# Reviews

ARNE SKJØLSVOLD: *Slettabøboplassen. Et bidrag til diskusjonen om forholdet mellem fangst- og bondesamfunnet i yngre steinalder og bronsealder. Arkeologisk museum i Stavanger – skrifter* 2. Stavanger 1977. 380 pp., including 67 plates. With an English summary and a report on preliminary mineralogical analysis of the pottery carried out by A.M. & I. Th. Rosenqvist.

The Stone Age settlement of Slettabø is situated in Rogaland, South-Western Norway, and was excavated by Arne Skjølsvold in four summer field-work programmes in 1963–68, after which a preliminary but fairly extensive account of the excavations was published in *Viking 1972*. The present monograph is the final publication, and is to be welcomed. It is not only a comprehensive presentation of important material but also discusses a number of problems of fundamental significance for the Norwegian, or for that matter the Scandinavian Stone Age. Consequently there is every reason to take a closer look at the book, the significance of which extends beyond the promise of the title.

The Slettabø settlement is now situated on the mainland, between seven and nine metres above sea level; but with a five to six metres higher water level in the Stone Age Tapes Sea the settlement would have been situated on a small island, probably next to the shore. The area is now, as it was during the Stone Age, afflicted by shifting sands, which at the beginning of the excavation completely covered the culture layers; in fact, these were sandwiched between sterile layers of shifting sand. Broadly speaking the stratification on the site was as follows:

turf
light grey sand
greyish brown sand
culture layer I
yellowish grey/brown sand
culture layer II
yellowish brown sand
culture layer III
yellowish grey/brown sand.

The extent and thickness of the culture layers varied a good deal, but in some areas the above mentioned stratification reached a thickness of over a metre.

The site was excavated in metre squares and in layers with a thickness of 10 cm, finds from each of these units being kept separate. The excavation was not total and 164 m² were examined while the whole site is supposed to cover c. 200 – 220 m². During the investigation sieving was only carried out on a small scale, whereas several sections were made to facilitate an understanding of the very complex stratification. One gets the impression that it was a very carefully conducted excavation, which is indeed crucial when assessing find frequency etc. of individual types of artefacts. On the other hand, the adoption of a system of co-ordinates with small and capital letters as well as positive and negative numerical values does not appear very useful. It is difficult to work with and it will often involve errors during the registration. – Why not employ a system of compass-orientated Cartesian co-ordinates with the use of positive values alone?

Judging by a number of $C^{14}$ dates, layer I belongs to the middle of the Bronze Age; one date stands out from the rest and may suggest occupation at the end of the Bronze Age. Some fireplaces and remains of pavements and stone packing were noticed but neither in layer I nor in the other habitation layers were distinctive traces of huts or houses, for exampel postholes, seen. The artefact material from layer I is limited: a few flat-trimmed tools, various tools of flint and rock, as well as pottery. There was only one bronze object: a fragmented pin that defies further identification. Several of the ca. 4.500 potsherds have been shown to belong to almost bucketshaped vessels. The pottery, a minute proportion of which is decorated, does not invite to further discussion. The osteological material is considerable but – as in the other layers – so badly preserved that it is difficult to identify. It has, however, been possible to recognize bone remains of cow, deer, whale, a couple of bird species, and cod. These finds, when related to the location of the settlement, support Skjølvold's assumption that Slettabø was a hunting and fishing settlement.

The subjacent layer II represents the main habitation on the site and has an average thickness of 35–40 cm. Here, too, the bone material suggests that we are dealing with a hunting and fishing settlement since bones from cow, deer, seal, porpoise and a few species of bird and fish have been recognized. The identification of cow/deer on the basis of tooth fragments is, however, said to be subject to some uncertainty. One would expect there to be high phosphate values in such layers, but this is not borne out by the analyses, and the low values (in comparison with, for instance, Swedish hunting sites) are regarded as a result of leaching of the sandy strata.

The flint material is considerable: c. 700 g per square metre, but this is said to be a normal quantity in Stone Age settlements in Rogaland. Both Senon and Danian Flint was

used, probably collected locally on the beach. Apart from the more commonplace flint objects and approx. 110.000 pieces of waste one notes the presence of over 200 tanged arrow-heads of the types A1–A3, including also some AO. Other types of arrow-head are single-edged, flat-chipped, and a few tanged arrow-heads of the types B and D, whereas no transverse arrow-heads have been found. Furthermore there are some slate arrow-heads, fragments from polished flint axes, many flint cores, including cylindrical ones, some axes of rock, pumice (with traces of wear) etc. Altogether, the material appears to be rich and varied. There are not many bone tools: some fragments of fish-hooks, a couple of bone points (from harpoons?) and a few small pieces of decorated bone.

The pottery from layer II is of particular interest, partly because of its abundance – almost 10.000 potsherds, i.e. approx. 250 g per sq. metre – and partly because it is a fairly varied collection, 11% of which is decorated. This contrasts with other South Norwegian coastal settlements where there are fewer finds of pottery and the range of types is small. Skjølsvold estimates that the sherds represent the remains of at least 185 pots of fairly varied shapes: almost hemispherical, conical-bottomed, flat-bottomed and with S-shaped profile. A mineralogical examination has shown considerable variation in clay and temper and also demonstrated the use of grog.

The discussion of the pottery, and especially the ornamentation, is very detailed, and there are many instructive drawings by T. Strenger. Comparative material is introduced from far and near and experiments are carried out with stamps to illustrate how ornamentation was produced. This comprehensive discussion of the pottery is amply justified since it is the first publication of a major pottery find from this region.

One exotic discovery is that of a sizable part of a bell-beaker – the first find of bell-beaker pottery in Norway. Analysis of the ware suggests a foreign, probably North German, origin. Some flat-trimmed, barbed arrow-heads with a short tang may also belong to the Bell-Beaker Culture. Corded-Ware pottery predominates in the rest of the pottery, as is generally the case on coastal sites in Southern Norway. The pottery is associated mainly with late types of pottery from the Battle Axe culture (Malmer's groups C, K, J and O) and in a few instances with Single-Grave pottery from Jutland. Potsherds decorated with grooves, horizontal zigzags and cross hatching are rare and regarded as Pitted Ware, although the possibility that they may represent pottery belonging to the Funnel Beaker Culture is not completely excluded. The Late Neolithic pottery includes sherds with the barbed wire motive and beading.

The bottom layer of the settlement (layer III) contained few finds and presented partly the same types as layer II. There were bone remains from deer, cod and haddock. The layer, incidentally, appeared merely as a thin discontinuous band.

The presentation of the material is followed by a wide-ranging discussion concerning definition and classification of the material. This is especially true of the tanged arrow-heads, where the results of K. Odner, A.B. Johansen and S. Indrelid are discussed. Skjølsvold reaches the conclusion that the division of the tanged arrow-heads into an early and a late group (A1/A2–3) does not apply to the Norwegian material since there is a clear predominance of A1 arrow-heads in a number of Norwegian sites from the Late Stone Age. The presence of pottery belonging to the Battle Axe Culture together with the tanged arrow-heads of type A, also indicates a different course of development from that in Southern Scandinavia.

On the basis of find contexts and the published tables it appears difficult to get a really clear picture with regard to the stratification and the chronology. This is especially true when one is looking at layers II and III. Types that, for all we know from elsewhere, are not of the same age here lie side by side. The layers so nicely sandwiched between sterile layers of shifting sand, as it can be seen on the photographs, must have been disturbed to a certain degree. This may be due to local activity during the Stone Age, or the artefacts may have "sunk" in connection with sand drift. In this connection it should be mentioned that, according to information from Arne Skjølsvold, the flint is not sand-worn and therefore is unlikely to have lain exposed for a long time.

A concluding chronological section provides the results from a number of $C^{14}$ datings, which add greatly to the understanding of the settlement. There are four dates from layer II: 2020, 1910, 1840 and 2700 B.C. with an uncertainty margin of ± 70–100 years. As Skjølsvold points out, Battle Axe pottery and its derivatives, B and D tanged arrow-heads, the Bell-Beaker element, Late Neolithic pottery and flat-trimmed arrow-heads can easily be placed within the period covered by the first three dates, and the same must apply to tanged arrow-heads of type A, which in Norway in all probability occur from the Mesolithic through the Neolithic. It is difficult, however, to concur with Skjølsvold in also placing pitted ware and a few other types of pottery as late as the first three dates indicate. On the other hand, as Skjølsvold emphasizes, there is pottery with cord and pit ornamentation on the same vessel. Here, as with certain other finds, we still know too little about the occurrence of the types in time and space. This is true, for instance, of slate arrow-heads and single-edged arrow-heads. The dating of 2700 B.C. presumably refers to layer III, which has yielded the following $C^{14}$ dates: 2780, 2520, 2690, 2870 and 2830 B.C. ± 100–180 years (the date of 2830, however, is from a charcoal layer below layer III). In the preliminary publication Skjølsvold thought that layer III did not form an independant settlement. Now, with a whole series of "early dates", he concludes that it does represent an independant settlement phase. For, according to Skjølsvold, some pottery from layer III, e.g. cord ornamented ware, is to be regarded as an intrusion from layer II. The remaining material form layer III is fairly sparse, as already mentioned, and there is a lack of distinctive types for closer dating. It can be assumed that six tanged arrow-heads of type A in layer III may in fact belong to it.

