MoSS
January 2004

Newsletter

1/2004

A shipwreck research project funded by the European Union Culture 2000 Programme

contents

Theme: Visualisation

Education and Culture
Culture 2000

Carl Olof Cederlund

What is Visualisation?

The Editor

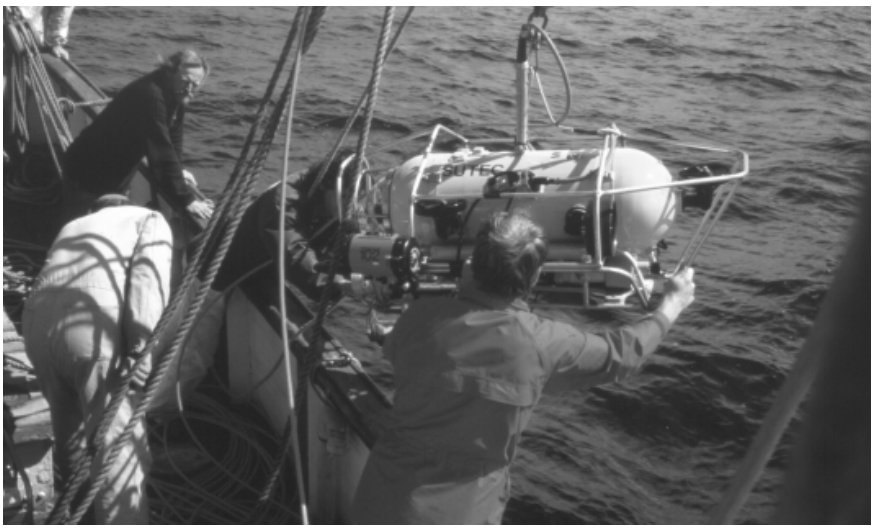
This sixth issue in the MoSS newsletter series is the first in a sequence of three where each one will focus on one of the themes of the project: Visualization, Monitoring and Safeguarding.
In the last newsletter of the project it was originally intended that a presentation of the project's preliminary results would be made. However, this newsletter will now not be published. Rather, work will focus on the finishing of the Final Report, where the results will be presented in full.

Carl Olof Cederlund

The term visualisation
The English concept "visualisation" seems to be a rather modern term. In the Chamber's Etymological Dictionary (enlarged edition) of 1919 it is not included. The concept itself comes out of the word –"visual", - which in turn is derived from the Latin "visus" sight, where "videre", to see, is the verb. "Visus" means seeing, the capacity to see, look, eyes, and also in the passive form: sight, vision, and phenomenon. In Swedish we have introduced the word "visualisation" as "visualisering", which means to show or to make something visible. In the Swedish Academy word list, "visuell" from which the former noun might be derived, is defined as "uppfattad med synen", which means "perceived with your sight".
So we, from a linguistic point of view, deal with visualisation as a term esp. related to our capacity to see. Is this a sufficient explanation of what we are doing, when we visualise our efforts in under water archaeology and maritime history? Of course it forms a part, due to the fact that our occupation is very much about the transference of visual information to the public. Nevertheless, I would argue that at the same time visualisation in our understanding of the concept is something multi sensual and not just related to our seeing. I will come back to this wider meaning.

The concept of visualisation
The concept of visualization is of course conjoined with several other important concepts when we negotiate these subjects, for example those of "perception" and "conception". I will therefore try to discuss the term visualisation in relation to the conceptual environment in which we find our use of the word. There is a practical / technical side to this concept, in the way we use it. I will touch upon this but not in detail. The technical side nevertheless has a strong connection to the principal one. It should be noted that this concept, as one of the three that underpin the basis of the work within the MoSS project – monitoring, safeguarding and visualising – is possibly the most basic or central of these - as it emanates from the use of our senses in the material world, a very primal situation. So it has a central role in the profession in which we are occupied. It is about how we actively or un-consciously visualise our messages and how these are perceived and conceived.

