

An in situ fireplace from the Mesolithic Period at “Ronæs Skov” in the Gamburg Fjord

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Résumé

Den submarine stenalderboplads “Ronæs Skov” blev opdaget af en lokal amatørarkæolog i 1980 i den vestfynske Gamburg fjord. Siden 1990 har undervandsarkæologer fra Marine-Arkæologisk Gruppe, Fredericia, i samarbejde med seniorforsker Søren H. Andersen, Nationalmuseets Marinarkæologiske Forskningscenter, Roskilde, foretaget regelmæssige undersøgelser på dette sted ved Lillebælt. Ronæs Skov-bopladsen, som må karakteriseres som rest af en basisboplads ved kysten, tilhørende Ertebølle-kulturens yngste del, C14 dateret til ca. 4.300-4.100 f. Kr. Selve bebyggelsen er borteroderet. Tilbage er kun “affaldsområdet” og “fiskepladsen”, hvor der stadigvæk findes aflejringer af fin, brun, iltfattige gyttje. Bevaringsforholdene for organisk materiale er så usædvanlige gode i disse gyttjeaflejringer, at der er fundet helt nye og hidtil ukendte træoldsager fra denne del af ældre stenalder.

I 2001 blev der in situ fundet et ildsted bestående af otte nævestore sten i en nogenlunde rund cirkel. I ildstedet lå der to stykker brændt træ (hassel og slåen) med spidserne rettet ind mod bælets midte. Ronæs Skov-bopladsen ligger lidt syd for landhævnings vippelinie og kan nu tjene som et sikkert referencepunkt fra den gamle landoverflade, som lå ca. 2,41 m under havets nuværende normalvandstand. Som andre submarine stenalderboplads ligger Ronæs Skov-pladsen under en beskyttende vegetationsdække, hvor ålegræs udgør lang den vigtigste del af havbundens vækster. Konstant tilbagegang for ålegræsset på grund af for høj tilførelse af næringsstoffer fra landbrug, industri og byer er en medvirkende årsag til, at de undersøiske stenalderboplads i disse år nedbrydes og forsvinder.

Zusammenfassung

Der versunkene Ertebølle-Siedlungsplatz “Ronæs Skov” im westfynischen Gamburg Fjord wurde 1980 von einem örtlichen Amateurarchäologen entdeckt. Seit 1990 haben Unterwasserarchäologen der Marine-Archäologischen Gruppe Fredericia in Zusammenarbeit mit Søren H. Andersen vom Marinarchäologischen Forschungszentrum (NMF) in Roskilde die Fundstelle am Kleinen Belt regelmäßig untersucht. Diese jung-ertebøllezeitliche Basisiedlung an der Küste ist radiokarbondatiert auf etwa 4300-4100 v. Chr. Der Siedlungsplatz selbst ist bereits wegerodiert, mit Ausnahme eines „Abfallplatzes“ und eines „Fischplatzes“, wo noch feine, braune, sauerstoffarme Gyttschichten vorhanden sind. Die hervorragenden Erhaltungsbedingungen für organisches Material in diesen Gyttschichten haben ganz neu und bisher unbekannt Holzgegenstände für diesen Abschnitt des Mesolithikums erbracht.

Im Jahr 2001 wurde eine Feuerstelle mit acht faustgroßen, in etwa kreisförmig gelegten Steinen entdeckt. In dem Steinkreis lagen noch zwei verkohlte Holzstücke aus Hasel und Schlehe in situ, mit den Spitzen auf die Mitte der Feuerstelle zeigend. Der Siedlungsplatz Ronæs Skov liegt etwas südlich der Kippachse der skandinavischen Landhebung und kann jetzt als sicherer Bezugspunkt für die alte Landoberfläche dienen, die an dieser Stelle 2,41 m unter dem heutigen Meeresspiegel liegt. Wie auch andere versunkene steinzeitliche Siedlungsplätze wird der Platz von Ronæs Skov von einer schützenden Vegetation bedeckt, die vor allem aus Seegrass besteht. Der konstante Rückgang des Seegrassbewuchses aufgrund erhöhter Nährstoffzuführung aus Landwirtschaft, Industrie und städtischer Bebauung ist eine der Ursachen dafür, daß die versunkenen Siedlungsplätze der Steinzeit in diesen Jahren erodieren und verschwinden.

