

Sjögren, K.-G., Apel, J., Willerslev, E., Storå, J., Götherström, A., & Jakobsson, M. (2014). Genomic diversity and admixture differs for stone-age Scandinavian foragers and farmers. *Science* 344 (6185): 747-750.

## Tybrind Vig. Submerged Mesolithic settlements in Denmark.

Søren H. Andersen with contributions by Bodil Bratlund, Kjeld Christensen, Hans Dal, Kasper Johansen, Lise Bender Jørgensen, Claus Malmros, Ole Nielsen, Kaj Strand Petersen, Kirsten Prangsgaard, Kaare Lund Rasmussen and Tine Trolle, Jutland Archaeological Society Publications Vol. 77, Jysk Arkæologisk Selskabs Skrifter, 2013, Aarhus, 527 pages, Hardback, 68.00 Euro, ISBN 978 87 88415 78 0

reviewed by

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Tybrind Vig, off the island of Fyn, is the largest Danish underwater excavation of a Mesolithic settlement site carried out to date with regard to the extent of the excavated area, the exclusiveness of archaeological artefacts and the diversity of preserved materials. Therefore the site, and not least the author, have fundamentally contributed to our knowledge about environmental circumstances and economic conditions during the Ertebølle period and have provided unique insight into cultural and social life of a coastal hunter-fisher-gatherer community.

The Ertebølle Culture is concentrated in the south-western Baltic region and is spread over Southern Sweden, Denmark, Northern Germany and Northwest Poland. This cultural manifestation is absolutely dated between 5400 and 4000 calBC. Actually, the Ertebølle Culture is the transitional period between Mesolithic and Neolithic lifestyles in Northern Central Europe, where hunter-fisher-gatherer societies lasted longer than in more central regions. Therefore, the investigations in this field were received with great interest and discussed intensively by different scholars following different research trends. Due to this wide reception, Tybrind Vig is justifiably one of the most famous archaeological sites in Europe. Consequently, the publication of Tybrind Vig as a monograph in English is a great chapter of research history.

The completion of this publication is due to Søren H. Andersen, who had the patience and elaborateness to present this comprehensive compilation, although the evocative highlights about the site were already well known. In the course of almost his entire scientific career, Søren H. Andersen spent time investigating Mesolithic Stone Age cultures, such as Maglemose,

Kongemose and the Ertebølle Culture at Moesgård Museum and Aarhus University. Among other things, he has already even published numerous articles in Danish and international journals about the results and findings of the site Tybrind Vig (e.g. Andersen 1985; 1987). But now, at the culmination point of his scientific life, it is his great achievement to summarize with other specialists all information available about Tybrind Vig from published and unpublished reports. Together with his previous book about Ronæs Skov, another underwater site in the Little Belt (Andersen 2009), Andersen provides all his knowledge for following generations of researchers.

The book is divided into two broad parts. In part 1, Andersen primarily presents facts about the site, results about the main find categories and a discussion about social and economic questions. This discussion is completed by information about other Ertebølle settlements in the region and by comparisons with neighboring regions. Part 1 ends with a conclusion and an outlook concerning further investigations in the future (pp. 317–324). In part 2, various reports are included, mainly by natural scientists about special investigations. Some of these manuscripts were originally submitted up to 15 years ago. But this does not diminish the value of the scientific work. Most important is that all information is now collected in one book. In the following, I will lead through the chapters of part 1 and will refer to the reports in part 2 as I proceed.

Chapter 1 is the most important chapter in this book and nearly every question one could have about the site is discussed in separate sections. At the beginning of the chapter, the particular story on the discovery of the site is told from the personnel point of view of the author so that the reader can really dive into the research history (pp. 11–14). Then details about geology, ancient coastlines, sea level changes, natural conditions revealed by faunal and pollen remains as well as local topography and deposition of artefacts at the site are explained (pp. 15–29). Further detailed information about geological conditions, as revealed by the marine molluscan fauna, is described by Kaj Strand Petersen in part 2 of the book (355–361). The excavation methods, environmental investigations, stratigraphy and absolute chronology are also discussed in chapter 1 (pp. 33–53). Additionally, particulars of radiocarbon dating and dendrochronological analysis are presented in part 2 of the book by Kaare Lund Rasmussen (pp. 363–364) and Kjeld Christensen (pp. 365–376).