What are we visualising?
What we are visualising both generally in under water archaeology and also in the MoSS project is central to this subject: as I see it, we are visualising old ship wrecks and other material cultural remains, their wrecking process, the ships as they were, the time, the environment, the culture, the society to which they belonged as well as the humans or individuals connected with them. This information is conveyed in the creation of images or conceptions of many different kinds in many shapes, as scholarly results, as museum exhibitions, or as reen-actments of the past the ship belonged to in other ways.
There can be several central, underlying motives for this activity as the historical creation process, as we know, is used in many ways in order to realise different ideas. This ideological aspect of the subject is of such a scope that in order to gain a proper understanding of it, we would need to deal with it separately in a way, which space does not allow us to do here.
It is my personal opinion though, that



The Swedish ROV, the Sea Owl, being prepared to document the wreck of the E. Nordevall at the investigations conducted on the lake Vättern site in 1987 (Photo: Carl Olof Cederlund).

one central idea or motive for our work is to create manifold pictures of the past, in order to encourage the capacity to understand the differentiation of life in the past. In this way the situation where one-sided images are presented which come to dominate the common awareness of the past is avoided. One important motive may be to create the opportunities for the individual to construct her or his own pictures of past life, thereby encouraging a manifold perception of it – while at the same time doing the same thing for life in the present. The present and the past are inseparably linked to each other in our minds. To provoke the perception of one of them is also to stimulate the perception of the other. There is no definite borderline between the present and the past in this respect. They both belong to a process where we look on life and existence in the same way, generally.

The visualisation of the paddle wheeler E. Nordevall – as our example

In what ways have we and are we visualising the wreck of the E. Nordevall, the Swedish "wreck case" in the MoSS project, which sank in lake Vättern, 148 years ago? And what relation has this to our understanding of the time period and cultural situation this vessel belonged to?

Visual documentation

Since the localisation of the ship in 1980 there has been extensive documentation of it with visual media instruments such as photo, filming and video recording. It has also been measured and plans have been made of it in order that information about its dimensions, structure and state of preservation could be transferred to the surface world. A series of steps have been taken in order to preserve the vessel on its site – this is against the daunting odds created by a deterioration process of which several factors are the underlying cause.

By building a full scale replica of the "Poeler Cog" in Wismar harbour (Germany), late medieval shipbuilding can be visualised (Photo: Roland Obst, Erfurt).

Exhibition arrangements have been made about the E. Nordevall, while reports, folders, information leaflets and other publications have been promulgated and video films shot. All this sends messages through the plentiful illustrations. A sizeable amount of conceptual information has also been distributed about the ship through the texts describing it.

Certain artefacts have been salvaged from the wreck for protective reasons esp., but also for exhibition, or in other words, visualisation. Since its localisation there has been a growing interest in salvaging the E. Nordevall – in order to be able to conserve and visualise this uniquely intact ship in full in its original form, so it can be exhibited in a museum open to the general public. Much of the under water documentation that has been undertaken has been motivated by the preparation for such a salvage.

Visualisation through replication

Since the middle of the 1990s the building of a full-scale replica of the E. Nordevall has been underway in Forsvik, Karlsborg municipality, which has been given the name Eric Nordevall II. This replica or ship copy will be launched in a few years in order to operate on the same routes that the original ship worked on, also today with passengers. This is yet another way to visualise an old ship. In this case, the recreated ship is being made visual in its original environment and its original role. One is then making the ship real by stimulating some of the other basic senses – such as the hearing and olfactory senses as well as allowing the perception of touch. When it comes to the direct experiencing of old steam ships, I have the notion that it is just this combination of sensual impressions which has a strong impact. We are back to multi sensuality as a central part of the visualisation process.

Visualising through contemporary evidence

Another way to visualise our message – whatever intention this has – is to mobilise contemporary environments, object, pictures, written evidence such as texts, as well as sounds, music, songs, with the intention of giving shape

to the human environment of the time we want to recreate. What we do then is not only a question of properly recording and visualising an old ship – it is just as much a question of searching, retrieving and presenting the physical environment and also the ideas this may carry about the period to which the E. Nordevall itself belonged.

