequences for the identification of small sherds. Genuine wound stamp (not maggots) here always indicates pottery which is later than TRB (Early Bronze Age in Netherland, LN in Denmark).
Just how confused the chronology became because no distinction was made between (a) and (b) in the West (often the result of poor observation) is obvious when it is realised that the little pot with widely wound stamp impressions from OHLENBURG-BOBERG (which contained the well-known Early Bronze Age metal hoard) was included in the Western Tiefstich pottery by Sprockhoff (1938, cf. section 2.12) and by Junghans, Sangmeister and Schröder (1960). The consequence of this for the metal groups of the TRB culture were confusing (note 6:19).

GITTERMUSTER: see SCREWDRIVER STAMP.

HEART STAMP is the name I have given to the heart-shaped impressions applied with an as yet unidentified stamp which was naturally available and which is frequently present on Western Tiefstich pottery of phase D (Schlicht 1968, plate 10:2). Less apt names for this stamp are *Kleeblattstempel* (trefoil-leaf stamp) (Schlicht) and *Pfeilstich* (arrow stamp) (East German colleagues). For the sake of brevity I generally include this stamp in the group of TVAERSTIK decorations.

HOLLOW STAMP impressions: made with the, generally frayed, top of a hollow bone, stick or quill.

MAGGOT impressions (Van Giffen: *kluwen indrukken*) are the only form of wound stamp impressions known on West Group Tiefstich pottery proper. These are impressions made with a roll of thread wound around a string or some other flexible axis. This little roll is always very short here, less than 1 1/2 cm long, in contrast to the one used on Northern Tiefstich pottery. It is possible that in the West, the roll was pressed in with a finger-tip. This ornamentation was restricted to the Drouwen A-C phases, roughly corresponding with the latest use by the North Group of the wound stamp decoration which arose during the EN C.

POINT STAMP LINE: impressions made with an implement with a point similar to that of a pencil, held at an angle, probably the tip of a quill (Dehnke 1940, p. 3, citing Schachtschabel).

SKATING MOTIF is the name I have given to the horizontal zigzag pattern, the straight lines of which connect each other as in the tracks left by a speed-skater (rim of fig. 30:7).

SCREWDRIVER STAMP was the name proposed (Bakker, Vogel & Wiślański 1969) for the oblong rectangular impression, made with a vertical spatula, which resembles an impression made with a screwdriver. This stamp is characteristic for the TRB East Group and HAASSEL pottery, and occurs rarely on Danish A/B pottery. Schwabedissen (1953) and Sprockhoff (1954) called impressions like this, placed parallel to each other in rectangular blocks, GITTERMUSTER (pattern of vertical bars).

TVAERSTIK (Danish (Müller 1913, 1918); German: *Querstich* (Schwabedissen 1953); Dutch: *dwarsstempel* (Bakker 1970), *dwarssteek* or, less appropriately, *pseudo-wikkeldraad,* Bakker 1962) would seem to be a good collective name for ornamentation consisting of impressions made in, along, or at right angles to a guide line or groove. It is a style of ornamentation incorporating many variants, most of which Knöll described more precisely. For the sake of convenience, I include under this term the techniques of ornamentation that were so popular in Drouwen D pottery. Unless otherwise stated, I have thus included the HEART STAMP and the BRACE STAMP here, as well.

WOUND STAMP impressions were applied with a stamp which consisted of a two-stranded cord wound around a spindle. This cord could be wound either loosely or closely on the spindle which was probably always flexible in the TRB culture (the same cord?). The term WHIPPED CORD is available for this in English. For the terminological confusion which has developed in connection with the post-TRB BARBED WIRE ornamentation, the reader is referred to the corresponding entry above and to Lanting 1973a. The HAASSEL STYLE displays long wound stamp impressions, whereas the West Group has only the very short ones which are called MAGGOT impressions (see corresponding entries). The only pot from a western Tiefstich context with really *long* wound stamp impressions (cf. Müller 1918, fig. 80) is a lugged beaker from TANNENHAUSEN, an import from the neighbourhood of HUSUM in western Schleswig-Holstein (Bakker 1970).

ZIPPER ORNAMENT (German: *Reissverschluss Muster*): Two parallel lines, with, in between them, short cross-lines alternatively touching each of these, not unlike a real zipper. Sometimes there is a third alternating row of cross-lines in the middle (Bagge & Kaelas 1950, p. 48: 18).

A2e *Shapes of graves of the TRB West and North Groups*

DOLMEN (Danish: *dysse,* German and Dutch: *Dolmen*): see HUNEBED.

EARTH GRAVE is the term which I have here borrowed from the Danish *(jordgrav)* for graves without stones, or with only a few stones, which, in the West and North Groups, generally contained one individual. The name is therefore partly synonymous with FLAT GRAVE, and with 'single' or 'individual grave'. There is a gradual transition from the earth grave to flat graves with a stone packing and, in Jutland, to the STONE PACKING GRAVES.

FLAT GRAVES are graves without a tumulus or a megalithic construction.

HUNEBED (Dutch, plural *hunebedden,* less often: *hunnebed(den);* English: hunebed(s); but German *Hünenbett* has a different meaning, see below, 4a-c).

1 In this book, whose main subject is not the megalithic architectural shapes and their taxonomy, I use the term 'hunebeds' in the sense of: '*T-shaped orthostatic passage graves of West-TRB type, regardless of the presence or absence of a peristalith*'. I call the graves hunebeds even if there is no passage to the entrance gap.
All the existing megalithic graves of Drente are thus covered by this term, whether they are 2 pairs of side-stones in length or far more, and whether their entrance, which is always present in one of the two long sides, was or was not extended with a passage of one or two pairs (never any more) of orthostats.
In this sense, the word has been current in English archaeological literature since at least the 1870's when A.W. Franks and W.C. Lukis lectured on the hunebeds of Drente in the Society of Antiquaries in London (*Proceedings Soc. Antiq.,* 2nd ser., 5, p. 258-267 (1872); p. 475-478 (1873); 8, p. 46-55 (1879)). This usage was further consolidated by Van Giffen's *The Hunebeds in the Netherlands* (Utrecht 1927), which was the English edition of Part I and the Atlas of his *De hunebedden in Nederland* (I, 1925; II, 1927).

2 The Scandinavian type of T-shaped passage grave, called *jaettestue* (plural *jaettestuer*) in Danish jargon (since S. Müller 1897, not H. Petersen 1881!), is very similar to the hunebeds as defined in (1). Both 'jaettestue' and 'hunebed' conform to Schuldt's definition (1972a) of a T-shaped passage grave (see below, under 6). But small, systematic differences make it possible to distinguish clearly between the two regional types (Aner 1969; Nordman 1935):
2a JAETTESTUER (Aner's First Main Group): the shape of the chamber tends to be elliptical. Instead of one large boulder, the ends of the chamber were sometimes formed by two end stones placed at an angle to each other, so that the shape of the chamber becomes an oblong polygon. The passage is generally longer than the chamber, a fact which is connected with the barrow shape of the grave, which often approaches the circular. The diameter of such a barrow around a chamber of this type implied an 'empty' half of the barrow behind the chamber.
2b HUNEBEDS (Aner's Second Main Group): chamber rectangular, from two pairs of side-stones to an extreme length of 27.5 m with 15 or more trilithons (WERLTE on the Hümmling, Spr. 830). This predilection for extreme lengths is found particularly between the IJsselmeer and the Weser. The passage consists of only one or two pairs of orthostats or is missing altogether. The areas of these two main groups overlap in a narrow strip on either side of the Eider in Schleswig-Holstein (Aner 1969). Representatives of both types also occur in present-day West-Mecklenburg (especially of the First Main Group? cf. Schuldt 1972a).

3 There would, in theory, be no objection to distinguishing between the two main groups by calling them HUNEBEDS and JAETTESTUER, respectively. In actual practice there would, however, be difficulties since great confusion has developed in the German literature regarding the meaning of the word *Hünenbett.*
All the other folk names or pseudo-folk names, such as *anta, cromlech, dysse, menhir, dolmen, cistvaen, jaettestue,* etc. were promoted to technical terms during the 18th and 19th century, and in the same way *hunebed-hunnebed-Hünenbett-Hünengrab* (Giant's Grave) were used over the whole of the Dutch-West German Plain simply as general terms for any kind of megalithic grave (locally, e.g. in Bentheim and Twente, occasionally for any barrow).
Just as every Frenchman (and the *Carte Michelin,* sheet Drente!) calls any megalithic grave a dolmen, the Dutch tourist refers to a 'hunebed' and the German sometimes to a 'Hünengrab'. The technical language, however, developed a narrower definition based on the situation existing in each particular region. Partly for this reason, differences between Netherland and some German regions developed. Difficulties arose whenever a taxonomy which fulfilled local requirements was extended to cover a wider area.
Westendorp was the first to codify the concept 'hunebed' in Netherland in his standard work (1815, 1822; see section 2.1). But his definition was heavily weighted genetically. What he called a hunebed is roughly what I also call one, but with the difference

that, in his opinion, a hunebed had never been situated within a barrow. He called the megalithic chambers which were discovered in barrows *grafkelders* (burial vaults); he thought they had been built somewhat differently and were representatives of a later stage, at which the hunebed builders had already yielded to the barrow builders who followed them.

Westendorp's book was presumably responsible for the adoption of the word HÜNENBETT as a technical term in Germany by e.g. Klemm (1836) and Wächter (1841). But, unfortunately, the taxonomy of those authors was extremely confusing.

The early 19th century definitions have lost their significance today, except, perhaps, Westendorp's opinion that every hunebed originally had a peristalith, which may have influenced the definition (4a) given below. It is significant that this definition has caught on in particularly that part of Germany which adjoins Drente.

4a 'A *Hünenbett* is a megalithic chamber with a peristalith' (Von Estorff 1856, quoted by Gummel 1938, p. 153, 256). This definition is often adhered to in Germany, west of the Elbe (Jacob-Friesen, *Einführung in Niedersachsens Urgeschichte* 1931[1], 1959[4]; Gummel 1927; Schlicht 1954). Only 15% of the Dutch megalithic graves are covered by this definition.

4b-c This usage is now being superseded by two others, as a result of the wide-spread use of certain textbooks. I am referring to the late 19th century linking of the Dutch-(West?)-German word *Hünenbett* with a not altogether fortunate concept in the taxonomy of the North Group *(Langdysse)*. Since the concept *Langdysse* was subject to reinterpretation, two meanings for *Hünenbett* (4b, 4c) evolved.

In Denmark, Worsaae's taxonomy (1843) was applied by Henry Petersen (1881) while he was making the first large-scale inventory of megalithic graves. He called the 54 Drente megalithic graves *Dysser* (p. 358) meaning 'megalithic graves'.

In his taxonomy Petersen distinguished between two chamber shapes, (a) the *Gangbygninger* (= T-shaped passage graves (jaettestuer) plus polygonal dolmens-with-passage), and (b) the *Gravkamre* of rectangular or polygonal shape without a passage plus *Gravkister* (stone cists). The latter category may occur detached, or in a barrow without a peristalith, but also in a *barrow with peristalith.* He subdivided the latter into *Runddysser* and *Langdysser.* In her translation of Petersen's article (1884), J. Mestorf spoke very fittingly of *Rund-Steinbett* or *Rundbett* and *Lang-Steinbett* or *Langbett,* excellent terms which Aner has recently used again.

In Denmark, the *Gangbygninger* apparently occurred so rarely in peristalithic barrows that Petersen did not include them among the *Runddysser* and *Langdysser.*

In the meantime, O. Montelius and S. Müller were contributing to the further development of the Scandinavian terminology. I mention in passing that they were not in complete agreement concerning the taxonomic borderline between a dolmen and a passage grave and that Müller (1897) emphatically did not include the dolmens with a passage among the *Jaettestuer* (passage graves, or, more exactly, T-shaped passage graves) as Montelius did; in fact he avoided the word *Gangbygninger* altogether. More important is the point that the word *Dys(se)* is now reserved exclusively for dolmen. (In the interest of clarity I have resorted to the French translation *dolmen* of *dys(se)* in this present-day meaning, with which it is used in English, Dutch and German for TRB graves).

4b *Langdysse* acquired the meaning of 'a peristalithic long barrow containing a dolmen', and was later translated by *Langdolmen.* Unfortunately, in his widely-read translation *Nordische Altertumskunde* (1897) of S. Müller's standard work *Vor Oldtid* (1897), O. Jiriczek introduced the term *Hünenbett* in the sense of 'Langdolmen'. Furthermore, Sprockhoff later (1954) even started to speak of *Kammerloses Hünenbett* ('unchambered long barrow' or peristalithic long barrow without a chamber, containing stone packed or earth grave(s)). Influenced by the Müller-Jiriczek terminology, Sprockhoff initially (1930, 1938) avoided using the term 'Hünenbett' in the sense of 'Langbett', if a T-shaped passage grave was present. One should note that, with this meaning (4b), the term 'Hünenbett' may not be applied to a 'hunebed' in the sense in which I use that word in this book. Not a single megalithic grave in Drente, then, would be covered by this term, and only a few in Lower Saxony.

4c Sprockhoff subsequently began to use 'Hünenbett' more generally for every peristalithic long barrow (= Langbett in the Mestorf-Aner terminology). After consultation with him Schuldt (1972a) did the same. Of all the graves in Drente, the long grave D43 (containing the T-shaped passage graves D43A and B) would be the only one to be covered by their definition of the word, although a considerably larger number in Lower Saxony would be.

5 At the Third Atlantic Colloquium in Moesgård (1969), P. R. Giot proposed stuffing all the worn-out and ambiguous old terms into a big bag and throwing this into the ocean. Everyone applauded his suggestion, but a set of good alternatives has not yet been created. Daniel (1970, p. 266-267) did put forward a few ideas, but they were largely old wine in new bottles: mainly a renaming of an already existing taxonomy which might be adequate for the British Isles and western France but far less so for the North European Plain. The intermediate position which the T-shaped passage graves would appear to occupy (taxonomically, not necessarily genetically) between the plans of the passage graves (the extreme example being KNOWTH's tapeworm) and those of the gallery graves (of the Daniel typology) has not (yet) been expressed in a new term. The newly suggested term 'Long Tombs' for the gallery graves would seem to be extremely confus-

ing considering that the hunebeds are frequently even longer. Moreover, Daniel (1970), when proposing the term 'Essé-Tressé' for the Long Tombs of Brittany, should not have neglected to mention that l'Helgouach (1965) had protested against this *'juxtaposition des choses totalement différentes'*.

6 Since the pseudo-Breton word *dolmen* is used exclusively in the sense of *dysse* (according to Müller) in the German, Dutch and English literature concerning TRB graves, there is no need for a replacement of the word DOLMEN in the specific Northern sense of the word, which is clearly defined. [Schuldt (1972a) defined the borderline between dolmen and (T-shaped) passage grave *(Ganggrab)* on the basis of the position of the entrance. In the chamber of the T-shaped passage graves, the entrance always lies in a long side, in the dolmens in a short one, if the dolmen is not round or square. *Urdolmens* ('primeval dolmens') have no entrance. Schuldt uses the term *Ganggrab* also for chambers without a passage, similarly to the term 'hunebed' in this book.]
On the other hand, the words *hunebed* and *Hünenbett* will certainly have to be banished from the taxonomy, for it is scarcely conceivable that our German colleagues would be prepared to adopt the word hunebed with its Dutch spelling ('Hünebed') for the burial chambers of Aner's First Main Group and 'Jaettestue' for Aner's Second, and that they would scrap the spelling *Hünenbett* and the meanings 4a-c. It would be equally unlikely that the Dutch would adopt one of the German meanings 4a-c with the spelling *Hünenbett,* certainly as long as the Germans have not yet come to a definite agreement among themselves about 4a-c. [Because D19 has had no peristalith, it is taxonomically incorrect to call it a *Hünenbett* (cf. Staal-Lugten 1976).]

7 The problem is to find good terms for the 'Northern TRB T-shaped passage graves' and the 'Western TRB T-shaped passage graves' which were described under 2a and 2b. These two terms themselves express exactly what is meant, but they are too long for repeated use. *Western T-grave* and *Northern T-grave,* maybe? If I remember rightly, somebody used these terms at the Third Atlantic Colloquium (1969).

HÜNENBETT (not identical with HUNEBED!): see under HUNEBED.

JAETTESTUE(R): see HUNEBED.

PERISTALITH: a kerb of large standing boulders, often with flat sides turned outwards and originally joined by dry stone walling, around the barrow of a megalithic grave or an 'unchambered' long barrow.

STONE CIST. In this book we discussed almost exclusively MN TRB stone cists of the West Group. Stone cists of later periods (e.g. Bell Beaker: Lanting 1973a and Appendix B5) are virtually ignored. This applies also to the stone cists after which the LN was previously called 'Stone Cist Period' in southern Scandinavia. The *Westfälisch-Hessische Steinkisten* are called 'gallery graves' (German: *Galeriegräber*) in the present book, following Schrickel (1966).
Knöll (1959, p. 48-51) reported a few TRB stone cists west of the Elbe, largely based on very incomplete observations of accidental finds, due to which generalisations on method of construction and dating are unjustified as yet. A rather thoroughly investigated specimen, that of DIEVER, is discussed in Appendix B5. See also note 7:6.
Madsen (1971) argued that the borderline between JAETTESTUE, STONE CIST, STONE-PACKING GRAVE, STONE-PACKED EARTH GRAVE and EARTH GRAVE is much vaguer than might be expected, due to all sorts of transitional shapes. This especially holds true for the carefully excavated graves; incomplete reports are often worthless.
In Mecklenburg, too, where particular attention is being paid to the still little-known MN stone cists, it is difficult to distinguish them from the genuine megalithic graves (Schuldt 1972a; Nilius 1971). The borderline between (Ur-)dolmen and stone cist is particularly problematic in non-excavated specimens. Schuldt distinguished between the groups on the basis of construction and dating (dolmen: Early Neolithic). But the occurrence of EN stone-packed earth graves and MN dolmens in Denmark suggests that new complications may develop on further investigation. (Later addition: cf. also Schuldt (1974) and Sprockhoff's discussion (1975, p. 35) of the ROLFSEN dolmen/stone cist).

STONE-PACKING GRAVES (or: 'stone-packed graves', or: 'stone heap graves', Danish: *stendyngegraver*) is the term under which a certain Jutish group of TRB FLAT GRAVES with a flat cover of stones and a stone packing in the grave was introduced in the literature (e.g. Becker 1967). Earth graves with stone packing do not appear to be especially connected with any particular TRB period; they constitute a rather nebulous transition from EARTH GRAVES TO STONE CISTS, but the Stone-packing Graves of Jutland date mainly from the second half of the MN.

Appendix B: Some important find-groups

Whereas the illustrations of the find-groups are given in chronological order, the text in which they are described is arranged in alphabetical order of the names. These find-groups are:

B1	ANGELSLO	figs. B1, B21
B1a	ANGELSLO-Heemingeslag	fig. B1
B1b	ANGELSLO-grave 14	fig. B21
B2	ANLO	–
B3	BEEKHUIZERZAND	–
B4	DENEKAMP	fig. B21
B5	DIEVER	figs. B2-3
B6	EKELBERG	figs. B16-17
B7	ELSPEET	figs. B6-9
B8	EMMEN-D43	–
B9	HOOGHALEN	figs. B4-5
B10	LANDERSUM	fig. B15
B11	LAREN	figs. B9-10
B12	MESUM	fig. B18
B13	MIDLAREN	fig. B1
B14	TINAARLO	fig. B10
B15	UDDELERMEER	figs. B19-20
B16	UGCHELEN-I-3	fig. B20
B17	ZEIJEN	figs. B11-15

The artefacts which came from the same 'closed find' (flat grave, refuse pit etc.) have been drawn within a box; 'semi-closed assemblages' (homogeneous refuse from a single settlement, for example, cf. A.D. Verlinde's 'open assemblages') have been bracketed in the corners of the illustration.

B1, figs. B1, B21
ANGELSLO
gemeente Emmen (Drente)
On the occasion of the building of the contiguous residential developments of Angelslo and Emmerhout on the east side of the new industrial town of Emmen in southeast Drente, the BAI had the opportunity to carry out large-scale excavations and numerous smaller observations in trenches dug for the foundations of houses, roads, etc. In this way, a good survey was obtained of the prehistoric remains within an area of several hectares. It will be several years before the results can be published by Van der Waals, the director of this work, but some interim reports have appeared. In addition, Van der Waals published a survey of the most important Late and Mid-Havelte TRB finds and their geographical situation (Bakker & Van der Waals 1973, section 3, figs. 2-9). Besides these TRB finds, there are also some which belong to the Drouwen style groups. In the following paragraphs, two TRB finds are briefly discussed.

B1a, ANGELSLO-Heemingeslag, fig. B1
Half of a pit-filling at a depth of c. 1 m was removed when a sewage trench was dug for the future street Heemingeslag. The other half, which was still in the section, was examined by A. Meijer and G. Delger on 2.05.1963. Sherds of two pots then came to light:
a a pail with vertical strip-ornamentation and a rim ornamentation consisting of only a single horizontal row of round impressions. Catalogue number 1963/V.1a.
b a belly sherd with a large, horizontal lug, undecorated. The sherd belonged to a pot with a spherical belly; if the lug was attached to the widest part of the belly, then its circumference was c. 19 cm. The drawing was produced on this assumption. However, there would be no great technical objection to the pot being a lugged jar (*) with lugs mid-way between its widest part and the rounded base. This second assumption was the basis for the discussion in section 6.1. Cf. e.g. Becker 1947, plate 24. Catalogue number 1963/V.1b.
Typochronologically, (a) belongs to Drouwen A, and (b) might, if the latter construction should be preferred, have to be regarded as a rudiment of the EN C. If the reconstruction of fig. B1 should be preferred, no dating can yet be given.
Present location: Assen museum.
Sources: Van der Waals 1965, p. 208.
Conclusion: Closed find, Drouwen A, perhaps with an EN C rudiment.

B1b, ANGELSLO, grave 14 (previous number: 464), fig. B21
The contents of this grave were recovered complete

from a 1965 excavation pit, 50 m east of hunebed D47. The following is a summary of Van der Waals' more detailed description, with situation drawings, of the find conditions (Bakker & Van der Waals 1973). Immediately below the layer of cultivated soil a dark, circular pit-filling appeared (diameter 3 m). The plan of the pit at a greater depth was a rounded-off rectangle. The profile was bowl-shaped, although one half was deeper (0.8 m below the present-day surface) than the other (0.5 m deep).
There were a number of carbonised sticks or narrow beams in the deeper half which stood up against or lay next to the wall of the pit. There were cremated remains of human bones, possibly of some animal bones too, at the bottom of the shallower half.
The homogeneous pit-filling contained a hammer-stone and sherds which had been sintered by the apparently still glowing fire that had been lit in the pit. Only a collared flask seems to have been put whole in the hot pit. Van der Waals regards this artefact as the only deliberate funeral gift of pottery, considering the sherds to be older settlement refuse which was there already and had landed in the pit by accident.
The C14 dating of the burnt wood (branches or beams) can apply, as far as the pottery is concerned, only to the collared flask; the remainder may be years older. This C14 dating (GrN-5070) was 2150 ± 30 BC, so far the latest date for Dutch Tiefstich pottery.
In the settlement refuse from this pit, one rim sherd and one wall sherd have a Middle Havelte ornamentation (fig. B21b:4, 7). Two other rim sherds came from necked bowls which are typical for Late Havelte (fig. B21b:5-6). Fragments of baking plates (fig. B21b:8-10) point to the domestic nature of this refuse. One baking plate had pointillé decoration on both sides. Among these sherds is a neck sherd of a corded PF beaker (type Glasbergen 1a) with a horizontal cordon with vertical nicks. See Bakker & Van der Waals (1973) and sections 6.8-9 for the implications of this virtually unique TRB-PFB contact find.
Present location: BAI.
Conclusion: Late Havelte cremation grave (phase G) with collared flask and accidentally present older sherd material (F + G + Protruding Foot Beaker 1a).

B2
ANLO
gemeente Anlo (Drente)
In 1957 and 1958, H.T. Waterbolk (BAI) excavated the greater part of a rectangle, dimensions 96 × 104 m, situated on the easterly slopes of the Hondsrug, at a distance of 600 m from pingo-like water holes and a stream, 1000 m from hunebed ANLO-D11, and also on the border between cover-sand and undeep boulder clay. The fact that the site was situated at the junction of several types of soil and vegetation made this point possibly attractive for the establishment of a number of settlements, as well as for graves or cultivated land, from the Late Palaeolithic to the Late Bronze Age. These included a settlement of the Uddel (E2) facies of the Early Havelte TRB phase, the greater part of which it was possible to excavate.
The artefacts recovered from the latter were in refuse pits and in the top soil. A system of concentric, successive fences with gates, which was excavated in its entirety, was interpreted as a cattle kraal, and attributed to a PFB settlement there as the most likely possibility. The numerous TRB sherds in the bedding trenches would then give a terminus post quem. C14 datings for remains of both of the culture groups there were virtually identical (Lanting & Van der Waals 1976, p. 37-39).
Waterbolk (1960) published a well illustrated, detailed 'preliminary report' on the pottery and the stone and flint artefacts of this settlement. Supplementary to these pottery illustrations, Van der Waals (1964a) reproduced a few new decorated sherds and some new or improved drawings of disc fragments.
It is striking that there is a complete absence of the tvaerstik line on this Early Havelte site (cf. section 6.6), and also that no pottery of the Drouwen style was found (with the exception of two or three minute sherds). The fragment of a knob-butted TRB battle-axe from this site was discussed in section 5.6.3, and elsewhere in the text repeated references were made to this excavation.
Present location: Assen museum.
Conclusion: settlement of the Early Havelte style, Uddel facies (E2).

B3
BEEKHUIZERZAND
gemeente Harderwijk (Gelderland)
25H:174.5/483.8
In 1964, P.J.R. Modderman and G.J. Verwers (IPL) recovered refuse of an Early Havelte settlement (E2 facies) in and along a filled-in stream. A full, amply illustrated report has recently been published (Modderman, Bakker & Heidinga 1976).
The TRB finds had a slight admixture from Late Bronze Age pottery which was partly collected in the same find-lots, but was generally higher in the deposits of the stream bed. This site produced the largest amount of E2 pottery so far known from a settlement. From most pots, however, only a few small sherds had remained. Recovered were: 2 kg baking plate fragments; 1.2 kg ornamented pot-sherds; 1.5 kg unornamented sherds with lugs; c. 25.5 kg unornamented sherds.
The low figure for ornamented TRB sherds is caused partly by the fact that the greatest part of an ornamented pot of this phase bears no decoration. The ornamented pottery (mainly amphorae) conforms well with the E2 pottery from other sites. The publication discusses slight regional differences within the E2 horizon.

