

# 'TEN GOLDEN YEARS': THE EXPERIENCE OF MARITIME ARCHAEOLOGY IN DENMARK

by Ole Crumlin-Pedersen

The Viking Ship Museum, Roskilde, Denmark

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*This paper surveys the strong position of maritime archaeology in Denmark during the period 1993-2003, and briefly discusses the relevance for the situation in the Severn Estuary region.*

## THE GENERAL BACKGROUND

Archaeology in general has had considerable public interest and support in Denmark for more than a century. In the mid-19<sup>th</sup> century, the general level of education among Danish farmers was raised to pave the way for a radical change in agriculture, from growing corn to animal production. The sons and daughters of farmers attending folk high schools were educated broadly in social relations, literature and history, and learned ancient local myths and legends. Thus the interest in the past was generally high in the communities of family-owned farmsteads where the majority of the Danish population lived in the 19<sup>th</sup> and early 20<sup>th</sup> centuries.

This situation created a good background for the early generations of Danish archaeologists, and in hindsight led to a very land-based concept of the cultures of the past, since only few finds from *non*-agricultural contexts were recorded at the time. Even at this stage, however, some of the sites that were investigated by professional archaeologists contained early boats and ships. From 1859-63 Conrad Engelhardt excavated the Late-Roman war booty offering in Nydam Mose, and in 1921-2 Rosenberg recovered the Pre-Roman Hjortspring find of a similar nature as well as in 1935-6 excavating the Viking-Age ship burial at Ladby. These excavations represent examples of archaeological fieldwork that preserved unique evidence of early ships and their contexts in Scandinavia.

## MARITIME ARCHAEOLOGY IN DENMARK

It was not until the late 1950s, however, that the National Museum of Denmark began to consider the excavation challenges offered by underwater finds, starting with three diving seasons at Skuldelev in Roskilde Fjord, where five ships had been scuttled in the 11<sup>th</sup> century. After realising the potentials of the find, a major excavation and recovery campaign of the ships was launched in 1962, and since 1969 the ships have been on display at the Viking Ship Museum in Roskilde where they were documented, conserved and restored. This museum was established as a daughter museum of the National Museum, specifically for the presentation of these ships as well as to serve as a base for developing maritime archaeology and heritage protection for underwater sites in Danish waters.

The geographical position of Denmark, between the Baltic and the North Sea, is somewhat similar to that of Greece, which lies between the Black Sea and the eastern Mediterranean. Both locations are ideal for the development of local shipping and maritime-oriented societies, and both areas serve as stepping-stones for land traffic between the European continent and neighbouring regions. At the same time, foreign ships have had to pass through these waters during all periods of prehistory and history.

According to the international regulations for the protection of the submerged cultural heritage, Denmark is responsible for the protection of all ancient sites and finds on the seabed within a distance of 12 nautical miles from its coast. Consequently, the Danish area to be surveyed and protected by the archaeological community

doubles when the underwater and terrestrial zones are combined.

In contrast to conditions in the Mediterranean and along Atlantic coasts, the Danish waters are shallow enough to allow normal scuba-diving activity almost everywhere, and there are practically no tides. Along the coastline are large expanses where sediments have been deposited, and due to the low salinity in the Baltic there are no active shipworms, such as *Teredo navalis*, in the south-eastern part of the waters. These conditions are ideal for the preservation of many of the thousands of ships that stranded or sank in these waters in the course of time. Consequently, the potential for the exposure of several ancient shipwrecks each year as a result of coastal erosion, construction works, or fishing activities is very high in Danish waters – just as is the case in the Severn Estuary.

The two crucial factors or preconditions that determine whether a historically-significant maritime cultural site is lost forever or preserved and included into the common heritage are:

1. *A well-functioning reporting system*, including interested locals among fishermen, contractors, sports divers, and the general public.
2. *An archaeological community that take earnest responsibility towards the finds from wetlands and submerged environments*, providing the resources for excavations as well as for a proper treatment of the finds, including analysis, conservation and publication.

Since 1970, groups of interested sports divers in Denmark have participated in annual intensive five-day courses on the principles of maritime archaeology and heritage protection, on board the museum schooner *Fulton*, which visits various archaeological sites in Danish waters. In this way a network of personal contacts has been established with most diving clubs in Denmark in order to obtain reports of their findings and to encourage a cooperative spirit so that club members do not loot archaeological sites.

As for the professional side, the initial funding for maritime archaeology in Denmark was provided by private sponsors, enabling the

National Museum to establish the documentation and conservation workshop for the Skuldelev ships, later to be expanded and used for the treatment of large quantities of water-logged wood from several other shipwrecks.