Both the original ship and the fullscale copy of it are well suited to create a stage on which we can re-enact the life of five generations ago. They are scenarios containing not only visual historical information about the ship but they also present us with the possibility to create an environment with and around them. To visualise is in this context not only to transfer proper visual information – but also to set a scene from the past. In a sense, this makes us the directors of that past – with the responsibility and the freedom this brings.

One of my favourite examples of what I mean by this comes with the possibility of not only being able to demonstrate the E. Nordevall getting underway for the public both on the shore or aboard, but also in our ability to re-enact other aspects of early 19th century Sweden at one or several of the E. Nordevall's original harbours. Some of these harbours are still intact from the Nordevall´s time. What I want to imply is that one may illustrate, that is visualise, life, trade, work, leisure, family life, generational shifts and differences, music and other important things in life through various forms of arrangement, even through theatrical acting, while also integrating the public at the harbour side – with the Eric Nordevall II open to visitors and with fire under the boiler and smoke rising out of the stack at the jetty in the background.

If the original ship is salvaged, conserved and displayed in a museum it would be possible in a similar way to re-enact the life of 150 or 200 years ago in a museum setting.

Visualisation in the under water environment

One kind of visualising – with a rather futuristic accent – is the one in which the E. Nordevall is safeguarded in an active way - and visualised at its site at a depth of 45 metres. I am not talking about the kind of safeguarding of old wrecks we normally encounter today, but a safeguarding activity, which has been expanded to cover both continuous monitoring and safeguarding, which also includes the restoration of the structure of the ship.

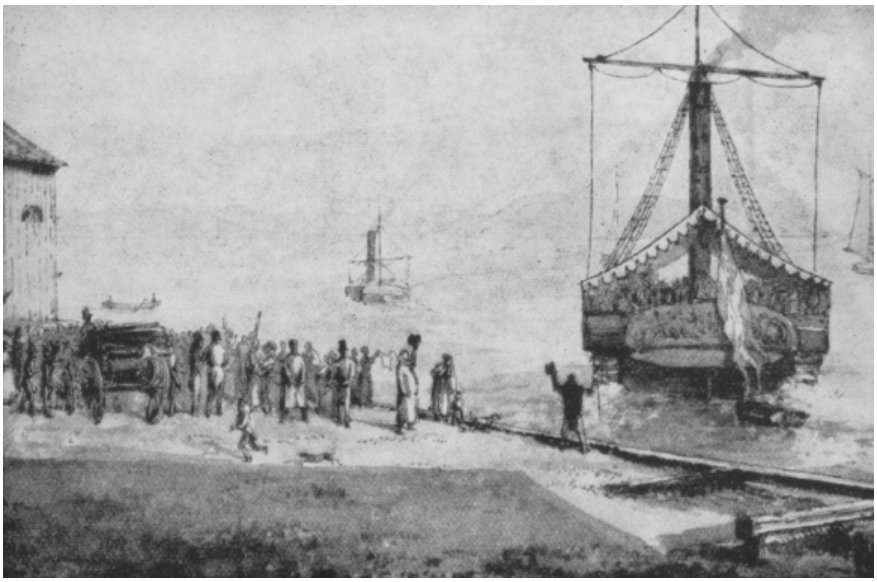
How the cultural potential of the vessel is to be used, or visualised, in its under water setting is an interesting question to discuss!

How far into the future lies the realisation – in an under water environment such as lake Vättern or the Baltic Sea coastal waters - of making a submerged cultural resource like the E. Nordevall or the wreck of the Vrouw Maria on the Finnish coast accessible on a bigger scale and to a large audience? Will it ever happen?

It is evident that the first step towards this is when you create an active management strategy and enact it for the ship on its site. One may naturally use the fast developing digital and virtual techniques to assist both the visualisation and also the safeguarding of the site and the ship. This should be done – in different ways - both for the divers who are permitted to go down to the site, but esp. for the general public on land – with this visualisation being transferred to a museum setting where the ship can be visualised through a direct link from the bottom, where various forms of arrangement such as lights, signs, texts, pictorial scenarios are used to describe, or visualise the ship and its history.