The section on chronology based on $C^{14}$ is less succesfull. Skjølsvold employs both the official half-life of 5570 and the "new" one of 5730. Since there is no agreement to abandon the official half-life and adopt the new one, it is quite superfluous to provide dates based on a half-life of 5730. It only helps to create confusion and, anyhow, does not produce "real" absolute dates, which in connection with the material in question is of minor importance but which could be provided by means of tree-ring calibration.

Moreover, the use of Welinder's chronological table for Scandinavia is an unfortunate choice in view of its problematic division of the Neolithic based on the long half-life as well as samples collected from an excessively large geographical area. It may be appropriate to point out that the period designations MN I – V should be used only within Danish territory since they were introduced largely on the basis of pottery found only in this country. To apply these terms to other Scandinavian regions where this material is absent will cause many problems. Furthermore the chronology of the Middle Neolithic in Denmark is certainly not so reliable as was once thought. Consequently it is necessary to establish a separate chronology for each individual area in Scandinavia. For the sake of good order it should be mentioned that Skjølsvold does not use the terms just mentioned to a larger extent, but merely points out that layer III belongs to the transition EN C/MN I, while layer II is said to fall within MN IV–V. Skjølsvold has not been able to take litterature published after 1975 into consideration, and there is obviously a good deal of recent litterature which is relevant to an assessment of the chapter on chronology.

A section on economy and settlement reports on recent studies into the penetration of agriculture into Southern Norway. As far as the Slettabø settlement is concerned it has so far not been possible, on the basis of pollen analysis in the immediate vicinity of the site, to demonstrate the presence of agriculture coeval with the settlement. The section on economy also deals with hunting, fishing, gathering etc. and includes a large collection of mainly etnographic material in the discussion. Another question considered is whether habitation was seasonal or permanent. Here, as elsewhere, the book explores the problems whether the inhabitants were farmers or not, thus following up the theme debated at the Nordic Archaeological conference in Tromsø in 1970.

There is also a useful survey of mountain investigations and the fairly intensive research that is being done on the Fosna and Nøstvet sites. In this connection it is natural to associate the $C^{14}$ dates from layer III with a local Mesolithic. There are still, however, difficulties in dividing the South Norwegian Mesolithic into reliable regional and chronological groups. It looks distinctly odd, for instance, that it is still possible to discuss whether there were microliths during the transition to the Late Neolithic period.

Skjølsvold refers to layer III as "Fosna-like", whereas no elements point toward Nøstvet. In view of the above comments on the division of the South Norwegian Mesolithic, and considering the paucity of types found in layer III, it would probably have been better to say nothing.

The discussion of the cultural affiliation of layer II inevitably touches upon the origin and nature of the Pitted Ware Culture, and a useful account is given of a number of Norwegian settlements. Material from the other Scandinavian countries is also considered. Skjølsvold does not find the term "Pitted Ware Culture" satisfactory, but sees no suitable replacement term for this, as he calls it, "Sub-Neolithic mixed culture". To the present writer the term "Sub Neolithic" to cover such diverse assemblages is also inadequate, apart from the fact that the term is occassionally used in a completely different context, i.e. the period immediately preceding the Greek Bronze Age.

The account of the non-Norwegian material leaves out some publications that might have contributed to the discussion, e.g. Edgren's excellent book on the Corded Ware Culture in Finland, some papers from Meinander and Tauber's survey of Danish $C^{14}$ readings. Nor has Janzon's book on Middle Neolithic graves on Gotland been included. Admittedly, publications now appear in such quantity that it is hard to keep up with them.

When analysing layer I from the Bronze Age Skjølsvold is disinclined to believe that the finds represent traces of the relatively rich Bronze Age society, the presence of which is otherwise manifested in the erection of large grave mounds and stone circles, as well as in the surplus invested heavily in metal objects. Instead he suggests that we may here be faced with traces of the old hunting and fishing culture, which persisted into the Bronze Age and co-existed with the carriers of the metal culture, and that such a dualism may indeed have been present also later in prehistoric times. In Skjølsvold's opinion it is easier to understand certain aspects of the prehistoric settlement pattern if we accept the presence of such a hunting population. The present writer, being convinced of the correctness of the theory of unilinear development, does certainly not agree!

As a publication of material Skjølsvold's book is of lasting value. Its survey of several Neolithic settlements and dwelling places in South Norway is also useful, as are the considerations of economy and settlement pattern. The picture is rounded off with a topical survey of research into the division of the Mesolithic, the beginning of the Neolithic, and finally the transition to the Bronze Age. Because of its wide range the book is a must for everyone who is concerned with these problems in Scandinavian archaeology.

This assessment is not altered by the objections raised against certain views in the book. After all, no two archaeologists will agree about chronology and cultural development in the late Scandinavian Stone Age. Here, if anywhere, a remark by Anatole France is appropriate: "Un archéologue, c'est un monsieur qui est d'un autre avis".

Svend Nielsen

KLAUS EBBESEN: *Tragtbægerkultur i Nordjylland. Nordiske Fortidsminder*, Serie B – in quarto, Vol. 5. Det kgl. nordiske Oldskriftselskab, Copenhagen 1978. 186 pp., 137 illustrations. Summary in German.

In 1975 K. Ebbesen published a comprehensive study of the material from the Middle Neolithic Funnel Beaker Culture (TRB) found on the Danish islands (K. Ebbesen, Die jüngere Trichterbecherkultur auf den dänischen Inseln. Arkæologiske Studier, Vol. II, Copenhagen 1975). The central part of this study is an analysis of style and form of the TRB pottery from megalithic graves on the Danish islands. It is the first survey of a very comprehensive collection of material. The subject-matter is difficult because of the lack of recent excavations of passage graves in Eastern Denmark. The whole mass of material has been collected over the last centuries and much of it stems from early excavations or unauthorized digging in metalithic graves. Consequently, there is a complete absence of chronological indicators such as, for example, stratigraphic data. Ebbesen employs a purely stylistic analysis. By means of an analysis of the combinations of stylistic elements he proposes a total of seven hypothetical stylistic groups. These are associated with the chronological divisions of the Middle Neolithic TRB in Denmark based on the pottery found in settlement sites (cf. C.J. Becker, Die mittel-neolitischen Kulturen in Südskandinavien. Acta Archaeologica Vol. XXV, 1954). The seven stylistic groups are termed MN I-style, MN II-style, Ferslev-style, MN III-style, MN IVA-style, MN IVB-style and MN V-style. The fact that the designations of style include the period designations should not, however, be regarded as definitive dating of the stylistic groups to the respective periods.

In "Tragtbægerkultur i Nordjylland" the Middle Neolithic TRB pottery from Jutland is analysed on the same lines. The book centres on the material from five megalithic graves in North Jutland and from this basis proceeds to an examination of the entire pottery material from the megalithic graves of Jutland. As in the book on the Danish islands the material from the settlements is not given primary attention, nor is the material from Jutland's stone packing graves, a considerable amount of which was published independently a few years ago (E. Jørgensen, Hagebrogård-Vroue-Koldkur. Neolitische Gräberfelder aus Nordwest-Jütland. Arkaeologiske Studier, Vol. IV, Copenhagen 1977. This publication also presents important new excavations of passage graves). Apart from the stylistic classification of pottery Ebbesen's book contains discussions of general problems concerning passage graves, and a brief survey of the rest of the material in megalithic graves from both the Middle Neolithic TRB, the Single-grave Culture, the Pitted-ware Culture and the Late Neolithic. In between one notices a short well-written passage on discoid mace heads. There is also an interesting passage on the development of burial customs in North Jutland.

These passages contain several new contributions, both in relation to the book of 1975 on the Danish islands and in relation to previous research. It is particularly important that the relative chronology of the Middle Neolithic has been revised and brought up to date so that it is now in agreement with the $C^{14}$ chronology. The book on the Danish islands argues strongly in favour of the traditional notion that the Middle Neolithic TRB continued to exist until the beginning of the Late Neolithic, so that the Single-grave Culture was contemporaneous with the late phase of the Middle Neolithic TRB (part of MN III as well as MN IV and V). Ebbesen was then of the opinion that he could demonstrate continuity from the TRB to the Late Neolithic, both as regards pottery forms and flint tool techniques. Also the Globular Amphorae Culture was used as a chronological horizon in an attempt to date the TRB and the Single-grave culture in relation to each other. In the study of the TRB in North Jutland this line of reasoning has been completely abandoned in favour of the picture that emerges from the $C^{14}$ dates. According to these the Single-grave Culture succeeds the TRB. Consequently, in the chronology diagram, fig. 108, a new terminology is proposed for the division of the Danish Neolithic, in which the terms *jættestuetid* (Passage Grave Period) and *enkeltgravstid* (Single-grave Period) are introduced. According to Ebbesen's terminology the *Mittle Neolithic* (MN) would signify the Middle Neolithic TRB and the *Later Neolithic* the subsequent phase, during which the Single-grave Culture is dominant, until the beginning of the Late Neolithic. Ebbesen thus sides with other researchers who in recent years have been studying the relationship between the TRB and the Single-grave Culture. In addition to the indications given by $C^{14}$ readings, excavations during the 1970's of single-grave barrows in Jutland have resulted in stratigraphic data indicating that the earliest phase of the Single-grave Culture is later than period V of the TRB, or briefly contemporaneous with it (K. Davidsen, Relativ kronologi i mellemneolitisk tid. Aarbøger for nord. Oldk. og Hist. 1975. – K. Davidsen, The Final TRB Culture in Denmark. A Settlement Study. Arkæologiske Studier, Vol. V. Copenhagen 1978, pp 86–92, 167–175). A relative chronology that accords with the $C^{14}$ dates has also been worked out on the basis of the thick-butted flint axes, in terms of typology and context (P.O. Nielsen, De tyknakkede flintøksers kronologi. Aarbøger f. nord. Oldk. og Hist. 1977).