Fieldwork activities were organised by the small staff of the Institute for Maritime Archaeology of the National Museum, with one or more underwater or wetland investigations and excavations undertaken practically each year from the 1970s to the 1990s, all within medieval Denmark, including present-day southern Sweden and northern Germany. In this way, a considerable number of finds of ships and boats were excavated and recorded, primarily of Viking-Age and medieval date, and some of these have been published in detail. The same applies to a number of navigational obstacles from the Pre-Roman Iron Age onwards that were established to block the entrances to narrow sounds from enemy ships. During the 1970s, colleagues at other museums began investigations of submerged Stone-Age settlements in the Danish coastal zone, producing important evidence and some remarkable finds, including decorated paddles and textile remains.

#### **ESTABLISHING THE CENTRE FOR MARITIME ARCHAEOLOGY IN ROSKILDE**

In the early 1990s, the newly-established Danish National Research Foundation recognised the potential of maritime archaeology, and in 1993 they provided the means for establishing a semi-permanent Maritime Archaeology Research Centre of the National Museum, located in Roskilde and collaborating closely with the Viking Ship Museum. The initial five-year work period was later prolonged to ten, the maximum allowable under the Research Foundation. A concentrated effort to intensify research into a broad range of maritime aspects of archaeology was foreseen, including new fieldwork, interdisciplinary research and an internationally-oriented publications policy.

The research programme of the Centre was designed for a mixed, international team of researchers with backgrounds in archaeology, conservation, natural sciences, naval architecture

and practical skills, all cooperating to promote research and development within three thematic sectors:

(1) *Maritime aspects of archaeology in general.* The potential of Maritime Archaeology should be exploited to give a better understanding of living conditions in the past in coastal regions, and this perspective should be made an integral part of mainstream archaeology.

(2) *The archaeology of watercraft.* Ship Archaeology should be promoted both nationally and internationally, taking as a starting point the particularly favourable opportunities and special responsibilities which Denmark has in this field.

(3) *Development of tools and techniques in Maritime Archaeology.* Techniques and methods for fieldwork, documentation and preservation should be developed as a continuation of the previous Danish contributions to the field.

#### *The first sector*

The projects within the first sector focused on human relations and activities within the land/sea interface in the prehistoric and medieval periods in northern Europe. The themes were treated as individual projects as well as through a series of international research seminars organised and published by the Centre. The first of these seminars was *The Ship as Symbol in Prehistoric and Medieval Scandinavia*, organised in 1994 with 115 participants and 21 invited papers (Crumlin-Pedersen & Thye 1995). The subject was continued in a study of engravings of ships on Bronze-Age bronze artefacts by Flemming Kaul, resulting in a large monograph on ancient cosmology (Kaul 1998).

Two international research seminars were organised on maritime warfare and its impact on Iron-Age and medieval society; *Military Aspects of Scandinavian Society in a European Perspective AD 1-1300* (1996), with 145 participants and 26 invited papers (Jørgensen & Clausen 1997), and *Maritime Warfare in Northern Europe 500 BC - 1500 AD* (2000), with 125 participants and 25 invited papers (Jørgensen *et al.* 2002). These two seminars and further studies in aspects of ancient warfare and defence were organised by Anne Nørgård Jørgensen.

The greater part of our projects within this 'general' sector, however, focused on identifying and interpreting traces of more peaceful human activities in the coastal zone. In the sequence of international research seminars, the theme *Maritime Topography and the Medieval Town* was studied in 1998 with 160 participants and 25 invited papers (Bill & Clausen 1999). To help identify archaeological indicators for ports, beach markets and settlements as part of the coastal topography, the Centre also supported its own studies, culminating in two books, published in Danish in 1996 and 1997; *The Coast of Funen in the Iron Age, Viking Age and Middle Ages* (Crumlin-Pedersen *et al.* 1996), and *Landing Places in Denmark 200-1100 AD* (Ulriksen 1998, see also Ulriksen 1994).

A major study of ethnicity, settlement and communications along the southern coast of the Baltic with a focus on the Oder River mouth area was undertaken at the Centre by George Indruszewski (Indruszewski 2004). The preparation of the final publication on the important Late-Roman Iron-Age *Lundeborg* beach site by Per Orla Thomsen has been supported by the Centre; the same was the case for the excavations of coastal Stone-Age sites, partly submerged today, and conducted throughout Denmark by Søren H. Andersen over the years.