It is also worth noting that for the last four years a diving and anchoring ban has existed on the site of the Eric Nordevall, which makes the latter alternative the only one, which is permitted in a formal respect.

One must also remember that if a 170-year-old paddle steamer is to be salvaged then the development of an active management plan of the site and the vessel is also a demanding task



A contemporary illustration of one of the paddle wheelers on the Göta Canal route leaving the harbour at Riddarholmen, Stockholm, for the journey to Gothenburg along the canal.

Scuba divers constructing the measurement system at the Darss Cog (Germany) (Photo: Roland Obst, Erfurt).

which must be responded to in the short term. Otherwise the ongoing deterioration process will see to it that in the foreseeable future, there will not be this unique ship to salvage from this site, but just a wreck in the true sense of this word.

We still have some way to go for visualisation to occur from the under water world on any more expanded level. Perhaps a generation or two in the future? The successive integration of humans in the underwater world might make us leave behind the attitudes we have today on these issues, i.e. where we – with very few exceptions - generally perceive and evaluate the cultural resources under water rather passively and with very few resources being devoted to either safeguarding or visualising them. With the technical means, which are continuously developing, we will in the future be able to visualise the cultural aspects of the under water world in a much more developed and active way than we do today. We have to reach a position in which we take the responsibility generally to actively protect these cultural and historical resources.

Visualisation through participation

Another dimension of the concept of visualisation I would like to mention is *participation* - an activity that may have a considerable meaning for a project like the one which concerns the E. Nordevall. It implies the integration of individuals in our own time in the concept of the old ship through their active participation in its building, equipment, handling, use, and in the settings of the time to which it belonged. This can be done as I envisaged earlier in the historical settings that one arranges around the Eric Nordevall II, in which one invites those who are interested to take part, possibly through making use of the dresses or roles of the time to which the Nordevall belonged.

One good example of a form of participation that already exists is the engagement of the shipbuilders or rather carpenter apprentices who are working as shipwrights to build the copy of the 170-year-old ship. In the future there will be many other roles of a similar type to create for those interested, both for professionals and for others in the form of a leisure pursuit – from the role of crew members on board, or as passengers, through to the re-enactment of the Nordevall's normal societal life along the shores of Lake Vättern and the Göta Kanal.

This way of visualising is really all about creating a multi sensual experience, namely by introducing today's humans to a scenario of the past which comprises as many parts of it as we know and can recreate.

There is another act of participation, which is also strongly connected to the concept of visualisation. This is the one that occurs when visiting the site of the E. Nordevall at a depth of 45 metres as a diver. Then one is in a real sense perceiving and visualising the old ship in its original shape, with the marks of time upon it. One makes a visit to the past in its material form. This is the form of visualisation, which is found in the concept of the under water archaeological parks, a type of arrangement, which exists in other parts of the world, but as yet not in Sweden.

Through this form of arrangement one can integrate the individual in an environment of the past which also has the potential to enlighten the visitor with the help of different kinds of message such as those found in texts, pictures and also orally at the site.

Visualisation as making alive

I would finally – following the reasoning employed in this introduction – like to couple the concept of *visualisation*, as we understand it, with the concept of *make alive*, in Swedish *levandegöra*. A general understanding of the concept is one which has something especially to do with making submerged cultural resources visible generally. The concept of visualisation is wider than just the producing and presenting of visual evidence. It is really a question of performing and integrating into real or recreated multi sensual situations of the past.

Hauke Jöns

Techniques of Documentation and Visualization

Nowadays, we are used to a daily intake of a large quantity of information on the most varied subjects and of having to use that information. Concerning this usage, information visualized by means of images, films, videos, drawings or graphics is playing an ever more important role. Skilled by this daily exercise, we are basically inclined to place our trust in pictures and their contents as they are apparently reflecting reality despite the fact that common techniques of picture processing make manipulation possible on an unlimited scale. Therefore, it has never been more important than it is now to be able to differentiate clearly between objective information, i. e. documentation, and the interpretation of documented facts.