The larger fragments of undecorated pottery add considerably to our knowledge. Shapes like Schlicht 1968, figs. 939-945 can now be assigned to E. Figs. 955-959 (ibid.) could also belong to phases F and G. One cup has a horizontal strip handle. Perforations below the rim of large pots occur sporadically. One collared flask was recognised. One baking plate had a hole in the middle, another had a central perforation. Examples with perforations along the rim and two holes near the rim were also found.
75 small discoid scrapers of poor local flint were found along with 2 borers, 2 triangular arrow-heads (TRB or Late Bronze Age) and a strike-a-light. Two fragments of stone axes with a rectangular cross-section came from the TRB layers. An unfinished diabase knob-butted battle-axe is discussed in section 5.6.3.
Charcoal from the TRB layers in the stream bed gave the C14 dating of 2570 ± 70 BC (GrN-7746). How much older this burnt wood was, on average, than the pottery, is unknown. Charcoal from a Late Bronze Age unlined well dug into the TRB layers in the stream bed gave a C14 dating of 2215 ± 35 BC (GrN-7745); most probably this was TRB charcoal with a slight admixture of Late Bronze Age charcoal.
Present location: Arnhem museum.
Sources: Modderman, Bakker & Heidinga 1976.
Note: Van der Waals (1964a) ascribed this site erroneously to the Drouwen period.

B4, fig. B21
DENEKAMP, Klokkenberg
gemeente Denekamp (Overijssel)
I published full particulars of this find elsewhere (Bakker & Van der Waals 1973). During the building of a village extension, Mrs. H. Bernink observed a round discolouration (diameter less than 1.5 m), apparently the filling of a prehistoric pit, in a building trench on the sandy hill Klokkenberg. The pit contained a heavy, thin-butted, Meuse flint axe with oval cross-section, of the Vlaardingen Type (section 5.4.2), two collared flasks and a necked bowl of the Late Havelte phase (G). Neither cremations nor traces of uncremated human remains were observed, but, since all the pieces must have been placed whole in the pit, it is plausible to interpret it as a grave.
This find confirmed the correctness of Knöll's idea (1959) that the collared flask survived in the West Group until the end of the TRB period (section 3.4.2). However, the last traces of doubt about this being a closed find were removed only with the discovery of grave 14 in ANGELSLO (see above) which was reported some months later.
Present location: Enschede museum (temporary loan from Denekamp museum).
Sources: Bakker & Van der Waals 1973.

B5, figs. B2-3
DIEVER – 'Stone cist barrow'
gemeente Diever (Drente)
16F:218.95/541.98
During his excavation of this barrow in August, 1929, Van Giffen found two TRB graves: a miniature hunebed without capstones, (I), and a 'child's grave', (Ia). He published the results of his excavation the following year (Van Giffen 1930).
Fig. B2 is a reproduction of the published drawing, which was meant to present all the relevant information within a single box (Van Giffen 1930, plate 12, fig. 7f). The new drawing which was done for *Drente* shows an altered grid, but the interpretation is no different (Van Giffen 1943c and 1944d, fig. 13); no other drawing was produced for the third printing (cf. section B17). J.N. Lanting (1973a) presented new drawings of plans and profiles (based on the original excavation drawings and photographs) and a few photographs, some of which had not yet been published.
Fig. B3 reproduces all the diagnostic TRB finds at a larger scale. Van Giffen's numbering of the finds is retained. Some pots have been reconstructed in fig. B3 (compare fig. B2).
The mini-hunebed (I) had been partially dismantled for the construction of *Grave II;* some of the latter's stones originated from the mini-hunebed, including the eastern end stone, side stones and pavement stones. Grave II contained a Bell Beaker of a late, local (Drente) type (fig. B2:23) from the Late Neolithic, richly decorated with comb stamp (Lanting 1973a, fig. 12). Lanting (1973a, p. 271-273) proved that the barrow itself was not as old as the TRB stone cist (as Van Giffen believed), but that it had been constructed over the Bell Beaker grave II. As seen in profiles A, B and D (Lanting 1973a, figs. 28b, 36) the yellow sand upcast from grave II lies on the original ground level virtually in the immediate vicinity of the TRB stone cist which must have had only a very small barrow. Moreover, the photographs of profile A (Lanting, fig. 36) show that the sods in the centre of the barrow had been laid like the tiles of a roof on top of the Bell Beaker stone cist II.
This implies that the pollen spectra which were made by W. van Zeist (1955, p. 43-44; 1967) and W. Groenman-van Waateringe (unpublished) of the old ground surface and the sods of the barrow involve the Bell Beaker, and not the TRB culture.

The dating of *Grave Ib* is a problem. The photographs of profile C suggest that the grave pit was dug through the body of the barrow, but the field drawing suggests that the yellow soil which was upcast from this grave lies on the old land surface under the barrow (Lanting 1973a). The sherds (no. 19) from this grave are lost. This was presumably also the case in 1930, or else Van Giffen would certainly have illustrated them. The accuracy of the field technician's note, 'hunebed sherds', in the find list is questionable.

TRB Child's Grave Ia (c. 0.5 × 0.5 m) no longer contained any human remains. It contained a biberon (12) and perhaps an ornamented sherd which cannot be traced now. Van Giffen (1930, p. 24) reported this sherd without illustrating it, and the find list and the field drawings make no mention of it.

TRB stone cist I, a miniature hunebed, without entrance or capstones, internal dimensions originally 3.1 m× 0.8 m; external dimensions c. 6 × 3.2 m. The originally laterally closed walls, c. 60 cm high (without entrance), were composed of end and side stones whose flat sides faced inwards, just as they do in a hunebed. The gaps in between were filled in by dry stone walling, another similarity with hunebeds. The floor of the chamber was paved with flat stones which were covered with a thin layer of burnt granite gravel (Van Giffen 1930, p. 24; fair copy of finds list at no. 28).

The cist contained the greater part of the grave goods, sand, and also several loose stones reminiscent of those above the primary find layer in the filling of hunebed chambers. In addition 'the remains, in a very advanced state of decay, of at least two individuals' (Van Giffen 1930) were found. The symbol for cremation in the field drawings indicates that the impression of the draughtsman, L. Postema, was that they were cremated remains.

The old land surface lay at the level of the grey humus layer which is c. 10 cm above the vertically shaded virgin soil in the published drawings. The floor of the stone cist was at a depth of c. 30-40 cm here and the side stones went even further down. A bank of the excavated soil against the side stones all around the cist projected 10 cm above the old land surface. On top of this was a scattering of stone chips and grit which were produced during the constructing of the cist.

Uncertainty remains concerning the construction of the roof. It must have been largely made of wood, since no stones have come to light anywhere in the excavation whose size and shape could have made them suitable for capstones of the type used for hunebeds. We should rather think of a wooden roof with a covering of sods and some stones (the stones which were found at some places in the cist above the pavement proper may have derived from it).

As far as the shape of the roof is concerned, we have the choice between a flat roof in the hunebed style or a pitched roof à la SCHÖNSTEDT (Feustel 1972), LEUBINGEN or WAYLAND'S SMITHY. In either case we must be dealing with a greatly reduced model, the floor area being only 2.5 square metres. Madsen's publication (1971) on EN stone-packing graves in Jutland gave several examples of temporary pitched roof constructions over these graves. Some of these (not the most characteristic) are very similar to the Diever cist (JATTRUP, ÅRSLEV). A new excavation at Diever could establish if here, too, a pair of heavy tent-poles had been adjacent to (or in) the narrow extremities of the cist. Madsen demonstrated that, in Jutland, this tradition continued into the late MN (Becker 1959, 1967). See also Appendix A2e: 'Stone cist'.

The funeral gifts from Grave I include: 3 decorated funnel beakers (5, 7, 9), 2 undecorated funnel beakers (4, 13, the latter with handle), 1 undecorated bowl (25), sherds of 5 decorated bowls and pails (10c, 4a, 4b, 20), 1 biberon (13a, was inside funnel beaker 13). Furthermore, an undamaged *Flint-Flachbeil* (8), two smashed *Flint-Flachbeile* (14, 16), 3 tranversal arrow-heads (6, 26, 29), 2 strike-a-lights (24, 26a), a number of flint waste flakes (including 10, 26b), a marble of markasite (identification P. Kruisinga, see Van Giffen 1944d, p. 433) (17), 2 flint-pebble hammer-stones (32, 32b) and one tubular amber bead (28). A third *Flint-Flachbeil* (30) was found in the soil removed during the excavation (the fair copy of the find list shows that it is not no. 14 as indicated by Van Giffen 1930, p. 24, note 1). The flint blade (22) which was found in grave II was probably in Grave I originally.

The field drawing indicates that the fragmentary bowl (3) was found either on top of or at the top of the stone packing of the stone cist.

A check of Van Giffen's detailed publication (1930) against the original sources (excavation plans, excavation photographs, rough and fair copies of find lists) did not produce changes in point of view. One does get the impression that the excavation was carried out rather hastily so that not all the sherds and small pieces of flint etc. were observed. What other explanation can there be for the incompleteness of, for example, funnel beakers 9 and 4, and possibly bowl 20, too? The occurrence of slight errors in the numbering during and shortly after the discovery can not be entirely excluded (see section B17), but if so, only the less remarkable finds are involved (labeled a and b). The missing sherds from Graves Ia and/or Ib (19) and from the northeastern quadrant (31) may now be among those from Stone cist I. Expressing such doubts, however, is not very constructive, in the absence of further information.

Typological interpretation. The whole find-group from Stone cist I, including the fragment of a bowl 3 that was found at its edge, can be regarded as a closed find. Consequently, only the typochronology of the finds themselves can indicate how long the burial chamber was used as such. Knöll (1959) took the facts that the pottery was situated at different levels in the burial chamber and that there seemed to be a 'second pavement' in it, just as in hunebeds, as indications that the stone cist had served as a burial chamber for quite a long time. This is possible, but, in our search for proof either for this theory or for the contrary, most of the pottery does not help us since it is of little typochronological value.

Among the fragments of decorated bowls and pails, 20, 4b, 4a and 10c look early (Drouwen B+C). Fragment 4b is derived from the lower part of a rather unusually decorated pail. Sherds 4a and 10c could originate from pails from phase B, possibly C. 4a has maggot impressions. No precise dating can be

obtained from either the funnel beakers or the other artefacts. The funnel beakers with belly-fringe are no later than Drouwen D, but, apart from that, are virtually useless typochronologically (section 3.4.1). Sherd 3 from a bowl which was found on the edge of the stone cist would appear to be foreign to this context. Knöll's placement of this sherd in Phase 2 (Havelte) was consistent typologically, but does not appear to be necessary. Is the bowl perhaps older than phase E, after all, and does it belong to the more perfunctorily decorated bowls of earlier phases, which it would be better not to use for dating (section 3.1)? Moreover, the technique of ornamentation of 3 strongly resembles that of 20.

In conclusion, there are two possible approaches to typochronological interpretation. The first is that of Knöll: used as a burial chamber during phases B+C, with a much later offering in phase E. On the other hand, the position that the find-group, including bowl 3, can be dated in phases B+C, would seem quite defensible. I myself am more inclined to this view. Although diagnostic pottery is scarce, I see some confirmation for this position in the absence of pottery with horizontal tvaerstik lines, which are seldom absent in phase D. This latter interpretation could point to a single burial in the stone cist, which then need not have been opened again until the Bell Beaker period.

Present location: BAI.

Sources: Van Giffen 1930, 1943c, 1944d; Knöll 1959; Van Zeist 1955, 1967; Lanting 1973a.

B6, figs. B16-17

EKELBERG (alias EKELENBERG, KERKENBOSCH, or ZUIDWOLDE)

gemeente Zuidwolde (Drente)

TRB finds were discovered in 1928-35 during sand quarrying on this natural sandy hillock, situated in the former Hoge Veld. In February-March, 1935, Van Giffen undertook a trial excavation here (15 × 15 m) which he himself described later as 'casual' (Van Giffen 1943c). In all, the existence of more than 10 flat graves was established, at a depth of about 50-90 cm under the plough soil. Reported grave lengths include 1.5 m (grave b) and 1.8 m (grave d, width 1 m). Some graves had a scanty stone packing. The position of the artefacts recovered before and during the excavation was incompletely and conflictingly indicated in the sources mentioned at the end of this section.

Van Giffen did not label the flat graves. The letters below are mine. They differ from Knöll's (1959) who incorrectly assigned all the finds to three instead of ten graves. No satisfactory compromise between the conflicting sources has been achieved (was one or were two pairs of querns found?). I have adhered largely to the plan (fig. 2a, Van Giffen 1937).

Flat grave a (30.3.1934; not in Van Giffen's fig. 2a, 1937). Grave pit, length c. 2.5 m, with stone packing which included two querns, 1934/III.3. It contained:

1 Battle-axe 1934/III.3d, discussed in section 5.6.3.

2 Bowl on footring, decorated with deeply incised lines, 1934/III.3b.

3 Bowl on footring, incompletely decorated with deeply incised lines and (along the rim) with two point stamp lines. 1934/III.3c.

4 Triangular arrow-head of flint with hollow base and finished with all-over flat retouch technique. This shape is typical for the Late Neolithic and the Bronze Age. 1934/III.3a.

Flat grave b (square E8) contained:

5 Amphora without foot-ring, with two pairs of lugs, decorated with tvaerstik impressions. The stamp had an irregular shape and is hardly recognisable because of weathering of the pot. 1935/III.1.

Flat grave c (square F3) contained:

6 An amphora without foot-ring, with two lugs, decorated with coarse point stamp lines. 1935/III.2.

Flat grave d (square G/H8) contained:

7 An undecorated little bowl. 1935/III.3.

8 2 granite querns: 1935/III.18c-d, which were part of the stone packing of this grave.

Flat grave e (square C/D5/6) contained:

9 A small undecorated amphora with a flat base, two lugs and a rather angular shoulder. 1935/III.9.

10 An undecorated double conical amphora with concave shoulder and two lugs. Base slightly hollow. 1935/III.10.

11 Bowl with foot-ring, chess-board patterned decoration made by broad, irregularly shaped stamp. 1935/III.11.

12 Shoulder pot with two lugs and flat base, decorated with fine point stamp lines. 1935/III.12.

13 Bowl with flat base, decorated with unusually deeply incised lines executed with a pointed implement. 1935/III.13.

Flat grave f (square D/E1-2) contained:

14 A fairly thin-bladed, convex trapezoidal *Fels-Rechteckbeil* (Brandt B2-1, with rounded-rectangular cross-section) of greenstone. 1935/III.14.

14a A grind stone or quern, smoothed by long use, diameter 12.5 cm. 1935/III.14a.

Flat grave g (square J7) contained:

15 A tureen with one lug and flat base, decorated with rather irregular tvaerstik lines. 1935/III.15.

16 Amphora with two lugs and flat base, decorated with splinter-like implement at right angles to guide line. 1935/III.16.

Flat grave h (square L7) contained:

17 Undecorated funnel beaker with flat base, without foot-ring. Beveled rim, very irregular profile. 1935/III.17.

Flat grave i (square H8-9) contained:

18 Undecorated bowl with flat base and low wall at right angles to it. 1935/III.18.

Flat grave j (square I9) contained:

19 Undecorated funnel beaker. 1935/III.18a.
The following were found on this site, with no further information as to position:
20 Small undecorated amphora; lugs and large rim sherds now missing. 1935/III.18b.
21 Small undecorated amphora with two lugs, found in 1928. 1932/VI.2 (Waterbolk 1958, fig. 3:3). Originally dated (list of acquisitions 1932 in NDV 1934 sub 13) in the Bronze Age Period Montelius IV.
22 TRB sherds and flint artefacts were found scattered 'over the whole site' up to the 'front of the house' (this is 30-40 metres west of the excavation). One of these sherds is illustrated (fig. B17:22). It is numbered 1935/III.14a (read: 1934/III.3e or 1935/III.19).
Present location of the finds: Assen museum 1932/VI.2; 1934/III.3, 3a-d; 1935/III.1-5, 9-19.
Sources: Van Giffen 1937, 1943c, and c. 1950 (drawing slightly altered and different measuring grid). Lists of acquisitions of the Assen museum of 1932 (no. 13; in NDV 1934), 1934 (nos. 37-38, 51-53; in NDV 1936) and 1935 (nos. 25-28, 45-59; in NDV 1937). Inventory, Assen museum. The photographic archives of the BAI (no other excavation documentation was found). Waterbolk 1958 ('Zuidwolde'). Knöll 1959, plate 39 ('Kerkenbosch') mistakenly regarded those artefacts which were not found in graves a ('1') and e ('3') as originating from another single grave ('2').
Conclusion: quite a large cemetery, perhaps adjoining a settlement. Further excavation of other remains which are possibly still present would be extremely desirable! The pottery recovered belongs typologically to a single, uninterrupted period, combining E2 characteristics with E1 characteristics and features which are reminiscent of the preceding Drouwen tradition (D2, pot 15, pot 12?). However, there are no typical Drouwen funnel beakers with belly-fringe. The triangular arrow-head would appear to be a later intrusion.

B7, figs. B6-9
ELSPEET
gemeente Nunspeet (Gelderland)
There has been scarcely any mention in the literature of this settlement which is c. 1 km long and is situated on a 50 m-wide strip of ground on the north bank of a periglacial stream bed which is generally dry. The site was discovered in 1930 when heathland was being trenched for afforestation. Other stretches along the Droge Beek (= Dry Stream) are now agricultural land or grassland; only a few minute scraps of heath are still untouched.
The discoverer, the late artist Jo Bezaan, collected a large number of artefacts, some of which he illustrated in his Manuscript (1932). The greater part was purchased by the Leiden museum (1932, 1940), unfortunately without further documentation as to the exact positions of the finds within the settlement. A smaller part of Bezaan's collection is in the BAI in Groningen, a few sherds are in the Arnhem museum, partly via the recently purchased collection of the late H. Westendorp.
In 1933, F.C. Bursch carried out some small-scale excavations in this settlement, a brief report of which later appeared (but without illustrations of the pottery) (Bursch 1940). Bursch's opinion that the pottery was Early Havelte was wrong; it was Drouwen pottery (see section 2.11). H. Knöll (1959) apparently had not seen the material, so that he did not enter find-site no. 253 in his Lists 127-128 of phase 1 and 1/2.
Since the last war, J. Mulder (Elspeet) has collected much material in fields along the Droge Beek and elsewhere, but without noting the exact find position on each sherd. At the request of the archaeologist G. Elzinga, Mulder later wrote capital letters on the sherds corresponding to the different find-spots. Errors were, however, made, for interlocking sherds got letters for different sites (see below).
During this same period, the late H. Westendorp was also collecting TRB material, whose very exact find-spots he was able to tell me in 1965. His report of a find led to the 1965 excavation of c. 350 m^2 on a remnant of heath (land registry number F 3940, Nunspeet) on the Rifle Range of Berkenhorst; this was carried out for ROB and IPP, by A. Bruijn and myself, and we established the presence of prehistoric post-holes, but no house-plan. An unlined well (Pit B, see below) was found in the Droge Beek, and TRB artefacts were discovered which can be considered as a small sample of what is characteristic of the settlement as a whole.
The pottery recovered by Bezaan and Bursch appears to have been very close to the site of the 1965 excavation. Westendorp's sherds came from some paths, his own vegetable garden and the garden opposite the club house of the Rifle Range next to and within the excavated area.
The site was generally an abundant source of other prehistoric habitation remains. The banks of the Droge Beek, which had to provide the drainage of a very large area after rain showers, must have been an attractive habitation area, in spite of the (according to present-day standards) extreme poverty of the fluvio-glacial deposits which were there covered by a very thin layer of cover-sand. Because of the intensive habitation, it is not possible to assign more than a few of the types of flint and stone artefacts which were scattered around in great quantities to this TRB settlement with any degree of certainty. The situation is rather different with the artefacts from the excavated area. This produced no diagnostic artefacts from other culture groups except a few sherds of a 1a-Protruding Foot Beaker and a triangular and hollow based flint arrow-head.
The TRB pottery from this site, provenienced or not, has the appearance of great homogeneity: it is Drouwen B+C. The Elspeet pottery usually has thicker walls than settlement pottery from the same period elsewhere (e.g. LAREN, B11). I know only of similar thick-walled pottery from a settlement at

MEHRINGEN on the Ems (unpublished sherds in Enschede museum; the site lies next to both hunebeds, the Dicke Steenen). Only one or two sherds from Elspeet (fig. B8:12) might indicate the continuation of the habitation into D. Only one sherd belongs to phase E2, i.e. the phase which is the most widely represented in the north of the Veluwe, including the valley of the Leuvenumse Beek, into which the Droge Beek runs via a small bog. I can not go here further into interesting questions like the choice of terrain of the site and the exceptionally large extent of this settlement.

All ceramic finds from this site that I could trace have been studied by A. Boomert (reports 1970-71). The following is a selection from a number of representative find-groups.

Flat grave (?) Bezaan recovered one reconstructable funnel beaker with belly fringe, which was illustrated in his Manuscript (quality of the photograph makes it difficult to reproduce) without indication of scale. Westendorp presumed that the find-site had been at Berkenhorst, close to the site of the 1965 excavation. I have not seen the original funnel beaker. It was not a large, domestic funnel beaker, but one of the normal-sized, thin-walled funerary type.

More or less closed find A (fig. B6). As mentioned above, J. Mulder did not originally keep his sherds separated according to find-spot. One unintentional exception according to his very decided pronouncement in 1965, was a basket of sherds, all of which he had excavated at one spot in a field during or before 1957 ('Harm-II' as Westendorp and Mulder called it; A. Bruijn's report (1958) also refers to this). The basket contained a remnant of this find, for the fine sherds, along with sherds from other find-sites, had been glued to pieces of cardboard. I labeled the sherds from the basket 'X', as I also did with the sherds from the pieces of cardboard if they belonged to the same pots. It turned out that sherds of the large bowl, (3), which was represented by at least two sherds in the basket, twice bore the find-letter K and once M. Something had apparently gone wrong when, after the event, at Elzinga's request, an attempt was made to locate the positions of the finds. The find-group thus reconstructed gives the impression of homogeneity. A bowl (3) of which a reconstruction could be drawn looks a little older typologically than the rest of the pottery from the settlement. The upper ornamentation allows for no closer dating than from B to D1, but the strips below it point to the beginning of phase B.

The position of the lugs on the borderline between upper and lower ornamentation is also an early feature. Some bases (7-9) which were perforated before the firing belong to this complex. Among the sherds of this find-group were found numerous others belonging to different, pot beaker-like vessels, large barbed-wire-impressed beakers, etc. These are post-TRB artefacts from the same findspot.

Pit B (fig. B7). In 1965, Bruijn and I recovered the filling of an unlined well in the middle of the Droge Beek (the high ground-water level forced us to leave part of it). The pottery gives a homogeneous impression. Boomert demonstrated later that sherds in the settlement on the bank and those in the unlined well belong to the same vessels. A few fragments of bowls (4, 8-9) and a shouldered pot (3), which date the group in phases B-C, are noteworthy, as are the large domestic funnel beakers (6-7, 10, 12), disc fragments (13), a biberon (2) and the remains of two undecorated footed bowls (1, 5). (5) was badly affected by the water. (1) was very well burnished (section 3.4.5).

From *the other finds* (figs. B8-9) of this settlement, I would like to mention a decorated disc fragment (76) (Leiden museum, e. 1940/1.94) which is virtually identical with that from Pit B, and which also had a hole as wide as a finger in the centre. In addition, there are an undecorated disc fragment (75) (ibid. e. 1940/1.95) with at least one hole situated near the rim, and two other rim fragments of discs (9-10). There are one sherd from a collared flask (7), one from a small funnel beaker with chevron and fringe ornamentation (36), a few sherds from shouldered pots (21, 49, 72-74), several from bowls and domestic funnel beakers. The heart stamps of bowl-sherd (12) are an exception (phases D-E1). The rest of the pottery belongs to phases B-C (one E2 sherd).

A fragment of a thick-bladed, thin-butted flint axe with polished wide and narrow sides was found during the excavation. In addition to the large quantity of flint artefacts in the Westendorp collection from this site, mainly scrapers of a TRB-like type, I would like to mention an unfinished specimen of a small flint axe (11) (Mulder's collection) which might be considered as a local TRB *Flint-Flachbeilchen*. However, this is not certain, and there is also a possibility that it was made by the Beaker cultures.

The only thing known about a fragment of the cutting edge of a thick-butted, thick-bladed TRB flint axe (Leiden museum, e. 1954/1.2) is that it was reported to come from 'Elspeet'. Since the find-site might therefore be miles away from the TRB site, we do not need to regard this find as a chronological problem.

Present location: Leiden museum; GAS collection in Arnhem museum (Bezaan and Westendorp collection); J. Mulder, Elspeet; IPP; BAI.

Sources: J. Bezaan (1932) *Manuscript,* a particularly valuable report with numerous illustrations of his finds, made at the request of and financed by Professor Dr. J. Hudig. Now in the possession of the GAS; *Verslag van den directeur over het jaar 1932, Rijksmuseum van Oudheden te Leiden;* Bursch 1940; *Nieuws-Bulletin KNOB* 1958, column *194 (report by A. Bruijn); J.A. Bakker, *Nieuws-Bulletin KNOB* 1965, p. *135-136; A. Boomert (1970, 1971) *Reports* on the investigation of find material from 1965 excavation (24.12.1970), Westendorp collection (16.03.1971), Bursch's excavation (1.04.1971), area Harm II (Mulder and Westendorp collections) (19.05.1971). IPP, unpublished.

Conclusion: an unusually large settlement of phases (early) B+C, with only two sherds in D style (fig. B8:12) and E2 style (cf. section 3.3).