Throughout the long duration of investigations in Tybrind Vig, remains of different settlement areas were excavated, denoted as settlements A-D (pp. 29–33), but settlement B provides the principal and most important portion of the available information. Here, different layers could be identified which demonstrate that a population group either lived there all year round or within a series of separated

visits of particular intensity during a period of 1300 years. While the uppermost layer is dated to 4300–4000 calBC, the underlying detritus gyttja (horizon 2) contains the majority of Ertebølle artefacts, in particular worked wood, and can be dated from 4700–4300 calBC. Beneath this horizon, a series of shell-rich layers (horizon 1) containing only artefacts of flint, bone and antler, is dated to 5400–4700 calBC (p. 56). The settlement layers constitute an area of waste deposition, a zone for fishing as well as a probable space for other activities during the times of low water. Thus, special archaeological features are described in several sections of chapter 1, such as the fish weir, the leister fishing area, hearths, a woodworking site for the assumed manufacture of dug-out boats, probably remains of a platform or a jetty and several bone heaps, especially of pine marten skeletons and fish bones (pp. 59–74). But not only settlement traces exist: burial remains of at least two different graves could be documented and scattered human bones were found. The investigation of the human bones is described by Tine Trolle in part 2 of the book (415–426).

Chapter 2 in part 1 is dedicated to artefacts of stone. The quantity of flint finds at Tybrind Vig is relatively small, probably because they originate from a near-coastal refuse area and not from the settlement itself. First, the vertical and horizontal distribution of flint is discussed and compared to other submerged Ertebølle settlement sites. Then types of raw flint and occurrences of fire-affected flint debris and flint-working techniques are examined (pp. 77–80). Results of the investigation of different flint artefacts from both horizons are described in detail, including cores and blades as artefacts from the primary reduction (pp. 80–88) as well as artefacts from the secondary reduction, such as scrapers, borers, burins, knives, retouched pieces, transverse arrowheads, axes, chisels and flint hammerstones (pp. 88–108). The majority of tools were made of blades, but flake and core tools also occur. According to the transverse arrowheads, types with concave side edges are most prominent. In addition, flake axes were observed three times more than core axes, while symmetrical, flat flake axes dominate. By a systematic comparison of the evidence of flint tool types at Tybrind Vig in horizons 1 and 2 with other Ertebølle sites, the author is able to emphasize development in time and regional differences.

In chapter 3, the most exciting artefacts of Tybrind Vig, at least for the reviewer, are presented: artefacts of wood, withies, fungi and plant fibres, which are extremely rare at the majority of archaeological sites due to the lack of advantageous preservation conditions for organic materials. After a short explanation of wood working techniques by means of working traces and rough outs (pp. 117–118), wooden artefact types of Tybrind Vig are presented in a collection of drawings and photos and interpreted in a discussion

of parallels from Northern Central Europe. Wood identification was mainly conducted by Claus Malmros and his report in part 2 of the book completes chapter 3 and goes further into the discussion on technical properties and the selection of wood types for specific tools (pp. 377–392). The most common wooden finds at Tybrind Vig are sharpened or pointed poles. According to their shape and size and by comparison with better preserved features from other sites, they were interpreted as remains of woven panels of fishing weirs (pp. 119–122). The report by Kasper Lambert Johansen about wooden stakes and rods in part 2 of the book (pp. 343–348) refers to the investigation of a total of 163 fragments of mainly worked hazel stakes, resulting in the reconstruction of the cutting technique, further tested by experimental work. Both Malmros and Johansen constitute that the hazel rods should be considered as evidence for the systematic management of hazel coppices during the Mesolithic time period (see also Kloob 2014). In the following, more wooden artefacts from the site are described and discussed by comparisons and ethnographic parallels, among them shafts of ash wood (pp. 123–131), angled adze handles (pp. 131–138), the outstanding number of 20 bows (pp. 139–149), club-shaped wooden arrowheads (pp. 149–150), wooden leister prongs of fishing spears (pp. 150–161), wooden staves with holes (pp. 161–166), fish trap baskets (pp. 166–169), paddles, including the exciting ornamented paddle blades of Tybrind Vig (pp. 169–185), and dug-out canoes with the documentation of boat III that was not published until now (pp. 185–203). The great opportunity was taken by the author to also display parallel finds from other sites, which is very helpful. But readers must be aware that cursory reading may lead to misunderstandings about the origin of the illustrated objects, therefore careful attention to the captions is recommended.

