J. TROELS-SMITH

THE ERTEBØLLE CULTURE AND ITS BACKGROUND

(Figs. 1–7)

The Danish kitchen middens, refuse heaps from the Older Stone Age of the Danish sequence (i.e. the Mesolithic), or the Ertebølle culture, have been investigated and interpreted in different ways for more than a hundred years (Troels-Smith, 1953).

Japetus Steenstrup was of the opinion that kitchen middens were contemporaneous with the Megalithic tombs and were the actual settlements of the Megalithic culture.

Worsaae held them to be older and belonging to a hunter people, in contrast to the younger Megalithic people, who cultivated grain and kept cattle.

Otto Rydbeck (1928) believed that the hunters and fishermen of the Ertebølle culture had lived at the same time as, but relatively uninfluenced by, the contemporary Megalithic farmers; while

C. A. Nordman (1927) pictured the Ertebølle culture as a secondary Neolithic culture of hunters and fishermen, who were gradually and increasingly influenced by the peasant cultures which existed to the south-west and south of Denmark, so that the Ertebølle culture developed into the Megalithic culture.

Iversen (1937) could show that the Stone Age Sea, the Tapes Sea, or the period of the Littorina Sea in Denmark, comprised several transgressions and regressions (3, or possibly 4), and at the same time the author (Troels-Smith, 1937a and b) presented pollen-analytical and stratigraphical material, which seemed to show that the Ertebølle culture was tied to the last two transgressions, of which the Younger (the Sub-boreal) was presumed to be contemporaneous with the Dolmen Period and the Passage Grave Period. These investigations thus seemed to show that Otto Rydbeck was right in his view that the hunters and fishermen of the Ertebølle culture had lived fairly undisturbed by the contemporary Megalithic people.

In the course of the last 25 years we have got to know settlements and individual finds, which partly supplement our knowledge of the Ertebølle culture, partly throw it into relief by giving it chronological depth. To this must be added that an intensification of the pollenanalytical method has enabled us to obtain substantially more exact relative datings than before, and by means of the Carbon-14 method it is
### Table 1. Indicating the Presence of Certain Characteristic Types of Artefacts from 24 Settlements

<table>
<thead>
<tr>
<th></th>
<th>Rhombic Arrows</th>
<th>Oblique Arrows</th>
<th>Transverse Arrows</th>
<th>Core Axes</th>
<th>Core Axes with specially treated edge</th>
<th>Flake Axes</th>
<th>Pointed-Butted polished Axes</th>
<th>Flint-Edged Spears</th>
<th>Deer-Antler Axes, T-shaped</th>
<th>Lamps</th>
<th>Pointed-Base Jars</th>
<th>Thickwalled Fragments</th>
<th>Thinwalled Fragments</th>
<th>A-Pottery</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Kongemosen</td>
<td>2500</td>
<td>?</td>
<td>90</td>
<td>114</td>
<td>3</td>
<td>8</td>
<td>1</td>
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<td>2. Gislinge Lammejord</td>
<td>27</td>
<td>2</td>
<td>26</td>
<td>111</td>
<td>3</td>
<td>8</td>
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<td>3. Amager, Niveau I</td>
<td>32</td>
<td>1</td>
<td>65</td>
<td>100</td>
<td>4</td>
<td>8</td>
<td>1</td>
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<td>4. Vedbæk Boldbaner</td>
<td>445</td>
<td>58</td>
<td>69</td>
<td>391</td>
<td>10</td>
<td>8</td>
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<td>5. Amager, Niveau II</td>
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<td>6. Bloksbjerg (lower part)</td>
<td>2(?)</td>
<td>102</td>
<td>90</td>
<td>248</td>
<td>13</td>
<td>8</td>
<td>1</td>
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<td>7. Hendriksholm</td>
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<td>8. Bloksbjerg (upper part)</td>
<td></td>
<td>115</td>
<td>225</td>
<td>163(?)</td>
<td>84</td>
<td>8</td>
<td>1</td>
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<td>9. Dyreholm I</td>
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<td>10. Nivaagaard</td>
<td></td>
<td>294</td>
<td>455</td>
<td>152(?)</td>
<td>159</td>
<td>8</td>
<td>1</td>
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<td>11. Amager, Niveau III</td>
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<td>12. Ertebølle</td>
<td>56</td>
<td>309</td>
<td>236</td>
<td>337</td>
<td>x</td>
<td>8</td>
<td>1</td>
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<td>1</td>
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<td>13. Dyreholm II</td>
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<td>14. Amager, Niveau IV</td>
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<td>15. Godsted I</td>
<td>292</td>
<td>1694</td>
<td>45</td>
<td>280</td>
<td>x</td>
<td>8</td>
<td>1</td>
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<td>16. Brabrand (1903-04), (1944-45)</td>
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<tr>
<td>17. Klintesø</td>
<td></td>
<td>7</td>
<td>37</td>
<td>158</td>
<td>x</td>
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<tr>
<td>18. Alstrup II</td>
<td></td>
<td>5</td>
<td>15</td>
<td>117</td>
<td>x</td>
<td>8</td>
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<tr>
<td>19. Vester Ulslev</td>
<td>153</td>
<td>1068</td>
<td>11</td>
<td>275</td>
<td>x</td>
<td>8</td>
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<td>20. Kassemose</td>
<td>52</td>
<td>215</td>
<td>4</td>
<td>411(?)</td>
<td>8</td>
<td>8</td>
<td>1</td>
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<tr>
<td>21. Ordrup Næs</td>
<td>325</td>
<td>1796</td>
<td>2</td>
<td>201</td>
<td>x</td>
<td>8</td>
<td>1</td>
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<tr>
<td>22. Muldbjerg I</td>
<td>6</td>
<td>267</td>
<td>1</td>
<td>146</td>
<td>x</td>
<td>8</td>
<td>1</td>
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<tr>
<td>23. Store Valby</td>
<td>5</td>
<td>43</td>
<td>6</td>
<td>323</td>
<td>x</td>
<td>8</td>
<td>1</td>
<td>2</td>
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<td>24. Oxie</td>
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now possible to obtain absolute chronological datings with an accuracy of ± 100 years. Increased knowledge of the pollen of cultivated plants has, furthermore, made it possible to establish the introduction of agriculture and animal husbandry in relation both to the vegetational history and to the sequence of cultures, in so far as the culture periods are pollen-analytical dated.