B8, figs. 19, 23
EMMEN-Schimmeres, gemeente Emmen (Drente), D43: two hunebeds (D43A and B) in peristalithic long barrow
In 1913, Holwerda excavated this grave which is unique for Netherland (Holwerda 1914, 1915). In connection with his restoration, in 1960, Van Giffen carried out a new excavation (Van Giffen 1962) after having already published extensively on the architecture of the grave (1927, 1956). It appears that the monument consists of two short hunebed chambers of the usual Drente type, with an entrance flanked by one pair of side stones, enclosed in a peristalithic long barrow. I refer to Van Giffen's publications and Chapter 7 above for a consideration of a possible secondary lengthening of this barrow. Van Giffen (1962) established that two stones of the peristalith had been pulled down, in his opinion to cover graves without goods in front of the peristalith.
The contents of the burial chambers, very summarily described by Holwerda, were sorted out and studied by A. Boomert, R.W. Brandt and P.J. Woltering at the IPP in 1969-1971. This was made possible by a long-term loan of this material from the Rijksmuseum van Oudheden in Leiden. The results were produced in two reports (Boomert, Brandt & Woltering 1970, 1971). Their results were partly summarised in section 3.3 and fig. 19, above. One conclusion was that, through an administrative error, the contents of the two chambers had been mixed up during or shortly after Holwerda's excavation.
Fig. 23 shows a funnel beaker which was perhaps imported from the Michelsberg culture (sections 3.4.1; 6.3; 6.9). A pit below the barrow between the two burial chambers contained the sherds of one or two B jugs and the burned fragments of a big 'Old' Danish flint axe (sections 5.3.12; 6.9 and Chapter 7). This was possibly a ritual pit. Holwerda's impression that the pit-filling was peppered with splinters of decayed (cremated?) bone vaguely recalls grave 14 at ANGELSLO (section B1). The chisel with quadrangular cross-section illustrated by Holwerda is of the EGK type (compare fig. 41:j). In section 5.7 we discussed a pendant from this grave which was made from a fragment of a petrified ammonite (Holwerda 1914, fig. 5).
Present location: Leiden museum c. 1913/12.1-31.
Sources: Documentation Leiden museum; Holwerda 1914, 1915; Van Giffen 1927, 1956, 1962; Knöll 1959; Boomert, Brandt & Woltering 1970, 1971.

B9, figs. B4-5
HOOGHALEN
gemeente Beilen (Drente)
17B:234.74/549.41
In 1963, W. Wijkel and W. van der Poel discovered TRB pottery c. 30 m from hunebed D54c, in a coversand ridge which was ploughed for reafforestation. Hunebed D54c itself had been discovered and excavated when the area had first been cleared (1946-47). The earliest pottery in this hunebed was from the Drouwen B phase (Chapter 7). Only after Wijkel and Van der Poel had recovered their finds did they report their discovery to the Assen museum. Van der Waals was able to establish at the site that the disturbance of the soil could have left intact only scarcely usable ground traces, even with a prompter report and an official excavation. The discoverers observed a ploughed, more or less rectangular area of c. 2 × 4 m (originally 1½ × 3½?) containing pottery and 100-125 football-sized stones. There was quite a lot of grit as well. There is no evidence for the existence of a barrow, nor is there any on pre-1946 maps or aerial photographs. Since the impression received from the pottery is one of chronological homogeneity and since there are, of course, no indications for a temple in this case, the site was probably a stone-packed earth grave or stone cist (Bakker 1970).
The pottery (figs. B4-5) was described in detail elsewhere (ibid.). It consists of:
1 a jug, type L, phase B.
2 a jug, type L, phase B (shape not quite satisfactorily reconstructed from few sherds).
3 a tureen, type M, phase C (but with features reminiscent of B). After the 1970 publication, a rim sherd was recognised which allowed the reconstruction of the slightly expanding rim.
4 a tureen, type M, phase C.
5 a lugged flask, undecorated. The few sherds do not allow alternative reconstructions, apart from the possibility of a higher neck. Typologically an MN I reminiscence of the EN C shapes of the North Group?
6 a shouldered pot with cylindrical neck, further reconstruction is not possible (one sherd).
7 a rim sherd of a pail which is identical with (8), but which cannot be matched with it. Type T, phase B.
8 a pail, type T, phase B.
9 a pail, type U1, phase cf. B.
10 a pail, type T, phase B. Maggot impressions. Few sherds.
11 an undecorated bowl.
12 a bowl, type T, phase B.
13 a bowl, type T, phase B.
14 three, small, weathered sherds from an atypical, carelessly decorated bowl or pail (phase A?).
15 a funnel beaker with strip decoration.
16 a funnel beaker.
17 a minute belly sherd of a funnel beaker with belly-fringe.

18 a number of sherds possibly from the belly of a collared flask.
19 a number of undecorated, small sherds.

With the exception of a single piece of flint, no other possible artefacts were found.
Present location: Assen museum 1966/I.3a-t (a is pot 1, etc.).
Sources: Bakker 1970.
Summarising: Presumably a dismantled stone-packed earth grave with at least 14 complete pots, but without stone artefacts as burial gifts. This typochronologically homogeneous group is one of the star witnesses for the applicability of the beginning of the typochronology used. Two of the ten diagnostic pots belong to phase C, the remainder to B. The horizontal tvaerstik line, characteristic of phase D, is absent. However, it might be possible to assign pot 14 to phase A and to recognise an EN C shape in pot 5 (a shape which, in that case, survived into the MN I).

B10, fig. B15
LANDERSUM-Penningsberg
Gemeinde Neuenkirchen, Kreis Steinfurt (Westphalia)
TRB artefacts came to light during the removal of part of a coversand hillock, called the 'Penningsberg', in 1938. H. Beck and W. Lange excavated an area of 4 × 6 m, and produced a detailed and well-illustrated report on those, and earlier finds (1950). Knöll (1959) summarised this work, but gave no illustrations. Since the 1950 publication is rather rare, I have here produced illustrations of the most important pottery, drawn after the published photographs (the scale, c. 1:3, is variable). Photographs of the axes were made available by the Münster museum.
The find consisted of 23 pots or large fragments of Tiefstich pottery and several sherds of mainly undecorated pots which were difficult to reconstruct. The significant pieces point to phase D2. Early Havelte stylistic features are conspicuous by their absence, whereas the Drouwen funnel beaker is conspicuously present and very varied with respect to profile. There was a biberon inside one of the funnel beakers (3a-b). Apart from the sherds of a disc with radial lines (not illustrated), there are no characteristic indications for a settlement at this spot such as, for instance, large quantities of flint scrapers and domestic funnel beakers. Although the ground traces were difficult to interpret, so that it is not completely clear which pieces belonged to each grave, the site is indisputably a small cemetery. A further excavation of the site would be highly desirable. Part of the dune was still in a virgin state in 1950!
We are faced with a chronologically difficult point in the presence of a northern Jutland flint axe, of unmistakably TRB facies, of the Lindø type (25). This specimen is theoretically 'too late' for this pottery (see sections 5.3.2; 6.9). The very scarce AOO beaker sherds from this site offer no convincing solution for this problem. In section 5.3.4 a *Flint-Flachbeil* (26) from this find-site was mentioned which Beck describes as consisting of Danien flint. A TRB counterpart to an arrow-shaft straightener (27) was discovered at LAREN (section B11).
Present location: Münster museum.
Sources: Beck & Lange 1950; Knöll 1959.
Conclusion: Cemetery phase D2, in which Early Havelte (E) appears to be absent.

B11, figs. B9-10
LAREN, end of Zeveneinder Drift (street)
gemeente Laren (North Holland)
32A:144.20/473.00
The site was discovered on 12.03.1960 by R.M.J. van Dijk while playing Red Indians. I was informed shortly afterwards by R.J. van den Berg. The site was excavated from 28.10-9.12.1960 and 29.04-28.05.1963 under the auspices of IPP and the Hilversum museum (additional subsidies granted by the Gemeente Laren, Vereniging van Vrienden van het Gooi and the Ministerie van Cultuur, Recreatie en Maatschappelijk Werk). The work was directed by me, assisted by C.R. Hooijer, M.F. Hamburger (IPP assistants), H.N. Donker (technical supervisor, IPP) and many volunteers, including the members of a work camp organised for this purpose by the Nederlandse Jeugdbond voor de Bestudering van de Geschiedenis, boy-scouts and other enthusiasts of antiquity.
A surface of 869 m² was excavated for artefacts. Each individual square metre of the soil was shaved off in thin slices with a spade. A sieve was not used. The 1-square-metre sections thus examined lie scattered in a field 70 × 80 m which was partly disturbed by pits where sand had been blown away (land registry nos. C and G 1634 and 972, owners: Stichting Goois Natuurreservaat and Gemeente Laren).
Furthermore, several school pupils dug up artefacts on this same site both before and after excavations. Nearly all of their finds became concentrated in the collections of A. Farjon, W.J. Manssen, R.M.J. van Dijk and J. van der Kruis – the members of the then active Studiekring voor Archaeologische Wetenschappen (their magazine was called *Onder de Wodanseik*). The collection was given on permanent loan to the Hilversum museum in 1965 and bought by it in 1977.
The find-site lies in the heath on periglacial coversand, just outside the *eng* (= *es*, or cultivated soil) of Laren, at the end of the Zeveneinder Drift. In the 15th-19th centuries, sheep grazing had caused the topsoil to be broken in numerous places, leaving large pits where the sand had been blown away, but otherwise it was intact. The surface of the undisturbed profile here is at 5.10-4.50 m + NAP (Dutch Ordnance Datum); there is an Allerød-like layer underneath it at c. 4 m + NAP. Below this, there is the top of the glacigenous, periglacially eroded, ice-pushed ridge with a covering of scattered boulders, at c. 3 m + NAP.

Apart from the more recent sand-pits and adjacent dunes, the TRB surface was presumably approximately the same as the present one. However, subsequent to the TRB habitation a podzol with iron pan and leached layer developed and this prevented the observation of TRB ground traces. Some indications were found that a slightly developed, patchy grey-brown podzolic forest soil preceded this podzol (without a leached layer, with much animal disturbance). No pits or post-holes from the TRB period were observed.

There were TRB sherds in and under the iron pan; in the latter case, sometimes in greyish soil, but often without any discolouration visible. The sherds in the leached layer had completely worn away – flint had acquired a white, shattered structure here. Under the iron pan, there were straight, horizontally running animal burrows (diameter 5 cm), which contained a few TRB artefacts. On the site, the finds were obviously concentrated in oblong areas. These concentrations may be rough indications of areas between dwellings.

The *TRB pottery* (figs. B9-10) which was found belongs, without exception, to the Drouwen style group, phases B+C. Most of the sherds (total dry weight 5-7 kg) are so small that the shapes of the pots are not sufficiently recognisable. The following were identified (counts by J. Slofstra and J.A. Bakker 1966): perhaps a minute, undecorated fragment of 1 *collared flask* (26); c. 21 *funnel beakers* (including 4-10), mostly the large domestic kind with belly-fringe. One (8) has a cordon with vertical maggot impressions on the base of the neck; the shoulder of 1 *jug*(?) (23) with vertical Tiefstich lines and chevrons of maggot impressions on the shoulder; the sherds of at least 9 *bowls and pails* (of type T (25 (1×)), U1-2 (1-2, 13, 18-19, 27 (8×)). One group of sherds with vertical Tiefstich lines comes from a left-handed-decorated rim (3) of another bowl (type U) or of the foot-ring of 1 *pedestalled bowl* (?).

Sherds of at least 5 *discs* (1-2 cm thick, 29-32). One disc fragment has a row of 3 mm-wide perforations along the rim. No trace of other decorations or holes was found, which is not surprising with the very few and small pieces.

The *ornamentation* of the pottery is limited to horizontal zigzag lines, vertical groove and Tiefstich lines or vertical chevron bands. It is significant that neither the tvaerstik line nor ladder and zipper strips are present. The rather unusual maggot impressions (23, 25; not present in, for instance, ELSPEET (figs. B6-B9)) are indications of connections with the Hunze-Hunte area and indirectly with Schleswig-Holstein (Knöll 1959, list 110). Here, as in ELSPEET, there are no pendant-triangle tureens.

The only *other prehistoric pottery* from the site were one sherd from the rim of the base and one from the wall of a pot from the Early Bronze Age with true, open barbed wire ornamentation.

The *stones and flints* of this site were – to the best of our knowledge – all collected. The only exceptions might have been occasioned by some helpers throwing away (contrary to instructions) the odd 'ordinary' stone. 576 pieces of flint and 125 kg stone were collected. Since the geology of the site entails its being completely devoid of stone – apart from the finest of gravel – the finds must all have been brought here by human beings. It is a deliberate selection of what they could pick up on the ice-pushed ridges (at least 500 m away) on spots without vegetation.

The 576 pieces of *flint* can be provisionally subdivided into 64 *scrapers* (various shapes, predominantly discoid), 3 *transversal arrow-heads,* 1 *leaf-shaped arrow-head,* 1-2 *borers,* 21 *fragments of polished axes* (including 4 of large axes with rectangular cross-section and 2 of an axe with flat-oval cross-section), 4 *hammer-stones* (not including one made from an axe fragment) and 481 *waste flakes.* A more detailed study would be desirable, however. Only one possible Mesolithic flint artefact was found among the material. In addition, 2 *fossil flint sea urchins* were found among the settlement refuse. These curiosities, as well as the other flint, may have been picked up on the ice-pushed ridge. The flint is largely of a local moraine type, the axes with rectangular cross-section may have been made of northern flint, and the one with flat-oval cross-section is of Meuse flint.

The 125 kg *stone* (other than flint), consisting of 1475 pieces, were identified by Dr. G.J. Boekschoten (Geological Institute, Rijksuniversiteit, Groningen). In the survey below, the bracketed figures give the percentages by weight and number respectively.

Two-thirds to three-quarters of the stones (67%; 71%) consist of pieces of sandstone, quartzitic sandstone and quartzite. Nearly half of them were identified as Dala sandstone (36%; 32% of the totals), but these are minimum figures; the true percentages could reach 50% of the total weight. These pieces of sandstone and quartzite had been used largely as *saddle querns* and *polishing or grind stones,* and were found in shattered fragments. Some fragments could be glued together and suggest diameters of up to 40 cm for the lower quern-stones. The upper quern-stones were smaller, as were also some *hammer-stones,* and *whetstones* suitable for sharpening smaller objects made, for instance, of bone. In addition, there was an *arrow-shaft or awl straightener* of the familiar type, which, until then, was known in conjunction with Tiefstich pottery at LANDERSUM (fig. B15:27).

The remainder consists largely of *crystalline rock* of moraine origin (28.5%; 23%). Included in this are smashed fragments of *querns* (not polishing stones) and a *hammer-stone.* No wasters connected with possible axe or battle-axe production were recognised.

One of the reasons for smashing the stones might be connected with the preparation of *temper* for pottery manufacture, although there is no direct evidence that this occurred here (was pre-glacial loam

or clay used for this purpose, for instance?). Neither is it clear from the composition of the temper of the sherds themselves whether the rejected implements of quartzite and sandstone were used for ceramic tempering, at least to any significant extent. C. van Driel-Murray alerted me (1976) to the possibility that they may have been *cooking or boiling stones.* This is plausible for both types of stone. The pieces were cracked in a manner identical with that of Viking Period cooking or boiling stones from ÅRHUS (Madsen 1965, photograph on p. 8. The hot stones broke when they were put into cold water. A stone weighing 1.5 kg and at 500° Cels. can bring one litre of water to the boil).
In this case, the matters of containers for the water (large funnel beakers or skins or pouches, cf. Coles 1973, p. 50-54) and the source of the drinking water become urgent problems. The Koesweerd, a pond of great antiquity is now the nearest place with open water (1.25 km away). The finds of lined wells at the KARLSQUELLE (Wegewitz 1963) and perhaps of another one at ANGELSLO (information Van der Waals) suggest a better possibility. At the Laren site, groundwater is now available at a maximum depth of more than 1.2 m, but at 250 m north of the site at 50-80 cm (*Bodemkaart van Nederland* 1:50,000, sheet 31-East, 1970).
The battered surfaces show that the larger specimens (3%; 3%) among the quartz stones (3%; 4%) are fragments of *hammer-stones.* The few small pieces are rounded pebbles, with diameter up to 5 cm, and their presence here may have been due partly to natural causes (niveo-aeolic), but also partly, perhaps, to a recent surfacing of a path through the settlement, which may have resulted in their being incorrectly included in our survey. Another possibility is that some of them were *burnishing stones* for pottery.
The remaining types of stone amount to less than 1% of the total weight and the total number. There is a *gneiss axe* with rectangular cross-section (693 g); also half (743 g) of a large *Fels-Ovalbeil* of an *unidentified type of stone,* burned, i.e. cracked by fire. Small rounded and flattened pebbles represent *siliceous shale* and a *siliceous stromatopore,* a piece of *basalt* is of southern origin.
A fragment of a flattened *copper or bronze ring* appears typologically to be a modern contamination, for example, from a horse-harness. It was not possible to collect any C14-datable samples of charcoal from an indisputably TRB context.
Present location: Both the finds discovered during the excavations and the Farjon-Manssen-Van Dijk collection are in the Hilversum museum.
Sources: unprinted excavation reports ('protocolboeken') LAREN/Neol./1960/J.A.B. and LAREN /Neol./1963/M.F.H. in IPP; *Nieuws-bulletin KNOB* 1960, * 109 and 268; J.A. Bakker, *In het voetspoor van A.E. van Giffen* 1966², p. 27-32, p. 170.
Conclusion: TRB settlement, presumably inhabited for one short period during the phases B+C. One of the few TRB settlements with a collection of flint and stones which can with certainty be assigned, almost in its entirety, to the TRB culture. It is the most westerly 'true' TRB settlement which has been excavated (cf. HAZENDONK, sections 2.21, 6.3 and note 3:10). LAREN proves, as does the ELSPEET settlement which started somewhat earlier, that such remote areas as Gooiland and the Veluwe were already being sporadically inhabited by the Tiefstich peoples roundabout the time of the transition from Knöll 1 to 1/2 (this changes the appearance of Knöll's 1959 maps 21-22).

B12, fig. B18
MESUM
Kreis Steinfurt (Westphalia)
During digging work in 1934, labourers found an approximately 2 m-wide pit containing the pottery described below grouped around a pot which had survived intact, with two flag-stones forming a roof above them. On further excavation, Knöll's impression was that the site might have been a vanished barrow, including a secondary cremation (no pottery found there!) and numerous post-holes. But the complete lack of any pattern in the positioning of these iron pan projections argues against this theory. Knöll (1938, 1959) gave a detailed description of the artefacts and the circumstances in which they were found.
Fig. B18, including its numbering, was based on Knöll's plate 37 (1959) and his description (1938). Also used were Knöll's unpublished diagrammatic drawings of the artefacts and my own notes, made after inspecting some of the artefacts in the Münster museum. The following were found:

1 a low shouldered pot with two or four lugs, decorated in point stamp lines.
2 a flint scraper (Knöll 1959, plate 37:2).
3 a shouldered pot with c. four lugs, decorated in point stamp lines, less carelessly than it appears on the photograph.
4 an undecorated globular bowl.
5 a funnel beaker decorated with tvaerstik and point stamp lines.
6 an amphora decorated with point stamp lines. Lugs and base are now missing.
7 a shouldered pot decorated with point stamp lines, at least one lug of which has been preserved. Base is now missing.
8 an undecorated bowl.
9 a one-lugged shouldered pot, decorated in Tiefstich or point stamp lines.
10 the sherds of an amphora, similar to (6), decorated in point stamp lines.
11 a wall sherd (K37:11), possibly from (3).
12 the neck of an undecorated collared flask, rim missing.
13 a little shouldered pot decorated with hollow stamp lines (not a lugged beaker). Rim and horizontal lines below it are my reconstruction.
14 rim sherd of an amphora(?) decorated with tvaerstik lines.

15 a small shouldered sherd, decorated with Tiefstich lines.
16 a bowl on foot-ring legs, decorated with tvaerstik lines.
17 the lower part of a bowl on foot-ring legs (see photograph K37:17).
18 a bowl on foot-ring legs, with knobs and a chess-board decoration of narrow Tiefstich lines.
19 a wall-base sherd of an undecorated shoulder pot.
20 the base of another collared flask (not (12): information Knöll).

Present location: Münster museum – but partly destroyed during the Second World War.
Sources: Knöll 1938, 1959; Knöll's 1938 drawing of these specimens and a personal inspection of those artefacts which were still available.
Conclusion: This closed find displays a mixture of the Uddel facies of the Early Havelte horizon (E2, for example 6, 10) and the E1 facies (ornamentation by tvaerstik).
Funnel beaker (5) represents the tail-end of the Drouwen tradition (D2).

B13, fig. B1
MIDLAREN, sandy hillock, due west of the Bolleveen
gemeente Zuidlaren (Drente)
12E:240.50/570.26
During the 1950's, a sandy hillock situated due west of the Bolleveen was levelled. The following finds, originating from a TRB settlement, were collected by M. de Swart. Van der Waals (1964) reported them and later put at my disposal for publication the drawings made at the BAI of this very interesting group.
The following were drawn (fig. B1): Twenty-four decorated sherds, the majority (6, 10-26) of which derived from large domestic funnel beakers of the Drouwen style with vertical grooves on the belly. Apart from a disc fragment (27; no special features), the remaining eight decorated wall sherds (1-5, 7-9) are remarkable. They display a rather varied ornamentation of widely-spaced vertical strips. These specimens belong to phases A and/or B, probably both. They could conceivably be sherds of bowls and jugs, perhaps also of lugged beakers or amphorae. A few dozen undecorated sherds (about double the quantity of decorated ones) were not drawn.
The 15 flint artefacts illustrated (28-42) included a trapezoidal arrow-head (30), a corner of a presumably thin-butted heavy Danish flint axe of the 'Old' type (28), a small borer (29) and a number of scrapers. Some of the specimens are relatively large for TRB sites in our region, including a burin(?) (40) and a blade (41). They could be much older.
Present location: BAI.
Sources: Van der Waals 1964a, p. 15; note 4 on p. 38; p. 96; 1965, p. 208; detailed information from Van der Waals.
Conclusion: A small collection of artefacts from an extremely interesting, but presumably vanished settlement site of phases Drouwen A-B.

B14, fig. B10
TINAARLO, adjacent to the dismantled hunebeds D6e-f
gemeente Vries (Drente)
The dismantled hunebeds D6e-f (Van Giffen 1944a) were rediscovered in 1927 and they were excavated in 1928 by Van Giffen. Towards the end of November 1931, the two complete pots described below were recovered, c. 2 m from Van Giffen's trenches. The pots were together in the ground, perhaps in a flat grave. I consider this to be a closed find-group.
1a an undamaged, angular tureen with hatched triangles on the shoulder and a handle extending upwards to slightly above the rim, type M, phase C.
1 a broken, but restored funnel beaker with smooth profile and the usual fringe on the belly, shape I.2 (section 3.4.1).

Present location: Assen museum, 1931/XII.1 and 1a.
Sources: Van Giffen 1944a (fig. 1 gives the exact find-spot and reduced scale figure); an article by Van Giffen in *Nieuwsblad van het Noorden,* 2 December 1931; log-book of the Assen museum.
Conclusion: Closed find of M-tureen and I.2-funnel beaker, phase C.

B15, figs. B19-20
UDDELERMEER, east bank, within and south of Hunneschans
gemeente Apeldoorn (Gelderland)
33A:180.75/473.3
The east bank of the enormous pingo of the lake Uddelermeer was the location of a large TRB settlement of (exclusively) the Early Havelte phase (E2). Holwerda carried out large-scale excavations there in the years 1908, 1910-11, during which he also found remains of other cultures.
The Hunneschans is an impressive medieval earthwork, the round wall of which partially covered the TRB settlement. Holwerda published detailed reports of his finds and paid considerable attention to the TRB remains (section 2.2). Knöll (1959) summarised the results on the basis of Holwerda's publications. No field drawings could be found in the Leiden museum. The finds in the museum were fairly well administered seventy years ago, although the collections from the settlement layer were rather roughly localised, no attention, for example, being paid to surface units, pit-filling, etc. For this reason, and also because artefacts of several other Neolithic cultures were found intermingled in one single layer, we have largely left out of consideration those TRB remains which cannot be clearly distinguished

visually from those of other cultures (flint, stone). The most important pottery is shown in the illustrations (figs. B19-20). It belongs and gives the name to the Uddel facies (E2) of the Early Havelte style group. The tvaerstik line, characteristic for the E1 facies was only extremely rarely (more or less accidentally?) applied to the neck/belly transition of amphorae. The heart stamp is absent. There is a remarkable, single occurrence of a tvaerstik-like moss stem pattern (8d).

The finds include:
Grave 1 (Holwerda 1909, p. 49-50, k-n):
1a (l.c., fig. XXI:h) small undecorated bowl whose rim is now missing, e. 1909/9.154.
1b (l.c., fig. XXI:i) undecorated, very wide-mouthed funnel beaker or funnel bowl, e. 1909/9.153.
1c (l.c., fig. XXI:j) small, decorated amphora with 6 knobs on the base of the neck, e.1909/9.151.
1d (l.c., fig. XXI:k) small, decorated amphora with two lugs. Judging from the repair holes, a baking flaw had been wired, e.1909/9.152.
Grave 2 (Holwerda 1909, p. 50-51, o-s):
2a (l.c., fig. XXI:d) undecorated funnel beaker with a thick base, now only partly attached to it, e.1909/9.157.
2b (l.c., fig. XXI:e) small, undecorated amphora with two lugs, e.1909/9.158.
2c (l.c., fig. XXI:f) tall, decorated amphora with two pairs of lugs, e.1909/9.155.
2d (l.c., fig. XXI:g) small decorated amphora, e.1909/9.156.
Holwerda reported emphatically that 'sherds of the same pottery, some of them with the same type of decoration' had been found 'on top of the second grave pit'. I have not been able to identify these.
Grave 3 ('sunken hut 9', according to the plan, fig. II, and Holwerda's 1909 text; 'grave' according to the 1912 plan) contained:
3 an undecorated bowl (Holwerda 1909, fig. XXI:b). This bowl had been put whole into the pit, which indicates that the pit was a grave. This would appear to be confirmed by the later general plan (1912) which reported 3 and 4 as graves as well as 1 and 2. e.1909/9.147.
Grave 4 The 1912 plan indicates four graves. Apart from Graves 1-3, there is a fourth one southeast of Grave 1. Pot 4 (Holwerda 1909, p. 49, h) was found 'upside down, southeast of the first grave pit (cf. fig. X:1)'. The discolourations in the foreground of fig. X:1 do not match well with those of the plan, but pot 4 is shown in a small pit, such as Grave 4 was, according to the plan.
4 a decorated bowl with 4 knobs. It is remarkable (Holwerda 1909, fig. XXI:c) that a large rim sherd of the pot (which was otherwise intact) was not found. The bore-holes along the line of fracture suggest an attempted repair. Or did they serve to attach a leather pouring-lip; and did the perforations in the line of fracture serve in breaking off the sherd? e.1909/9.148.
Grave 5 'A grave, whose existence I expected close to those of 1908, was excavated this year. Only one specimen of the familiar pottery was found in it (cf. fig. 10)' (Holwerda 1912, p. 7, note 1). Either Grave 4 or 5 was not indicated on the 1912 plan.
5 a small decorated bowl (Holwerda 1912, fig. 10 bottom right), e.1912/12.16.
There was thus *a small cemetery of five graves* (area at least 11 × 6 m) in the northwestern part of the Hunneschans. Possibly the cemetery continues further under the wall of that earth-work. According to the 1909 plan (scale 1:400), the plan of Grave 1 was slightly trapezium-shaped, 3.5 × 2.5 m; that of Grave 2 rectangular, 2.8 × 1.6 m; that of Grave 3 oval, 2.2 × 1.2 m; and that of Grave 4 (or 5) oval, 1.2 × 0.8 m.
The group of pits 1-8 was situated 11 m west of Grave 1, closer to the lake. Pit 5 was regarded as a 'rubbish heap', the remainder as 'sunken huts'. These pits are probably rubbish-filled pits of the TRB settlement. Those numbered 3-4, 6 and 8 contained the following sherds:
Sunken hut 3 (Holwerda 1909, fig. XVI:1, p. 48-49, b-c) contained:
6a a large fragment (l.c., fig. XXI:a) of a decorated amphora. The missing rim and two of the three horizontal lines under it were reconstructed by analogy. e.1909/9.142.
6b 'small undecorated sherds of this pottery, found with the above'. I was unable to locate these.
Sunken hut 4 contained the undecorated sherds l.c., fig. XX:d. Not illustrated in the present work.
Sunken hut 6 contained the sherds l.c., fig. XX:c. Not illustrated in the present work.
Sunken hut 8 contained the small sherds l.c., fig. XX:e, from which it was possible to reconstruct on paper (7) a decorated amphora. e.1909/9.146.
There were *other places within the Hunneschans* where TRB settlement material was collected, along the banks of the lake. The existence of pits could not be established there. The half of the knob-butted battle-axe (section 5.6.3; e.1909/9.132; Holwerda 1909, fig. XIX:a, p. 47, III-V) was found along with a large grindstone and flint waste material(?) (fig. XIX:b) in the so-called *temenos*, actually a later prehistoric barrow (Glasbergen 1954), evidently built on top of the settlement layer. Much of the flint illustrated by Holwerda (1909, figs. XVIII, XIX) would seem to originate from the TRB settlement, including the discoid scrapers, larger cores and the hammer-stone.
South of the Hunneschans, the TRB settlement continued into a strip along the present bank of the lake (Holwerda 1912, figs. 1 and 11). There Holwerda found traces of palisades (sometimes ditches, sometimes rows of post-holes, see his fig. 11 and the text) which are reminiscent of those of ANLO (section B2). The difficulties of interpretation with which the report now confronts us if it is considered from the present-day chronological perspective, are insoluble, since, among other reasons, the original documentation concerning this excavation has been lost.