Even more exciting and rare are the finds of Mesolithic textile remains from Tybrind Vig, which are presented by Lise Bender Jørgensen in a report in part 2 of the book (pp. 393–400). The textile remains are comprised of a bundle of fibres, fragments of strings and fragments of fabrics made in a variation of slightly different techniques. The identification of the used plant fibres was a difficult task and three appendices with identification studies are attached and documented by a series of photographs. According to this, bast of willow was frequently used. By listing other evidence of prehistoric textiles, the introduction of different materials and the development of spinning and other textile techniques are discussed.

In chapter 4, artefacts of bone and antler are explained which also only occur on well-preserved sites. In addition to finished tools, an outstanding amount of waste from tool production was found at Tybrind Vig. On their surfaces, different working traces like saw or cut marks could be observed. Thus, the method of manufacture is discussed with the help

of tool marks and rough outs for each artefact type. The description of antler and bone artefacts is enriched with illustrations and information about parallel findings from other Ertebølle sites. Fabricators are the most common finds made of red deer antler (pp. 243–248). Further finds include red deer antler axes of type T-axe and of type rosenøkse, partially ornamented (pp. 228–239), one roe deer antler harpoon (pp. 227), three antler handles, one of them ornamented with a net-like ornament (pp. 249–252), and antler chisels (pp. 240–242). Bone tools are represented by knives (pp. 256–258), two ulnar daggers (pp. 258), scrapers of wild boar tusk (pp. 259–262), awls (pp. 262–263), bone points (pp. 263–267) and 16 examples of fish hooks made from ribs (pp. 268–272) as well as four tooth pendants and ornamental plates of enamel from the outer surface of wild boar tusks (pp. 258–261). In part 2 of the book, Ole Nielsen contributed an experimental study about simple bone points with their break patterns (pp. 349–354). As a result, Nielsen concludes that the bone points probably had a number of different purposes, for instance, they might have been used for sewing leather or for basket production while they were held directly in the hand. But they could also have been implemented as hafted bone arrow-heads or as central prongs in the characteristic Ertebølle fishing leisters.

Kirsten Prangsgaard described and discussed the pottery remains in chapter 5 of part 1. The two vessel types, a pointed-based vessel and a lamp, which are associated with the Ertebølle Culture, are both represented in the assemblage of well-preserved sherds of Tybrind Vig which lay in the uppermost part of the gyttja deposit. Most exciting are the intact finds and nearly complete examples of both vessel types. But seen in relation to the lifetime of the settlement, the amount of ceramic finds is modest, specifically for lamps, and their appearance is surprisingly late (p. 289). Thickness, surface and temper of sherds as well as the construction method, shape and size of the vessels were investigated (pp. 277–285). Moreover the function of the vessels, the distribution of the pottery and its dating is discussed (pp. 285–289). Andersen added some remarks about previous and recent investigations of charred food crusts which occur unusually thick and well-preserved and in relatively high numbers at Tybrind Vig (pp. 289–229).