My idea here is to give a short outline of my interpretation of the Ertebølle culture and its background, based on the material at hand.

**WHAT DOES THE CONCEPT "ERTEBØLLE CULTURE" IMPLY?**

The authors mentioned above have all mainly based their studies on the kitchen middens or refuse heaps from the Older Stone Age, as they are to be found in the shape of accumulations of salt water mussels and other shells (chiefly oysters), mixed up with culture remains of stone, bone, antlers and ceramics, situated on the uppermost shore lines of the Littorina Sea. In other words; the concept „Ertebølle culture" covers the contents of the Ertebølle kitchen midden (*locus classicus*) and the other refuse heaps form the Older Stone Age, as described by Sophus Müller a.o. in the monograph “Affaldsdyninger fra Stenalderen i Danmark”, published in 1900.

Westerby (1920 and 1927) published the Bloksbjerg-find, and separated the older part of this find, where no ceramic objects were found, as a separate culture, the “Bloksbjerg culture”.

In the surveys written by Brøndsted (1938), Mathiassen (1942), and Brøndsted (1957) on the Ertebølle culture, only sites in which pottery is found are, on principle, included in the term “Ertebølle culture”.

Opposed to this stands Becker (1939), who suggested a distinction between three

Information on the settlements given in the table:

periods inside the Ertebølle culture, partly based on the classification of core axes and flake axes given by the present author (Troels-Smith, 1938), and partly supported by a division of different types of arrowheads. In the oldest group, Period I, are counted finds like Carstensminde, Gislinge Lammefjord, and the older part of Bloksbjerg—in other words, finds in which no ceramic objects were found.

In 1953 the author particularly called attention to the fact that there seems to be a fundamental difference between the younger settlements where pottery, flat-trimmed flake axes, core axes with specially treated edges, and T-shaped stag antler axes (as well as shell-heaps) are found, and the older settlements where these items (including shell heaps) are not found. To avoid any kind of misunderstanding the author therefore used the term "Classical Ertebølle culture" for the younger finds, in view of the fact that the above mentioned objects are all found in the Ertebølle midden (locus classicus).