However, if it is correct that one of the palisade trenches sliced through a cremation spot (l.c., p. 13 and fig. 14) which was part of a barrow with two consecutive 'single closely spaced circles of posts' (Type 5 according to Glasbergen 1954, II, p. 47, p. 17), then a Bronze Age – or later – date would seem to be more probable (Celtic Field-like plot boundaries?).
Holwerda briefly described and gave illustrations of some of the pottery from the numerous 'sunken huts' (i.e. refuse pits) in this area; figure B20 (centre) illustrates the following selection from this pottery (cf. Holwerda 1912, fig. 10):
8a a bowl with a chess-board pattern in point stamp lines, which was reconstructed on paper on the basis of a few sherds, e.1912/12.8.
8b a shoulder sherd with a knob of a decorated amphora, e. 1912/12.6.
8c the neck sherds of a decorated amphora, e.1912/12.6 (not identical with 8b).
8d a neck sherd with remains of a pierced lug, with an exceptional decoration of horizontal lines of the tvaerstik family (sometimes described as moss stem or fir branch), e.1912/12.6.
8e a belly sherd of a wide amphora, decorated on the belly with vertical point stamp lines grouped in threes, e.1912/12.6.
8f (l.c., fig. 10 bottom left; not illustrated in the present work) a small undecorated two-lugged amphora.
8g a small undecorated funnel beaker, reconstructable from the sherds (l.c., fig. 10 top left; not illustrated in the present work).
At least 23 disc fragments were found during Holwerda's excavation. It was not possible to establish the position of their finger-wide holes. Some had perforations along the rim (Bakker 1962).
At the site of Tumulus B, which had been excavated in 1911, A. Bruijn (1960, see also W. Glasbergen 1960) found traces of a palisade, c. 50 m south of the moat of the Hunneschans, comparable, perhaps, with that of ANLO (this time, however, without a large quantity of beaker or barbed wire pottery; the TRB culture is its most probable origin on account of the quantity of material). The ground here had been thoroughly disturbed in connection with the building of a swimming pool.
As a follow-up to these finds, *a large-scale excavation* was carried out *in 1963,* under the auspices of the ROB and led by J.F. van Regteren Altena. This excavation produced very few TRB sherds, only in the western extremities of the trenches, near the lake. This pottery was situated at the level of the base of the iron pan in the ground; no refuse pits or graves were observed.
Only the following are here illustrated (fig. B20; centre):
9 two sherds of a small decorated amphora of the usual type.
Present location: Leiden museum (partly on permanent loan in the Barneveld museum); ROB (1963 excavation).
Sources: Holwerda 1909, 1911, 1912; Documentation Leiden museum (field reports missing); Bruijn (1960) *Nieuws-bulletin KNOB* 1960, p. 267; Glasbergen (1954); Glasbergen (1960) *Nieuws-bulletin KNOB* 1960, p. 107; Bakker 1962.
Conclusion: Type-locality of the Uddel facies of the Early Havelte style (E2) settlement and graves.

B16, fig. B20
UGCHELEN 1-3
gemeente Apeldoorn (Gelderland)
Three sites near this village produced TRB pottery, all of it of the Early Havelte style (E2). The find-spots are situated on the southern slope of the periglacial Assel-Ugchelen valley which lies in an east-west direction and cuts into the eastern ice-pushed ridge of the Veluwe. This valley, through which now run a railway-line and the new E8/A1 motorway, is dry. Formerly, it may have contained a few streams which carried rain-water away, although these were possibly subterranean. The synchronous find-groups were two burial places and a settlement situated between them, c. 1 km from the cemeteries.

UGCHELEN-1, Kooiberg (fig. B20, bottom left)
33B:190.21/465.33
J.D. Moerman found many TRB sherds in 'a large sand pit' here in 1926, some of which he exchanged with other people and museums. In 1967 it was discovered that sherds belonging to one pot had found their way to the Leiden museum (e.1928/12.20-21, 2 sherds), the Arnhem museum (GAS-552, 3 sherds from the J. Bezaan collection) and the Apeldoorn museum (the remainder, with mention of the find-spot, from the Moerman collection). From those sherds, the pot (1a) was reconstructed in the IPP during that year (now Apeldoorn museum, unnumbered; the remaining sherds in the two other museums).
There were also three sherds from another Early Havelte pot (1b) in the Apeldoorn museum, with no mention of their find-spot. Since they were mixed up with sherds of the former, or were in a box with Moerman's label 'Kooiberg, hunebed culture', I assume that this pot originates from the same find-spot.
The two pots are (fig. B20):
1a an amphora of the Early Havelte style group, Uddel (E2) facies, originally with 5 lug knobs, decorated with fine point stamp lines.
1b an amphora, decorated in the same style with another spatula, with 4 lug knobs, also characteristic of the same style and facies.
Sources: Notes by J.D. Moerman, G. Elzinga and P.J.R. Modderman in GAS (Arnhem museum) and ROB documentation, all referring back to Moerman's information.
Conclusion: 1-2 pots, very probably from a small E2 cemetery.

UGCHELEN-2, north side of Heidehof cemetery (fig, B20: bottom right)
33B:192.20/465.65 or: 33B:192.14/465.73
In gravel pits on the north side of the modern Heidehof cemetery, Moerman found (date unknown) the sherds of a small, two lugged amphora (fig. B20: bottom right), with a perforation (rudiment of a spout?) on one side of the neck mid-way between the two lugs. There was a note that the pot was found 'in complete isolation'. The pot was restored at the ROB in 1957. This was again a representative of the Early Havelte style group, Uddel facies (E2). The ornamentation, in extremely fine point stamp line, was rather carelessly applied, almost certainly by the same hand as had decorated pot (1a) from UGCHELEN-1.
Present location: Arnhem museum, GAS-32.
Sources: notes by G. Elzinga in GAS and ROB documentation, according to information from J.D. Moerman and P.J.R. Modderman.
Conclusion: Grave of the Early Havelte style group, Uddel facies, E2.

UGCHELEN-3
33B:191.03/466.05
In the autumn of 1971, during the building of the new Hoenderlo-Apeldoorn road, J. Maris discovered a settlement of the Early Havelte style group and Uddel facies under the soil of the Ugcheler Enk, immediately to the south of the equally new E8/A1 motorway. Other prehistoric pottery was unearthed, but no pottery of other style phases of the TRB culture. The pottery recovered deserves further study; the find-site, still largely under the surface of the *enk* (= arable soil), would merit legal protection for later excavation. R.S. Hulst observed some pit-fillings, a ditch and a post-hole connected with this pottery. The latter included sherds of decorated amphorae and bowls; in addition, about 15 scrapers and some splinters from sharpened axes were collected.
Present location: Arnhem museum.
Sources: inspection (1971) of find-site and finds, together with the finder and R.S. Hulst, official archaeologist for the Province of Gelderland; Hulst (1972) *Nieuws-bulletin KNOB* 1972, p. 106-107.
Conclusion: Settlement of the Early Havelte style group, E2, the dwelling place of the individuals buried in find-sites 1 and 2.

B17, figs. B11-15
ZEIJEN, Tumulus II on Noordse Veld
gemeente Vries (Drente)
Van Giffen carried out successive excavations of this barrow in June and July, 1925, Autumn, 1925, September, 1927 and October, 1928. These excavations led to discovery, under the barrow, of four or five TRB graves and the remains of nearly 30 pots (13 of which were complete), 4 flint axes, a transversal arrow-head, etc. Apart from some remains of section baulks (which have disappeared in the meantime due to cultivation), the entire tumulus, including the uppermost part of its base, was excavated. Thanks to the detailed publication in *Die Bauart der Einzelgräber* (1930), the existence of these finds quickly became generally known.
Less widely-known is the fact that, in *Opgravingen in Drente (tot 1941),* (1943[1], 1944[2]) there appeared a version of the survey drawing incorporating rather extensive modifications as far as stratigraphy is concerned, and also the fact that, for the unpublished third edition of this publication (c. 1950), a further revised and extended version was drawn and prepared for printing (fig. B11).
This find-group is of crucial importance for the typochronologies of both Van Giffen (1927) and Knöll (1959). In Van Giffen's opinion (1930, p. 12) it represented the transition from Drouwen to Early Havelte (fragment 20 (fig. B14) was seen as originating from an Early Havelte amphora), and this seemed to agree well with the position which he wished to assign to the Zeijen graves in his degenerative sequence of grave types (section 2.9).
Knöll (1959, p. 90-91) did not dispute this, and assigned the pottery from this find-group to each of his three phases. This is his main argument for the conclusion that these three phases 'have large overlaps'. Since this conclusion would actually be fatal for the usefulness of the typochronology which I am proposing, which involves a further subdivision of Knöll's three phases, a detailed analysis of this find complex is required, with reference both to find association and typology.

For the exact location and the stratigraphical position of the finds, the following information was available to me (if unpublished: in BAI archives):

1 the 1:40 plans and the 1:20 profile drawings, both made during the excavation by the draughtsman, L. Postema. These are clear, although a reference point is sometimes missing, and one has to refer to the publication drawing (1930) to see how some of the drawings of details have to be fitted into the whole. As is generally also the case with more recent field drawings, it is not always clear what are later additions, added during preparation of the publications or of the wooden scale-models by Postema.

2 the extensive series of excellent excavation photographs.

3 the rough and the fair copy note-book with the finds administration from 1925, the rough note-book from 1927, the rough and the fair note-book from 1928. These notes of the field technicians are brief.
Furthermore, the sherds themselves were numbered: in pencil (field numbering), in ink (provisional numbering), both with a single figure, and, if they were drawn for publication, the Assen museum

inventory number, too, in ink or white paint, indicating year, month and serial number (final numbering).
The artefacts were numbered as follows:

Field numbers	*Final numbers*
(1925/VI.)1-15	1925/VI.1-15
(1925/VI.16-19 are soil samples)	
(1927/XI.)1-5	1927/XI.21-25
(1927/XI.)6	1927/XI.20, 20a-h
(1928/X.)I	1928/X.26, 26a-e

Since the positions of the specimens which were recovered complete were established unequivocably by excavation photographs and notes, and since the designations 'sherds' and 'sherd' coincide only with the find numbers (1925/VI.)1 and (1928/X.)I = 1928/X.26, the possibility of confusion between these re-numberings was actually only slight after the provisional numbers were applied to the cleaned sherds.
In 1925-1928, Tumulus III was excavated simultaneously with the nearby barrow II and finds from II got mixed with those from III. The publication on Tumulus III mentioned neither sherds nor TRB artefacts whatsoever (Van Giffen 1927, p. 303; 1930, p. 130-134, plates 93-98); the find notebooks did, erroneously, mention them, and, in accordance with these notes, several TRB sherds which partly fitted to those from Barrow II, were (later?) classified in the Assen museum as originating from Barrow III.
The following designation 'sherd' or 'sherds' coincide with similar notes on finds from Barrow II: 1925/VI.2 (Tum. II, no. 2) and (1925/VI.)2 = 1925/IX.2 (Tum. III, no. 2); 1925/VI.5 (Tum. II, no. 5) and (1925/VI.)5 = 1925/IX.5 (Tum. III, no. 5). We have seen above that there was a possibility for confusing find-groups 26 and 1 from Tumulus II. A check of the numbers on the sherds shows that the number of demonstrable errors is reassuringly small. The most important sherds, which were drawn for the 1927, 1930 and c. 1950 publications, had been given their complete inventory numbers prior to being used for this purpose. Thus, there remains only some doubt about the small decorated bowl 34 (fig. B13) belonging to find-group 15 of Barrow II, and a sherd from funnel beaker 20 from Tumulus II which was classified under find-group 2 of Tumulus III. It is also possible that, among a few funnel beaker sherds which are typologically not very distinctive, some interchanges of find-groups could have occurred, but these would seem to be of little importance.

4 This concludes the survey of the fairly satisfying results of an investigation into the documents described under 1-3 and the notes on the sherds themselves. At a later point, however, a log-book of Van Giffen's of the first campaign appeared (25.06-4.07.1925; I had no access to those of the later campaigns), and this contains a discouraging additional piece of information. The following remark appears for grave c: 'a good many sherds in the soil above it' and, with general reference to the excavation of the southeast quadrant: 'at places an occasional sherd'. The former remark, in particular, implies that *a mix-up of sherds had indeed occurred previous to any administration having been carried out.*
According to the other administrative data, no other finds were discovered in this area in 1925, apart from the complete pots from graves b (southern section) and c. The sherds which are now missing can no doubt be found among the sherds entered under grave a (and surroundings), since this grave was excavated during the same campaign. Grave b was excavated at the same time, but the log-book unequivocably mentions only pots 13a-e, i.e. no sherds. During this campaign, grave e was touched on in the central east-west trench, but, according to *Die Bauart,* no sherds were recovered then; everything was covered up and not surveyed until 1927. As mentioned above, these mix-ups cannot be traced by means of the other administrative data. It would seem unlikely that the log-books of the other campaigns (Van Giffen's estate, not consulted by me) will clarify this point complètely.

5 *De Hunebedden in Nederland II* (Van Giffen 1927, p. 303-304, text-figures 15-16b) illustrates a selection of the most important finds and situation photographs up to and including 1925, but provides no description.

6 *Die Bauart der Einzelgräber* (Van Giffen 1930, p. 10-23, plates 2-8) interpreted and discussed the results of the excavation in detail. The order of the excavation campaigns and the accompanying developing stratigraphical problems determined the composition of the article. A considerable and representative selection of the situation photographs, a situation drawing (plate 7), and a reconstruction drawing in perspective of the grave, accompany the text.
Plate 7 provides, in Van Giffen's favourite manner, within one box, basically all the essential information on the results of this excavation. The interplay of plans and sections is a classic example of his method. Also illustrated within that block are the complete pots and the sherds which were then considered to be the most important. Knöll (1959) was justified in noting that the very small illustrations of the artefacts (scale 1:9) are useless for typological study, the more so since they were often definitely incorrectly drawn. But, by means of these drawings, the finds can be at least reasonably identified.
As Van Giffen described in his text, his interpretation concerning the nature of the original surface on which the barrow had been built changed radically during the excavation. At first he had thought that the original surface had been at approximately the level of the present-day surface around the barrow (as is also indicated in his field drawings and photographs). But subsequently he came to the conclusion that there had been a c. 1/2-metre-deep depres-

sion here, into which the graves had been dug, simultaneously and very shallowly. The depression was assumed to have been filled-in at the same time. The reconstruction drawing, plates 7 and 8, illustrated this view.

7 *Opgravingen in Drente tot 1941* (Van Giffen 1943[1]; 1944[2], p. 432, figs. 14-16) provided a re-interpretation. Fig. 16 is a condensed, redrawn version of plate 7 from *Die Bauart.* A few plans and sections were omitted, and the previously illustrated sherds were depicted with the same numbers and redrawn after the old illustration. The area grid and the numbering of the profiles were changed. An essential change appeared in the interpretation: the original surface was brought up again to the level first assumed. Since this book gives a general survey, the text did not go into details. The presentation was not changed in the second edition (1944[2]).

8 The 'third extended and completely revised edition' of *Opgravingen in Drente* was to have been a radically altered and supplemented edition of the previous ones. Van Giffen worked on it from about 1945 to 1952 and later, but it was unfortunately not published (Van Giffen c. 1950). In 1970, Prof. van Giffen placed at my disposal a copy of it, 80% of which was ready for publication, with his permission to reproduce the new survey drawing for the first time (fig. B11). The text on this assemblage is virtually identical with that of 1943 and 1944. But the survey drawing was thoroughly revised on the basis of the excavation documentation and redrawn, with the areas and profiles receiving new names (unless otherwise indicated, I have used the numbering of this drawing, reproduced here as fig. B11). The interpretation of the stratigraphy was not essentially altered on this occasion. J.C. Kat-van Hulten, however, added reconstruction drawings of pots from find-number 1928/X.26, 26a-e, only a few sherds of which had been illustrated before. Without these additional drawings I would never have become aware of this pottery group in 1970, since it had not yet been returned to Assen from Groningen.

9 In 1959 (plate 40:1-13), Knöll published his photographs, taken in 1938, of the complete pots, not of the sherds. He based the stratigraphy exclusively on *Die Bauart.*

Revised interpretation of the stratigraphy:
The available documents were meticulously studied by J.N. Lanting and myself several times. Without Lanting's assistance (he has much experience in the re-interpretation of this sort of data), I would have presented the following, appreciably altered, stratigraphical sequence with less confidence and more vaguely. The plan on fig. 12-top was recomposed on the basis of the field drawings and the photographs. (Later addition: see now also Waterbolk 1977).

Phase O: The TRB graves (a, b, c, e) belong to this phase. There are no indications of any small barrows on top of these graves. The old surface was situated c. 10 cm above the level indicated on the drawing. Some stones lay on or in this former surface. The TRB finds outside the graves were generally at a depth of a few centimetres in the ground (due to animals or covering with dug-out earth?). Before the barrow was constructed, a slight development of podzolic soil had already begun. According to the field drawing of profile A, its brown layer obliterated the outer edges of grave-pits a and b. It was only at a depth of a further 20 cm (thin broken line across vertical hatching in fig. B11) that the outline of the pits became discernible. This must have been one of the reasons for Van Giffen's temporary change of opinion on the position of the surface, under which, or on top of which, the TRB graves were built (*Die Bauart,* see above, (6)).

Phase I A barrow was constructed on top of the phase O layer with a single circle of widely-spaced posts (Glasbergen 1954, type 3). The post-holes were sketched in on the excavation plans, and are also clearly visible on photographs and drawings of some profiles. Since they do not cut across the barrow and the clearly discernible podzol which developed above it, the post-circle cannot be assigned to phase II. The presence of these posts was observed only in the western half of the barrow and apparently not under ideal circumstances; they formed an irregular circle (distances between centres of the six posts: 1.8; 2.1; 3.1; 3.2 and 4.4 m). There may originally have been a larger number of posts at shorter distances from each other. The information available on the dating of such posts (Glasbergen 1954; Van der Waals 1964c) makes a dating in the Neolithic improbable; the Bronze Age is a more likely possibility. This agrees with the type of grave of this and the subsequent phase, which contained no burial gifts.
Grave d or g represents the primary, central grave of this phase. The tangential shaft grave h discernible in profiles C and H was dug into this barrow from the surface, quite a long time before the level was raised in phase II, since this rise has not subsided into the grave-pit.

Phase II The barrow was heightened with a covering layer of sods. Grave g or d, with indications of subsidence into the body of Barrow II, represents a central shaft grave (the two graves d and g are clearly recognisable, their mutual sequence more difficult to establish). It is not impossible that the discolourations i-k observed on two levels are tangential shaft graves of phase II.
Later addition: Waterbolk (1977) paid further attention to 'phases I' and 'II' and discerned 3 phases, from the Early Bronze Age, the Middle Bronze Age and the Iron Age, respectively. I refer to his argumentation.

Position and contents of the find-groups of phase O (figs. B12-15)

In the description below, the numbering of Van Giffen's publications was retained for the complete artefacts. The pots which were re-assembled from sherds, if only on paper, were nearly all assigned new numbers (30-46). (These numbers were not affixed to the sherds themselves. For each reconstructed pot, the numbers appearing on the sherds will be given, as will those assigned to them in figs. B11 and B12).

Grave b A packing of 8 field stones left a space of c. 0.6 × 1.2 m. The length measurement is a minimum; the pit must have been longer (1.6 m), since there was a funnel beaker lying on its side a little more to the south (not upright as on the reconstruction photograph, Van Giffen 1930, plate 4:3a). Van Giffen concluded an interment in an extended position in a N-S direction. The grave contained:

13a the large funnel beaker mentioned above
13b a small decorated bowl
13c a small funnel beaker
13d a biberon
13e a small undecorated bowl.

All the specimens except 13a were in the northern part of the grave, 13e was inside 13b.

Grave c The following were found in the lower part of a poorly defined, charcoal-rich discolouration, 0.4 × 1.4 m, of a grave pit-filling:

14a a large funnel beaker, upside-down
14b a smaller funnel beaker
14c a miniature tureen with shoulder triangles.

According to the log-book (2.07.25), there were 'a good many sherds' in the upper part of the grave pit-filling. These are now lost. There was a 'small vessel' (14c?) 10 cm above the two other pots in the pit-filling.

Grave a This central grave had been so thoroughly disturbed by an exploration in 1855 by the shepherd, H. Kraemer, of Zeijen (Van Giffen 1930, p. 11, note 2) that part of its construction will remain doubtful.

A concentration of field stones extended over an area of 5.8 × 1.2 m, past the disturbance caused by the later shaft graves, d and g. Van Giffen thought that the large stone standing at right-angles in the centre of this concentration had marked the southern end of the grave proper. Adjacent to this were the remains of stone packing along the walls of a 0.9 m-wide grave which must have left a 0.6 m-wide space. Kraemer's disturbance prevented identification of the other end to the north. Van Giffen estimated the length of the grave pit at 3 m, which conforms to the area where artefacts were found deeper than 10 cm.

It was reported that Kraemer presented the then mayor of Vries with a large, undamaged pot and some smaller ones, all of which were decorated (Van Giffen, l.c.). Their whereabouts are unknown. Perhaps an investigation into the provincial archives, the museum in Assen and Van Giffen's notes would make it possible to clear up this point (cf. the 1856 finds in hunebed ZEYEN-D5!).

Kraemer left behind in his pit an axe (3) which he had knocked to pieces, and pottery sherds. But this can by no means explain the breaking of all the artefacts, since, for example, find numbers (figs. B11-12) 4, 5, 8 and 15 were found at the level of, or 10 cm below, the primary surface outside the recent disturbances, next to grave a. Some of them were found a little way beyond the horizontal concentration of stones described above.

How to explain these stones and the sherd scatter is a difficult problem.

They must have existed before phase I. One might think of funeral meals or other rituals or even of the possibility that grave a was partly dismantled before or during the construction of the later barrow, similarly to the DIEVER stone cist. The documentation is of no assistance here. However, the remarks made below concerning the sherd content of the various find-groups make the former theory very plausible and the latter unlikely.

The following were found in or near grave a (figs. B12:1-11, 15; B13a)

3 a *Flint-Flachbeil* or reshaped 'Old' thin-butted axe with rectangular cross-section (sections 5.3.4 and 5.3.1), knocked to pieces by Kraemer, now glued together and marked 1925/VI.3.

6 a small flint axe with oval cross-section (section 5.4.3), marked 1925/VI.6.

9 a *Flint-Flachbeil* with rectangular cross-section, marked 1925/VI.9.

30 a butt piece of a thick-bladed, 'Old Type' thin-butted flint axe (section 5.3.1), with rectangular cross-section and four polished sides, shattered long ago, marked 1925/VI.10 (fig. B11a:10).

31 a trapezoidal arrow-head marked 1925/VI.10.

32 a flint blade marked 1925/XI.10. Fig. B11a:6a.

33 a jug just reconstructable in drawing. 5 sherds identified, marked 1925/VI.4; 1925/VI.5; 1925/VI.10a; 1925/IX.15 (2×). These include the sherds illustrated in fig. B11-I:4, d:5 and a:10a. Fig. B12:4, 5, 10, 15.

34 a small bowl. 4 sherds identified, marked 1925/IX.9. This must be 1925/IV.15. Fig. B12:15.

35 a funnel beaker. 3 wall sherds identified, marked 1925/VI.11 or only 11. Fig. B11a:11. Fig. B12:11.

36 a funnel beaker. 4 neck sherds identified, marked 1 (once 1925/VI.1b), 3 belly sherds marked 1 (once 1925/VI.1c), 5 belly sherds marked 11 (once 1925/VI.11a), 1 base sherd marked 2. Fig. B11a:1b, 1c, 11a. Fig. B12:1, 2, 11.

37 a funnel beaker. 10 belly sherds identified, marked 1 (8×); 1925/VI.2; 1925/VI.15; 6 (or 5?). Fig. B11E:15, 15a; a:2. Fig. B12:1, 2, 5 or 6, 15.

38/39 sherds from one or two small, undecorated pots with globular belly, marked 1; 1925/VI.10b;

10; 11. Fig. B11a:10. Fig. B12:1, 10, 11.

The following were found in grave e and near grave a:

40 a pail. 7 fragments were identified, marked 1925/VI.5 (corrected to 7); 1 (4×, one fragment of which fits one of the previous ones); (1927/XI.20b (alias 6); 1927/XI.20e (alias 6 and 8). Fig. B11d:7; e: 20b. Fig. B12:7 (or 5) and 20.