Übersetzt von Anton Englert

It is unusual for marine archeologists to come across a fireplace from the Mesolithic Period where the pieces of firewood that were laid on the fire 6.000 years ago still remain in place. One such “in-situ” fireplace was excavated last summer in Gamburg Fjord on the Fynen side of the Lillebælt coast.

Over the last 11 years, marine archeologists from the Marine Archeological Group in Fredericia assisted by senior researcher Søren H. Andersen from the National Museum’s Marine Archeological Research Centre in Roskilde have made regular surveys of the submerged Ertebølle settlement “Ronæs Skov”. Even if ar-

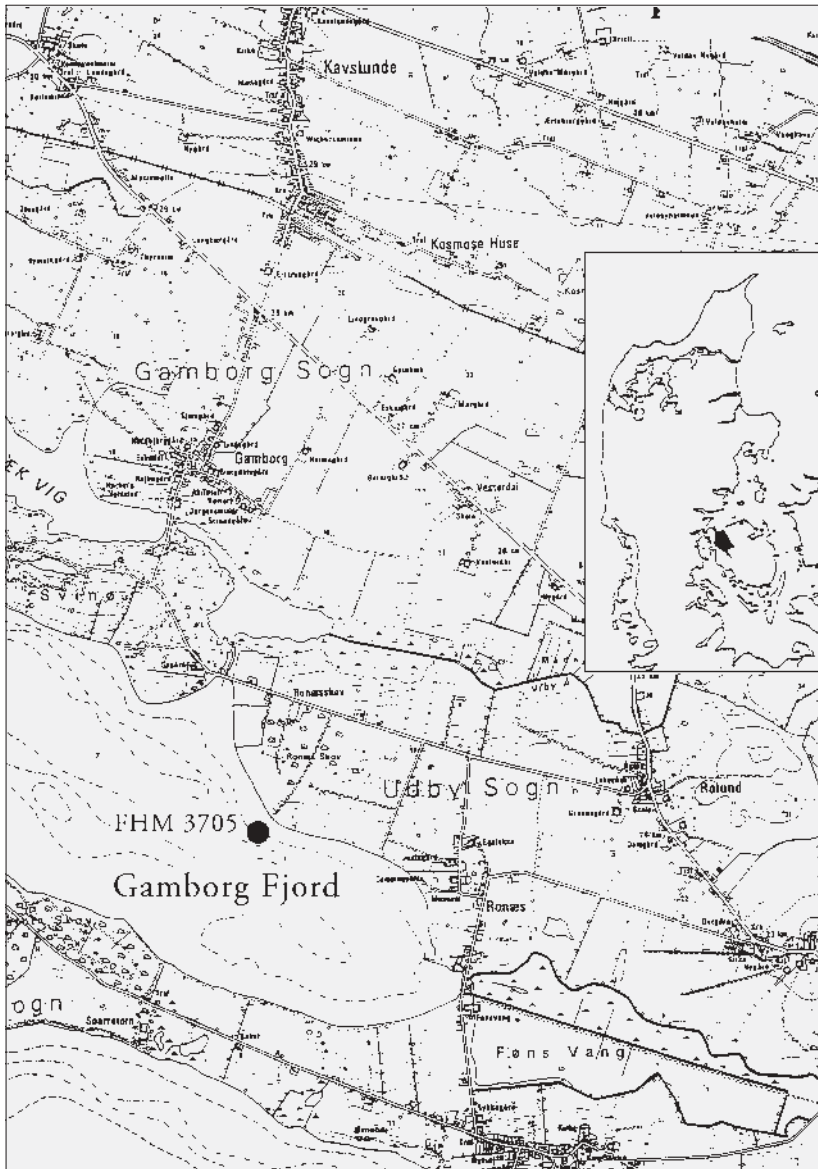


Fig. 1: Situation of the location "Ronæs Skov" in the Gømborg Fjord (Fotos and Illustrations H. Dal).

cheologists have become used to finding good preservation conditions for "soft" raw materials at these settlements, "Ronæs Skov" settlement stands out because of its extremely good preservation conditions for organic artefacts – especially those of wood.