Another important problem touched on in Ebbesen's book is the dating of Danish passage graves. Previously (including Ebbesen's book of 1975) the earliest building of passage graves has been dated to MN Ib (the Klintebakke phase; cf. H. Berg, Meddelelser fra Langelands Museum, 1951). Recently, however, Erik Jørgensen published a collection of pottery from passage graves in West Jutland (E. Jørgensen, op. cit.), which he assigns to MN Ia. Accordingly, Ebbesen suggests that the first passage graves in Denmark (Jutland) may have been erected during the earliest phase of the Middle Neolithic. In this connection Ebbesen dissociates himself from the wide-spread notion that the inspiration for Danish passage graves came from Western Europe: they were the result of an independent development within the Scandinavian megalithic area from polygonal dolmens via the large dolmens (*Grossdolmen*) to passage graves.

Let us now return to the studies of pottery, with which the book is mainly concerned. Viewed against the background of developments in pottery within the entire North European TRB area, North Jutland forms a regional sub-group with a partially independent stylistic development. The MN I-style corresponds to the East Danish MN I-style, but contains several local features. The MN II-style is sparsely represented. The Ferslev-style is in part contemporaneous with MN II in East Denmark. In North Jutland it acquires a distinctive form and it probably represents the most original pottery produced in North Jutland during the Middle Neolithic. The Ferslev-style is dated to the late MN II and MN III. The MN III and MN IV-styles that characterize a major part of the pottery from East Denmark's megalithic graves are of hardly any significance in North Jutland (and in Jutland generally). The sequence ends with a small number of MN IVB-style sherds and a slightly larger quantity representing MN V. A few minor objections may be raised to Ebbesen's developmental outline. In order to comprehend the development of the Ferslev-style, especially in North and Central Jutland, it is neccessary to draw a straight line from certain elements of the MN I-style (e.g. on the Troldebjerg bowls) to the Ferslev-style. One may therefore question the sequence MN I-style – MN II-style – Ferslev-style and rather assume a development from MN I-style to Ferslev-style, with MN II forming a largely East Danish stylistic element, which in Jutland is partly contemporaneous with the Ferslev-style (during MN II). Another objection concerns the MN IVB-style. In 1973 Karsten Davidsen dated the Jutland pottery decorated with the leitmotif of this style – suspended and standing triangles formed by means of short incisions – to MN V (K. Davidsen, Neolitiske lerskiver belyst af danske fund. Aarbøger f. nord. Oldk. og Hist. 1973, p. 30 note 88. Cf. Ebbesen's note 88 p. 163). In Davidsen's latest publication (op. cit. 1978, pp. 102 and 109) this dating is further supported by the presentation of a number of settlement finds from MN V the pottery of which exhibits this motif. This leaves very little evidence of Ebbesen's MN IV among the pottery from Jutland's megalithic graves. The difficulty of demonstrating definite MN IV pottery in Jutland – in graves as well as settlement sites – has also been pointed out by others (Davidsen, op. cit. 1978, pp. 113–117). The MN IV-style is beginning to look more and more like a local stylistic phase on the Danish islands, its main distribution being in the south-east.

There is an interesting demonstration of the local features characteristic of the Middle Neolithic TRB in North Jutland. For instance, the custom in votive offerings of placing pottery in front of the entrances to passage graves continued longer in North Jutland than on the islands, i.e. these deposits extended into MN III in North Jutland whereas they ceased during MN II on the islands. In contrast to the traditional belief that there was a break in continuity in the use of megalithic graves in Jutland (one of the arguments in favour of the early dating of the Single-grave Culture) Ebbesen's investigation demonstrates continuity right up to the close of MN. However, there was a development in burial custom, e.g. the votive offerings at the entrances and kerb stones changed from pottery to burnt and unburnt flint tools. As was the case on the Danish islands there was a reduction in the quantity of pottery placed in grave chambers from MN I to MN V. On the other hand, during the late TRB relatively many flint tools, axes and chisels were deposited in the chambers.

The book reflects the writer's interest in broad outlines. As in the study from 1975 the depicted pottery material is culled from a number of find contexts in order to provide examples of shapes and decorative styles. It would certainly have assisted the reader's comprehension greatly if Ebbesen had made use of typological tables to illustrate the individual styles. A subject of this kind almost demands it. Another difficulty about reading the book is the fact that the styles are not dated in the figure captions. For part, though not all, of the depicted pottery the date of styles must be deduced from the description of pottery *forms*.

Poul Otto Nielsen

BIRGITTA HULTHÉN: *On Ceramic Technology during the Scanian Neolithic and Bronze Age.* Akademilitteratur, Stockholm, Sweden, 1977, 226 pp.

This thesis is a pioneer work within Nordic prehistoric research. It was preceded by: "On Documentation of Pottery" (Hulthén 1974 a.), "On choice of Element for Determination of Quantity of Pottery" (Hulthén 1974 b.) and "On Thermal Colour Test" (Hulthén 1976).

Hulthén has put a lot of work into registering and data coding of her material, and developed methods of her own, both practical and technical.

The basic material is 250 kg of pottery, 17000 sherds, emanating from systematic excavations in Hagestad, S-E Scania. As a complement, material from adjacent regions have been brought into the investigation. For comparative analysis, sherds from Danish and other N.European localities have been examined by the same methods as the Hagestad material. The time stretches from the Ertebølle period to the end of the Bronze Age, a span of 3000 years. Middle Neolithic TRB culture is represented by 10200 sherds (59%) the others are, in order of quantity, Pitted Ware, Early Neolithic TRB, Late Neolithic, Bronze Age, Battleaxe and Ertebølle, the last represented by 160 sherds (1%).

The intention of the work is to contribute to the understanding of how ceramic manufacturing techniques developed and changed during the Stone and Bronze Age in Scania. The complex of problems is channelled into five principal questions: (p.13)

1. "Have potters with different cultural origins practiced particular manufacturing methods, which were specific to the individual cultures?"

2. "Is it possible to make observations concerning continuity and discontinuity respectively on the basis of technical studies of archaeological ceramics?"
3. "How have raw material resources been exploited by prehistoric potters?"
4. "Do manufacturing techniques and the selection of raw materials vary with distinct vessel functions? If so, can qualitative differences be observed in pottery material of a culture group within the same interval of time?"
5. "Is it feasible to study vessel distribution within an area by means of results from technological investigations?"

To what extent these problems could be solved or elucidated is discussed in the concluding chapter. (p.205 ff.)

Methods are described in short in the introducing chapter (p. 16–23). If nothing else is stated, the following quotations are from these pages.

17000 sherds have been recorded. This must have involved a tremendous amount of work; not only had matters like finding place, culture, shape and decoration to be noted, but also sherd thickness, weight, colour, temper, vessel-forming technique etc. (The bulk of the material, MN TRB, appears to be registered in less detail.) The methods are more fully presented in Hulthén 1974 a and b.

The data have been coded on data forms. "All measured values have been statistically treated and evaluated by means of a computer. Also by means of computer, a random sample has been obtained *within each group* of material taking *culture, finding place, layers etc.* into consideration" (my underlinings). The *etc.* is unfortunate in connection with "a random sample". The representativity depends on the number of "groups" and the sample size within each of them. There is no information on the number of "groups" or the number of test sherds within each "group", nor even, so far as I have been able to ascertain, on the number of selected test sherds within each culture. "The number of selected test sherds is 350."

The samples have been further analysed concerning clay, temper, vessel-forming techniques, surface finish and firing conditions. A number of methods have been used: petrological microscopy, chemical analyses, X-ray diffraction analyses and thermal analyses.

An important part of the work is the investigation of raw clays in the area. Samples of 80 clays, from "various depths", have been analysed. "They have all been sieved in order to determine the grain size." According to table 5, the modules are: "coarse sand", "fine sand", "silt" and "clay". An additional method of separation must have been used, since "silt", the fraction below ca. 0,07 mm, is the finest fraction obtained by sieving. "The amounts of 23 elements have been determined by chemical spectrographical (emission) analysis."

Differential Thermal Analysis (DTA) has been used to assess original firing temperature on sherds, and for clay mineral identification. Clay minerals have also been identified by means of X-ray diffraction analysis.

Thermal Colour Test (TCT) has been performed on all 80 clays and on 200 of the test sherds. As this is a new and simple method for investigations of clay composition in pottery as well as raw clays, introduced by Hulthén, it is more fully presented and discussed in the thesis than the other methods.

"TCT is based on temperature-dependent colour changes of clays. These changes are due to the mineral contents and to the impurities of the individual clays." (Hulthén 1976, p. 2). The test sherds or clays are heated to 1000°C, and the colour changes are recorded for every 100°C. For colour recording the Munsell Color Chart system is used. The test results in three curves, hue, value and chroma respectively, for each test piece. "Clays of the same type – with *approximately* the same mineral contents and the same impurities – have *similar or identical curves.*" (my underlinings). The curves obtained from clays can be compared with each other and with those of sherds. "There is a significant difference between the two kinds of curves. The reason for this is that the clay in the sherds already has passed through the first 4–5 or even 6 stages during the original firing. The colour does not start changing until the original firing temperature has been exceeded." Thus, "conclusions about the approximate original firing temperature" can be drawn. (Hulthén 1976, p. 5) "Identity between the TCT curves of clays and sherds is not to be interpreted as the final answer to the question of raw material sources. Further tests, such as DTA and X-ray diffraction analyses are needed to confirm the results of TCT before a final decision can be made." (Hulthén 1976, p. 5).