41 a funnel beaker. 6 wall sherds identified, marked 1927/XI.20a (alias 6); 1 (4×); 15. Fig. B11e:20d. Fig. B12:1, 15, 20. It is unlikely that funnel beaker 41 is the same as funnel beaker 20 (from grave e). Not illustrated.

Grave e:

A few stones and the complete pots which were found left a space of c. 0.4 × 1.2 m inside a grey pit-filling with 'much charcoal and sherds' (1.6 × 0.8 m). The following pots were found in this grave:

21 a funnel beaker

22 a tureen

23 a small undecorated bowl

24 a decorated bowl, virtually identical with 13b from grave b

25 a funnel beaker.

In addition, sherds of the following pots were located exclusively in this grave:

20a belly sherd of a jug similar to 33, but differing in ornamentation and diameter. Fig. B11e:20a. Fig. B12:20.

20 a large funnel beaker or bowl. 5-8 sherds identified, marked 1927/XI; 1927/XI.20; 1927/XI.6; 1927/XI.20g (alias 6); presumably also 6; 1927/XI.20f (alias 6); 1927/XI.20h (alias 6). It is fairly certain that 1925/IX.5 also belongs here (not originating from Tumulus III, but from II, grave a (e?)). Fig. B11e:20, 20f, 20h. Fig. B12:20 (possibly also 5).

Van Giffen (1930) erroneously thought that the big wall sherd (fig. B11:20) of this funnel beaker was from an Early Havelte amphora, which was fatal for his own chronology and later for that of Knöll as well. This pot was presumably broken inadvertently before the discovery of the grave: the lines of fracture of this sturdy pot are of recent date.

The following came from find-group f and possibly from grave e:

42 a funnel beaker. 4 sherds (interlocking) identified, marked I and 1928/X.26; 16 wall sherds, partly interlocking and some marked 26 or 1928/X.26, also 1927/XI.20e. Fig. B11C:26, e:20e. Fig. B12:26, 20.

Perhaps also:

43 a funnel beaker. C. 24 unnumbered sherds identified; in 1970 the sherds were found mixed up with those of 42 and 46. Not illustrated. Normal type with belly-fringe.

Find-group (grave?) f:

Under find-number 26, a number of pottery sherds were registered from the centre-north profile C and surroundings which, being situated at the level of the old surface, might represent the remains of some burial ritual (pail 44 is among the finest pieces of the West Group), possibly next to an unnoticed grave without funeral pottery of its own. These sherds include:

44 sherds of an exceptionally delicate pail whose reconstruction J.W.N. Vermeulen and I were able to take a little further than Kat-van Hulten had previously been able to do (fig. B11C:centre). 34 sherds were identified, marked 1926/X.26; 1928/X.26; 1928/X.26b, c. Fig. B12:26.

45 sherds of a funnel beaker. 6 interlocking rim/neck sherds identified, marked 1928/X.26a; 9 belly sherds, partly interlocking and some marked I and 1928/X.26a. Figs. B11C, top left: 26a, d, e. Fig. B12:26.

The following originate from find-group f and the surroundings of grave a:

46 a funnel beaker. 5 belly sherds identified and marked I; 7; 1928/X.26e (interlocking); 1925/VI.1 and 1a (interlocking; 1925/VI.8; 1 (4×). Fig. B11C:26; a: 1 and 1a (interchanged). Fig. B11C incorrectly incorporates in the right-hand funnel beaker ('26') sherds from two specimens, 42 and 46. Figs. B12: 1, 7, 26.

Finally, there remains a number of sherds of little diagnostic value, the origin of which I have not attempted to trace. Nearly all the identifiable sherds are from funnel beaker necks (including those marked 1, 11, 1927/XI.20f and h) and funnel beaker bellies (some of them registered under Tumulus III). Fig. B11a: 20f, 20h. A few flint waste flakes are left out of consideration as well.

The chronological relationship between the find-groups

Even without any knowledge of typochronology it is possible to demonstrate from the list above, that some find-groups must have been more or less synchronous:

grave b with grave e (the small bowls 13b and 24 are virtually identical);

grave a and surroundings, with grave e (jug 20a is very closely related to jug 33; moreover, sherds of pail 40 and funnel beaker 41 were found in both find-groups. It is quite inconceivable that a recent mix-up of sherds could be solely responsible for this).

It is less certain (administrative errors cannot be completely excluded here) that funnel beaker 46 is represented by sherds in find-group f and adjacent to grave a, whereas funnel beaker 42 and perhaps funnel beaker 43 are represented by sherds in find-group f and grave e.

To summarise:

b ≡ e = a – f – e

Typochronology
The entire finds belong to the Drouwen style group. The purpose of this section is to establish precisely which of the phases A to D was involved.
The following pots are, in my opinion, of chronotypological significance:

bowl 13b:	type T,	phase B
tureen 14c:	type M,	phase C
jug 33:	type L,	phase B
pail 40:	type V,	phase C
tureen 22:	type M,	phase C
bowl 24:	type T,	phase B
jug 20a:	type L,	phase B
pail 44:	type V,	phase C, so that

Phase B is present in grave b (13b)
Phase B+C in grave e (22, 24, 20a)
Phase C in grave c (14c) and in find-group f (44).

This, combined with the formula just established above, b ≡ e = a – f — e, can lead only to the conclusion that:

All the find-groups must be of approximately the same age and they represent the Drouwen B+C phases.
Consequently, the administrative mix-ups become typochronologically irrelevant.

This conclusion differs from that of Knöll's analysis (1959, p. 90-91) but the latter still took into consideration, wrongly in my opinion, (1) the profile of the funnel beakers, (2) the poorer finish of some pots and (3) the assignment by Van Giffen of fragment 20 to the Early Havelte style (E). For (2), see section 3.1(4); (3) is based on an error; as for (1), in my interpretation, the identifiable funnel beakers – 15 at least – are *consequently* synchronous with phases B+C, and all the types of profile represented were then current (compare section 3.4.1).

A NOTE TO FIGS. B1-B21 The illustrations were produced after ▶ the originals with the following exceptions: B2 according to Van Giffen (1930); B11a-b according to Van Giffen (c. 1950); B15, LANDERSUM, redrawn after Beck & Lange (1950), the scale 1:3 is very approximate; B18 after Knöll (see text); B21, bottom, according to Bakker & Van der Waals (1950). Several pots are reconstructions on paper only (see text).

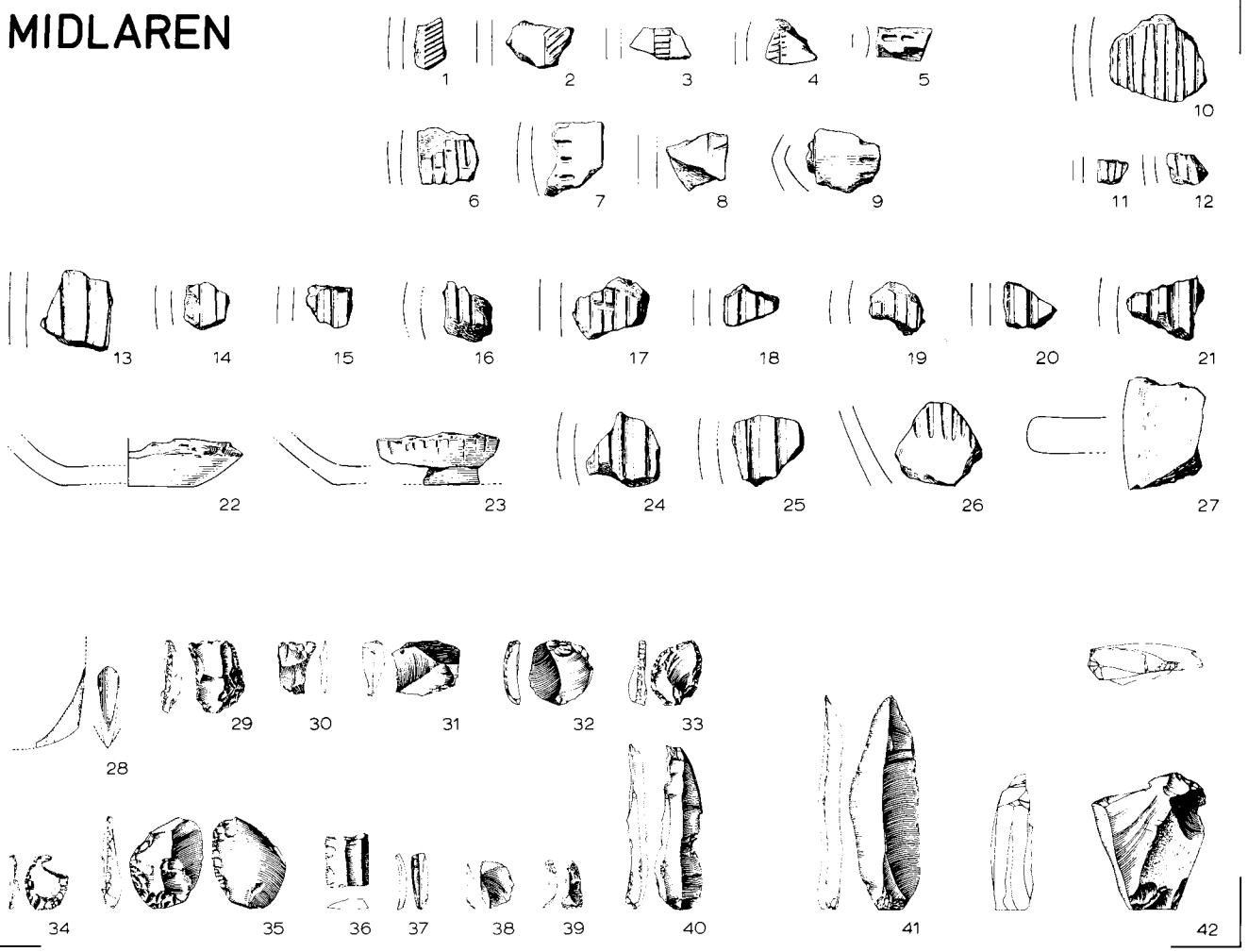
ERRATA. FIG. B12 (plan): number 11 should be added to the findspot 3 in grave a; 13c and 13e should be interchanged in grave b.

FIG. B13: the large funnel beaker in grave c should be numbered 14a instead of 14c.

FIG. B16: one more line should be drawn between the assemblages d and e.

FIG.
B 1

MIDLAREN



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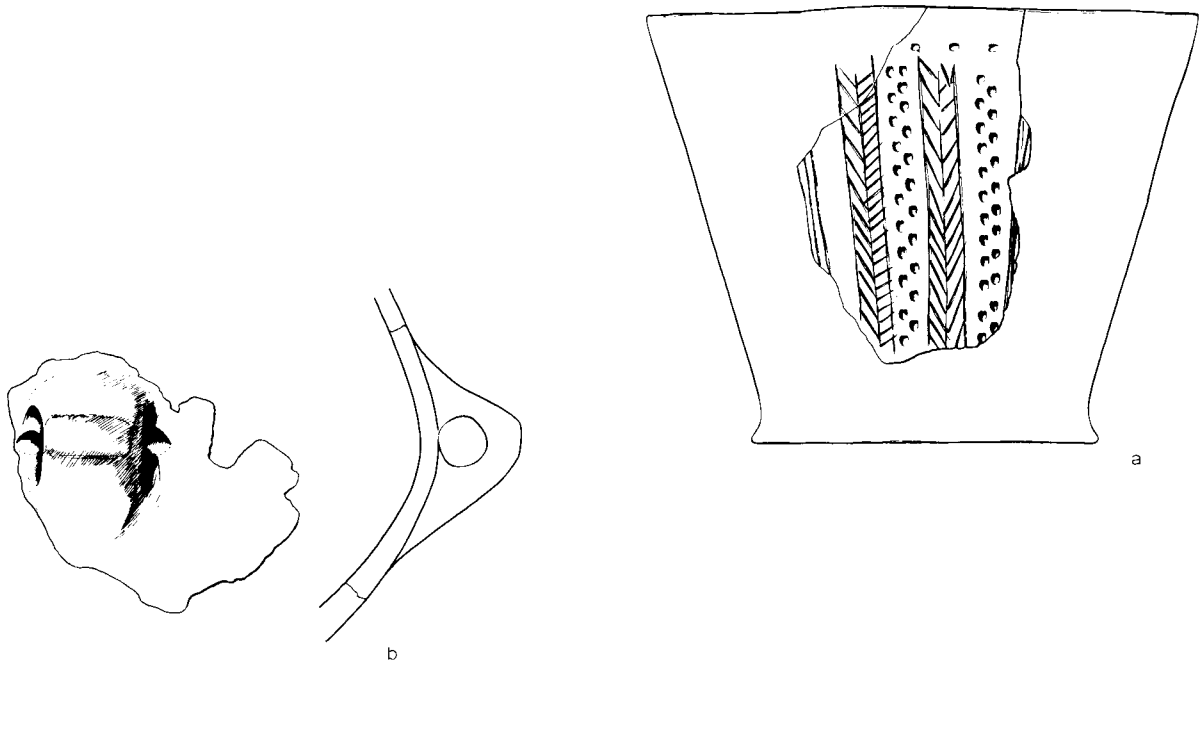
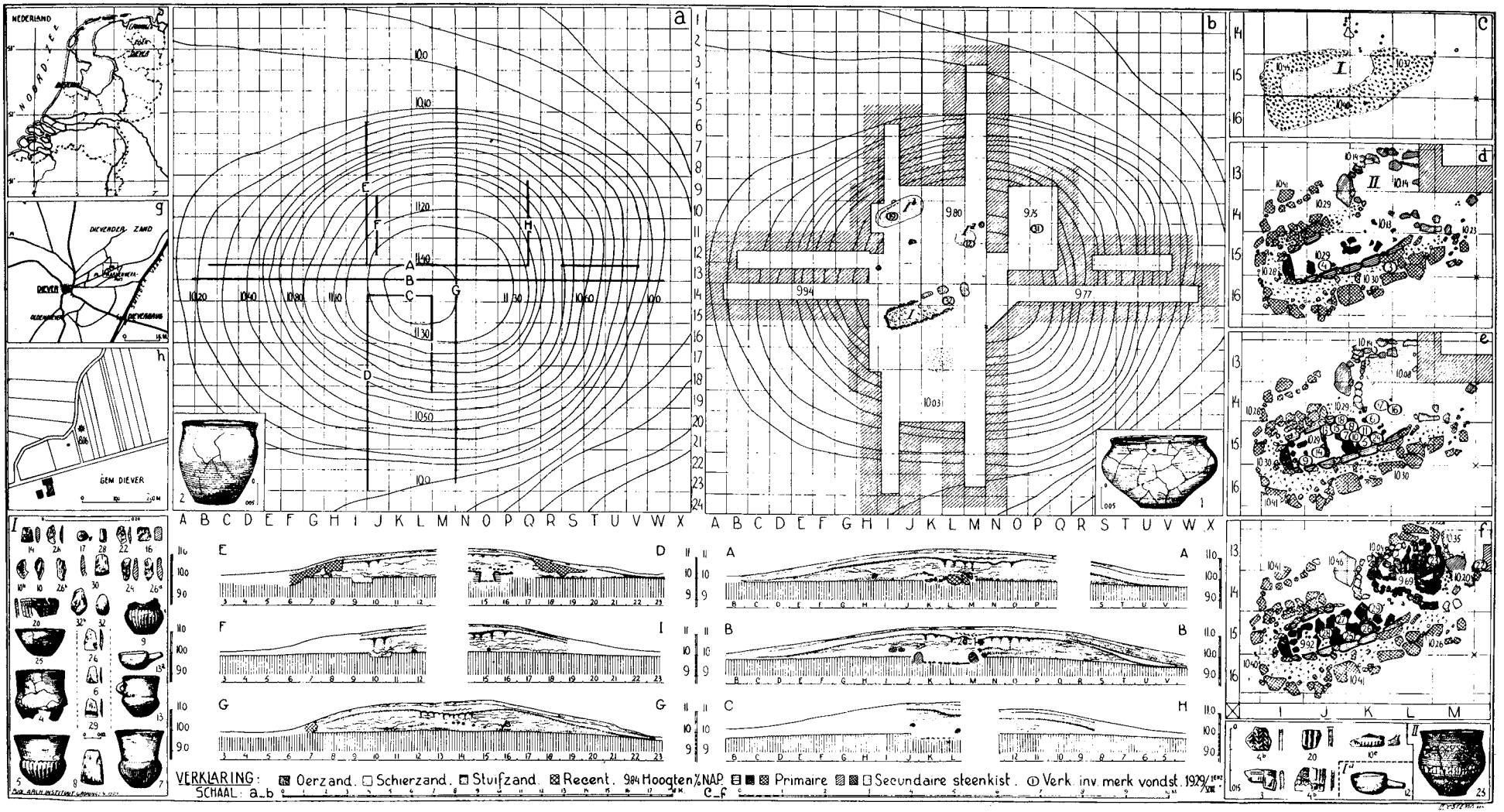


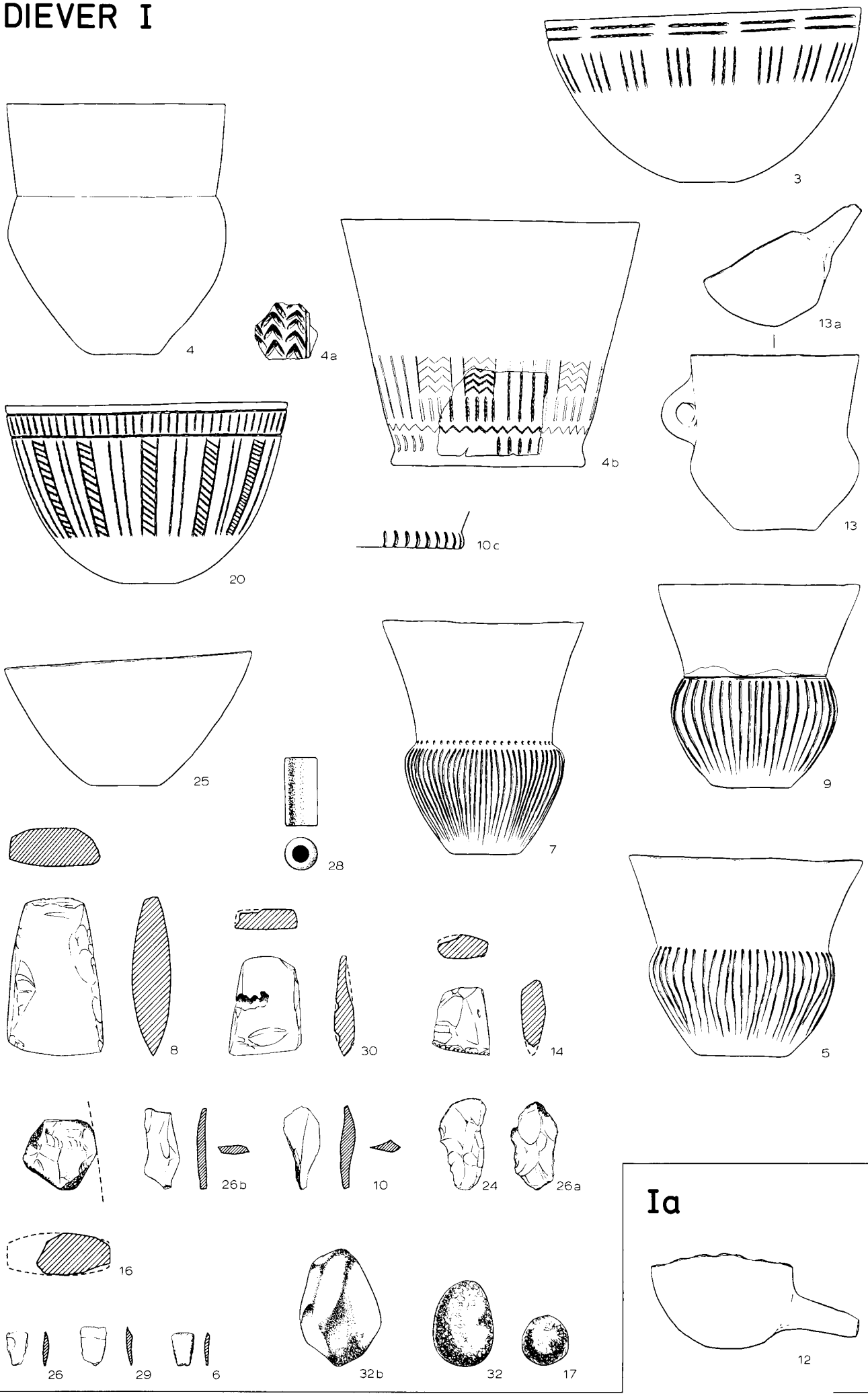


Das Steinkistengrab bei Diever, Ausgrabungskarte (1929).

a) Kurvenkarte mit Profilenangabe und mit der nachbestatteten Urne 2 (links unten).
b) Plan des Endstadiums der Ausgrabung mit Hauptgrab (I, die primäre Steinkiste mit den Wandsteinen und deren Standspuren), zwei Nebengräbern (Ia eines Kindes bzw. Ib einer Frau) und einigen Randsteinen, sowie der nachbestatteten Urne 1 (rechts unten).
g—h) Zwei Situationspläne.
c—f) Die verschiedenen Ausgrabungsstadien der primären (I) und sekundären (II) Steinkiste.
A—H. Die verschiedenen Vertikalschnitte.
I. Die Funde aus der primären Steinkiste.
Ia. Die Beigabe aus dem Kindergrabe.
II. Die Beigabe aus der sekundären Steinkiste.

