



Book Review: Oceans of Archaeology

OLE BENNIKE

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Ole Bennike [obe@geus.dk], Geological Survey of Denmark and Greenland, Øster Voldgade 10, DK-1350 Copenhagen K, Denmark.

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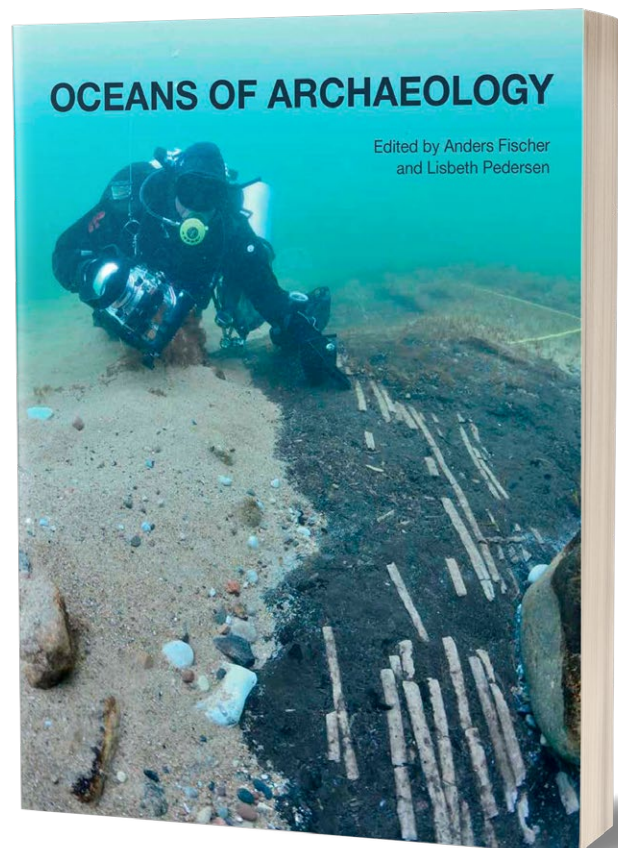
This book describes flooded Stone Age settlements in Europe and puts them into a temporal and spatial context. During the last ice age, the global sea level was *c.* 130 m lower than at present. About 20 000 years ago, the sea level began to rise and vast shallow-water areas with settlements were flooded. In many parts of the world, high energy levels and large waves mean that traces of former archaeological sites were erased when the coastal shelf was inundated. However, at places that have been sheltered from large waves, the submarine archaeological sites may be far better preserved than sites on land. This book presents numerous examples of such well-preserved sea floor sites from all over Europe, with a strong representation of sites from the sheltered inner Danish waters.

The last decades have seen a marked rise in exploitation of the sea floor around the world. At the same time, there has been tremendous technological advances in high-resolution submarine surveys. Also scuba diving has developed, allowing researchers and amateur archaeologists to explore the sea floor much more efficiently than before. Another technological development concerns chemical analyses of lipids found as food crusts on pottery, an aspect briefly touched on in one chapter. Finally, radiocarbon dating by accelerator mass spectrometry has led to a revolution in age determination of small samples.

Oceans of Archaeology developed out of an EU network. Two books have appeared as a result of the network's effort: one on the geology of submerged prehistoric landscapes and the present volume dealing with archaeology.

Although *Oceans of Archaeology* mainly deals with archaeology, the volume also includes a wealth of data and interpretations that are highly relevant to

geologists. Perhaps the most important issues relate to relative sea-level changes and the palaeogeographical evolution after the last deglaciation. These subjects have been debated for many years. In 1840, J.G. Forchhammer noted that raised marine and littoral deposits in Denmark are found only in the north-eastern part of the country, and he suggested that this part of the



land was rising whereas areas to the south-east were subsiding. His so-called tilt line dividing these areas is included in a map on page 68; however modern GPS measurements and high-precision levelling now indicate that land is rising all over Denmark, even in the south-west.

Several curves showing sea-level changes are included in the book. One shows global eustatic changes over the past 450 000 years, another curve provides a more detailed picture of changes over the last 35 000 years, and a curve shows relative sea-level changes in Øresund. Unfortunately, it is difficult to evaluate the latter curve because no details are provided on the samples that were used to construct the curve or how differences in land uplift were accounted for. Hopefully, details will be published elsewhere. Anyway, there is a large potential for cooperation between geologists and archaeologists when it comes to study relative shore-level changes in southern Scandinavia. The book also states: "it would clearly be advantageous to develop partnerships with the geological and technical research disciplines engaged in studying submerged landscapes" (page 198).