As the name Ertebølle culture has been used for a long period of time, and is still by most scholars used as a term for a series of settlement-finds, which include kitchen middens from the Older Stone Age, and contain flake axes, pottery, etc., it would be inadvisable to make the term cover more than what can be found in the Ertebølle middens itself.

THE ERTEBØLLE CULTURE IN RELATION TO OLDER FINDS

In the table (p. 506) is indicated the presence of certain characteristic types of artefacts from 24 settlements. For the sake of simplicity we will chose 5 settlements:

1. Kongemosen,
4. Vedbaek Boldbaner,
6. Bloksbjerg (lower part),
13. Dyrholm II,
22. Muldbjerg I.

Of these five settlements, each shows a characteristic artefact assemblage, and they all presumably represent relatively short periods of settlement, which can with reasonable accuracy be geologically dated inside a sequence of time, 1 being the oldest and 22 the youngest. (See also Diagram Fig. 7, where 1 = A, 4 = B, 6 = C, 13 = D, and 22 = E).

1. Kongemosen. (Fig. 1; Svend Jørgensen, 1956)

The settlement is pollen-analytically dated to the upper part of pollen-zone VI, presumably contemporaneous with the lower part of the Early Atlantic transgression.
Fig. 1. Artefacts of the Kongemose culture. Scale 2:3.
Fig. 2. Artefacts of the Vedbaek culture. Scale 2 : 3.
The settlement is sealed in peat and gyttja, and must be considered as being without intermixture of older or younger artefacts.

The artefact-assemblage is characterized by numerous rhombic arrowheads (\textit{skaevpde}), while transverse arrowheads (\textit{tovaerpile}) and oblique arrowheads (\textit{skaevetovaerpile} i.e. oblique edged transverse arrowheads) together represent less than 10\% of the total. The core axes, and amongst these, rhombic axes, predominate, while axes resembling flake axes constitute less than 10\%. Slotted bone points with flint insets and large flint picks occur.

The pollen-analytical dating of the Kongemose settlement shows, that, generally speaking, it must be contemporaneous with the Sværodborg dwelling place, the artefact-assemblage of which differs totally from the one of the Kongemose settlement: the lack of rhombic arrows, the great numbers of triangular microliths, as well as numerous leister prongs of types which are not found at the Kongemose settlement.

### 4. \textit{Vedbæk Boldbaner} (Fig. 2; Mathiassen, 1946)

The highest water level of the Littorina Sea close to the site of the find of Vedbæk Boldbaner is about 4.25 m above the present sea level. The settlement itself is situated on a small islet, the highest point of which is 2.59 m above present sea level. If we suppose that the different transgression maxima have been of the same magnitude at Vedbæk as at Amager (Troels-Smith, 1939), then both the High-Atlantic, the Late-Atlantic, and the Sub-boreal transgressions would have rendered any habitation on the islet impossible, as even the water level of the High-Atlantic transgression must have come up to about 2.50 m above the present-day sea level. The Early-Atlantic transgression maximum must have reached 0.50 m below present sea level.

The artefacts from the settlements were found partly on the sand bottom itself (presumably glacial sand), partly rebedded in the lower part of marine sand to a depth of 1 m above the present sea level. At lower levels the artefact-containing sand layer (which here is mixed with clay-gyttja) rests on an apparently marine layer of turf-containing clay-gyttja. The layer is here covered by marine clay-gyttja. (Unpublished geological investigation by B. Brorson Christensen and the author).

Summing up, it can be said that the settlement must be younger than the beginning of the High-Atlantic transgression (indicated by the turf-containing gyttja), and older than the maximum of the High-Atlantic transgression, which prevented habitation on the islet. The possibility cannot be excluded that the place may have been visited during the regressions between the High-Atlantic and Late-Atlantic transgressions, though this is improbable.

Here also the rhombic arrowheads predominate, (making up about 80\% of
Fig. 3. Artefacts and pottery of the Bloksbjerg culture. Scale 2 : 3.
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the total of rhombic arrowheads, oblique arrowheads and transverse arrowheads). But, on the other hand, oblique arrowheads and transverse arrowheads here appear in quantities together exceeding 10%, and about half of these are oblique arrowheads. The core axes dominate absolutely, and axes resembling flake axes constitute less than 10%. Slotted bone points with flint insets also occur.