FIG.
B3

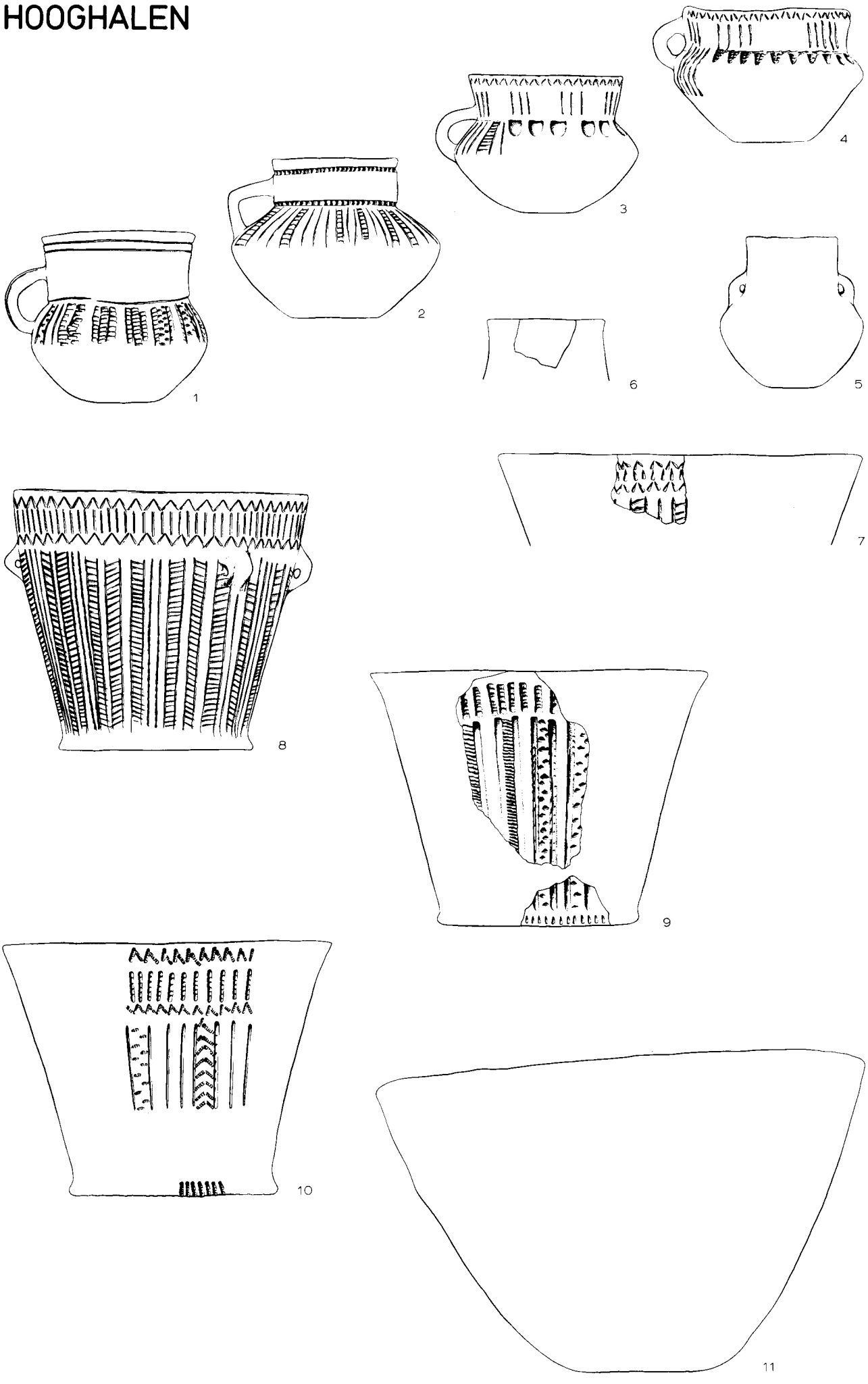
DIEVER I

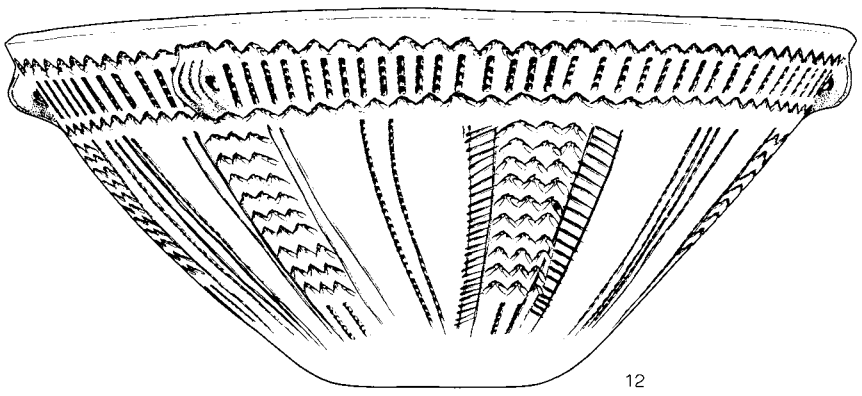


Ia

FIG.
B4

HOOGHALEN

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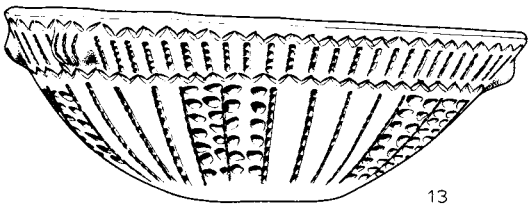
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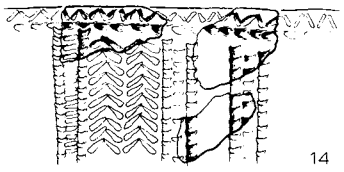
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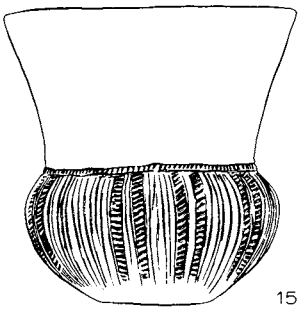
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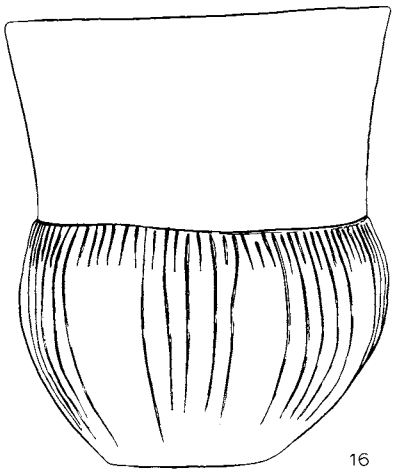
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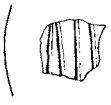
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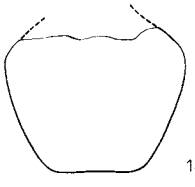
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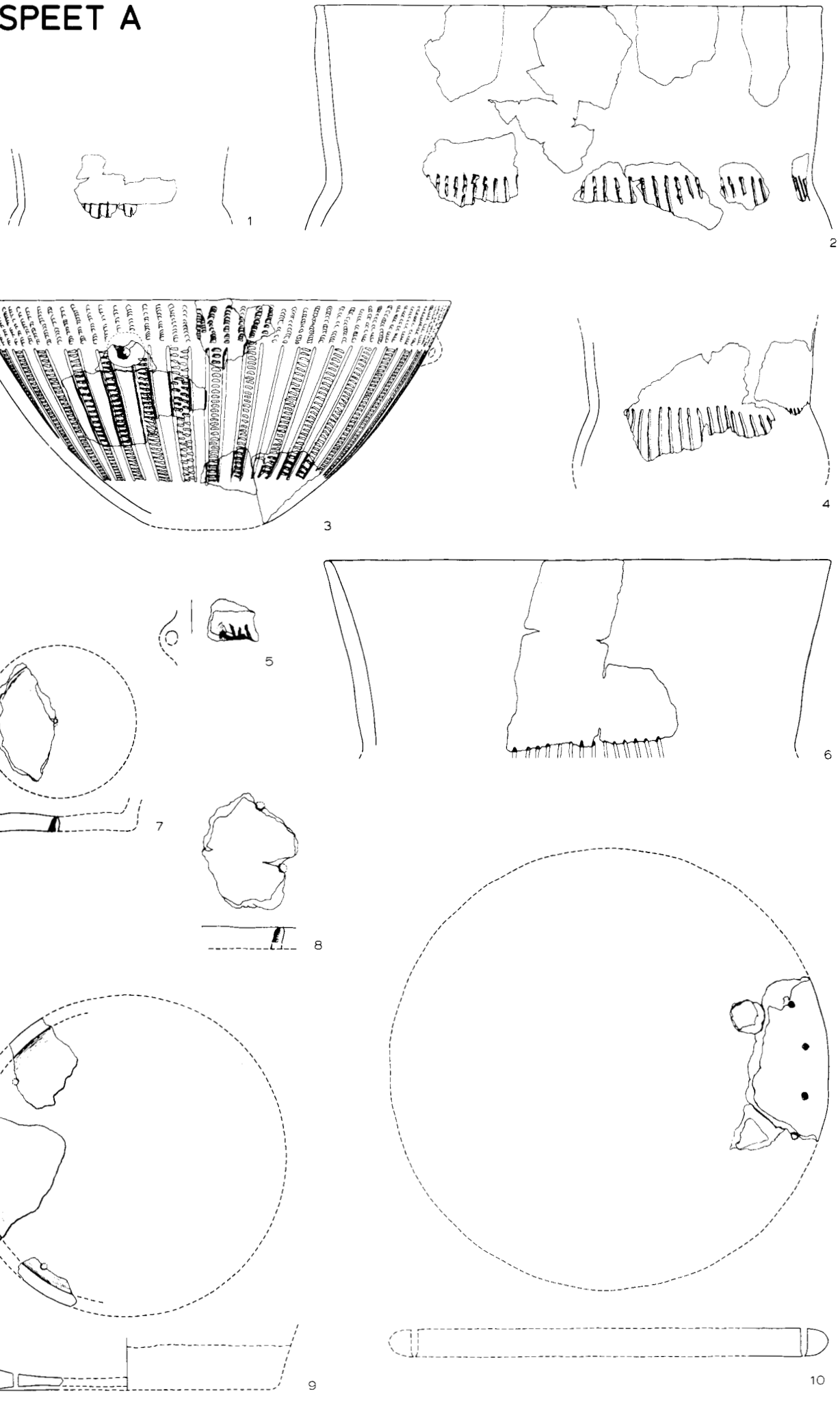
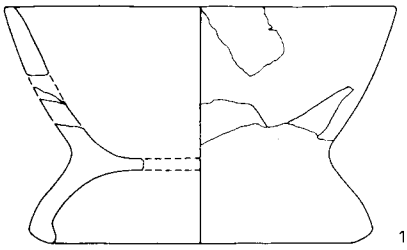
FIG.
B6

ELSPEET A



ELSPEET B

FIG. B7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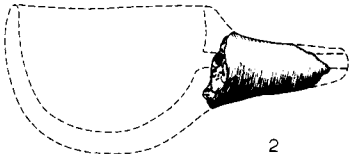
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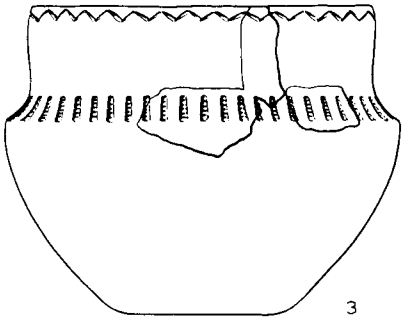
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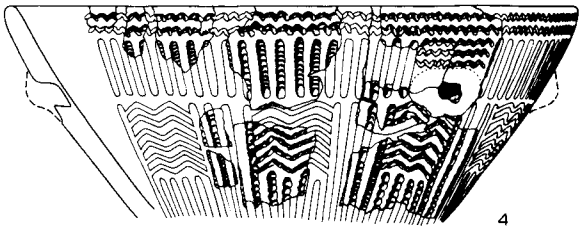
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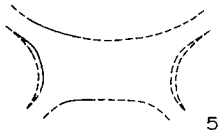
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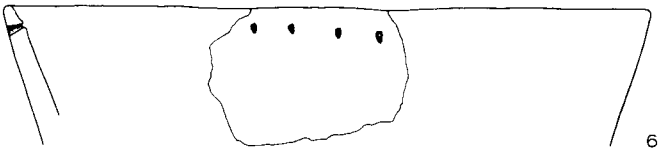
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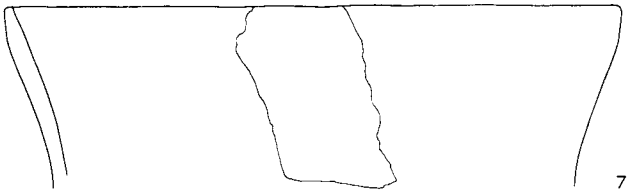
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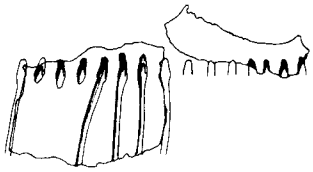
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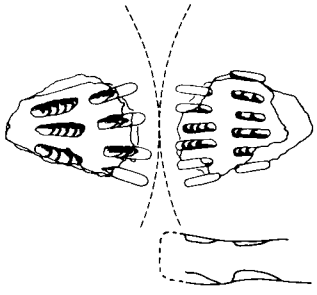
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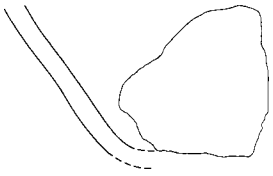
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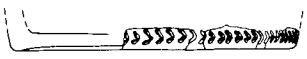
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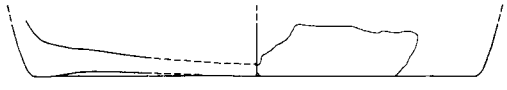
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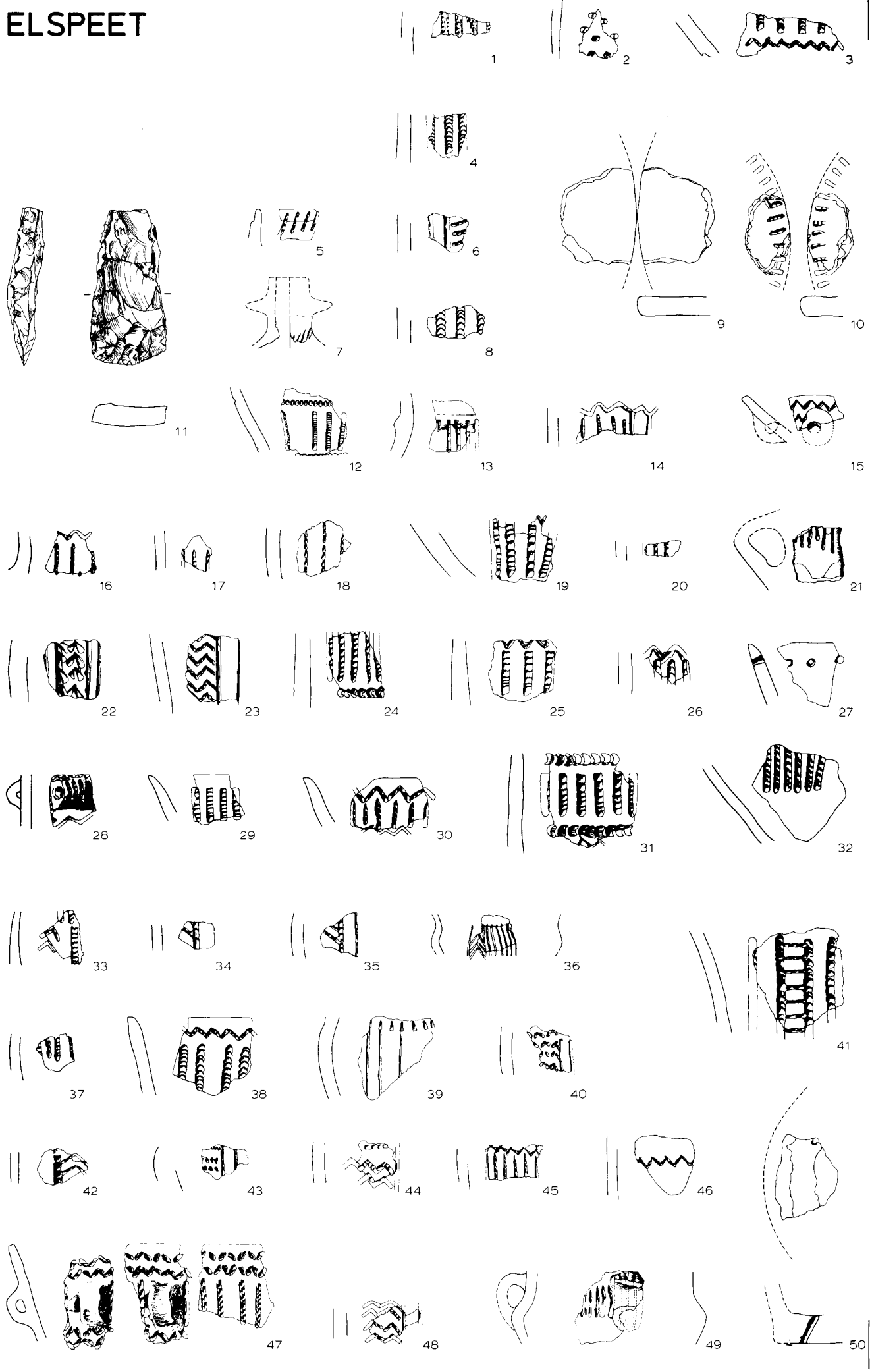
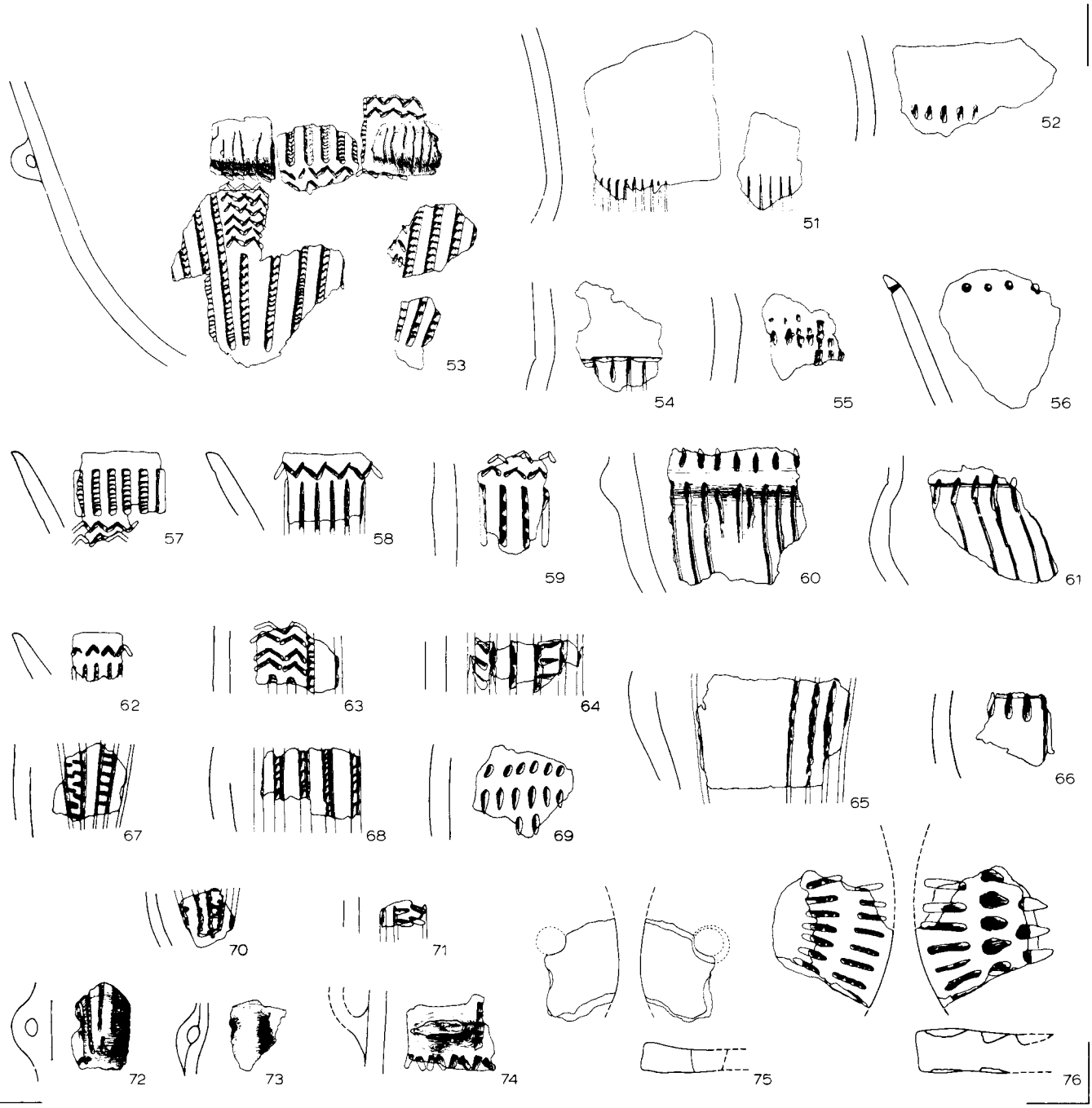
FIG. B8

ELSPEET

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LAREN

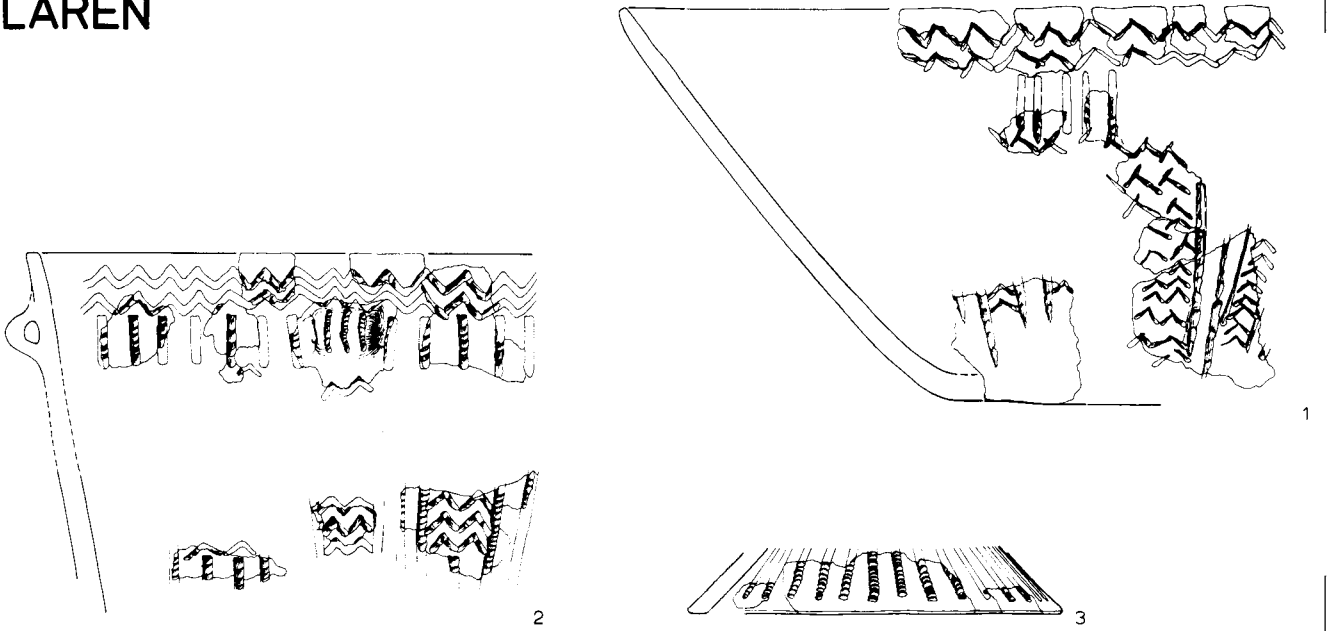
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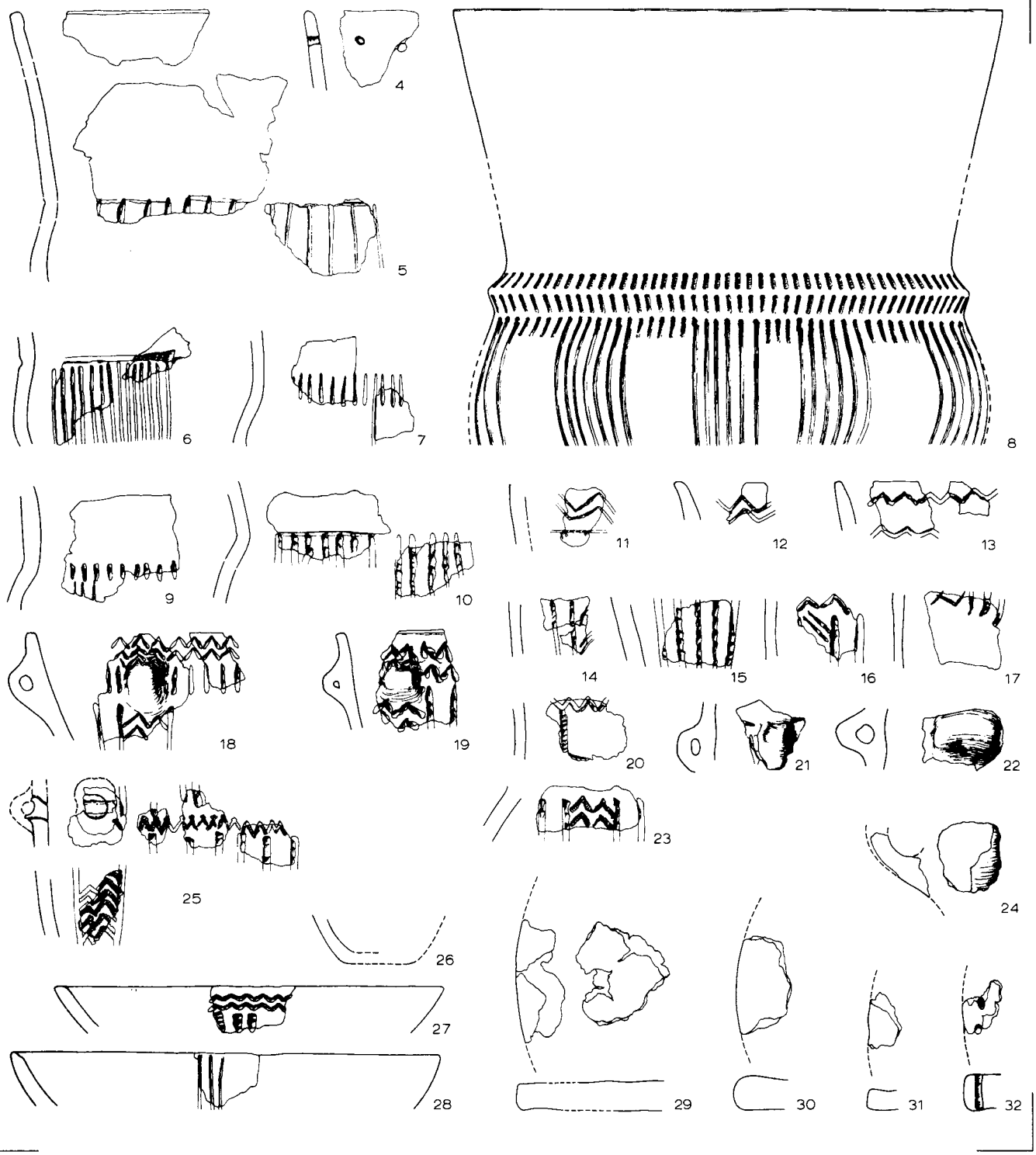
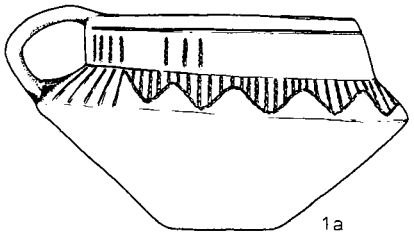
FIG.
B10



TINAARLO



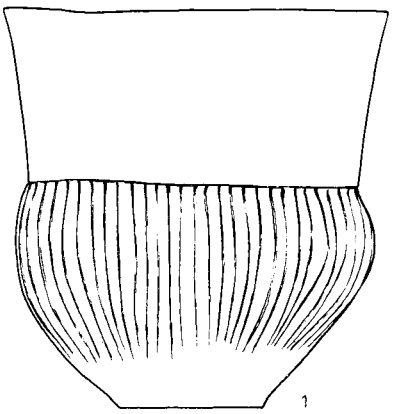


FIG. B 1 1 overleaf

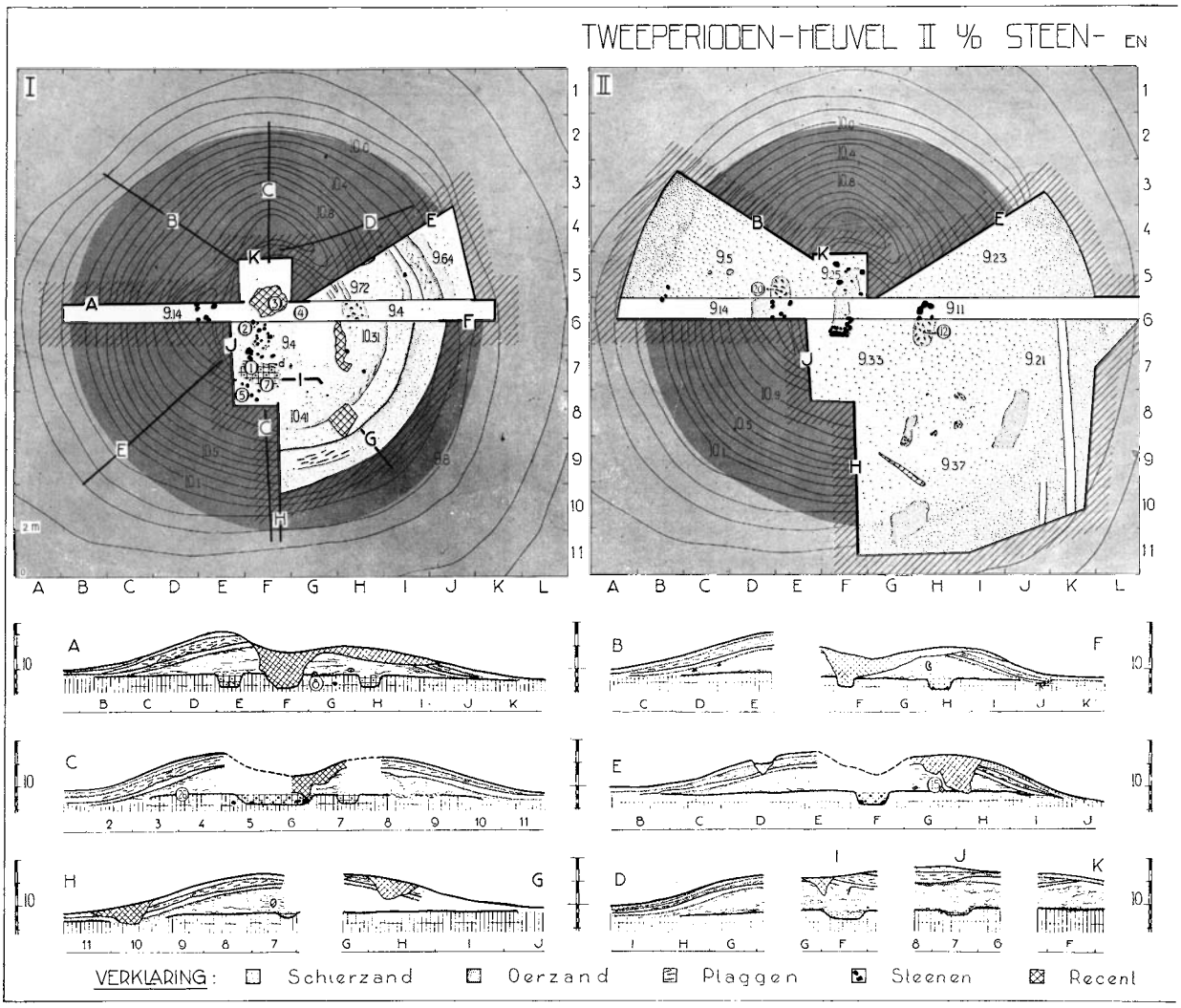

TWEEPERIODEN-HEUVEL II % STEEN- EN
I
II
A B C D E F G H I J K L
1 2 3 4 5 6 7 8 9 10 11
VERKLARING: Schierzand Oerzand Plaggen Steenen Recent