This also applies in a very real sense to science and particularly to archaeology and other related disciplines. Here, images and pictures are not only used to visualize the results of research or even reconstruct historical events for instance in books and museums, but they are also used in electronic media as well. But photographs, videotapes and drawings are also indispensable components of documentation of archaeological finds and sites.

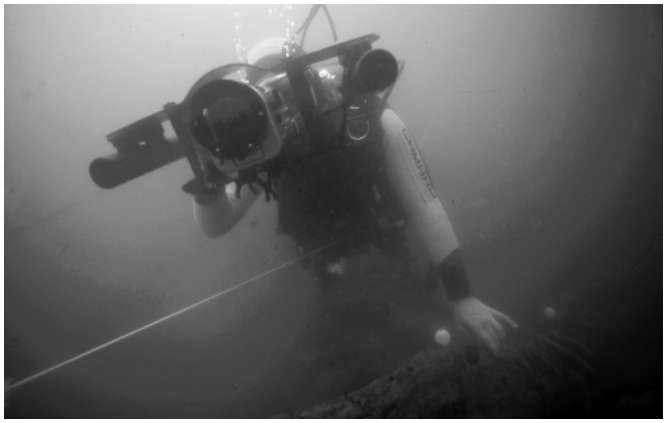
Concerning the documentation of our underwater heritage, a number of specialized techniques have been developed. They allow detailed information of underwater sites to be given even to those persons who cannot dive and who therefore have no possibility of seeing or enjoying these sites themselves. One important aim of the MoSS project is to use these techniques and to develop them further. Through the use of these techniques the variety and importance of our common cultural heritage, represented here by four very well preserved shipwrecks of great historical significance, can be visualized for the citizens of Europe and so help convince them of the value of the wrecks' conservation and the necessity of the sustainable safeguarding of our underwater cultural heritage.

Which techniques are used for the documentation of wreck sites is basically dependent on the on-site conditions. Three factors are of great importance: first, the state of preservation of the wreck itself, second, the visibility at the site and third, the extent to which the wreck or part of the wreck is covered by sediment.

Within the MoSS-Project, the *Vrouw Maria* and the *Eric Nordevall* are in an excellent state of preservation due to their environmental conditions, so much so that it is difficult to even believe, that these ships didn't sink a few weeks but rather hundreds of years ago. Video and photographic documentation can be used immediately for visualising these wrecks. In the case of the two other MoSS-project wrecks, the *Darss Cog* and especially the *Burgzand Noord 10* wrecksite we have a different situation, because only parts of each ship are well preserved. So the documentation of these ship remains has to be "translated" by specialists before they can be visualised as ships by ordinary members of the general public.

The visibility at the site is also of utmost importance for the possibility of direct visualization of shipwreck sites. Visibility depends on the one hand, on the quantity of light – diminishing continually with growing depth – and on the other hand, on the number of organisms like plankton or algae. The existence of micro-organisms and algae is connected to water temperature and the presence of nutrients and therefore undergoes seasonal fluctuations. The four wrecks of the MoSS project are situated in totally differing depths and milieus of water, which means that their degree of visibility varies greatly. Therefore, the means of visualization have to be different.

The *Vrouw Maria*, which is lying off the Finnish shore at a depth of 40 m, is covered in darkness for most of the year. The sea absorbs nearly all of the sunlight, although the quantity of micro-organisms is small in comparison with other parts of Europe's seas. It is only on sunny summer days that the sunlight reaches the seabed and the wreck is discernible without artificial light. Therefore, a mini robot camera (ROV) and a digital video camera operated by a diver have been used for the documentation of the wreck. The videotapes are an important source of information concerning the wreck and its cargo. The digital sequences give a three-dimensional impression and the most instructive pictures can be extracted and directly used for the wreck's visualization. Because of the great progress made in the development of techniques of digital picture recording and processing in recent



In the MoSS-project the photogrammetry documentation is done by using a normal high-duty analogue camera, covered in a special protective casing (Photo: Roland Obst, Erfurt).

years, the grade of resolution achieved by digital cameras already reaches that of analogue systems. So, conventional videocameras and reflex cameras will probably loose their importance in underwater archaeology in the next few years.