6. Bloksbjerg (lower part) (Fig. 3; Westerby, 1920 and 1927)

Knud Jessen has carried out pollen-analytical investigations of layers E and D at Bloksbjerg at a time before 1927. According to these investigations layer E should be older than the middle of the Atlantic period, while layer D should be younger than the middle of the Atlantic period. The artefacts were found on levels between 1.46 and 4.08 m above present-day sea level. As there seems to have been habitation directly on the sand bottom at levels below 2 m above sea level, the oldest part of the settlement must be older than the maximum of the Atlantic transgression, which here must have reached about 2 m above sea level (cf. the levels at Amager). It can further be said that the habitation phase must have terminated before the maximum of the Subboreal transgression was reached, at a height of 4.25 m above present-day sea level.

From the point of view of artefacts it seems that the oldest period of the settlement at Bloksbjerg should be placed as younger than the settlement at Vedbæk Boldbaner, as in the latter place numerous rhombic arrowheads were found, while only a few of these were found at the Bloksbjerg settlement. The lower part of the Bloksbjerg find is furthermore likely to be older than the regression between the High and Late-Atlantic transgression, and presumably contemporaneous with the maximum of the High-Atlantic transgression, since from Dyrholm II in Jutland, which can be dated to the regression after the High-Atlantic transgression, there is a predominance of flake-axes, as well as the presence of pottery and core axes with specially treated edges. At Amager the core axes predominate at level II (= the maximum of the High-Atlantic transgression), while the flake axes predominate at level III (= the Late-Atlantic transgression).

It is thus reasonable to assume that the lower part of the Bloksbjerg site is younger than the Vedbæk Boldbaner site, and that it dates from a relatively short period contemporaneous with the latter part of the High-Atlantic transgression.

A few odd rhombic arrowheads occur, but it is questionable whether these are not accidental forms. On the other hand we find numerous transverse arrowheads and oblique arrowheads, the latter constituting about 50% of the total number of arrowheads. Core axes predominate, and of axes resembling flake axes there were fewer than 10%. Slotted bone points with flint insets were found.
Fig. 4. Artefacts of the Ertebølle culture, Dyrholm II stage. Scale 2 : 3.
Fig. 5. Pottery of the Ertebølle culture, Dyrholm II stage. Scale 2 : 3.
J. Troels-Smith

13. *Dyrholm II.* (Fig. 4–5; Mathiassen, Degerbol and Troels-Smith, 1942)

Dyrholm II is pollen-analytically dated to the time about the Elm-fall, and as the settlement area was covered by water during the High-Atlantic transgression, and is covered by sediments of the Late-Atlantic transgression, the settlement must be contemporaneous with the regression between the High- and Late-Atlantic transgression. The possibility cannot however be excluded that amongst the material found there are artefacts older than the maximum of the High-Atlantic transgression.

Rhombic arrowheads were not found at all. Of transverse arrowheads and oblique arrowheads the latter make up less than 20% of the combined total. Core axes are rare compared with flake axes, which here constitute more than 80% of the total number of axes. As new elements we now find core axes with specially treated edges, T-shaped stag antler axes, and pottery, thick-walled potsherds predominating (pointed-based clay vessels, flat bowls: “blubberlamps”). Thin-walled potsherds (under 1 cm thick) were also found, including a pointed base.

22. *Muldbjerg I.* (Fig. 6; Troels-Smith, 1953, 1959)

The Muldbjerg find represents a short habitation, possibly only a single summer, from the beginning of June to the end of September. It is pollen-analytically dated to a time after the Elm-fall, and immediately before the increase in the Lanceolate Plantain curve, which represents a land occupation phase (cf. Iversen, 1941) in the pollen diagram. Judging from what we know the settlement must be contemporaneous with the oldest part of the regression period between the Late-Atlantic and the Sub-boreal transgressions. Using Carbon-14 the settlement has been dated to 2830 ± 100 B.C. (Average of K 123–29 and K 131–32; Tauber, 1956 and 1960, and Troels-Smith, 1956 and 1960b).