Beside these themes, the centre has supported in-depth studies by Inge Bødker Enghoff of the early history of fishing, based on the study of fish bones from excavation sites in the North Sea and Baltic regions (Enghoff 1999, 2000).

As shown here, the Sea has played an important role in several aspects of life in past societies. This approach to archaeology is now spreading rapidly in Denmark and elsewhere, not the least thanks to the many books, articles and newsletters<sup>1</sup> published from the Centre.

#### *The second sector*

The projects of the second sector, *The ship archaeological projects*, might just as well have been incorporated into the former group, since these all reflect the central aspect of human interaction with nature in a coastal or fluvial

environment. In our case, however, the ship finds were treated separately since several had been excavated prior to the Centre's establishment and were now ready for the final analysis and subsequent publication as monographs in the series *Ships & Boats of the North* (SBN), published by the Viking Ship Museum.

The first of these to appear were the volumes on *Viking-Age Ships and Shipbuilding in Hedeby and Schleswig* by Ole Crumlin-Pedersen *et al.* (1997), *Ladby. A Danish Ship-Grave from the Viking Age* by Anne C. Sørensen *et al.* (2001), *The Skuldelev Ships I* by Ole Crumlin-Pedersen *et al.* (2002), and *Hjortspring. A pre-Roman Iron-Age Warship in Context* by Ole Crumlin-Pedersen *et al.* (2003).

In these monographs the authors give full data on excavation, conservation, restoration and naval architectural features for each of the finds in question. They analyse and describe the historical background for the vessels and conclude with the contributions that these finds offer our understanding of practical needs and social aspirations in the societies where these ships were built and used.

Several SBN volumes are now being prepared for publication, including *Large Cargo ships in Danish Waters 1000-1200* by Anton Englert, *Dutch Renaissance Ships from Christianshavn* by Christian Lemée, *Small-Scale Seafaring in Danish Waters 1000-1600* by Jan Bill, *Danish Medieval Cog Finds* by Fred Hocker *et al.*, *The Skuldelev Ships II & III* by Ole Crumlin-Pedersen *et al.*, *The Utrecht Ship in Context* by Aleydis Van de Moortel, and *The Nydam Ships I & II* by Flemming Rieck *et al.*

These volumes are based on fieldwork and analyses undertaken before and during the Centre's 1993-2003 existence. In the case of the Skuldelev ships, extensive experimental archaeological activities will be reported. The volumes on the Nydam ships will present the results of the new excavations at the wetland site of this war-spoil find and the interdisciplinary environmental analyses of the parameters affecting the *in-situ* preservation of the numerous artefacts remaining in the un-excavated areas of the site. These volumes will be published over the

next few years, as the means for their printing have been provided, and further volumes are planned.

In addition to these monographs, the Centre has contributed to the study of ancient technology related to early shipbuilding, including wood technology and materials used to manufacture ropes and sailcloth. These studies are applied to the experiments with the reconstructions of some of the investigated ships (Andersen 1995, 2001; Andersen *et al.* 1997; Möeller-Wiering 2002).

### *The third sector*

The projects of the third sector, *The development of tools and techniques in Maritime Archaeology*, included studies in conservation by Poul Jensen and David Gregory, (Jensen 1997), as well as naval architectural studies by Kenn Jensen (Jensen 1999).

Techniques for surveys and recording under water have been studied and tested by applying seismic techniques to archaeological sites, and the use of an AUV (Autonomous Underwater Vehicle) for mapping underwater sites was designed by Fred Hocker. For the detailed recording of archaeological finds, including ships' timbers, the following techniques have been developed or adapted to archaeological needs: *Object illustration* by PhotoDraw, by Jørgen Holm, and *Digital documentation* with the FaroArm by Fred Hocker, the latter enabling precise three-dimensional recording of complex elements, such as ships' parts, and the fitting together of these into their complex original structures.

## STAFF AND STRUCTURE OF THE CENTRE

Admittedly, this intense research activity was made possible only by the fact that sufficient financial resources were at hand to fulfil the aims of the Centre, and that a considerable degree of freedom was granted to the director of the Centre, in order to establish the programme and select researchers.

The team was based on 3-4 senior researchers, who were supplemented over the



entire period by 6-7 project researchers, 12 PhD students, and 16 graduate students, as well as a small graphics and administrative staff. This staff included archaeologists, naval architects, conservators, wood specialists, divers and a computer specialist, all interacting in a very productive way and in cooperation with the Natural Sciences Unit of the National Museum. The PhD projects were carried out in collaboration with seven different universities in Denmark and Germany, and of the twelve PhD-students, only one has yet to complete his studies.