Another important part of the work is the examination by petrological microscopy of tempering materials in the test sherds; amount, grain size distribution, orientation, type and original raw material were investigated.

When possible, shape and decoration have been recorded and analysed.

The results have been treated statistically. "Mean values, standard deviations and correlation coefficients have been calculated. When necessary, the $X^2$-test has been used to prove probability."

In the following, I would like to discuss the methods used, especially the TCT. The reason for this is, that TCT plays an important role as a link in the chain of evidence, that is used to elucidate or solve the archaeological problems formulated as five questions in the introducing chapter.

TCT is based on the observation that clays change colour when heated. Colour tests are not normally used by clay mineralogists, because the colours, according to Grim, depend "much more on the nonclay minerals that are present and the conditions of firing than on the clay mineral composition. Thus, the presence of iron oxide, particularly in the free state, and the oxidizing-reducing conditions in the kiln are likely to be the determinative factors." All clays, except kaolinite and halloysite, "are likely to contain some iron, and there is no characteristic color that any of them develops." (Grim 1962, p. 122).

X-ray diffraction analyses and DTA offer more reliable information. Hulthén is aware of this and states very clearly

in her first paper on TCT, cited above (Hulthén 1976), that such tests are needed to confirm TCT results. TCT is a tentative method.

The problem is, however, that neither DTA nor X-ray diffraction analyses are designed to, or capable of giving the final answer to identity between clays of composite character and ceramics – fired clay of mixed composition. Both give diagrams as result, and these have to be interpreted.

There are at least two more problems in this archaeological-technological research situation:

1) the proportion of colouring components in the raw clays *in situ* might have changed during the past 3000 – 6000 years;
2) the sherds might be contaminated by e.g. soluble salts.

To make an attempt to localize raw material resources is, even under the most favourable geological circumstances, difficult, time consuming and beset with uncertainties. As Hulthén remarks: "The clay situation of great parts of Scania is very complex and clay types vary considerably within limited areas." (p. 209) The situation in Denmark is the same.

My criticism of the methods, presented here, was prompted by some confusing results. I will take an example:

Hulthén in question 3: "How have raw material resources been exploited by prehistoric potters?" Her answer to this question starts: "Information extracted from studies of raw materials, clays and temper, indicates that the prehistoric potters in the area investigated were highly aware of the available materials. They paid particular attention to the types of clay to use for ceramics. From craft traditions, by trial and error and most probably via information from outside their own group, they learnt to utilize certain clays and to avoid others. In most cases the composition of the rejected clays was such that pottery made from them would have undesired qualities." (p. 205 f)

This seems very reasonable, but the presented results confuse the picture:

The investigated clays contain between 40% and 90% nonclay components. Few, if any, of these clays would have been improved by temper of any kind. The nonclay components provide a "natural temper" and all of them are likely to contain organic material.

According to Hulthén, the whole range of clays were used for pottery manufacturing. This is not stated explicitly, but can be deduced from table 5 (Properties of some raw clays) with e.g. table 8 (Early Neolithic TRB pottery). The finest clay, number 35, a Hagestad sample, contains 40% nonclay minerals and the coarsest, number 14a, a Hörup sample, 86%. The estimated amounts of added temper do not seem to be negatively correlated to the coarseness of the suggested clays. If one, like Hulthén, wants to show that the prehistoric potters knew their job, and one has a fair sample and a computer, a negative correlation between coarseness of clay and amount of temper would be one of the first things to look for.

The above-mentioned clays, 14a and 35, and five of intermediate coarseness, are identified by Hulthén as raw clays used by Early Neolithic TRB potters. The estimated amount of added temper to the coarse clay 14a is 20–22%; in clay 35, the finer one, it is 15% (table 8). Thus, in this case the coarser clay was more tempered than the finer. This is strange: a fat clay is improved by temper, a lean one becomes less workable and more brittle in dry as well as fired state.

Clay 14a, with 86% of nonclay components, is suggested as a raw clay resource exploited not only by the Early Neolithic potters, but also by the succeeding Middle Neolithic ones and by Pitted Ware producers and Battleaxe people. They would have had to walk 5 km to get it. (figs. 32, 33, 58, 79 and 98).

As this clay plays a central role in Hulthéns hypotheses regarding the connections between raw clay resources, settlements and graves, (figs. 58, 78a and 98; compare Hulthén 1976, fig. 4) results from X-ray diffraction analyses and DTA on clay 14a would have been of crucial interest. They are not presented.

Clay 35, with 40% of nonclay components, is also suggested as a raw clay resource exploited by Early Neolithic TRBs. This clay could be dug 1 km away from the main settlement area. It seems to have been rejected by all succeeding potters. A possible reason for this could be that it is too fine in structure and / or that its content of smectite is high. Smectite is a 'swelling clay' with several undesired ceramic properties. No information on clay minerals in clay 35 is given.

This kind of problems have not been discussed or penetrated by Hulthén, to the extent that one would have wished.

Concerning estimated firing temperatures: TCT curves, as published (figs. 5 and 42), start changing at about 300°C. This is far too low a temperature to produce a ceramic ware. Hulthén has not commented on this, as far as I have observed. Her estimated firing temperatures range from 400°C to 900°C, the most common being 500–600°C. The reason for the colour change, starting at 300°C is obvious: the reactions causing colour changes are not completed in the original firing. The dark core frequently encountered in prehistoric pottery, is, in most cases, due to a short period of heating and thus incompletely oxidized organic impurities. The problems concerning firing conditions, oxidizing – reducing firing, are too complicated to be discussed here.

Another way of approaching Hulthéns work could have been to discuss the value and results of the extensive data recording. It seems that time and / or space has not permitted Hulthén to present the results of the analyses program, which was outlined in her methods section.

Hulthén has made the final conclusion herself: The work should be looked upon "as an attempt to systematize, priorate and test various methods and routines for investigation of ceramic artefacts. Much work remains within this field and future efforts will especially be devoted to development and improvement of investigation techniques." (p. 209).

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Ulla Engberg

RENATE ROLLE, *Totenkult der Skythen I. Das Steppengebiet, Vorgeschichtliche Forschungen* 18, I, 1 and I, 2, Walter de Gruyter, Berlin–New York 1979, DM 260 (I, 1: 188 pp., 45 tables, 2 maps; I, 2: 155 pp., 15 fold-out plans).

In the first volume on Scythian burial customs and social conditions Renate Rolle discusses the finds from the South Russian steppe, i.e. the black earth areas just north of the Black Sea between the mouth of the Danube and the lower reaches of the Don. To the north lies the taiga, the finds from which will be presented in the next volume. Cultural conditions on the steppe among a nomadic people subsisting on their domestic animals is characterized in part by contacts with the Greek towns by the sea and the mouths of rivers. The fertile land was already under cultivation by farmers when the Scythians, an Iranian nomadic tribe, penetrated and obtained control. It is primarily by means of the graves, including impressive mounds with deep graves, that Scythian society can be identified. The writer has spent two years in the Soviet Union and participated in e.g. the very productive excavation at Ordžonikidze in 1971. The material comprises more than 700 graves, several of which are the result of the successful large-scale excavations in recent years.

Renate Rolle states a number of criteria for social ranking, which are of interest also in a North European context. She operates with three categories to establish princely rank: the dimensions of the grave, people and means of transport buried with the deceased, and personal wealth. As we know, some of the grave goods are among the richest of the time owing to the presence of gold ornaments and gold foil for the clothes, richly decorated weapons, and status symbols. It is a curious fact that weapons may occur in female graves and beads in male graves; but otherwise the majority of goods are distributed according to sexual criteria corresponding to those of the West.

A characteristic of princely graves is that the mounds measure at least 5 metres across and contain extended burials at least four or five metres deep, with niches and hiding-places for treasures. The so-called catacombs are deep, large extensions, occasionally over 120 sq. metres in size. The mounds are built with turves of black earth, which may have been collected some distance away and possibly represents a whole field of pasture.

Princely status is further denoted by the accompanying burials of many people, horses, vehicles, worked gold and jewels of excellent quality and objects shaped like a sceptre. Goods imported from Greece, including collections of amphorae and metal vessels, might suggest funeral feasts. A curious feature of the Ordžonikidze ornament is the picture of an amphora which was evidently used for the storing of milk. As in Northern Europe we thus see imported wine containers used for local beverages. This obviously does not preclude importation of wine, but is a strightforward utilization of the vessels in their new context.

The high women's headdress with vase-shaped gold ornaments (on which the most recent publication is Sovjetskaja arkheologija 1980) and shoes with star-shaped gold buttons are most impressive. They must have distinguished the wearers as did the numerous pieces of decorated gold foil that covered parts of the dress.

Among the graves that meet the criteria mentioned seven or eight are singled out as being especially outstanding; another 23 have been accorded princely status. The former, at least, reminds one of Herodotus' description of royal burials; they involved, of course, the killing of numerous people and horses. His account of embalming also appears to be based on fact, since it is known from related graves in Altai where the corpses and other organic remains are in an excellent state of preservation.