The broadly-based economy of the Tybrind Vig settlement is demonstrated in chapter 6. Foremost well-preserved animal bones, but also shells of invertebrates, plant remains and analytical data for human bones as well as the investigated food crusts reveal dietary habits. Furthermore, the topographic location and tools associated with hunting and fishing verify the exploitation of terrestrial and marine resources. In part 2, Tine Trolle presents the human bones and, in addition, particularly detailed results and measurements of the investigation of animal

bones. Here, important information about hunting and processing of game, dominated by red deer, roe deer and wild boar, is offered. Moreover, the seasons of residence at the site are thereby indicated. Furthermore, an important amount of bones of pine marten and other fur bearing animals was recorded, which probably were trapped intensively with the aim to use their fur. In contrast, evidence of sea mammals and birds is modest at Tybrind Vig, but fish bones occur in high number, dominated by cod (pp. 426–496). One special find sheds light on hunting practices. The shoulder blade of a wild boar with a partially healed arrow wound is presented and discussed by Bodil Bratlund in part 2 of the book (pp. 497–503). The wide range of animal species reflects the ideal location of the site that provided access to different biotopes. Moreover, the site was visited during all seasons and thus can be characterized as a sedentary settlement. Hunting terrestrial game and fur animals as well as fishing were characteristic elements in the economy of Tybrind Vig. Evidence of gathered plants substantiates an additional supplier to the human diet (pp. 293–301).

In chapter 7, Tybrind Vig is integrated in the regional settlement system. The site is compared with other known settlements, firstly with settlements in the coastal area, especially with those of Little Belt, and secondly with those of the inland area of Funen. Differences concerning size, function, artefact spectrum and population groups could be worked out. Therefore, a picture of extensive and stable coastal settlements like Tybrind Vig, and coeval small localities in the inland region was developed by Andersen. Furthermore, well-developed coastal communication to the south becomes apparent by similarities to Ertebølle settlements on the North German Baltic coast (Hartz et al. 2014).

In the last report, Hans Dal, the leader of the practical tasks at the excavations between 1978 and 1987, described the equipment and excavation techniques as well as the organization of the field work under water and above sea level. Indeed, the development of gear and working procedures that was undertaken by the Marine-Arkæologisk-Gruppe (MAG) and a group of archaeologically-interested volunteer scuba-divers was pioneering in Northern Europe and served as an example for further examinations on submerged settlement sites, for instance, in Sweden and Northern Germany (Hartz et al. 2014).

The Tybrind Vig book contains very special information about the investigations of specific artefacts, but also tells the comprehensive story about a typical Danish cultural phenomenon and an interesting part of archaeological research history beneath the surface of the Baltic Sea. The relatively rapid process during the completion of the book, I assume, resulted in editorial work that could not prevent minor inaccuracies or contradictions. Therefore, the book is not perfectly edited, but inspiring and fascinating through

the diversity of the presented archaeological remains and applied scientific methodology. But the greatest treasure of this book is the complete overview on the current state of research about the Ertebølle Culture offered by the author and his colleagues. Because of the detailed and good structured information in short sections and with its many photos, drawings and figures, it is a pleasure to browse over and study this substantial monograph.

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#### Literature cited

**Andersen, S. H. (1985).** Tybrind Vig. A Preliminary Report on a Submerged Ertebølle Settlement on the West Coast of Fyn. *Journal of Danish Archaeology* 4: 52–69.

**Andersen, S. H. (1987).** Mesolithic Dug-Outs and Paddles from Tybrind Vig, Denmark. *Acta Archaeologica* 57, 1986: 87–106.

**Andersen, S. H. (2009).** *Ronæs Skov. Marinearkæologiske undersøgelser af en kystboplads fra Ertebølletid.* Jysk Arkæologisk Selskabs Skrifter, Aarhus.

**Hartz, S., Jöns, H., Lübke, H., Schmöcke, U., von Carnap-Bornheim, C., Heinrich, D., Kloß, S., Lüth, F. & Wolters, S. (2014).** Prehistoric Settlements in the south-western Baltic Sea area and development of the regional stone age economy. *Bericht der Römisch-Germanischen Kommission* 92, 2011: 77–210.

**Kloß, S. (2014).** They were fishing in the sea and coppicing the forest – Terminal Mesolithic and Early Neolithic wooden artefacts of coastal settlements on the Southwestern Baltic Sea. *Bericht der Römisch-Germanischen Kommission* 92, 2011: 251–274.