The team of researchers was very international, comprised of members from Denmark, Sweden, Finland, Germany, England and the USA. Nine external PhD students from five different countries, as well as twenty-six guest researchers from eight different countries also joined the team. An international advisory council was also established and met annually, and the Centre was subjected three times to international evaluation, each time achieving the highest marks.

Nevertheless, by 1<sup>st</sup> September 2003, the Centre had to close down since none of the centres funded by the Research Foundation could be supported for more than ten years. At the same time, the National Museum was subjected to serious financial cuts leading to the reduction of its permanent staff, also affecting the few members of the maritime archaeology unit outside the Centre.

### **THE FUTURE OF MARITIME ARCHAEOLOGY IN ROSKILDE**

Fortunately, the Viking Ship Museum in Roskilde managed to engage a few of the staff members from the Centre, and from January 2004 the National Museum has transferred its remaining maritime archaeology staff and activities, including heritage protection and research, to the Viking Ship Museum.

This museum will now continue the publications programme of the *Ships & Boats of the North* series, and has already demonstrated its willingness to play an active international role by hosting the tenth International Symposium of Boat and Ship Archaeology in September 2004. Two

international and interdisciplinary research seminars on 9<sup>th</sup>-10<sup>th</sup> century seafaring in the north, based on studies of the reports of two Viking-Age travellers, Ottar and Wulfstan, recorded at the court of King Alfred in Wessex, have also been held recently at the initiative of the museum. These seminar papers will be published in two volumes in a new major series of the museum: *Maritime Studies of the North*, edited by Jan Bill and Anton Englert.

The remains of nine medieval ships, found in 1996-97 during the dredging of a harbour dock facility at the museum in Roskilde, are now being documented and analysed prior to conservation. In addition, the Viking Ship Museum is currently engaged in new excavations in Denmark, Sweden, Iceland and the Shetland Islands.

In regards to experimental archaeology, the Viking Ship Museum has held a strong position for several years, and a highlight in this programme was the 4<sup>th</sup> September 2004 launch of a full-scale reconstruction of the 30 m long warship, Skuldelev 2. The vessel was originally built near Dublin in 1042, and hopefully the reconstruction will undertake a voyage on its own keel to Ireland in 2007 or 2008.

With such a background, it seems realistic to be optimistic regarding the continuation of the research-oriented 'Roskilde' maritime archaeology in the future, in spite of the severe reductions in the staff and the available funding, compared to the 'ten golden years' from 1993 to 2003.

### **POSSIBLE RELEVANCE FOR THE SEVERN ESTUARY SCENE?**

The Danish maritime archaeology case history may be of some relevance to the banks of the Severn Estuary, as the coastal landscape in this region holds considerable potential for maritime archaeology, and related fields of study are defined as they have been in Roskilde, comprising all aspects of the interrelation between humans and the sea in Prehistory and the Middle Ages.

The Severn Estuary coastal landscape is very different from the Danish coast in terms of geology and hydrography. However, the estuarine

environment provides the potential for important archaeological as well as palaeoenvironmental finds, sealed in sediments that are optimal for the preservation of organic remains, though difficult to work in. This has been clearly demonstrated within the group of finds I know best, ships and boats, ranging from the finds of sewn Bronze-Age boat parts from Caldicot and Goldcliff, to the Celtic sailing coaster from 300 AD found at Barland's Farm, the Magor Pill medieval trading boat and the remarkable 15<sup>th</sup>-century Newport ship.

Based on my experience, you should expect in the future new important finds to emerge very frequently, under water, in the tidal zone, and in wetlands. Such an impending situation calls for action from the responsible authorities for this cultural heritage. Ideally, a specialised research-oriented unit designed to excavate, document, analyse, conserve and develop displays should be established. Such a unit would need a minimum, permanent research staff of three core persons: an experienced maritime archaeologist, an environmental specialist, and a conservator. This unit could then increase with staff members when required for specific projects.

The present situation in South Wales, after the excavation of the Newport ship, calls for such action to be taken. Such an effort could ideally be combined with an attempt to bring together these regional boat and ship finds into a common display to serve as the base for the unit suggested here. The unit would be responsible for these finds as well as other aspects of maritime archaeology of the Severn Estuary. These finds are, no doubt, going to challenge the archaeological community over and over again to take action, not as improvised, *ad hoc* solutions but through a competent research and protection group set up by the responsible administrative bodies and the relevant museums. If such a unit could be established and work closely together with the Waterfront Project, offering ongoing research and expertise into the vital maritime aspects of the archaeology of the Severn Estuary, an outstanding attraction could be created, worthy of the region's maritime past.