Renate Rolle's book points out several interesting aspects of Scythian culture; some other points are not discussed and must be found in other publications, such as the classic works by Minn and Rostovtzeff. New finds are still adding to our knowledge of the links with Iranian art. The transition to the Sarmatian style is of considerable interest also for Northern Europe.

Another aspect of cultural life is the relationship between the nomads – the Scythians themselves –, the farmers and Greek cities. A productive agricultural economy with cereal croups was a *sine qua non* for these cities which imported food and functioned as ports of exportation to the western world. During the 4th to 3rd century B.C. the Scythians themselves were developing permanent settlements, both rural and semi-urban, the latter with metallurgy (mentioned on p. 160 ff), as, for instance, in the fortified town of Kamenskoje. The Scythians were being influenced by their environment and were adapting to the changing conditions brought about by cultural development and by a well-defined pastoral zone.

Altogether this first volume presents weighty documentary material which adds to our knowledge of Scythian society and culture. During the last fifteen years our knowledge has expanded considerably and this makes the present material even more welcome.

† Ole Klindt-Jensen

WERNER HAARNAGEL: *Die Grabung Feddersen Wierde. Methode, Hausbau, Siedlungs- u. Wirtschaftsformen sowie Sozialstruktur.* Röm. German. Komm. d. Dt. Archäolog. Inst. zu Frankfurt am Main u. Niedersächs. Landesinst. für Marschen- u. Wurtenforschung in Wilhelmshaven. Wiesbaden: Steiner, 1979. The publication consists of a volume of text with 55 illustrations, a volume of 190 tables, and 31 appendices.

Archaeological investigations of *terpen** settlements in the marshlands in North Holland and North-West Germany have been going on for many years. The first scientific study took place in Holland with van Giffen's excavations starting in 1908 and in particular the systematic excavations from 1931 to 1934 of the large *terp* settlement of Esinge in Groningen, which resulted in the first uncovering of large areas of a *terp* settlement. Since then excavations of several *terpen* have been carried out in North-West Germany and Holland. One of the most recent and most detailed investigations is the nearly complete excavation of the *terp* settlement of Feddersen Wierde near Wilhelmshafen.

The choice of Feddersen Wierde for excavation was not accidental. It was preceded by extensive studies of *terpen* in the marshlands between the Elbe and the Weser. In the years 1954–56 a great many drilling examinations had already shown that a complete excavation of Feddersen Wierde would provide a large quantity of data not previously attainable. The drillings also supplied a rough idea of the stratigraphy and habitation levels of the *terp* to be excavated. The excavations lasted from 1955 till 1963 and covered an area of 26,000 m². The *terp* has a diameter of approx. 200 m and a thickness of 4 m.

The excavations were conducted in exemplary co-operation between biologists and archaeologists under the day-to-day supervision of Professor U. Körber-Grohne, biologist, with Professor P. Schmid as archaeologist.

A preliminary survey was published as early as 1956, following the first excavation project the year before. Since then preliminary reports have been published almost every year, so that it has been possible to follow the work in progress and researchers have been able to study the results from a very early stage.

A major series of publications has been planned to present the results, and in 1967 there appeared two independent volumes by U. Körber-Grohne containing geo-botanical data from Feddersen Wierde. We now (1979) have volume II, dealing with the prehistoric buildings. Additional volumes are planned, including one by Rechstein on bone finds and one by P. Schmid on pottery.

The 325-page publication provides an exemplary account, with many illustrations, of the excavation results.

The main volume consists of 23 sections in which the different topics are analysed and comparable finds are discussed from, especially, North-West Germany and Holland. One of the first sections deals with the excavation method employed, including the recording of finds, and discusses the special approach required when excavating marshland settlements. The next section discusses the settlement at Feddersen Wierde and also refers to the other *terpen* in the North Sea region.

Occupation of the *terp* started during the 1st century B.C. and continued until the 5th century. Then there was a gap followed by fresh, scattered occupation during the Middle Ages (8th–9th century). There was no subsequent habitation.

The next section deals with houses and their structure and draws comparisons with houses of the same type from other areas. As a result of the unique preservation conditions obtaining in marshland, woodwork is often preserved from the lower structure of houses. This is true of the roof-supporting posts and the walls of interlaced branches, but also of the interior parts of the houses with fireplaces, stalls, dung channels etc.

A total of 205 houses have been excavated, but there are drawings only of the 52 long houses, on a 1:150 scale.

In this country, house posts have been preserved only in exceptional cases, so from a Danish perspective the unique marshland conditions of preservation offer an exciting prospect of completing our picture of Iron Age houses, since there is no great difference between houses in the North-West German marshlands and Danish Iron Age houses – only minor structural details dependent on differences between Danish and North-West German settlement patterns.

At a time when Iron Age long houses are being reconstructed and rebuilt in many places the house analysis in the Feddersen Wierde publication is particularly useful. It is noteworthy, however, that despite the excellent preservation conditions for organic material no fragments of the roof have been found among the great quantity of wood. This is interpreted by Dr. Haarnagel as the result of consistent re-use of the wood.

The long houses are of the type with living quarters and a fireplace at one end and stable and stalls at the other. In the middle of the house there is an entrance in each long wall, and this middle section is regarded as a kind of work room. Furthermore, these houses always have a characteristic doorway in the end wall leading to the stable.

The houses generally have transverse walls and in comparison with Danish Iron Age houses it should be noted that, unlike stall partitions and external walls, these walls are not dug into a foundation trench. Consequently, transverse walls have been recognized only where the woodwork remains. Another feature not found in Danish Iron Age houses is the frequent presence of small rooms with partitions, placed between the roof-supporting posts and the external walls.

Houses of a special type are the small houses with normal, spacious living quarters but a tiny stable where the few stalls are often built parallel to the long walls of the house. They are described as artisans' cottages, whose inhabitants worked mainly as artisans but also engaged in small-scale subsistence farming.

There are some long houses that have no transverse walls,

*) *terp* (singular) / *terpen* (plural): the Frisian word for artificial mounds built out of turf sods. The equivalent Dutch term is *wierde* as in Feddersen Wierde.

stall partitions, or dung channel and only a few chambers. These houses are believed to have had a special function, some as simply dwelling houses for a chieftain, others as meeting houses.

To almost every long house belongs a separate building indicated by the presence of 4, 6, 8, 9, 12 or 16 posts placed in a square. They are interpreted as storage outhouses. It is characteristic of the settlement that a long house with living quarters and stable as well as a storage outhouse form a farm unit.

The woodwork of the houses at Feddersen Wierde contains many details that reveal complete mastery of timber construction.

One of the most important sections in this publication is the analysis of individual habitation levels and the actual type of settlement. This places the settlement in a wider context. As far as the social structure at Feddersen Wierde is concerned, the surrounding drainage trenches and, to some extent, the surviving fences indicate the size of each farm unit.

Towards the end of the Pre-Roman Iron Age, 1st century B.C., began the large-scale exploitation of land in the Elbe-Weser triangle, both in the marshland and the geest behind it. This sizeable occupation must have been planned and directed. References are made to Heidenschanze, the nearly contemporary circular-walled settlement close by, in which only minor excavations have taken place. Heidenschanze is viewed as the centre of the new settlement and it probably contained a fortified market or a trading post where people from the geest and the marshlands could exchange goods.

The earliest habitation level, from the second half of the 1st century B.C., consists of five equally large farmsteads, each comprising a long house and a storage outhouse. It is not a raised settlement, but is superimposed on the original surface. It was later enlarged to a total of 11 farmsteads placed in a row close to each other.

The first *terp* habitation proper is found in the next habitation level, 1st-2nd century A.D. Each farm is built on its own *terp*, the core *terp*, which is surrounded by a fence and a drainage ditch. The incipient *terp*-formation was caused by a slight rise in sea level. In this settlement the village plan was radically altered. The settlement was arranged radially around an open square, i.e. a change in village structure. Artisans' cottages can now be identified for the first time. The radial village plan persist in later levels. Subsequently, there was a gradual enlargement of the mound with more farms and more workshops. Settlement level No. 3 contains a dike surrounding parts of the habitation site, where a larger farming unit now begins to emerge. It is the oldest dike of its kind known so far.

The enlarged farming unit consists of several farmsteads surrounded by a fence. It is interpreted as a chieftain's estate. There are two long houses without stables. One of them is regarded as the chieftain's residence, while the other houses within the unit provided stabling for his cattle. The other long house has no kind of interior divisions and contains a hearth in the usual place in the western wall. This house is regarded as a kind of meeting house. Several graves with human skeletons have been discovered near it, so it is possible that it may have been a centre of both secular and religious activities.

As far as I can judge from the published plans there is no difference in the actual construction between long houses with living quarters and stable on the one hand, and meeting houses on the other. It is curious that the meeting house only has a fireplace in the western end as is customary in long houses with a stable. There is an entrance in the middle of each long wall and one at the house end, as is also customary. If it is indeed a meeting house, the location of the doorway at the east end of the house, which in the long houses evidently opens into the stables, may also appear strange. Though there is no storage outhouse belonging to the meeting house, nevertheless the interpretation appears problematic.

The new organization of the village is thought to have emanated from the chieftain's farm. The settlement continues to expand in later levels. In the habitation level from the 3rd century the individual core *terpen* have amalgamated into one large mound. The individual farms on this mound are separated only by narrow drainage ditches or fences, and the settlement now covers an area of c. 210 m in diameter.