The artefact assemblage consists of: transverse and oblique arrowheads, of which the latter make up less than 20% of the total; flake axes (apart from a fragment of a polished point-butted axe and a wooden haft, apparently made for this type of axe, no core axes have been found); much pottery, dominated by A-funnel-necked beakers, in highly varied shapes. Vessels with flat bottoms and horizontally pierced lugs, placed either at the bottom of the body or at the transition between neck and body also occur, and in addition a few characteristic thick-walled potsherds (the so-called thick-walled Ertebølle pottery) with fractures at right angles to the wall of the vessel, corresponding to construction coils, on which can be seen finger- and nail impressions.
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Fig. 6. Artefacts of the Ertebølle culture, Mulbjerg I stage. Scale 2 : 3.
From this survey it can be seen that all five settlements (see Diagram Fig. 7) in two’s, and sometimes in three’s, have characteristic types of tool in common. A–B have a dominance of rhombic arrowheads. A–C have a dominance of core axes as well as the presence of slotted bone points with flint insets ("flint-edged spears"). B–C contain both transverse and oblique arrowheads. (Although these two types together only constitute just over 10% of the total arrowhead material at B, yet almost 100% at C, they have in common, that in both cases the ratio of transverse to oblique arrowheads is the same, the two types being present in roughly equal proportions (although in differing amounts) on the two sites). In C–E rhombic arrowheads are not found (see p. 513), but, on the other hand we find transverse arrowheads, though these constitute only 50% in C and over 80% in D and E. In D–E flake axes constitute more than 50% of the total axe material; and furthermore we find pottery, both thick-walled and thin-walled – the thick-walled however dominating in D and the thin-walled in E.
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While there is a clear continuity in a progressive sequence in time – the younger settlements always having something in common with the immediately preceding ones – we find literally no type of artefact common between A, on the one hand, and D–E on the other. The most obvious dividing line is evidently between the settlements C and D. If we look at the inventory of the artefacts from the 24 settlements which has been set out in the Table, p. 506, it can be seen that they may all be easily grouped in relation to the five settlements characterized above. It can further be seen that certain settlements in the table seem to cover two or more stages, for example Ertebølle (D and E) and Bloksbjerg (upper part) (C–E?). This is no doubt due to the fact that the finds in question cover a relatively long span of time.

We are consequently able to separate five culture groups, based on the settlements discussed above, i.e. A. Kongemose culture, B. Vedbæk culture, C. Bloksbjerg culture, and finally Ertebølle culture, comprising D. the Dyrholm II stage (= Dyrholm culture) and E. the Muldbjerg I stage (= Muldbjerg culture).

On the following pages the terms Dyrholm and Muldbjerg cultures – together constituting the Ertebølle culture – are used. Possibly the Ertebølle culture might be named the “Flake Axe culture”, but in this case the term „Asymmetrical (Core) Axe culture” would have to be used for the Kongemose-, Vedbæk-, and Bloksbjerg cultures collectively.

While all 5 culture groups are represented in Zealand, the two oldest (Kongemose culture and Vedbæk culture) have, up till now, not been found in Jutland. In the autumn of 1964 a typical rhombic arrowhead was, however, found in a bog near Øster Jølby in Mors, Jutland (Report in the Department of Natural Sciences of the National Museum, NM VIII j. nr. A 4706), and continued investigations will presumably produce evidence that also these two cultures are to be found in Jutland and on Fünien. As for the Bloksbjerg culture we find, both at Dyrholm I and at the oldest stage of Kolind (Mathiassen a.o., 1942), an artefact assemblage containing many core axes and transverse arrowheads (but no core axes with specially treated edges), and few or no flake axes: in other words, in agreement with the Bloksbjerg culture, apart from the fact that oblique arrowheads and slotted bone points with flint insets are lacking. Potsherds are said to have been found at these settlements. As for Dyrholm there is no geological certainty that the potsherds belong to the first stage (Dyrholm I), as they are only covered by the deposits of the Late-Atlantic transgression. The potsherd mentioned from Kolind was found in an isolated trial-trench, and we have no guarantee that it actually derives from the oldest layer.

It should be mentioned that some slotted bone points with flint insets have been found in the eastern part of Jutland, in Østbirk (Vebæk, 1938), and in Djursland (Brøndsted, 1938). These are not known from stages D and E, and may thus be classed with the period covering the Kongemose culture and the Bloksbjerg culture.
THE ÆRTØBBØLLE CULTURE IN RELATION TO THE MEGALITHIC CULTURE

The Muldbjerg stage (E) is, as mentioned above, pollen-analytically dated to the early part of the regression between the Late-Atlantic and the Sub-boreal transgression. The large content of A-funnel-necked beakers, the small quantity of thick-walled potsherds, as well as the presence of a fragment of a polished point-butted axe seem, in advance, to indicate that this find must be placed very late in the Ærtebølle culture.