**NOTE:** <sup>1</sup>A complete list of publications from the Centre 1993-2004 is printed in *Maritime Archaeology Newsletter from Roskilde* 20, 2003.

## BIBLIOGRAPHY

- Andersen, E. (1995) Square Sails of Wool. In O. Olsen, J. S. Madsen & F. Rieck (eds.) *Shipshape. Essays for Ole Crumlin-Pedersen*. 249-270. Roskilde.
- Andersen, E. (2001) The woollen sail. Research in long lengths. *Maritime Archaeology Newsletter Roskilde* 16: 22-29.
- Andersen, E. *et al.* (1997) *Roar Ege - Skuldelev 3 skibet som arkæologisk eksperiment*. Roskilde.
- Bill, J. & Clausen, B. L. (1999) (eds). *Maritime Topography and the Medieval Town*. PNM Studies in Archaeology & History 4. Copenhagen.
- Crumlin-Pedersen, O. & Olsen, O. (2002) (eds.) *The Skuldelev Ships I. Topography, Archaeology, History, Conservation and Display*. Ships and Boats of the North 4.1. Roskilde.
- Crumlin-Pedersen, O. & Thye, B. (1995) (eds.). *The Ship as Symbol in Prehistoric and Medieval Scandinavia*. PNM Studies in Archaeology & History 1. Copenhagen.
- Crumlin-Pedersen, O. & Trakadas, A. (2003) (eds.) *Hjortspring. A Pre-Roman Iron-Age Warship in Context*. Ships and Boats of the North 5. Roskilde.
- Crumlin-Pedersen, O., Porsmose, E. & Thrane, H. (1996) (eds.). *Atlas over Fyns kyst i jernalder, vikingetid og middelalder*. Odense.
- Crumlin-Pedersen, O. *et al.* (1997) *Viking-Age ships and shipbuilding in Hedeby/Haithabu and Schleswig*. Ships and Boats of the North 2. Schleswig & Roskilde.
- Enghoff, I. B. (1999) Fishing in the Baltic region from the 5th century BC to the 16th century AD. Evidence from Fish Bones. *Archaeofauna* 8: 41-85.
- Enghoff, I. B. (2000): Fishing in the Southern North Sea Region from the 1st to the 16th Century AD: Evidence from Fish Bones. *Archaeofauna* 9: 59-132

Indruszewski, G. (2004) *Man, Ship, Landscape. Ships and seafaring in the Oder Mouth Area AD 400-1400. A case study of an ideological context.* PNM Studies in Archaeology & History 9. Copenhagen.

Jensen, K. (1999): *Documentation and Analysis of Ancient Ships.* Centre for Maritime Archaeology and Department of Naval Architecture and Offshore Engineering. Technical University of Denmark. Lyngby.

Jensen, P. (1997) Diffusion in waterlogged wood. Computer programs, & sorption of water and water soluble agents in the waterlogged wooden cell wall. *Proceedings of the 6th ICOM Group on Wet Organic Archaeological Materials Conference.* York 1996.

Jørgensen, A.N. & Clausen, B.L. (1997) (eds.). *Military Aspects of Scandinavian Society in a European Perspective AD 1-1300.* PNM Studies in Archaeology & History 2. Copenhagen.

Jørgensen, A. N., Pind, J., Jørgensen, L. & Clausen, B. (2002) (eds.). *Maritime Warfare in Northern Europe. Technology, organisation, logistics and administration 500 BC-1500 AD.* PNM Studies in Archaeology & History 6. Copenhagen.

Kaul, F. (1998) *Ships on Bronzes: A study in Bronze Age religion and Iconography.* PNM Studies in Archaeology & History, Copenhagen.

Möller-Wiering, S. (2002) *Segeltuch und Emballage. Textilien im mittelalterlichen Warentransport auf Nord- und Ostsee.* Internationale Archäologie 70. Rahden/Westf.

Sørensen, A.C. et al. (2001) *Ladby. A Danish Ship-Grave from the Viking Age.* Ships and Boats of the North 3. Roskilde.

Ulriksen, J. (1994) Danish sites and settlements with a maritime context, AD 200-1200. *Antiquity* 68, No. 261: 797-811.

Ulriksen, J. (1998) *Anløbspladser. Besejling og bebyggelse i Danmark mellem 200 og 1100 e.Kr.* Vikingskibshallen i Roskilde.