In this settlement layer there is a continued expansion of the chieftain's farm, near which the majority of the imported objects have been found. Furthermore, it now becomes possible to distinguish a new, completely independent workshop area north of the settlement. This artisan area is regarded as belonging to the chieftain's farm so that handicrafts as well as trade are concentrated around this farm. The imported goods are mainly from the Roman provinces. Judging by the finds, trade with these areas culminates during the 4th century.

Later in the 4th century (habitation level No. 7) the state of preservation has deteriorated but the settlement has grown to comprise a total of 25 farms. It now extends beyond the area excavated. The separate workshop area no longer exists but has become covered with small farms. Otherwise the settlement is unchanged though all the farms turn out to be small, suggesting that agriculture is on the decline.

The last level from the 4th-5th century is in a worse state of preservation because it is found immediately below the present-day ground surface. The settlement pattern changed in the course of the 4th century. The radial village plan has been abandoned. There are no large farms, only two middle-sized and twenty small farms. An impoverished population in the last century before the settlement is abandoned?

The smaller houses suggest that the settlement now supported itself mainly by handicrafts. After the 5th century the rise in sea level caused the *terp* to be abandoned. It is especially noteworthy that there is very little change in the location of farms from the foundation of the radial village until its end.

Owing to the excellent conditions of preservation a very large quantity of bone has survived. A total of 70,000 have been discovered, of which 60,000 have been identified. This creates fresh opportunities of assessing occupational and economic conditions in the different levels. It is clear from

the great number of bones and the numerous stalls in the long houses that stock breeding dominated the economy. According to the bones, the domestic animals were cow, sheep, goat, pig, horse and dog. The extensive bone material has provided a number of excellent descriptions and dimensions of the various domestic animals that lived in the settlement, and the number of stalls indicates the size of the winter herd in each settlement level.

The number of stock appears to have increased steadily from 100 animals in the earliest level to 450 animals in the 3rd century, after which it decreased during the 4th-5th century to c. 242 animals. Increased workshop activities probably compensated for the decline in stock-raising.

The excellent preservation conditions for bones have also led to the discovery of several human and animal skeletons buried in pits within the settlement area. Most of them probably represent regular sacrifices. Animals are sometimes buried under the hearth, under the door, or near the houses. Several human skeletons are buried in pits underneath the settlement. The usual burical custom is cremation, but here we find burials of whole skeletons – children as well as adults. A few skeletons of children have been found buried under the fireplace. They too are regarded as victims of some kind of sacrifice.

The *terpen* are densely distributed, one or two km apart. This implies that practically all available marsh and grassland must have been used for pasturing the large herds. Because the marshlands have a clear boundary it is possible to quantify the area of pasture available to each *terp*. Bone analyses indicate that about half the animals were cattle, one quarter sheep (goat) and the last quarter divided between horses and pig.

The geography of the area shows that compared to the extensive pastures there was little arable land available in the marshland. At the time of the earliest settlement, around the birth of Christ, there were cultivated fields of nearly the same size as those found on the mainland. The fields are bounded by ditches that served as drainage canals. It should be emphasized that cultivation was identified by the presence of furrows, and cross sections reveal that the soil was turned, i.e. it was ploughed with a plough with mould-board. In this connection one of the finds from Feddersen Wierde is significant, namely a triangular plough-share of iron. It is one of the earliest finds of a plough-share and also among the earliest evidence of ploughing with a mould-board known so far north.

The comprehensive biological investigation has revealed the vegetation around Feddersen Wierde and also which cereals were cultivated. It appears that c. 50% were barley and oats, 25% beans and c. 25% flax. Around the settlement have been discovered remains of a kind of garden in which there are visible traces of digging, probably with a spade.

Hunting and fishing played a fairly minor role at Feddersen Wierde. Bones of wild animals constitute only 0.5% of the total number of bones. All the game are animals not found in the marshland, only in the geest.

Another important section deals with handicraft at Feddersen Wierde. The find maps include iron slag and crucibles, bone tools of various types, grindstones and whetstones, spindle whorls, warp weights as well as grinding slabs, but strangely enough iron slag and crucibles are the only artefacts that indicate special workshop areas.

Among the household articles the querns are important. Some of them are made of local granite procured from the geest, and a great many others are imported querns made of Rhine Mayern basalt. No special workshop areas for querns can be recognized. One special discovery should be mentioned in this context: a wooden handle for the cover stone of a quern, which could hold it and help turn it. The querns of Rhenish basalt are also among the earliest finds of this kind. As early as around the birth of Christ they represent 7%, and they are particularly numerous in the 4th-5th century, representing 62% of the querns.

The textile finds are particularly noteworthy. There is a great number of them and they reveal a very high quality of weaving technique.

Another subject is pottery kilns. The publication contains a discussion of one of the best-preserved pottery kilns found so far. It was discovered in 1967 at Boomberg-Hatzum and dates from the Early Roman Iron Age. It is among the most advanced kilns found until now and differs radically from previous finds.

There is a great number of worked bones. The semi-finished ones suggest the existence of a few manufacturing areas near some small workshops. In general, however, the find maps seem to indicate the absence of specific workshop areas for the working of bones.

An exceptionally large number of wooden objects have survived. The people made furniture: the so-called milking stools, seats of chairs and whole chairs – a group of artefacts not previously present in settlement finds. There is also evidence of cooperage, and several parts of vehicles and spoked wheels have been found.

Other important finds include turned wooden bowls and vats as well as handles. There can be no doubt that wood-turning was carried out on the site itself. To the best of my knowledge this is the first demonstration of turnery in such an early settlement find. It is a discovery of particular significance for the turned wooden artefacts from the Early Iron Age in Denmark. They show no signs why they should not have been made locally, as indeed is suggested by some turned pieces of wood from the recently excavated basement at Overbygård in Vendsyssel (Jutland). The turned wooden dishes are of masterly execution and could hardly be bettered today.

Two types of artisans are recognized: a) artisans who support themselves by small-scale agriculture and b) artisans solely dependent on their trade – the blacksmith and the bronze founder. The blacksmiths worked in the workshop area situated in the chieftain's farm-yard, not in the square by the artisans' cottages inside the village. The whole workshop area is clearly situated on the outskirts of the settlement, and the artisans are consequently thought to have belonged to the chieftain's estate. Judging by the finds I consider this

relationship somewhat dubious. It seems equally plausible that we are dealing with a special workshop area, which to some extent was kept isolated from the ordinary functions of the village, and from the livestock. Many finds of crucibles for bronze casting indicate that workshops too existed in the village. They are mainly concentrated in two areas near two workshops inside the settlement, but not, according to the find maps, in the same areas as the smithies. In this connection it will be interesting to see whether the analysis of pottery finds will lead to identification of special pottery workshops in the area.

There is evidence of active trading at Feddersen Wierde. Because of its location in marshland many of the daily requirements of material – wood and clay – had to be procured in great quantity from the geest. There are also clear signs of long-distance trade with the provinces of the Roman Empire. Trade started already in the first settlement and is associated with the chieftain's farm, which begins to appear simultaneously with the growing trade.

The imported finds are Roman *terra sigillata* sherds, glass beads and, especially, the many basalt querns. There is no evidence of the type of goods exported from Feddersen Wierde, but it can hardly have been anything but animal food, meat and hides. It is believed that there was a great demand for provisions for the Roman legionaries, and perhaps also for cloth: as mentioned above the textile finds were of a high quality.

It is important to note that twice during the existence of the settlement there was a visible change in the social structure. In the earliest habitation level the farmers were, on the whole, equal. The earliest members of the village community were farmers enjoying equal rights, but this state of affairs changed in the late phase of the next level. Habitation level No. 2, and especially level No. 3, reveal the emergence of social stratification, with the rise of a leader who must be characterized as the village chieftain. The size of the farms suggests a gradual transition towards this social stratification.

The excavation of Feddersen Wierde is the result of a deliberate effort to locate the most suitable *terp* that would provide a maximum of excavation data. Both the excavation and the publication of results have taken place in a spirit of exemplary co-operation between archaeology and the natural sciences. It illustrates how such efforts may produce the best possible results from a complete excavation, unlike the date yielded by an incidental investigation conditioned by external factors (as is, unfortunately, often the case, also in Denmark).

Although the publication under review does not present the complete material, the presentation and interpretation are so satisfactory that the reader gets a clear impression of the potential of the material as well as a number of interpretations with which one can disagree only on minor details. The comprehensive find material has widened our understanding of Iron Age villages, and as a *terp*-settlement publication it is a valuable supplement to the Danish village excavations, which have retrieved organic material only in exceptional cases.

In future, the research programme focussing on Iron Age settlements in the marshlands will be significantly amplified by the recently finished complete excavation of the neighbouring geest-settlement at Flögeln, but it is beyond the scope of this review to assess the relations between the *terp*-settlement of Feddersen Wierde and the geest-settlement. The publication of the investigation at Feddersen Wierde is highly important for our knowledge of settlement and, by implication, social structure in the Iron Age.

Steen Hvass

U. NÄSMAN and E. WEGRAEUS (editors): *Eketorp. Fortification and Settlement on Öland / Sweden. The Setting.* Royal Academy of Letters, History and Antiquities. Almqvist & Wiksell International, Stockholm, Sweden, 1979.

The publication of the Eketorp monument, volume 2, deals with a variety of themes: "Introduction" by U. Näsman and E. Wegraeus, "Öland during the Iron Age and early Middle Ages" by U.E. Hagberg, "The Surroundings of Eketorp" also by U.E. Hagberg, "Medieval Eketorp and Contemporary Turn-over Places on Öland" by N. Blomkvist, "The Shaping of the Landscape of Eketorp. Geology and Hydrology" by C.-G. Holdar and finally "Agronomic Practices in Migration Period Eketorp" by H. Helbæk.