We need to go back 27 years to 1975 when by chance I found the submerged Ertebølle settlement at Tybrind Vig on the Fynen side of the Lillebælt coast. This was the start of marine archaeological excavations of settlements along the Lillebælt, and led to the formation of the Marine Archeological Group, an apolitical and non-commercial union of divers interested in underwater archaeology. The purpose of the group is to promote underwater archaeology in

cooperation with museums, archeologists and other authorities etc, and to popularise an understanding of the importance of registering and preserving threatened prehistoric artefacts from the sea bed.

I still remember that Sunday in May 1975 when I, together with some friends, had gone to Tybrind Vig to look for archeological specimens. We didn't really find much that day, so later on in the afternoon I swam out to harpoon some plaice. About 300 metres from the coast I came upon a dark brown section of the sea bed filled with oyster shells, old flints and large tree trunks, a type of sea bed I had never previously encountered during my many diving expeditions in the area.

"What the hell. There were wild boars in Denmark a hundred years ago," was my first thought when I found the bottom jaw of a wild boar. But then when I also found antlers, flint tools and pieces of wood sticking up through the gyttja I realised that I must have found a Mesolithic settlement.

The Prehistoric Museum at Moesgård in Århus was contacted, and lecturer Søren H. Andersen's collaboration on the project began. In 1978, a 14-day trial excavation took place in Tybrind Vig. This gave such fine results that it formed the beginning of the Tybrind Vig project, which over a ten-year period from 1978–87, developed into the first, large, systematic excavation of a submerged Mesolithic settlement in northern Europe. The Marine Archeological Group took this initiative and were responsible for the construction and implementation of the technical and diving aspects of the excavation. Our experience over the years enabled us to develop new and better excavation equipment, while related techniques, work procedures and methods were progressively evolved.

One day while excavating in Tybrind Vig in 1980, we were contacted by a local grassroots archeologist who had collected Ertebølle specimens at low water from the more northerly lying Gømborg Fjord. During a later inspection of the site we dug a small sample hole about 150 metres from the coast. In the gyttja layer were found an axe made from a T-shaped antler with the remains of the wooden handle intact, together with a fragment from an Ertebølle pot. The finds indicated that this was a submerged Ertebølle settlement with excavations condi-

ons similar to Tybrind Vig. Even so, ten years were to pass before the archeological excavations in Gamborg Fjord were resumed in 1990.

Gamborg Fjord lies a little to the south of Middlefart, about 10 kilometres north from Tybrind Vig on the Fynen side of the Lillebælt coast, facing southeast-northwest and stretches about 7.5 kilometres into the west Fynen hills. The fjord is very narrow, only about 2.5 at the widest point, and only about 1 kilometre broad at the settlement. In the Mesolithic Period the fjord has been about 10.3 kilometres longer because Føns Vang, which has now dried out, formed a southeasterly extension. Water depths vary from between 2–12 metres, with the depth increasing to 24 metres out towards the mouth at Fæno Sund between Føns Skov Rev and Fæno. This part of the Lillebælt has a very indented coastline. Towards the south lies the small peninsular of Fønsskov and the coast of Fynen lies towards the north. North-northwest of the settlement between Ellebæk Vig and Svinø the coastline is irregular with many small coves and sounds, and here several small rivers flow into the sea, including Viby Å, one of Fynen's largest.