The paddle steamer *Eric Nordevall* lies at a depth of c. 45 m in the Swedish lake, Vättern. The visibility conditions are similar to those around the *Vrouw Maria*. Therefore, artificial lighting was indispensable during the detailed photographical and video documentation of the wreck that occurred in the 1980s. Today, these photographs and videotapes are important elements in the wreck's visualization.

Visibility is most difficult in the Dutch Waddenzee. As a result of the tidal flow, strong currents move small particles so that the water resembles a thick 'soup'. Here, the MoSS wreck *Burgzand Noord 10* lies at a depth of around 10 m. Only on rare occasions it is visible from more than a 1m distance. Therefore, video or photographical documentation is only possible for details, which means that documentation is mostly restricted to plans drawn with the help of a purpose-built CAD technique.

Of the four MoSS wrecks, the *Darss Cog* has the most advantageous visibility conditions. The wreck lies at a depth of only 6 m, off the German shore of the Baltic Sea. On calm days with gentle winds during winter and spring, the wreck is visible from the surface of the water and the conditions for photographing and videotaping it can be excellent. For this reason, the wreck has been chosen to test and develop "Underwater Photogrammetry", a wellknown method that has been adapted from the surveying of buildings and extended to underwater conditions. The aim is to be able to gain reliable data on the exact dimension of every single wreck object and its constructional elements from the photographic documentation. The hitherto obligatory and time consuming diving survey and hand made drawing may possibly be reduced or even made unnecessary in future. With photogrammetrical documentation overlapping photographs have to be taken of the whole wreck so that every detail is documented on at least two or three photos. To have fixed marks in each image, steel measurement tapes as well as small coloured plastic balls are placed on all parts of the wreck. Both help to connect the photographs correctly and they are the basis of the computerized photogrammetrical analysis.

The photographical documentation of the *Darss Cog* is done with a normal, analogue high-duty camera, so that the photographs all have to be scanned before they can be analysed digitally. To avoid this additional work, in future digital cameras with a high luminous intensity will be used. At the moment, it can be stated that the photogrammetrical analysis achieved mostly with a combination of the computer programme PHODIS-ST and the CAD-package MicroStation of those parts of the ship that are placed nearly horizontally, already allows very precise measurements of the wreck. On the other hand, this technique worked less than satisfactorily on its more deeply submerged parts. But with the aid of the programme package Photomodeler good threedimensional views could also be generated, even when the measurement still lacked precision. Because deviations of sometimes more than 30 cm are not tolerable, one of the final aims of this part of the MoSS project is to join the different systems in the photogrammetrical documentation. Finally it is hoped that this technique will be able to be used in underwater archaeology for everyday routine work.

Different methods of prospection are also used to document wrecksites in situ. The most common is the side-scan sonar, which is numbered among the hydroacoustical methods. It is used in varying degrees on all the wrecks of the MoSS project. The method is based on the use of different sound frequencies that are sent to the seabed and on their recorded echoes. The echoes of parts of wrecks are significantly different from those of the surrounding sediment. So, conclusions on the spatial dimension and the position of the different wreck parts are possible. Low frequency sounds can reach a considerable depth into the ground, up to several meters, although the information gained from their reflection is of very small resolution. On the other hand, very detailed mappings of wreck sites can be generated by means of high frequency sounds but only wrecks and artefacts on the surface of the ground are recorded, because these sounds are only able to penetrate a few centimetres into the sediment.

At the *Darss Cog*, sediment sonar was used, that was developed specially for underwater sites. High and low frequency sounds can be sent jointly, so that it is possible to also gain information on the more submerged parts of wrecks. Last but not least, an under-water georadar is utilized at the site of the *Darss Cog* that gives information on even items that are situated under the wreck.

Because of the poor visibility in the North Sea's waters the use of side scan sonars is of great importance for the documentation of shipwreck-sites in the Netherlands. At the *Burgzand Noord 10*-site a specially developed multibeam side scan sonar is also used, that is not only able to detect submerged wrecks, but which also delivers three-dimensional images and plots of these objects.