The publication is an essential supplement to the first volume, which primarily described and analysed the ringfort itself, its different phases, its development and internal function. In the new publication Eketorp is related to natural as well as man-made factors, to the landscape as well as other surviving sites, to the physical as well as the cultural landscape. In this way we gain an understanding of Eketorp's location and its function, both internally and in relation to other sites.

The introductory section gives a brief outline of Eketorp's location and development, discusses practical matters regarding the form of publication, introduces the authors and describes their involvement with the many-sided work on the Eketorp material.

U.E. Hagberg's survey of the Iron Age and Early Middle Ages on Öland presents a wide range of material without which Eketorp cannot be seen in its proper context. The section summarizes the archaeological history of Öland and the other Baltic islands and also discusses recent archaeological excavations. There is also a comprehensive survey of burial and settlement sites. Recent large-scale excavation projects have disclosed the very depressing fact that until about 1940 only approx. 10% of the island's ancient monuments known today had been recorded.

A special section is devoted to the Roman Iron Age, the late phase of which is contemporaneous with the earliest Eketorp construction (I), the refuge fort. It is important

partly because during this period Öland played a significant role in a highly complex pattern of communications, and partly because of the advent in recent years of much essential material with a bearing also on our understanding of the position of Öland within the Scandinavian region. As in other recent publications the special female grave goods – knives, pins and bodkins for leather working – are associated with extensive stock-breeding and the large-scale working of hides – an article in great demand in the Roman Empire. While animal husbandry was important, cereal-cultivation was also intensified, as indicated by pollen analysis. Contacts with the Roman Empire – perhaps via other regions – resulted in the presence of Roman products such as glass, bronzes, coins, figurines etc. In comparison with Gotland only a few of a great many known farms have been excavated, but a picture has now emerged of settlements similar to e.g. Vallhagar on Gotland. Moreover, recent excavations have disclosed houses without external walls of stone but built according to the long-house pattern as known, for instance, from Denmark. As far as we can tell from the relatively few excavations, Öland too saw a break in settlement pattern towards the end of the Early Germanic Iron Age, often observed in connection with the large hoards of solidi. Today we have far more varied interpretations of these deposits. The finds also include bog sacrifices like Skedemosse.

U.E. Hagberg's account furthermore includes later phases of the Iron Age as well as a very important survey of Viking Age / mediaeval sites, especially those with trading functions. Hagberg's account is a welcome updating of existing surveys, an updating that is difficult for outsiders to accomplish because of shortage of publications.

U.E. Hagberg is also the author of the analysis of Eketorp's surroundings (Gräsgård parish). There is a more detailed analysis of Roman imports, gold finds, iron bars (probably imported from Småland) and of the buildings for whose protection the refuge fort was erected. The same applies to the later material.

To facilitate a proper understanding of Eketorp's functions it is only natural to include an analysis of find material from the surrounding area. It seems inadequate, however, to study the material – such as imported Roman goods – from only one parish. In this context the whole of Öland would appear to be the smallest geographical unit on which conclusions can be based concerning a prehistoric phase with considerable external activity.

N. Blomkvist's section on the early mediaeval phase of Eketorp (Eketorp-III) and the contemporaneous habitation on Öland is a very important contribution to the debate on early urbanization and its characteristics. The characterization of Eketorp-III is affected by the fact that traditional definitions of the town do not include, for instance, densely populated areas without agriculture but with handicrafts.

Öland's important role in the Baltic trade during the Iron Age continued in the mediaeval period. Its political rulers exploited this position throughout the Middle Ages. According to Blomkvist, Swedish mediaeval towns were built on the model of North German sea ports which, in their turn, were inspired by the towns of the Rhineland. In Sweden urbanization seems to have been promoted by the central authorities and to some extent by the Church. In this way an exchange system for goods was introduced that lasted throughout the Middle Ages. Although the foundation of towns was due to influences from the South, the towns did not expand in a commercial vacuum but at the expense of a less sophisticated system often called "*farmanna*", i.e. agriculturalists engaged in occasional long-distance trade. The foundation of towns also led to the creation of artisan and trading centres.

The character of Eketorp-III gives it a central place in the discussion of the minimum requirements for the definition of a town. As a case in point Blomkvist refers to Fritz's narrow definition of a town in contrast to Schück's broader definition. In his further analysis of Eketorp-III, Blomkvist adopts Fritz's definition according to which Eketorp-III does not qualify as an urban settlement. Instead Eketorp-III is described as "an organized concentration of houses where, to judge from the find material, many have lived or regularly stayed, chiefly engaged in other activities than the production of things necessary for their livelihood and for their own use." This description can apply to a town, a trading centre, an estate, a manufacturing industry, a monestary, a fishing place etc. Until an analysis of artefacts from Eketorp-III is available it is impossible to decide whether the settlement was in contact with the rest of South Öland or with other areas.

Blomkvist stresses the importance of the function of a society within its own region, in which a distinction is necessary between natural centres of, for instance, concentrically located surroundings called "central places" and centres that have arisen through special circumstances, e.g. centres that exploit natural resources and have a multi-regional market, called "production places". A third concept is that of "transit places", i.e. settlements that have arisen as a result of special boundary conditions, e.g. a border or a place where great quantities of goods are reloaded because of transport factors. Clearly Eketorp-III must have pursued activities that made it attractive for villagers to leave home and settle elsewhere. What places of this kind have in common is the fact that goods or abstract values are produced there and change owners. They are referred to as "turn-over places". This concept is subdivided into actual "trade places" where goods are purchased and exported, and "administrative places" which provide authority, expertise and cultic values, i.e. suppliers of abstract values. The systematic exchange of goods and/or abstract capital is common to these places, whether professionally or otherwise.

Eketorp-III is interpreted as a densely populated "turn-over place" with a ring-wall and with houses grouped round an agora. The settlement is not an agricultural site though there are indications that it was of a more than temporary nature. Only the artefact analyses pending can determine whether Eketorp-III was an administrative centre, a trading centre or both. In relation to this point the article contains an extremely comprehensive survey of a) other "turn-over places" such as Köping and Sikavarp (both trading centres)

and Borgholm (administrative centre) and b) other ancient monuments that may suggest the presence of such a centre, e.g. a chapel, a well or other buildings.

The historical analysis of Eketorp-III is forced to conclude that by itself the method employed is incapable of discerning the function of Eketorp-III, although it resulted in a theoretical model and a number of hypotheses.

Several of Öland's "turn-over places" seem to be in close association, Eketorp-III, for instance, with the fishing village of Kyrkohamn on the southern tip of Öland.

C.-G. Holdar's section on the shaping of the landscape around Eketorp comprises both a geological and a hydrological review.

The bedrock consists of limestone, underneath which are Cambrian slate and sandstone. To the west, Öland rises sharply to a ridge called "Västra landborgen". From there the terrain declines towards the east. The dominant terrain on South Öland is Stora Alvaret (300 km$^2$), bounded to the west by "Västra landborgen" and to the east by a Littorina coastal cliff. Stora Alvaret consists of bedrock and in parts a thin remnant layer of wind-eroded earth; clay soil has made settlement and cultivation possible. The Littorina cliff delimits a series of elongated lakes and swamps; Eketorp is situated by one of these basins.

Holdar's paper is crucial to our understanding of Eketorp's location and function. His account also makes the exploitation of the landscape comprehensible and logical.

The last chapter of the book is H. Helbæk's discussion of agriculture in Eketorp during the Migration period (Eketorp-II). The section is based on the identification of charred grains and other seeds recovered during the excavation.

The inhabitants of Eketorp-II (permanent agricultural settlement) cultivated gravel areas north, east and south of the swamp to the east of Eketorp. Judging by the plant remains the areas were exploited intensively, including the swampy banks of the bog and the sandy zone along the foot of the Littorina cliff.

The analyses of the Eketorp material – the most extensive we have from Sweden's Iron Age – are related to our knowledge of plants on Gotland and Bornholm, in particular, and the Baltic countries in general. Similarities and differences between the various areas are accounted for.

Two species of six-rowed barley were cultivated on Öland (Hordeum vulgare L. and H. hexastichum L.). The question is raised whether this combination of two barley species came from climatically severer zones further north in Scandinavia or whether it was a common mixture in the Baltic countries, and was introduced from there. It is noteworthy, however, that certain weeds of Siberian/Middle Eastern origin were present on Öland and Gotland during the Migration period, i.e. several centuries before they are known from other parts of Scandinavia. In Denmark the two barley species have been found together only on one site, namely the settlement of Drengsted in South Jutland.

An important feature of Eketorp's range of weeds etc. is the great proportion of Galium (the madder family). These plants probably reached Öland from the East in the company of flax, with which they are specially associated as weeds. Other weed seeds point in the same direction, including Neslia (ball mustard), which is unmistakably of eastern origin: it comes from Siberia and is a common weed in the Middle East. It was first discovered west of Russia in the barley from Eketorp. Thus it is clear from Helbæk's analysis of Eketorp's barley remains that – as with the grain from Fyrkat in Denmark – with the diffusion of cultivated plants through trade and other contacts many wild plants were moved from one area to another and established themselves where ecological conditions were satisfactory.