FIG. B 11

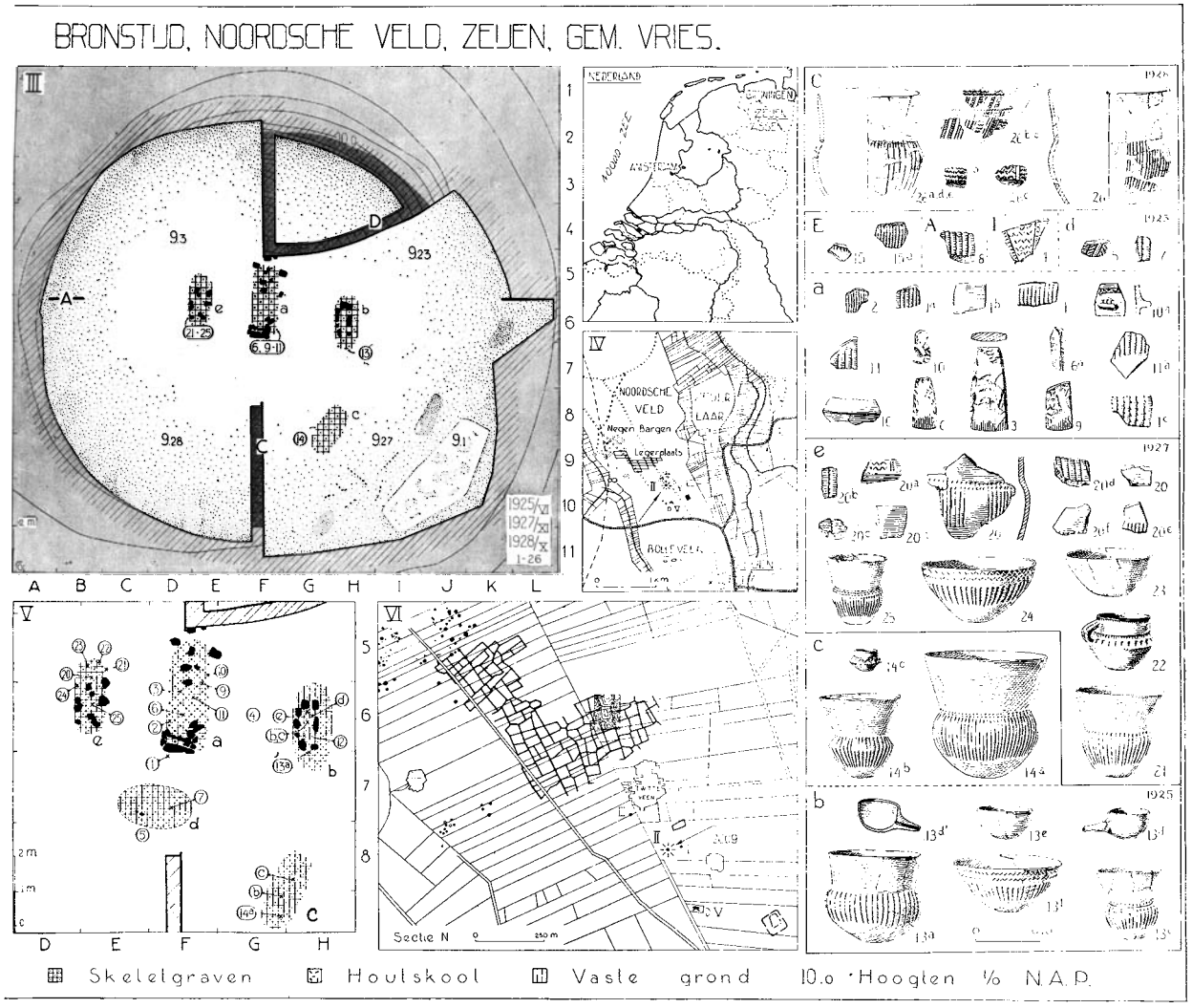
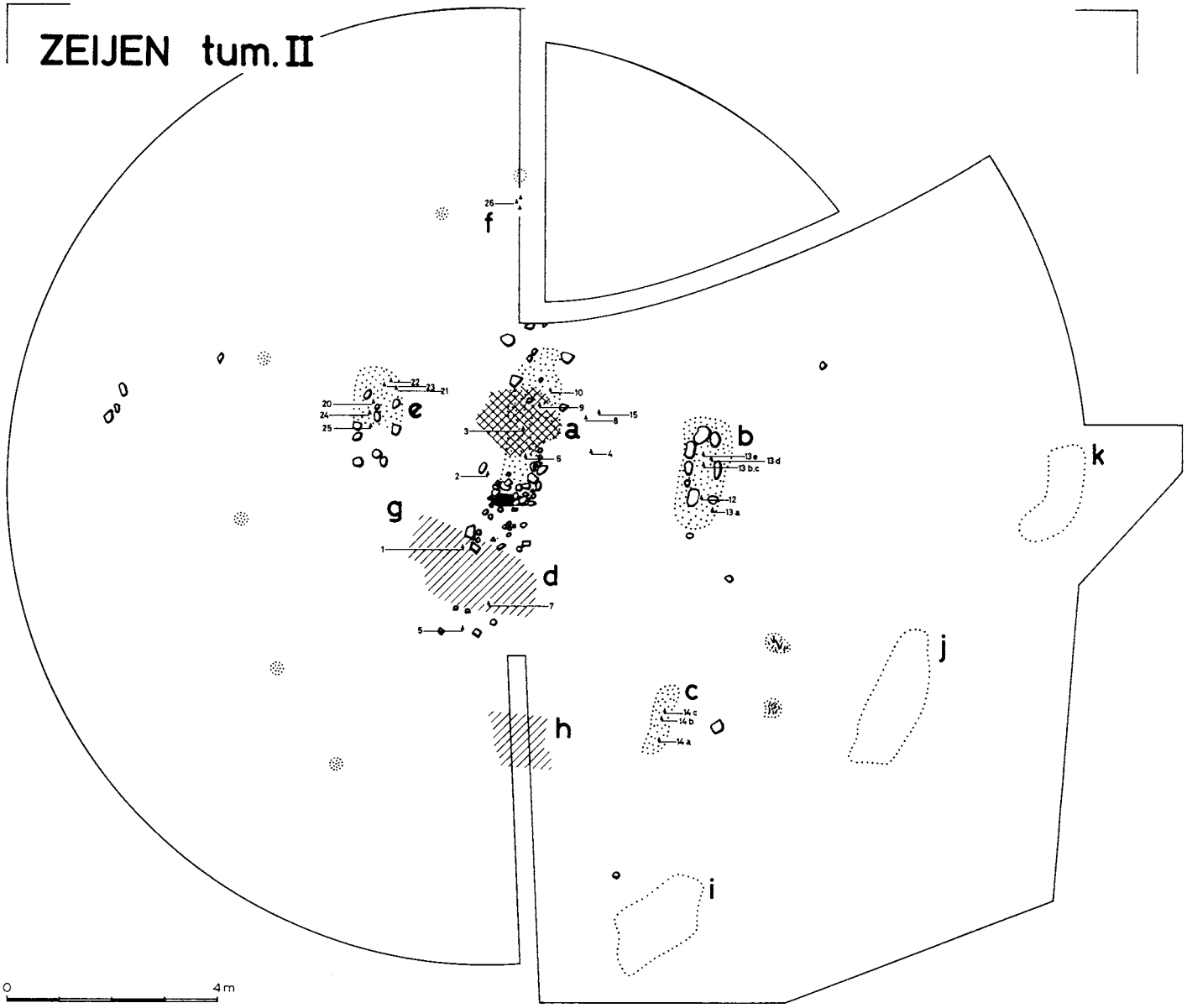
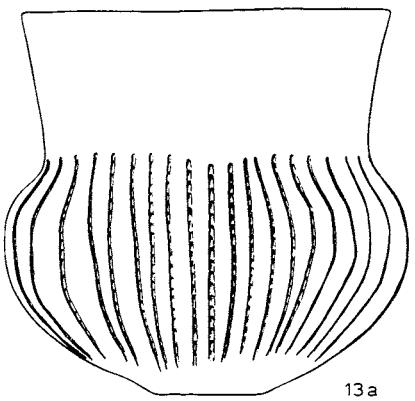

BRONSTIJD, NOORDSCHE VELD, ZEIJEN, GEM. VRIES.
III
D
A
93
923
928
927
91
1925/VI
1927/XI
1928/X
1-26
NEDERLAND
GRONINGEN
ZEIJEN
NOORD ZEE
AMSTERDAM
IV
NOORDSCHE VELD
LAAR
Negen Bergen
Legerplaats
ASSEN
V
VI
Sectie N
0 250 m
1925
1927
1928
Skeletgraven
Houtskool
Vaste grond
10.0 Hoogten % N.A.P.

FIG.
B 12

ZEIJEN tum. II



ZEIJEN b
tum. II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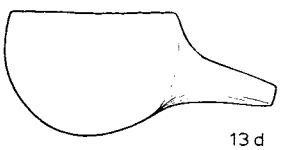
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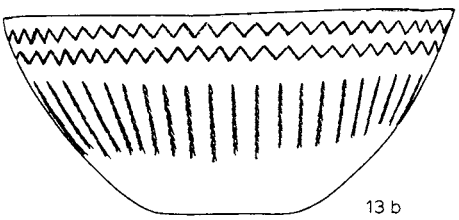
13 e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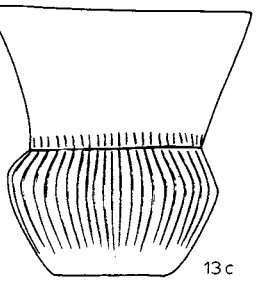
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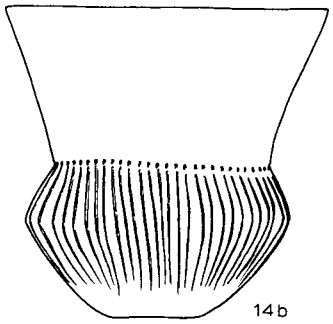
FIG.
B13

ZEIJEN c
tum. II

+?


14c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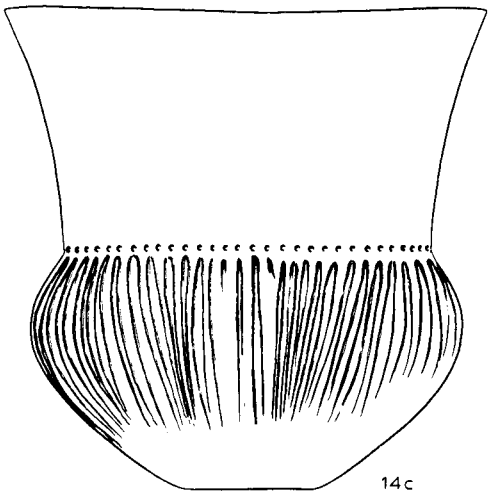
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a
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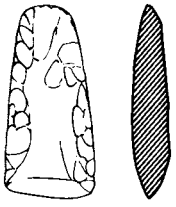
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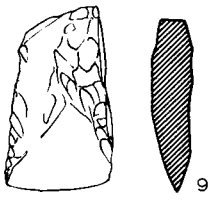
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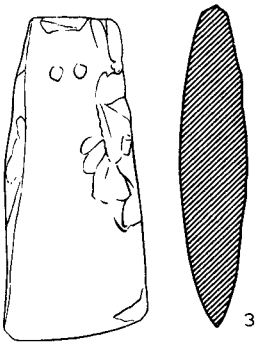
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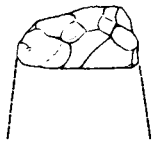
31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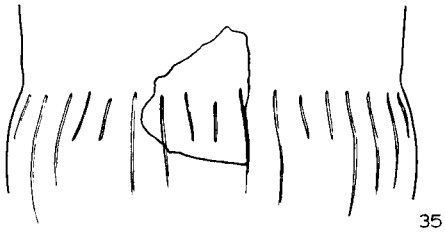
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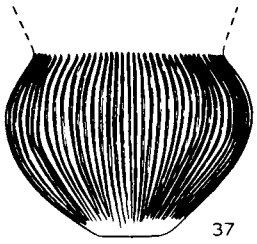
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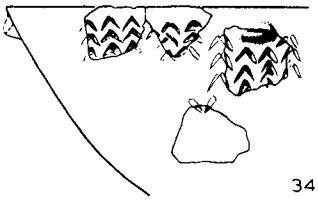
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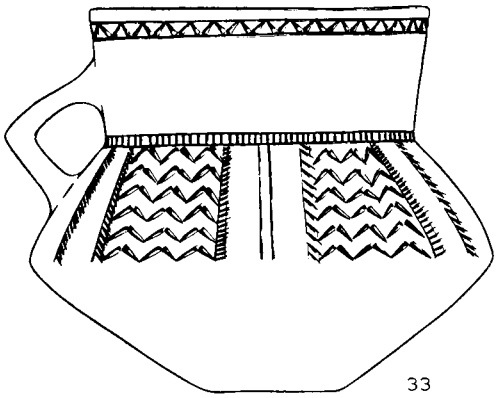
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+?
-?
+38/39

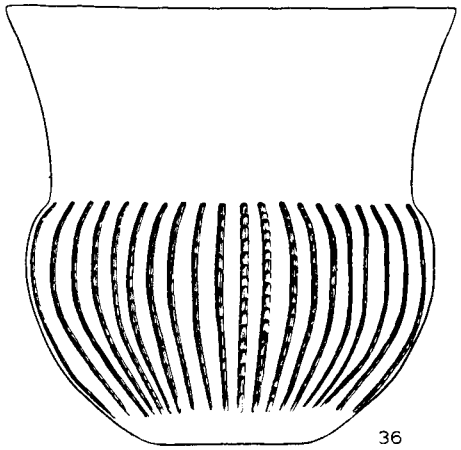
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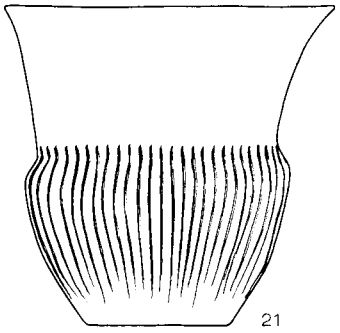
FIG.
B14

ZEIJEN e
tum. II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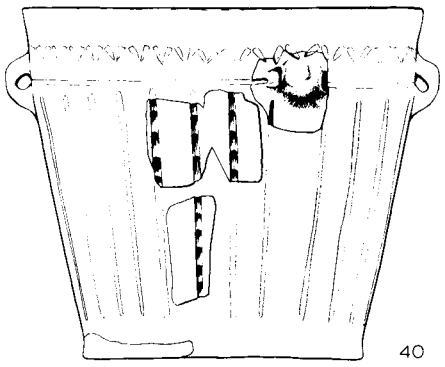
a+e

+41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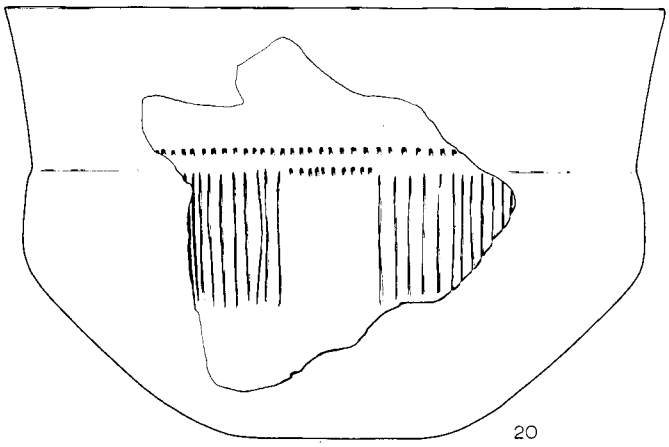
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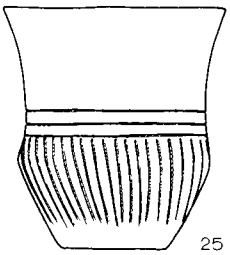
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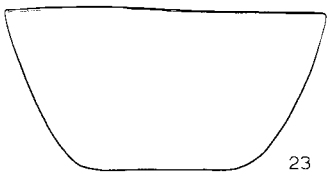
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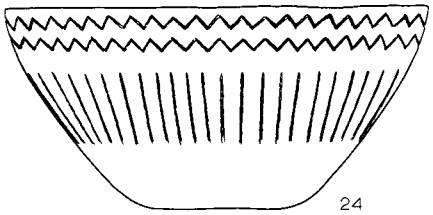
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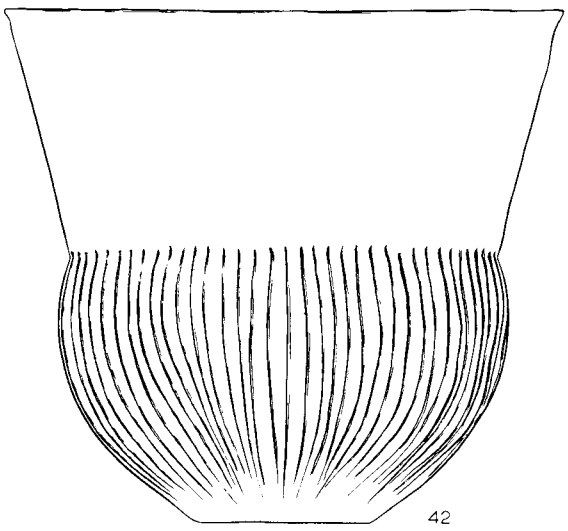
f+?e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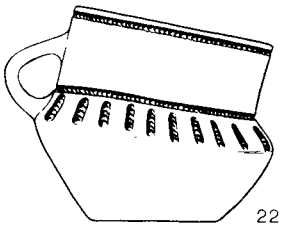
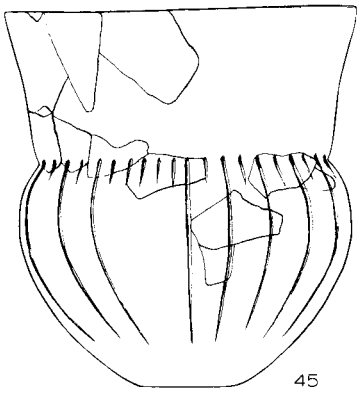
+43?

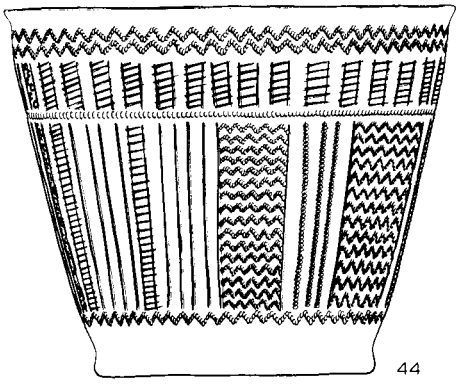

22


20a

FIG.
B15

ZEIJEN f
tum. II

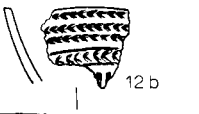


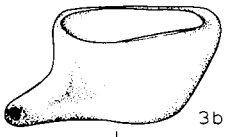


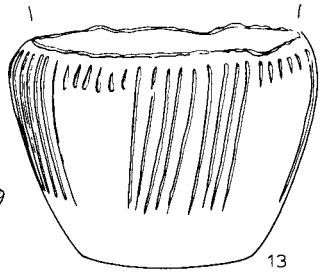
f+a

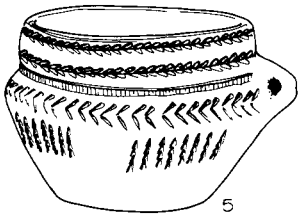
46

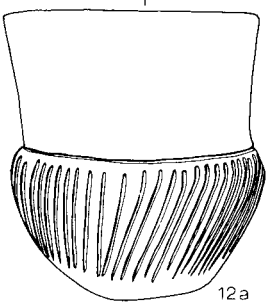
LANDERSUM

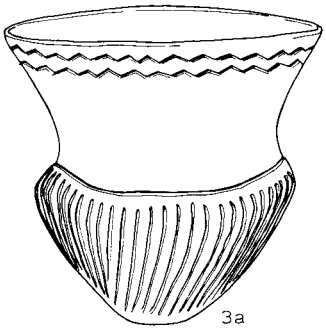


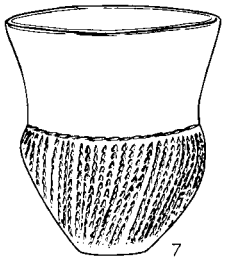


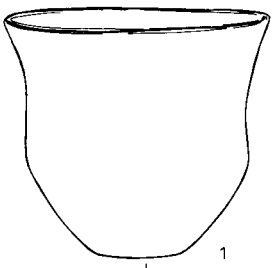


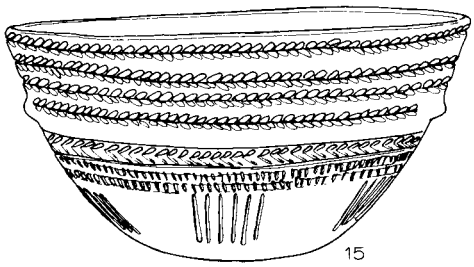


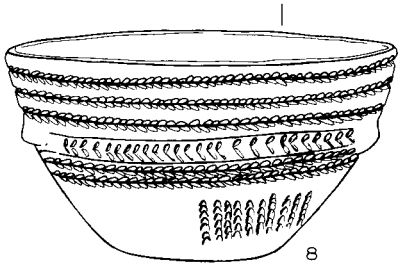


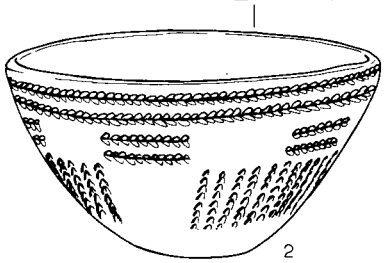


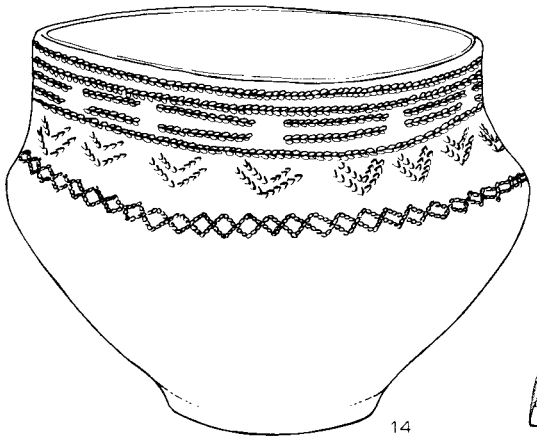












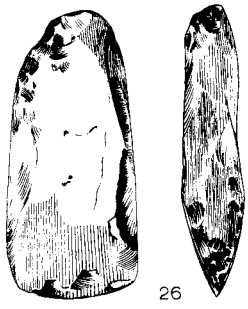
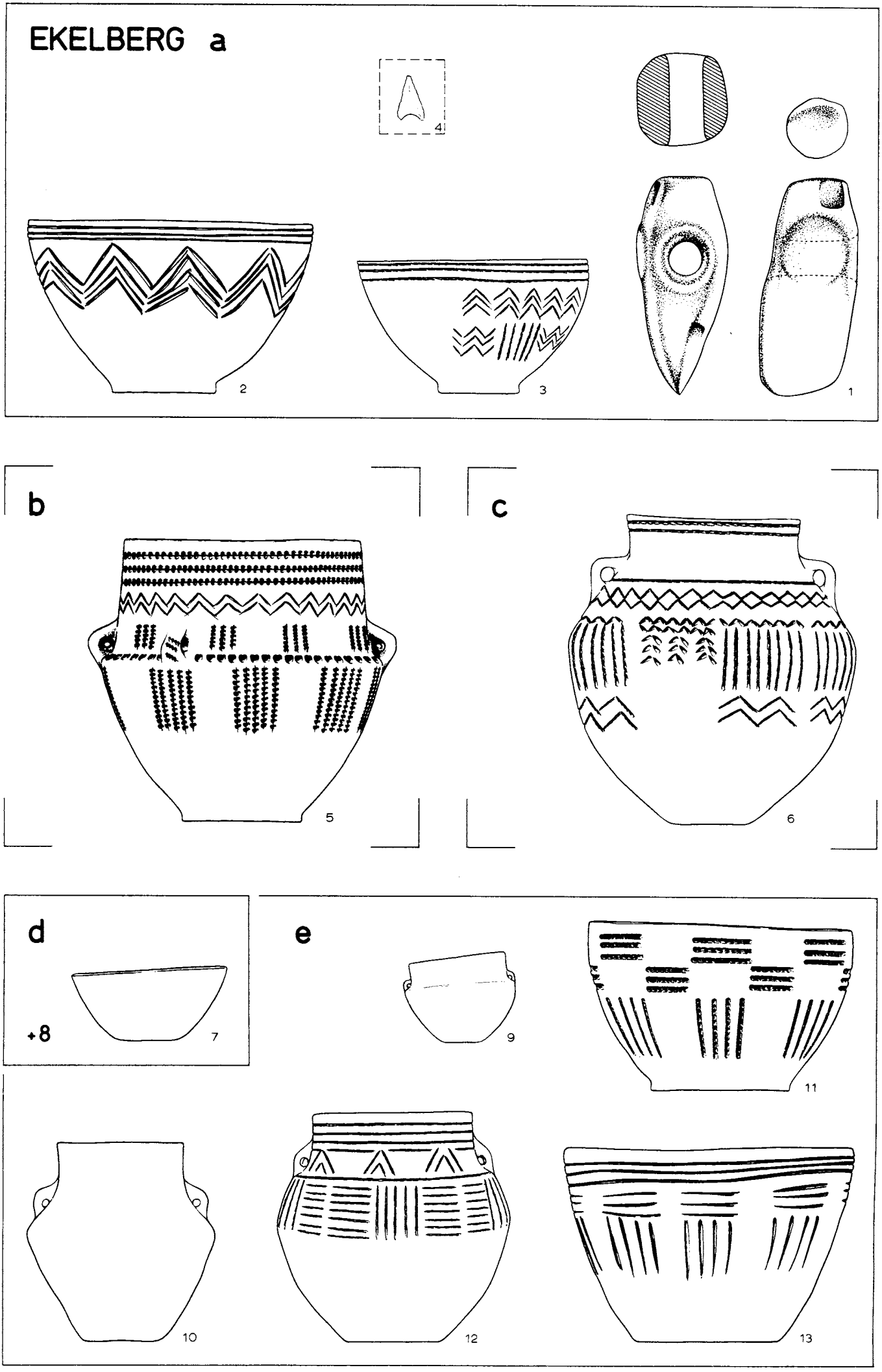
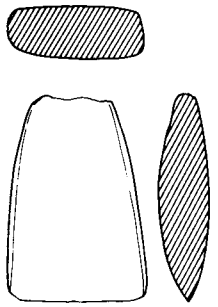