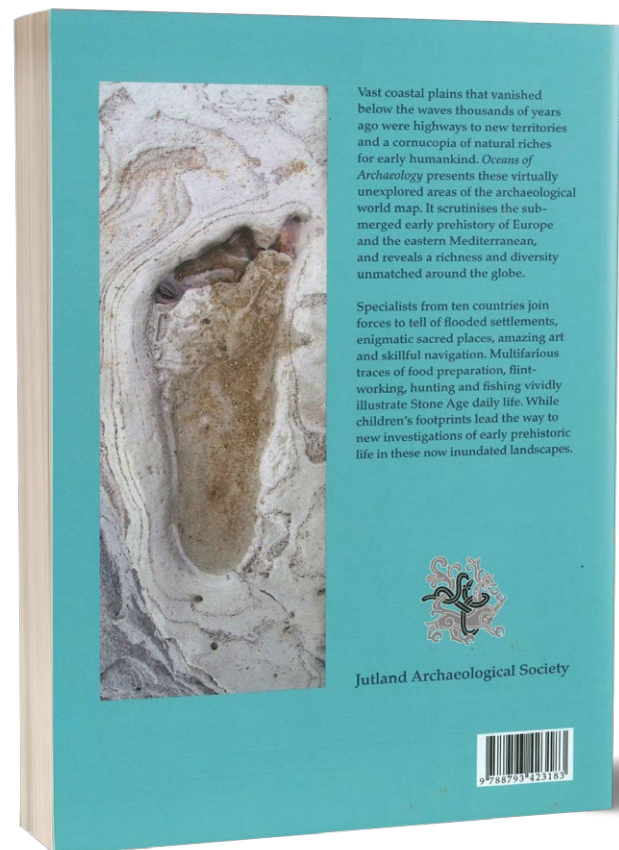
A few maps show the distribution of submerged sites across Europe. The high concentration of sites in Danish waters is remarkable. A series of six maps illustrate the palaeogeographical evolution of southern Scandinavia from 14 000 to 6500 years BP; these maps are based on publications by Danish, Swedish and Polish geologists. The book also contains numerous photographs, all of a high quality, showing divers in action, tree stumps on the sea floor and 6000 years old, still green leaves, but the majority of the photos shows artefacts, many of them made of wood. There are also many drawings, the most remarkable are perhaps those showing paddle blades from Tybrind Vig in Denmark. The blades show detailed patterns that are interpreted as human faces.

Some of the photographs show remains of mammals dredged from the sea floor. From a site in Køge Bugt come reindeer remains that have been modified by humans, and from the North Sea comes a red deer antler also modified by humans. From the southern North Sea is a skull of a mammoth, several molars of mammoth and a canine of a walrus found on a beach in Belgium. The latter was originally identified as a horn of the woolly rhinoceros, but according to the figure caption, it is now identified as an upper canine of the extant walrus (*Odobenus rosmarus*). However, the dark colour of the specimen may indicate that it comes from the Pliocene walrus *Ontocetus*. The inclusion of these non-archaeological finds helps to widen the scope of the book.

The book comprises 33 chapters that are grouped into six parts. Part 1 is an introduction, part 2 deals

with land-based sites, part 3 explores inundated sites and provides national overviews, part 4 describes methods, management and preservation of flooded sites, part 5 provides a synthesis and discusses strategies for the future, and part 6 includes a long list of radiocarbon dates. The list includes laboratory numbers and radiocarbon ages. This means that the reader will be able to re-calibrate ages when the calibration curves are modified in the future. Many older archaeological articles only give calibrated ages and no laboratory numbers, which means that the reader is unable to re-calibrate the ages. Hence, it is a great help that these details are provided in the book. It is also a great help to geologists that the book uses years BP throughout; archaeologists often use years BC/AD, which can hamper discussions between geologists and archaeologists. Each chapter is followed by a list of references, which is a great help to the reader, instead of having all references listed at the very end of the book.

Because the book developed from an EU network, most chapters deal with Europe, but some notes on Israel and Turkey are also included. Denmark is strongly represented both in terms of chapters and in terms of contributors. This reflects the fact that Denmark has by far the largest dataset, with several sites studied in detail.



One of the chapters discusses how far prehistoric people travelled over the sea. Already about 50 000 years ago, people crossed over from south-east Asia to Australia, a journey at least 70 km long. In Denmark, Stone Age people travelled 25 km from Sjælland to Hesselø for hunting, and travelled on the Kattegat during winter to hunt sea birds that came from breeding grounds in the north. Early prehistoric seafarers also crossed Skagerrak, travelled along the coast of Norway and from the Orkney Islands to the Shetland Islands – but not to the Faroe Islands or Iceland.

During the reading, I discovered very few errors, reflecting thorough editorial handling and work by the reviewers – two reviewers evaluated each chapter. However, I was surprised to learn on page 185 that European Neanderthals hunted penguins during the last interglacial. I assume it should be great auk (*Pinguinus impennis*, gejrfugl). The name penguin was originally applied to the great auk – but later used for a similar-looking, flight-less bird in the south.

A total of 35 authors from ten countries have contributed to the book, and an additional c. 70 persons

have acted as reviewers, provided photos or helped in other ways. From these numbers it is clear that it has taken a tremendous effort to put the book together. Many of the chapters are authored or co-authored by Anders Fischer, and he has also taken many of the photographs of divers in action. The book is well written and easy to read, well organised and very well illustrated. In addition, the numerous references make it easy for the reader to pursue special interests. The price is 348 DKK ex. VAT for the hard-cover book + e-book; 240 DKK ex. VAT for the e-book.

Several books and numerous papers have appeared during the last decades dealing with submerged Stone Age settlements and drowned landscapes. One may ask if we need another book. However, *Oceans of Archaeology* is the first book to cover the whole European continent. The reviewer was impressed by all the topics covered in this book. I can happily recommend it not only to archaeologists but also to geoscientists, in particular to those interested in the coastal zone, in the huge areas covered by the sea, in Quaternary science and in geoarchaeology.