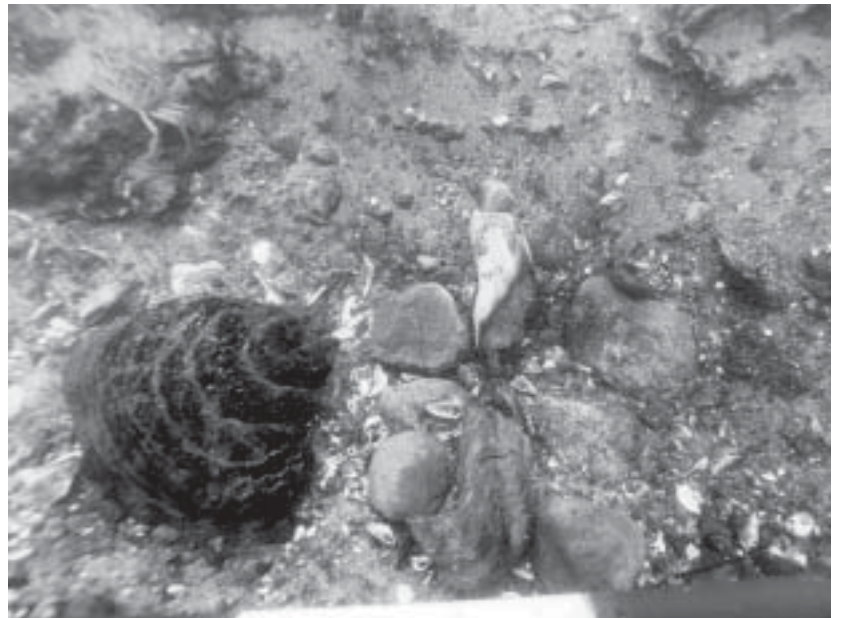
It is necessary to differentiate between the present topography of the area and that found at the time of the settlement. The increase in sea level and the sinking of the land which have been going on since the last Ice Age have changed the original character of the landscape so that throughout the period the coastline has been broken down and smoothed out. Off Ronæs Skov the coastline in the Mesolithic Period has more or less followed the present 2-metre curve. Previously the settlement was situated on the north coast on the innermost part of the fjord on a little promontory sticking out from the coast close to what used to be the mouths of two streams, which today can only be discerned as depressions in the landscape. From the opposite side of the fjord, i.e. on the south side a similar promontory stretches to the north. Small islands have thus formed a small strait which has made the innermost part of the fjord into a large, pudding-shaped cove. Several streams, brooks and rivers have flowed into the fjord from the hinterland that has been surrounded by a low range of hills, making the innermost waters of the fjord more brackish. The good position of the settlement gave it easy access to several different resource areas e.g. the woods in the hinterland, the brackish cove, se-

veral mouths of rivers and streams flowing into the open fjord, Fæno Sund and Lillebælt.

The Ronæs Skov settlement must be characterised as the remainder of a settlement unit (coastal settlement) belonging to the earlier period of the Ertebølle Culture C14 dated to approx. 4.300–4.100 BC. The settlement itself has been washed away and what remains are only the rubbish areas/ marine layers and the fishing area where there are still deposits of good brown gyttja. These were deposited when the inland ice melted during the Ice Age, raising both the level of the sea and the fjord. The prehistoric wooden artefacts

Fig. 2 (above): The "in situ" fireplace at "Ronæs Skov".

Fig. 3 (below): Underwater Documentation of the "in situ" fireplace at "Ronæs Skov".





*Fig. 4: Dug-out canoes: A large fragment of a "in situ" dug-out canoes at "Ronæs Skov", made of straight trunk of lime (*Tilia* sp.) And work was carried out with an axe or adze.*

are well preserved because the composition of the gyttja layers contains little oxygen, and the artefacts have remained constantly damp.

Previously, stones marked by fire, charcoal stumps and Ertebølle-type pottery shards from one of the settlement fireplaces were found lying in a layer of sandy gyttja under a layer of shells. We found two soot marked stones when digging up a large tinder fungus (*Fomes fomentarius*) which was discovered during a reconnaissance in the summer of 2001. The area was cordoned off, and out of the gyttja emerged an "in-situ" fireplace with eight, fist-sized stones in a more or less round circle with two pieces of burnt wood (hazel and sloe) lying with their points towards the centre of the fire. The fireplace was embedded in 36 cm layer of gyttja over a layer of moraine clay (underground) that had gently sloped to the southeast on the prehistoric coast line. It lay about 100 metres from the present shore line, at a normal water depth of 2.05 metres. Several of the stones from the fireplace showed clear signs of being exposed to heat, and round about lay several pieces of burnt wood which could have come from the fire. The tinder fungus which was found close to the fireplace could have been used to light the fire. Close by at a depth of 39 cm, i.e. about 3 cm below the level of the fireplace, was found a small flake axe, three Leister prongs and half a heart-shaped oar blade.