In the Aamose basin (Troels-Smith, 1943) we have a long series of finds which, from the archaeological point of view, corresponds with the Dyrholm culture (Dyrholm II). Those of the finds which are sealed in peat and gyttja – and thus protected from older or younger intermixture – can be shown by stratigraphy and pollen-analysis to be older than the Muldbjerg site (e.g. the settlements Storelyng I, II, III, IV, and X; see reports kept in the Department of Natural Sciences of the National Museum, NM VIII j. nr. A 3926–28, A 3929, A 3930, A 3931, and A 3937).

In contrast we have the fact that in the carefully investigated Aamose area, no funnel-necked beakers of types B and C or thin-butted axes have been found which have been dated pollen-analytically to a period contemporary with, or older than, the Muldbjerg site: in all carefully examined cases they have been proved to be clearly younger than the Muldbjerg site.

In short, it can be said that the Aamose investigations have shown that even the youngest phase of the Ærtebølle culture, i.e. the Muldbjerg culture, is older than the Dolmen period with its characteristic types of artefacts, as, for example the B- and C-funnel-necked beakers and thin-butted axes.

This result contradicts the datings of Late Ærtebølle settlements published by me in 1942 and 1943. There is therefore good reason for re-valuing these datings.

The above mentioned (Troels-Smith, 1942, and 1943) datings rested mainly on three suppositions:

1. That the Troldebjerg find (older Passage-grave period) was pollen-analytically contemporaneous with the oldest part of pollen zone VIII (Knud Jessen, 1938).

   In 1941 Iversen showed that the zone border defined by Knud Jessen was not caused by climatic factors, but was the result of forest clearing carried out by people cultivating grain and keeping cattle. We have no proof that these clearings were contemporaneous inside Danish territory. Iversen's investigations further showed that the refuse layer from the Troldebjerg settlement was in an interval-layer between dated deposits (the interval representing the older part of the Sub-boreal period). This means that there is no certainty that the Troldebjerg find actually goes back to the oldest part of the Sub-boreal period, and that, in the light of our investigations at Aamosen, it must with certainty be placed later in this period.
2. That finds of artefacts in marine gyttja must be contemporaneous with the gyttja in which they are found.

In 1957 Erling Johansen, in a paper read to the Danish Geological Society, presented material showing that artefacts from coastal settlements, by being icebound, were highly exposed to the risk of being transported out to deeper waters, and then, when the ice thawed, being deposited in geological formations which might be considerably younger than the settlement in question. This circumstance must therefore be taken into consideration when dating coastal settlements. In other words: artefacts in a given marine gyttja are bound to be contemporaneous with, or older than the layer in which they are found; but how much older is difficult to say, beyond the fact that they must be older than the layer which covers them. In lakes, and particularly in lakes in the process of filling up, this source of error must be considered not to exist, or at least to be much less frequent.

3. In some places artefacts have been found whose surfaces show no action of waves, or any change as the result of having been in sea water. As they were resting on levels below the highest sea level during the Littorina period, it was consequently presumed (Troels-Smith, 1939) that these artefacts were younger than the highest Littorina Sea level at the places in question.

When the artefacts are found in tilled fields the possibility cannot be excluded that in the course of cultivation of the soil they may have been transported to lower levels than the highest level of the Littorina Sea. Should this have been the case, nothing can be said of their age.

The youngest dated finds from Dyrholm III and Brabrand are rendered uncertain by the considerations under Point 2, and these apply partly to Alstrup III as well. The considerations under Point 3 affect Amager level IV and also Alstrup III. As for the Klintesø midden, its dating rests on the supposition that the rebedded parts of the midden can be paralleled with the youngest transgression shown in the bog at Tengslemark. There is, however, no guarantee that this supposition is correct (Knud Jessen, 1937). And finally, as regards Ordrup Næs, only a very small part of the culture layer is, with certainty, related to the raised Littorina beach found there - apart from the fact that the pollen-analytical age of this raised beach is not known.

If we compare the foundation on which the above mentioned very late datings of Ertebølle finds are based with the datings we now have from the Aamose area, it is obvious that we must set greater store by the latter and as there is a clear discrepancy between the two sets of datings, it seems reasonable, for the time being, to give credence to the stratigraphical and pollen-analytical datings from the Aamose.