The conclusion drawn from these analyses is that in several respects Eketorp's seed material shows close contacts with the Baltic countries to the south and east. This is interpreted as the result of generally peaceful commercial relations between the three large Baltic islands and the areas to the east and south. The grain has so far been traced only towards the east; the place of origin of some weeds has been fully established.

Some of the Eketorp weeds were found in the northern Roman provinces, though considerably earlier. Helbæk concludes therefore that since the Romans never had direct communication with Denmark and the Baltic region we must assume the existence of two independent diffusion routes: the Danube and the Rhine were essential to the introduction of plants in Western Europe, while more easterly rivers like the Oder and the Vistula must have been the main routes south as far as the Baltic region is concerned.

Helbæk's analysis of the seed material from Eketorp makes very exciting reading. Similar analyses ought to be a matter of course these days – if the material survives – in all major investigations of settlement sites where land exploitation is one of the problems being explored. This procedure gives valuable data not only on the cultivation of cereals and other plants but also on associated weeds and growing conditions, which in their turn may illustrate which parts of the surrounding area came under cultivation. An analysis of cereal combinations and weeds may also reveal contacts with distant regions. Even so, Helbæk's unconditional eastern derivation, motivated by the lack of contacts with the Roman Empire, produces some reservations.

Recent research into the Roman Iron Age in Scandinavia indicates, for a variety of reasons, that there was fairly regular contact with the Roman Empire, which may therefore have influenced the special picture shown by the Öland material. On this point Hagberg's paper is therefore not in agreement with Helbæk's interpretation, and a comment on this would have been welcome. For the same reason an analysis of seed material from other parts of Scandinavia where the archaeological source material suggests contacts with the Roman Empire would be very important for testing Helbæk's theory.

Volume II in the series of publications on Eketorp is a very valuable supplement to the first volume and, according to the preface, was originally intended to have been published as an integral part of it. We now await publication of, *inter alia*, the artefact material.

The many analyses that have been carried out in connec-

tion with the excavation of Eketorp are exemplary in their diversity, and it would be desirable if this procedure was adopted far more often. The efforts have indeed been rewarded, for the analyses in volume II are successful in placing Eketorp in a well-documented context with other prehistoric and historic phenomena. At the same time the publication as a whole succeeds in accounting for fascinating phases of the cultural development of Öland, while its individual papers make valuable contributions to research in the whole of Scandinavia.

Ulla Lund Hansen

INGRID ULBRICHT: *Die Geweihverarbeitung in Haithabu. Die Ausgrabungen in Haithabu*, Vol. 7. 151 pp., 77 diagrams, 40 find distribution maps and 54 plates. Summary in German, English and Russian. Neumünster 1978.
HEID GJÖSTEIN RESI: *Die Speicksteinfunde aus Haithabu. Berichte über die Ausgrabungen in Haithabu*, 14. 184 pp., 132 figs. Summary in German and Norwegian. With contributions by Else Augdahl, Bjørn E. Alfsen and Olav H.J. Christie. Neumünster 1979.

In the 1960's the pre-war Hedeby excavations were resumed with extensive investigations both inside and outside the semi-circular earthwork. This has naturally resulted in a high output of publications in recent years based on the Hedeby material. Thus the monograph series "Die Ausgrabungen in Haithabu" has been expanded with several important volumes, and a new series of publications has also appeared, edited by Kurt Schietzel, "Berichte über die Ausgrabungen in Haithabu", which – usually in the form of articles – presents minor or major topics concerning the archaeology of Hedeby.

Ingrid Ulbricht's book on the working of antler belongs to the monograph series and was submitted for a doctorate at Hamburg University in 1975. The work is based on nearly all the antler material discovered inside the semi-circular earthwork in recent excavations and only excludes the combs which have already been analysed by Wolf Dieter Tempel in his doctoral thesis. The material then consists of no less than 288,000 pieces comprising both raw material, semi-finished and finished artefacts as well as waste products. The study seeks to clarify the technical and organizational aspects of antler working – primarily comb making – whereas it does not aim at establishing the actual typology or dates of the finished products.

The material consists almost exclusively of antler from red deer with, strangely enough, reindeer as the next most important source, though the latter accounts for only 0.5% of the material. By a meticulous examination of the marks left by working Ingrid Ulbricht is able to demonstrate which tools and manufacturing techniques were used in connection with the manufacture of finished products such as combs, pins, gaming counters, dice etc., and with her knowledge of the specific semi-finished goods can determine which products were made at Hedeby.

The find distribution is discussed in immense detail in an attempt to grasp the means of production. It is impossible to identify workshops, but refuse heaps containing antler can be found scattered throughout the settlement area, and it can therefore safely be argued that there was no special comb manufacturing quarter.

The find distribution has very properly been examined in great detail both from a horizontal and a stratigraphic point of view, and the large-scale systematic surface collections carried out in recent years at Hedeby have also been studied. Even so the text could have been considerably shortened on this point since the distribution analyses do not yield many results and, furthermore, are well illustrated in 40 excellent maps.

Then, however, the writer embarks upon some exciting subjects which the abundant material makes possible: an appraisal of the scope of production and organization together with an assessment of the trade in raw material and finished products.

Because of the presence of certain waste fragments (sawn-off pieces of the middle sections of the combs) Ingrid Ulbricht is able to establish that a total of approx. 2000 combs were produced within the excavated area. Considering that this represents only 6% of the town area and considering that the manufacture of combs at Hedeby only began in the 10th century and is untraceable in the top aerated culture layers, it can be concluded that there was a maximum annual output of 250 combs at Hedeby. In view of this modest production Ingrid Ulbricht supposes that the comb makers must have had other daily tasks than just manufacturing combs, although they must definitely be regarded as specialists. The methodical exploitation of the raw material and the manufacturing technique itself testify to their expertise. During the 9th century it appears that the inhabitants of Hedeby imported their combs from Friesland and Scandinavia but in the 10th century a production started in Hedeby. The large amount of red deer antler is not accompanied by finds of bones from this animal, so the antlers must have been acquired by trade, in the last resort from farmers and foresters. Ingrid Ulbricht does not consider the possibility that migratory comb-makers came from time to time to Hedeby with their materials and carried on business for a time.

Towards the end of the Hedeby period, i.e. the 11th century, there was a change, in that bones now began to be used for the manufacture of combs, and this trend persisted in Schleswig during the early Middle Ages. The writer interprets this to mean that in this period the forests became hunting grounds for the privileged – royalty and nobility – as a result of which antlers functioned as trophees and therefore became less accessible to the comb makers. However, Ingrid Ulbricht herself is sceptical about this hypothesis, since in a number of other sites antler continued as a raw

material for a very long time. The correctness of this social historical explanation obviously depends on the results of further investigations. It may be added, however, that a similar shift from antler to bone is also revealed in the 13th century deposits at Søndervold in Århus. It is therefore very reasonable to look for a general explanation of this change in the comb-making technique.

Heid Gjöstein Resi's study of soapstone finds takes up an entire volume of "Berichte über die Ausgrabungen in Haithabu". The material comprises all finds of soapstone at Hedeby, a total of 3,428 pieces with a total weight of c. 540 kg, and thus constitutes the biggest collection of soapstone from a single site. It consists almost exclusively of fragments, primarily of vessels, though *tuyères*, spindle whorls, casting moulds etc. also appear. A sensible typological division provides an insight into the diversity of the Hedeby material; furthermore there is a compilation of different find lists covering the appearance of soapstone in Scandinavian and North European finds.

The large amount of material has also prompted special investigations, e.g. into the use of soapstone vessels, which reveal that it was the medium-sized vessels that were primarily used for cooking (external traces of soot), and that the vessels with a crudely worked interior were also used for this purpose.

Yet the soapstone vessels should be viewed only as a precious supplement to locally made cooking vessels. This is clear not just from the numerous finds of sooty pots of local manufacture but also from the relatively modest number of soapstone vessels that we are actually dealing with. For if we assume that the entire Viking Age quantity of soapstone still remains within the semi-circular wall, and if we further regard the quantity found within the excavation area as fairly representative, then Heid Resi can demonstrate two methods of calculating the original number of soapstone vessels. On the basis of the rim-sherds, each of which of course represents a certain percentage of the whole pot rim, we can calculate by a simple process of addition the rim percentage of the whole excavation area as being the equivalent of 65 whole vessels, which corresponds to approx. 1085 soapstone vessels for the whole semi-circular area. However, Resi reduces this figure by 25% on the grounds that the whole town is unlikely to have the same density of finds as the centrally located excavation area, and she thus arrives at a total of 814 vessels at Hedeby. By a more complicated method of calculation based on the weight of the soapstone fragments she arrives at a total number of 853, and she therefore concludes that imports into Hedeby amounted to 700–1000 soapstone vessels altogether. This means that the whole material could well have been transported in a single shipload, as far as both weight and volume are concerned.

Presumably the soapstone objects actually arrived as finished products, since there is only an insignificant quantity of waste products, and both archaeological and scientific investigations point to East Norway / South-West Sweden as the production area for Hedeby's soapstone material.

It is impossible of course to discuss here all the results presented in the two books under review. Both publications give evidence of much thorough work, and because of the large amount of find material from a well-studied site they arrive at results of a kind that can rarely be obtained. Unfortunately, the absence of stratigraphic data for the excavation weakens the statements on chronology, but it may be hoped that dendrochronology will help to remove such difficulties in similar works to come.

H. J. Madsen

The reviews in this volume were translated by Ole Bay-Petersen