It is seldom to find a fireplace from the Mesolithic Period with burnt pieces of wood lying "in-situ", and therefore it is a bit of a mystery how it came to be preserved and avoided being dismantled. The presence of half-burnt pieces of wood around the fireplace indicate that the burning of the wood took place on or near where it was found, and that the wood became interbedded shortly after being burnt, and has lain undisturbed since. One explanation can be that the fireplace lay close to the water, and there was a high tide that flooded and covered it with seaweed and sand. Later, the area was flooded because of the rise in sea level during the end of the Atlantic Period.

An analysis of charcoal from the settlement showed gnawing marks from insects and the presence of fungi, so it must be presumed that a large part of the firewood came from so-called dead wood. The presence of tree roots in the samples can also indicate that the collected wood came from fallen trees with visible roots. Therefore the wood must have been collected close to the settlement where coastal erosion could have been responsible for toppling them and leaving their roots exposed. The many tinder fungi that were found indicate that there must have been a substantial number of dead or weakened trees, and that the contemporary population must have had easy access to a large supply of dead and/or overturned trees.

As the Ronæs Skov settlement lies south of the “tilt line”, we must look for the prehistoric coastline under the water. We now have a reliable reference point from the old land surface that has lain about 2.41 metres under the present sea level, and because of this we also have completely reliable information about the rise in sea level since the end of the Mesolithic Period.

Apart from all the artefacts normally found at Ertebølle settlements the following items were also recovered: flints, antlers, bones and ceramics. However, the preservation conditions for organic material in the damp gyttja deposits are so unusually good at the Ronæs Skov settlement that completely new and hitherto unknown wooden artefacts have also been found.

Most of the wood found in the gyttja layers, such as unworked branches – thick fragments, both short and long, from hazel trees etc with a diameter of 3–8 cm – lies in a natural, horizontal position. Many pointed hazel wood poles, both with and without bark, that lay in a horizontal position have also been found, some with a diameter of about 5 cm and over 4 metres long. Several of the poles were already broken in prehistoric times and were found at an angle. Others were upright, knocked into the sea bed off the settlement and could be the remains of Mesolithic fishing equipment.

Twelve tree trunks and pieces of tree trunk lying either at right angles or at an angle to the old coast line were registered. The largest trunk was found by accident at a depth of about 2.20 metres when the wash from the propeller of a diving ship sluiced away the uppermost layer of sand covering it. The trunk was from a well-grown oak about 17.3 metres long with its roots intact, lying westnorthwest-eastsoutheast with the roots facing west i.e. in towards the prehistoric coast line. The trunk was sucked free and raised to the surface by the crane on the diving ship. A slice was sawn off for dendrochronological dating, after which it was returned to bottom of the sea bed and covered up.

An exciting wooden artefact of which there were several in the Ronæs Skov settlement is the “Y-branch” but we do not know what it was used for. The first “Y-branch” was found in Tybrind Vig in 1985 and at that stage it was believed to be some sort of fishing equipment. “Y-branches” are unworked branches found in many different lengths and thicknesses, and the shaft can be pointed so that it could be knocked into the earth or the sea bed. There was a clearly marked groove on the shaft below the fork of one of the “Y-branches” which could have been made by rope. This could indicate that the “Y-branch” had been used to hold some sort of object such as a trap, tool, fishing net etc. Recently on Danish TV I saw a programme about a soldier making a bivouac who was using what



Fig. 5: M/S Louise: M/S Louise, Marine Archeological Groups diving boat at the submerged Ertebølle Settlement “Ronæs Skov”.

Fig. 6: Leister prong:
A leister prong of hazel (*Corylus*
sp.) "in situ" at "Ronæs Skov".
The prongs were used in pairs
symmetrically attached to a long
shaft of wood.