Stefan Wessman &
Kari Uotila

3D Models in a Digital and Virtual World - its Use in Archaeology

Modelling Archaeological Fact, Deduction and Interpretation

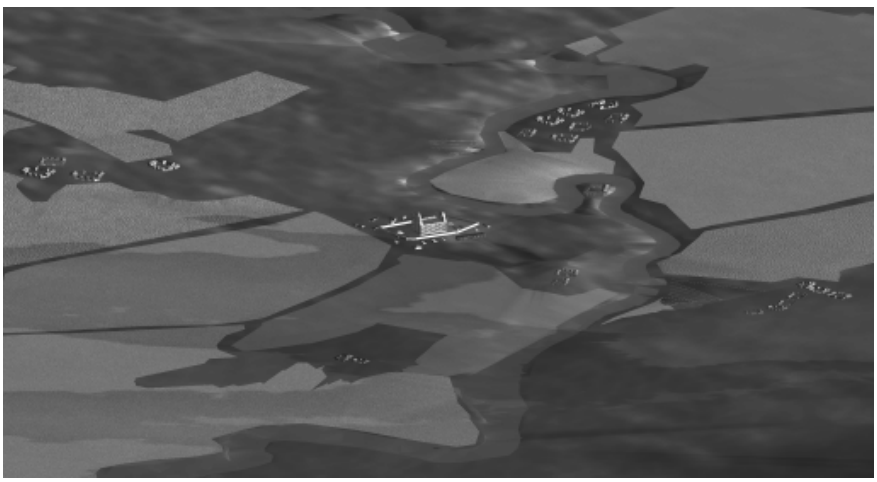
During recent years, the development of computer technology has offered opportunities to render models or reconstructions of more and more realistic-looking people, buildings and whole landscapes of the past and the present. In archaeological research one of the central disciplinary questions is how to connect the hard facts produced by excavations and any subsequent deductions to a wider context and interpretation of the past.

In relation to virtual archaeology, problems may arise from the fact that it is difficult to join a traditional evaluation of sources, as well as a defence of one's own interpretations to an individually rendered image, multimedia program or video presentation. In the various parts of the international research community that are concentrating on virtual archaeology, there is an ongoing discussion about this problem of using source material. It is already conceivable that a databank or a database could be added to at least those models that have been made in a digital format. From such a database, other researchers could obtain the necessary information to evaluate the research, that is, the sources and methods of the visualisation. It is, however, obvious that virtual archaeology is an approach in which the number of deductions and interpretation is always large.

The Landscape of the Past as a Subject of Computer Modelling

In Finland, landscape archaeology has been one of the most strongly developing subdivisions of archaeology during recent years. Its emphasis is partly on the need, which arises from the management of ancient sites, to study the different layers and dimensions of the landscape. When rendering a landscape, the aim is to present the landscape of the past with all its parts in as much detail as is justifiably possible on the basis of our present knowledge. In this respect, it is assembling research, in which the research results, deductions and interpretations of many disciplines – both the natural sciences and the humanities – are combined.

The stone tower in Stenberga, Masku and its surroundings at the end of the 14th century.



The district of Mynämäki during the time of the construction of the medieval stone church.

Based on our study the following advantages have been identified:

1. The visualization of land uplift covering large areas is an effective tool for the reconstruction of the prehistoric and medieval shore displacement that had a socioeconomic impact.
2. The visualization of the landscape is helpful in studying sailing routes and navigation both on a large and small scale.
3. Visibility analysis (point to point) from a chosen location can be carried out in a more sophisticated manner.
4. Factors carrying a strong symbolic meaning about the landscape such as prehistoric graves or medieval chapels and manor houses can also be rendered.