The conclusion then must be, that as yet we have no certain grounds for maintaining that the Ertebølle culture existed contemporaneously with the Sub-boreal transgression, and thus with the polished thin-butted axes and B- and C-funnel-necked beakers, let alone with later periods.
THE DISTRIBUTION OF SETTLEMENTS ON THE COAST AND IN THE INTERIOR

With the exception of the Kongemose culture, of which, until now, we have not been able to find certain traces on the coast (possibly because here it cannot be separated from the younger finds), the Vedbæk culture, the Bloksbjerg- and the Dyrholm cultures are all represented by coastal finds. The last phase of the Ertebølle culture, the Muldbjerg culture, is obviously also represented on the coast, but is here, as yet, difficult to distinguish from the older Dyrholm culture.

From the interior – associated with lakes and streams – both the Kongemose culture (among these settlements the locus classicus) and, at least the older stages of the Vedbæk culture are known. The Bloksbjerg culture, however, is missing – it has not been found at all in the carefully investigated Aamose area. In contrast to this we have the very frequent presence of the Ertebølle culture in the interior, both Dyrholm culture and Muldbjerg culture. From the interior, but not associated with lake or stream, we know settlements from the Muldbjerg culture, viz. Store Valby (Becker, 1954), Oxie (in Schonen) (Althin, 1954), and, presumably, the oldest part of the Havnelev find (Mathiassen, 1940; C. A. Nordman, 1929).

ECONOMY

The bones found at the Kongemose settlement show that the hunting of the larger game animals took first place – principally red deer, roe deer, and wild pig. Fish bones are, on the other hand, very rare. In this respect the Kongemose culture contrasts sharply with Sværborg culture settlements, at which fish bones are plentiful. The same is true of Vedbæk culture sites in the Aamose.

At the settlement at Vedbaek Boldbaner bones of red and roe deer predominate, and to a lesser extent those of wild pig. It is characteristic that there are also a number of bones of grey seal, ringed seal and porpoise. Fishbones are not common, but a single coalfish (black cod) bone was found. A roughly corresponding fauna was found in the lower layers at Bloksbjerg.

It is characteristic that large numbers of mollusc shells, (clearly left after the shellfish had been eaten), are found at Ertebølle sites (the “kitchen-middens”), and at Muldbjerg, a lake site, where large numbers of fresh-water mussel shells were recovered. Corresponding shell middens have not been found with certainty at sites that are earlier than the Ertebølle culture.

At sites of the Ertebølle culture bones of game animals predominate – red and roe deer, wild pig, and marine animals, such as seals and porpoises with, in addition, birds and fish. Yet at nearly all sites of the Ertebølle culture bones of domestic cattle.
also are found in small quantities, and in the majority of cases it is hard to show that they are other than contemporary with the rest of the finds. There are, moreover, reliable pollen-analytical datings of domestic ox bones to the time of the Dyrholm culture, while the well-dated and uncontaminated Muldbjerg site produced sheep as well as tame ox. Numerous imprints of naked barley, emmer wheat, and club or bread wheat have been found on the pottery of the Muldbjerg culture (A-vessels), and moreover pollen of these cereals has been found in deposits of the same age as the Dyrholm culture.

One can therefore sum up by saying that agriculture and stock rearing came to Denmark during the first stage of the Ertebølle culture, the Dyrholm culture; and since Neolithic settlements whose assemblages are different from that of the Dyrholm and Muldbjerg cultures, and which are contemporary with these, have as yet not been found, one is forced to the conclusion that the folk who left the Ertebølle sites behind them cultivated cereals and kept domestic animals (cf. Troels-Smith, 1953, 1959, 1960b and 1961; Schwabedissen, 1957/58 and 1961; Jazdzewski, 1961a and b; for a different view see Becker, 1954, 1955, 1961a, b and c).

In my earlier publications (1953, 1959, 1960a and b, and 1961) I have suggested that this form of agriculture was characterized by keeping the cattle mainly stalled and fed with leaves, and by cultivating small, more or less permanent fields. It was only after the abandonment of the Muldbjerg settlement that we found the earliest traces of a herding folk in Denmark, whose arrival is betrayed by extensive clearance and the creating of relatively widespread rough pasture (cf. Iversen, 1941).