FIG.
B16



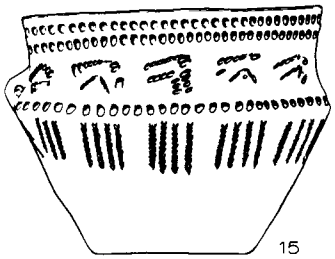
EKELBERG f



+14a

14

g



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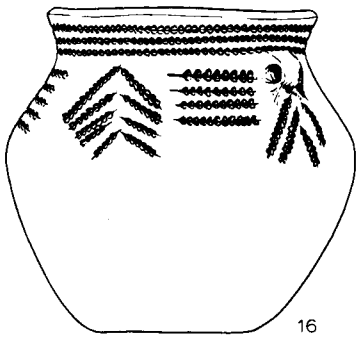

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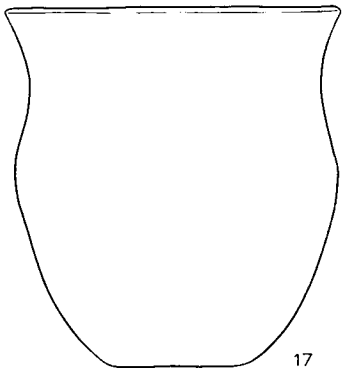

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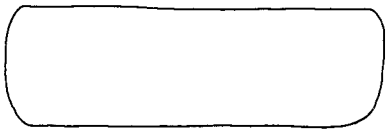
i



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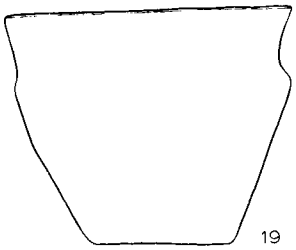

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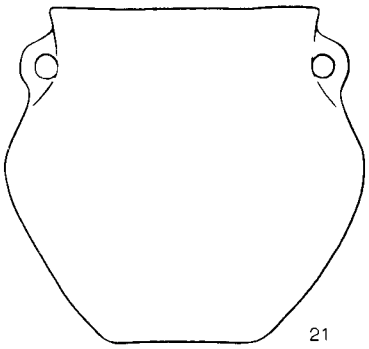

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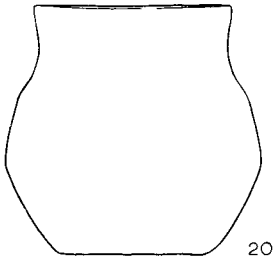

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FIG.
B18

MESUM

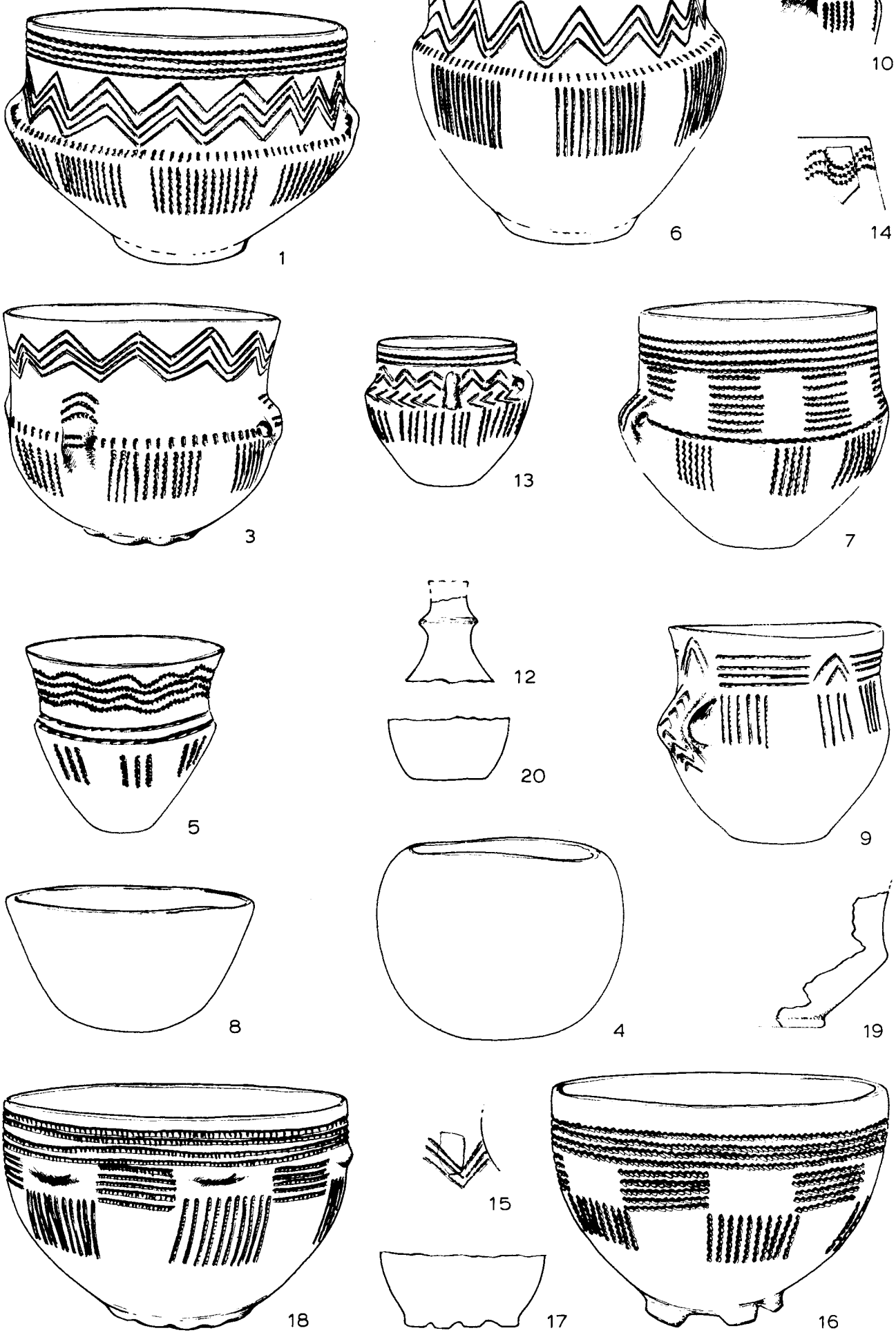
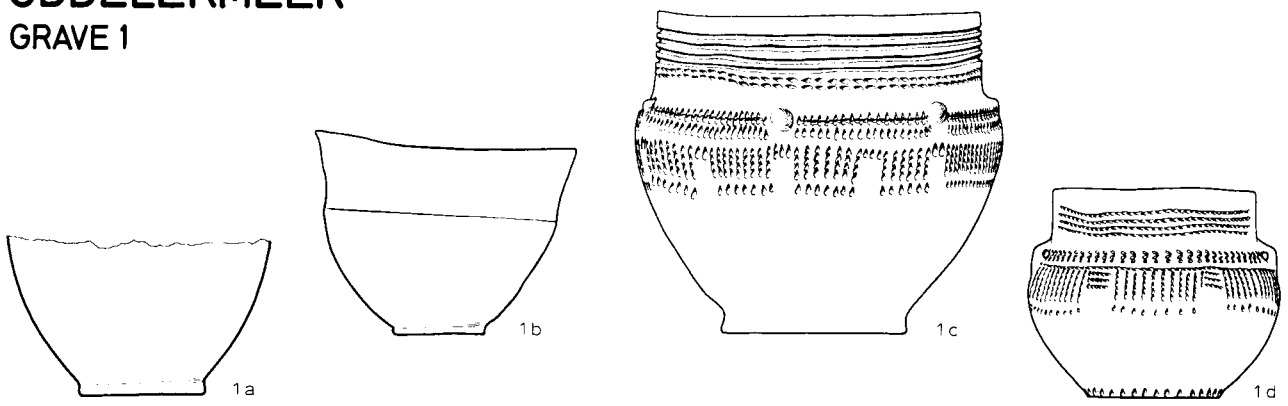


FIG.
B19

UDDELERMEER
GRAVE 1



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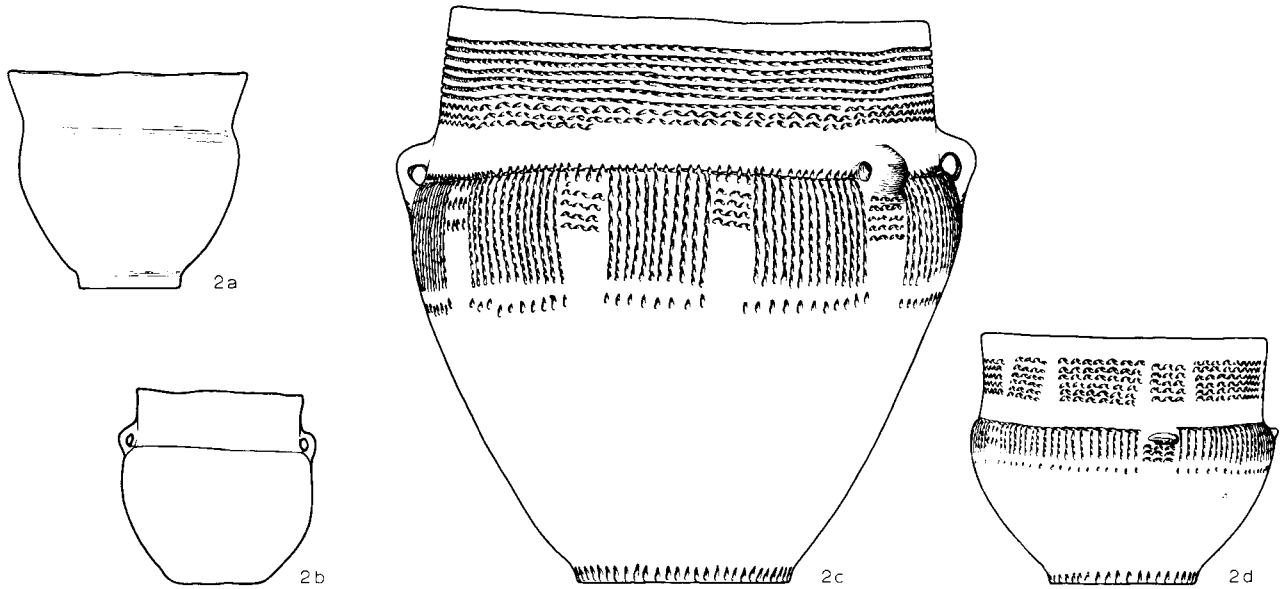

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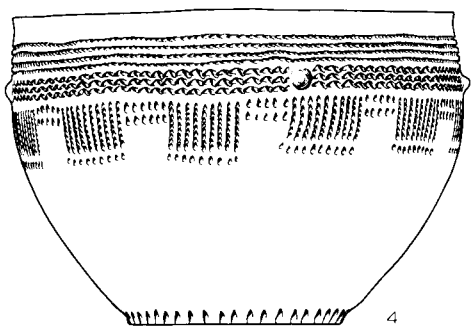

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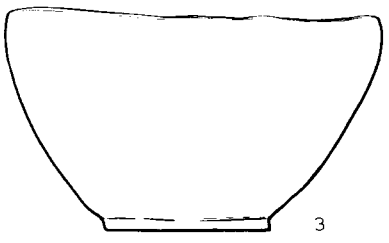

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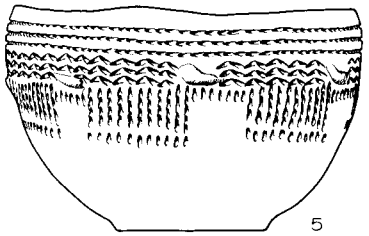
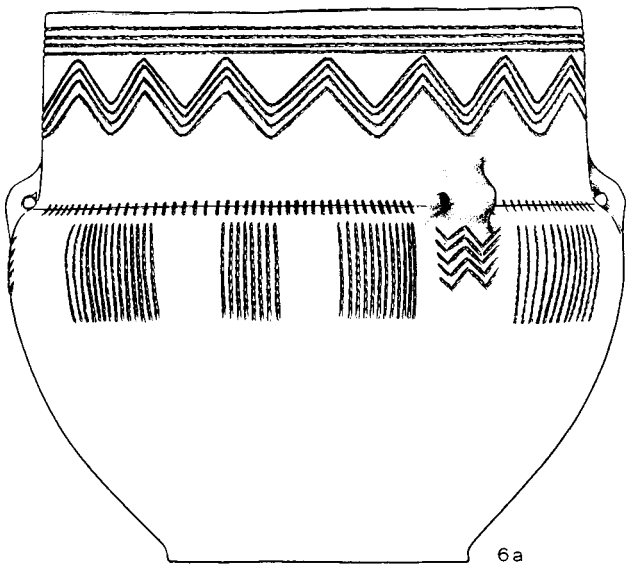


FIG.
B20

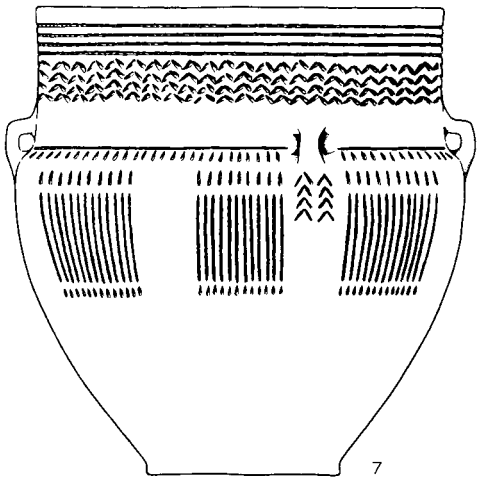
UDDELERMEER

hut 3

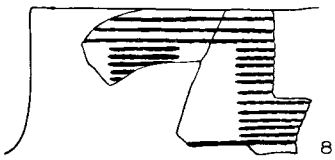
+6b

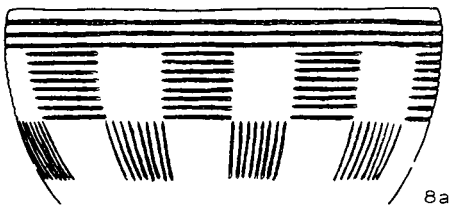


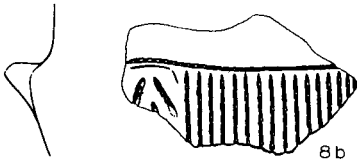
hut 8

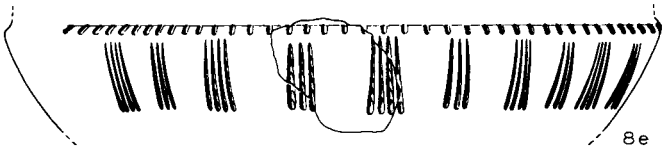


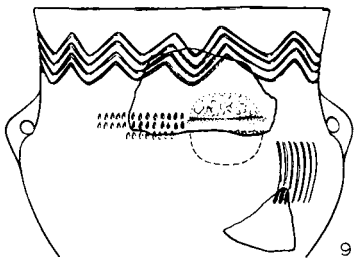
S. of Hunneschans











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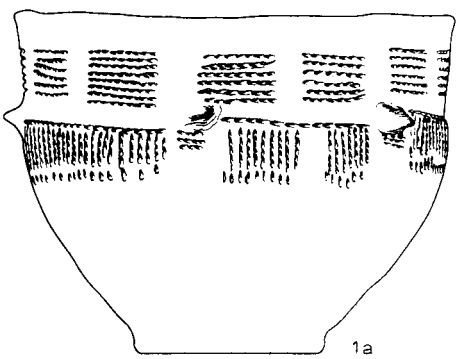

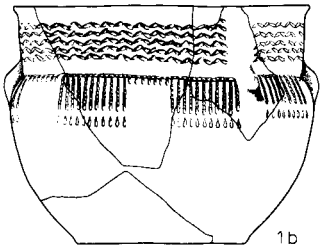

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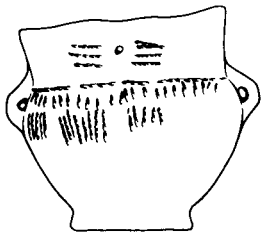

FIG.
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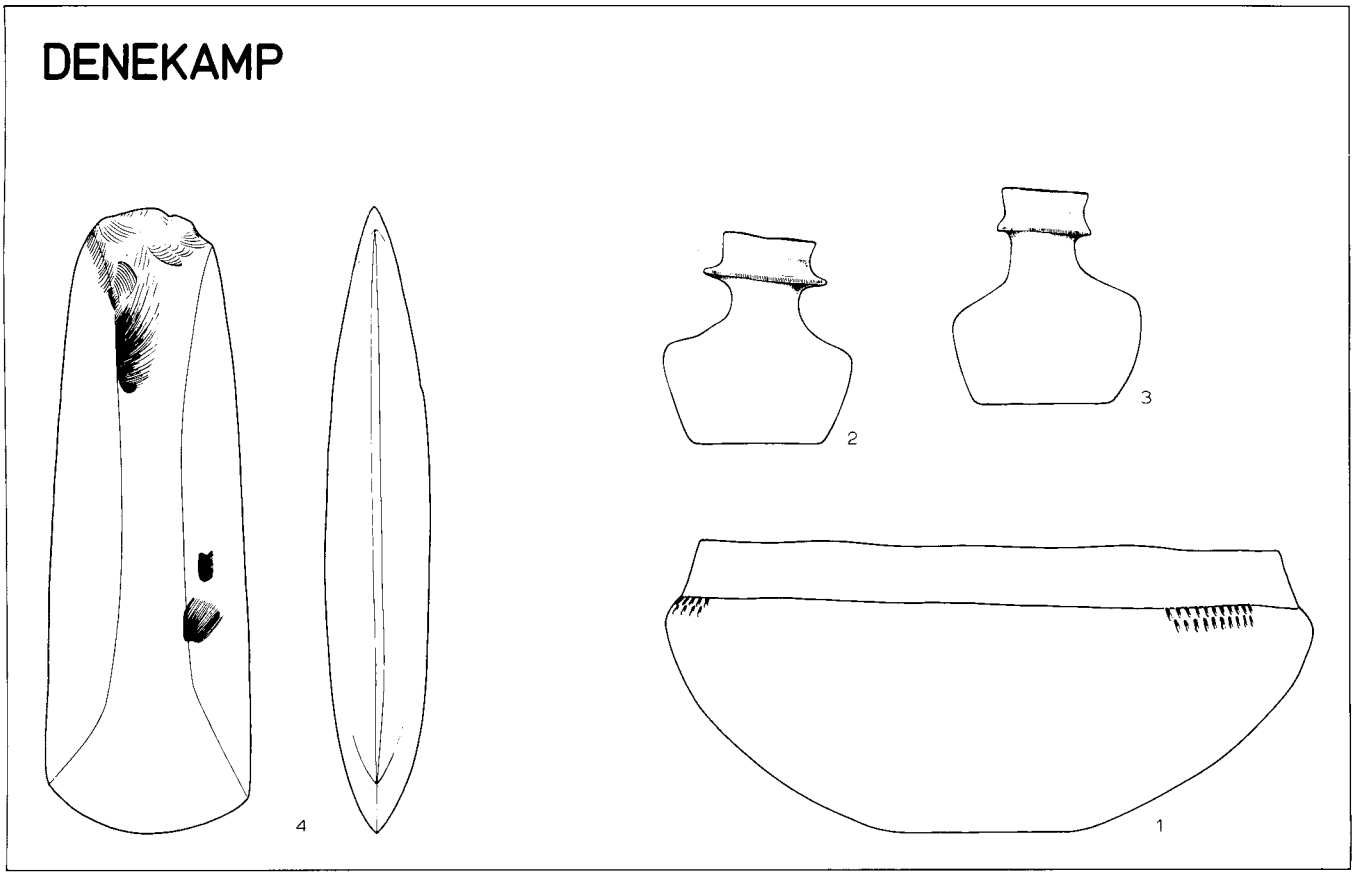

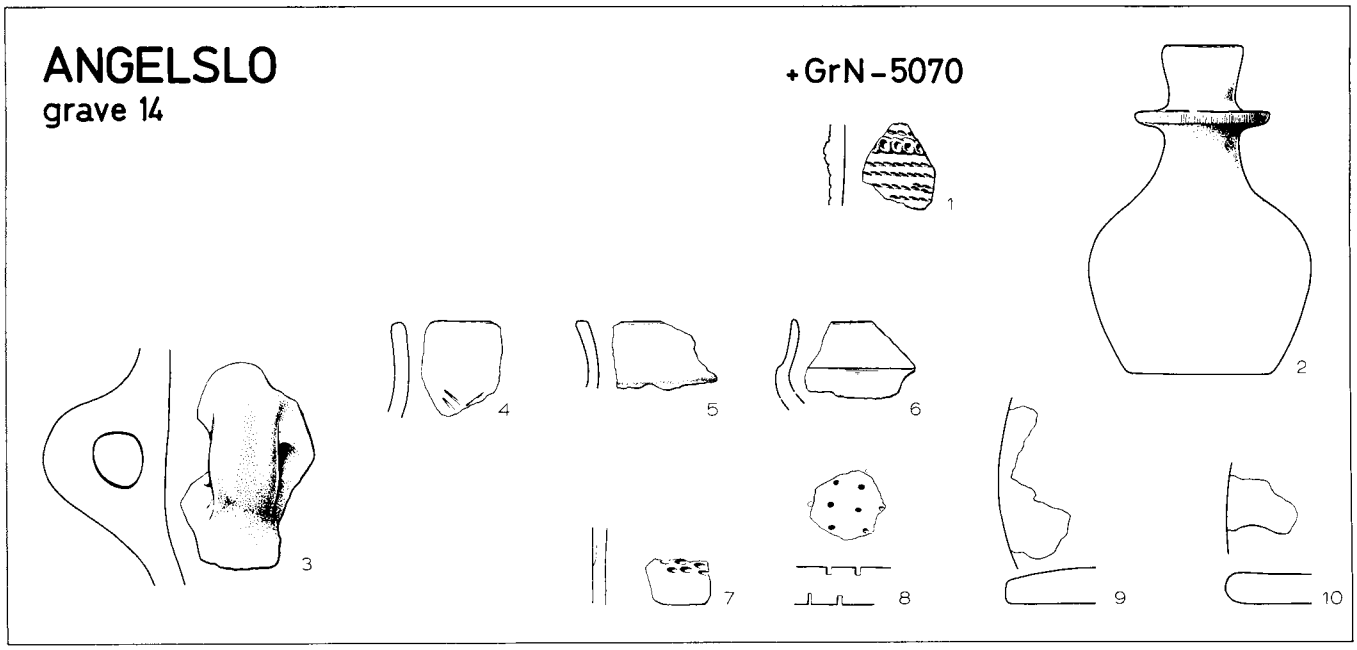

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Abbreviated titles

Aarbøger	= *Aarbøger for Nordisk Oldkyndighed og Historie.* Copenhagen.
AA	= *Acta Archaeologica.* Copenhagen.
AKB	= *Archäologisches Korrespondenzblatt,* Urgeschichte-Römerzeit-Frühmittelalter. Mainz.
AUF	= *Ausgrabungen und Funde.* Berlin.
BGLVA	= *Beiträge zur Geschichte, Landes- und Volkskunde der Altmark.* Stendal.
Ber. ROB	= *Berichten van de Rijksdienst voor het Oudheidkundig Bodemonderzoek.* The Hague.
DVFDFSH	= Die vor- und frühgeschichtlichen Denkmäler und Funde in Schleswig-Holstein

EFAP = *L'Europe à la fin de l'âge de la pierre.* Actes du Symposium consacré aux problèmes du Neolithique européen, Prague-Liblice-Brno 1959. Prague 1961.

FAH = *Fundberichte aus Hessen.* Bonn.

FVFD = *Führer zu vor- und frühgeschichtlichen Denkmälern.* Mainz.

HEN = *Honderd eeuwen Nederland* (ed. J.E. BOGAERS et al.). The Hague.

JMB = *Jahrbuch Bodendenkmalpflege in Mecklenburg* (ed. E. SCHULDT). Berlin.

JMV = *Jahresschrift für mitteldeutsche Vorgeschichte.* Halle.

JRGZM = *Jahrbuch des Römisch-Germanischen Zentralmuseums Mainz.*

Kwart eeuw = *Een kwart eeuw oudheidkundig bodemonderzoek in Nederland, Gedenkboek A.E. van Giffen* (ed. H.E. VAN GELDER et al.). Meppel 1947.

NAFN = *Neue Ausgrabungen und Forschungen in Niedersachsen.* Hildesheim.

NBKNOB = *Nieuws-Bulletin van de Koninklijke Nederlandsche Oudheidkundige Bond.*

NDV = *Nieuwe Drents(ch)e Volksalmanak.* Assen.

NNU = *Nachrichten aus Niedersachsens Urgeschichte.* Hanover.

OJ = *Oldenburger Jahrbuch.* Oldenburg.

OMROL = *Oudheidkundige Mededе(e)lingen van het (uit 's) Rijksmuseum van Oudheden te Leiden.* Leiden.

ORG = *Verslagen en Mededе(e)lingen Ver(e)eniging tot Beoefening Overijsselsch Regt en Geschiedenis.*

PPS = *Proceedings of the Prehistoric Society.* London.

PZ = *Praehistorische Zeitschrift.* Berlin.

R = *Radiocarbon* published by the American Journal of Science. New Haven (Conn.)

SAM = *Studien zu den Anfängen der Metallurgie.* Berlin.

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