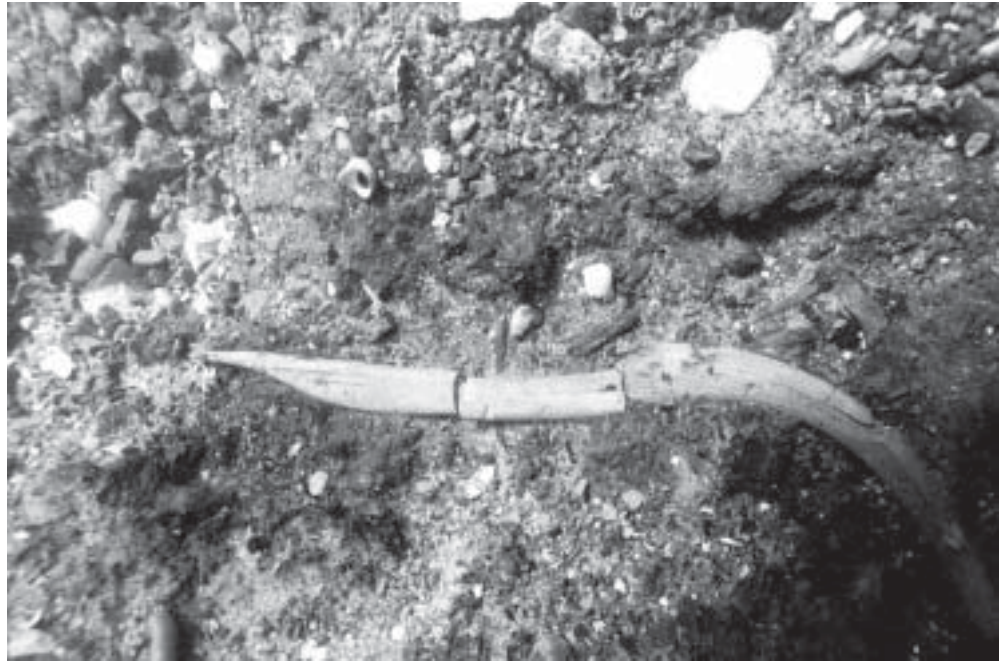


Fig. 7: "Y-branch":
A "Y-branch" from "Ronæs
Skov" with marked groove,
which could have been
made by rope.

he called "Y-branches", which were knocked into the ground to hold some horizontal poles.

Other well-preserved wooden artefacts include a large part of a very well-preserved elm wood bow, a fragment of an oar blade, a fragment of an arrow, fragments of a dugout canoe, a bow drill, notched sticks, Leister prongs, "Y-branches" and pointed hazel sticks, together with various stumps of uncloven wood etc.

Eleven years of investigation of the Ronæs Skov settlement are a further proof of how much important scientific material lies hidden in submerged Mesolithic settlements, waiting for research to be done. Unfortunately, nature's destructive forces are at work everywhere under the water, quickly eroding the marine layers of gyttja – also at Gamborg Fjord.

A close vegetation cover is the best protection against the erosion of submerged Mesolithic settlements. By far the most common plant on the sea bed is eel grass, whose root system provides an important shield against erosion, and maintains the thickness of sand over the gyttja layers. But eel grass is being destroyed because for several years massive amounts of fertilizer, primarily nitrogen from over-fertilization, industrial phosphates and waste water from towns have been discharged into the sea, including Gamborg Fjord.

Another major reason for the erosion of the

gyttja layer is the activity of crabs and benthic animals living on the sea bed. When the eel grass disappears leaving the gyttja exposed, crabs dig down through the layers in search of food. This creates holes in the gyttja that are enlarged by the action of waves until finally the gyttja breaks up into large lumps, making the whole layer liable to erosion. Soft clams, razor shells, piddocks, sand leeches and lugworms dig/grow 15–30 cm long tunnels into the gyttja layer and destroy wooden artefacts, either by gnawing into the wood, or because the animals' breathing holes let in oxygen.

There is therefore every good reason to take seriously the many alarming reports on the decline of eel grass in Denmark. There appears to be little doubt that one reason for this well-documented fact is the constant damage to the marine environment, and that the disappearance of eel grass is a major reason for the destruction and disappearance of submerged Mesolithic settlements.

Anschrift des Verfassers

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