The majority of sites of the Dyrholm culture were probably only inhabited at certain seasons of the year, as a consequence of the seasonal collecting of molluscs, fowling, etc. This is certainly true of the Muldbjerg settlement itself, where fish- and birdremains together with bones of red deer, roe deer, and wild pig, show that the site was a base for hunting and fishing in summer only. But since the Ertebølle folk, as already pointed out, apparently were familiar with agriculture and stock rearing, it will be a future task to find sites of this kind. Success might reasonably be expected in the rear of the kitchen middens; areas unfortunately generally largely destroyed by cultivation. Attention should therefore be directed towards undisturbed areas behind the middens. The Store Valby and Oxie settlements certainly represent agricultural sites proper, and it is characteristic that at these two sites transverse arrowheads make up less than 15% of the total of arrowheads and axes, while at the hunting station of Muldbjerg they account for 89%, nearly the same as at Ordrup Næs (91%).
The Ertebølle culture includes elements known in the earlier Bloksbjerg culture – primarily transverse arrowheads, but also a small number of other types, e.g. asymmetrical core-axes (*Schiefebeile*) (Troels-Smith, 1938), and antler axes with perforation near the burr. But characteristic of this culture is the appearance of a series of types with no root in the earlier Bloksbjerg culture – flake-axes, core-axes with specially treated worked edge, polished point-butted axes, T-shaped antler axes, and pottery. The question is, where should we look for the origin of these forms – unless they are an indigenous development arising out of the native growth of a demand for these types.

1. **Flake-axes, and core-axes with specially treated working edge**

   Corresponding types are known from Bohuslän in Sweden and from the Fosna and Komsa cultures of Norway, and there is much to suggest that they may be earlier in these two areas than at their earliest appearance in Denmark (Troels-Smith, 1938). Scientifically dated finds which prove that these types really are older in Norway and Sweden than in Denmark are, on the other hand, still lacking. The same applied to the French Campignian finds.

2. **Point-butted polished axes**

   This type is very common in Western Europe (Åberg, 1912), and it is reasonable to look for the origin of the Danish forms there, despite the absence of a scientific guarantee for the priority of the West European finds over the Danish. Another factor is that mere familiarity with flint polishing would bring about the result that the late specialized core-axe forms would turn into point-butted axes by polishing (Troels-Smith, 1938).

3. **T-shaped antler axes**

   These appear for instance on Danubian sites and are here apparently older than on the earliest Danish sites, so that influence from that quarter seems reasonable to assume.
4. Pottery

Pointed based Ertebølle vessels and A-ware are known mainly from Denmark and Scania (Becker, 1947, 1954 and 1955), but pointed bases and pottery that closely resembles A-ware have been found at the habitation site of Mogetorp in Södermanland (Sweden) (Sten Florin, 1958) and Boberg near Hamburg (Schindler, 1953).

When trying to determine whence knowledge of these ceramic forms came to the Ertebølle culture, one must remember that the pointed-based vessels, the flat bowls, and the various forms which include the so-called A-ware, must be taken together and regarded as a whole; and that outside the restricted NW European area where these forms appear, it has hitherto been difficult to find cultures or culture-groups where these forms are found together.

These forms are, however, not necessarily derived from abroad. It is possible that the inhabitants, after learning to mould and bake clay, copied the shapes of vessels of perishable materials in baked clay (Troels-Smith, 1959a, Jażdżewski, 1961a and b). It is therefore important that the well-known wooden vessels from Christiansholms mose (Troels-Smith, 1959), one of which has the typical funnel-beaker shape (by Becker, 1947, compared with C-funnel-beakers), should recently have been Carbon-14 dated with the help of two pieces of worked wood, respectively of elm and oak, which were part of the find. The dates are K 729: 3360 ± 100 B.C. and K 750: 3420 ± 100 B.C. (Tauber, 1964). The pollen-analytical dating of the find points to a date before the Elm-fall, and there is accordingly every reason to suppose that the wooden vessels are contemporary with the Bloksbjerg culture (C). (The Bloksbjerg settlement lies incidentally less than 300 m from where these wooden vessels were found).

[As presented in 1964.]

LITERATURE


Mathiassen, T., 1946. *En Boplads fra ældre Stenalder ved Vedbaek Boldbaner.* (Søllerød Bogen).