As with all reconstructions, a landscape model is a combination of hard scientific fact and looser scientific deductions. However, the reason for using modelling software has been because of the intention to use the finished research material later, for

Invitation to a Seminar on the Monitoring and Safeguarding of Shipwrecks and Shipwreck Sites in Great Britain, Portsmouth in 5th - 6th of June 2004

The European Community Culture 2000 Programme Project "Monitoring, Safeguarding and Visualizing North-European Shipwreck Sites: Common European Underwater Cultural Heritage - Challenges for Cultural Resource Management" (The MoSS Project)

A Seminar on the Safeguarding and Monitoring of Shipwrecks and Shipwreck Sites

Saturday - Sunday, the 5th - 6th of June 2004

The Maritime Institute, HM Naval Base, Portsmouth and the National Maritime Museum, Greenwich (UK)

The seminar is open for the general public.

The Seminar will be held at the Maritime Institute, HM Naval Base on Saturday the 5th of June. On Sunday the 6th of June there will be a visit to the National Maritime Museum, Greenwich.

Saturday the 5th of June 2004

09.00 Welcome words by Rear Admiral John Lippiett, Chief Executive Mary Rose Trust
09.10 Introduction by coordinator Riikka Alvik, The National Board of Antiquities, FIN

Session I. Monitoring and gathering data on shipwreck site variables
Chairman: David Gregory

09.20 - 09.40 David Precious (EauxSys UK): Design of MoSS dataloggers
09.40 - 10.00 Sven Ober (NISA, NL): NISA Operation of EauxSys dataloggers
10.00 - 10.20 Juha Flinkman (Fimr, FIN): The datalogger experiences at the wreck Vrouw Maria
10.20 - 11.00 Questions and discussion
11.00 - 11.30 Break / Coffee

Session II.
Chairman: Mark Jones

11.30 - 11.50 Paola Palma (MRAS, UK): Analysis of MoSS-project samples
11.50 - 12.10 Ellie Landy (Portsmouth University, Bacpoles project, UK): The limitations of the technique
12.10 - 12.40 Discussion / Questions
12.40 - 14.00 Lunch

Session III. Safeguarding historic shipwrecks
Chairman: Ian Oxley (Head of Maritime Archaeology English Heritage)

14.00 - 14.20 Vicki Richards (Maritime Museum Fremantle WA): Practice and experience in Western Australia [TBC]
14.20 - 14.40 Martijn Manders (NISA, NL): Practice and experience in the Baltic and Wadden sea
14.40 - 15.00 Kevin Camidge (Independent maritime archaeologist UK): HMS Colossus application of practice and experience
15.00 - 15.30 Discussion / Questions
15.30 - 16.00 Coffee break

Session IV. The MoSS Project - The Conclusion
Chairman: Charles Barker (MRAS, GB)

16.00 - 16.20 Carl Olof Cederlund: Visualization - practice and experience
16.20 - 16.40 Martijn Manders / Friedrich Lueth: Safeguarding - practice and experience
16.40 - 17.00 Mark Jones (MRAS, GB): Monitoring - practice and experience
17.00 - 17.20 Riikka Alvik (The National Board of Antiquities, FIN): Managing the project - Conclusions
17.20 - 17.50 Discussion / Questions
17.50 - 18.00 Carl Olof Cederlund: The conclusion of the project
18.30 - 20.00 Reception in the Mary Rose Museum

Dinner in Portsmouth
Return to Keppels Head Hotel

Sunday the 6th of June

10.00 - Leave Keppels Head Hotel, visit to the National Maritime Museum, Greenwich

End of the seminar and departure from Greenwich

INFORMATION ON THE ARRANGEMENTS OF THE MoSS SEMINAR ON THE MONITORING AND SAFEGUARDING OF SHIPWRECKS AND SHIPWRECK SITES IN PORTSMOUTH THE 5TH - 6TH OF JUNE 2004

General program information:
The seminar will start at the Maritime Institute, Portsmouth on Saturday the 5th of June 2004 at 9.00 AM.

The seminar will be held at the Maritime Institute. On Sunday the 6th of June there will be a visit to National Maritime Museum, Greenwich.

Registration:
To register your booking of lodging and meals for the seminar please fill in the registration form, which you can find in the MoSS website at address http://www.nba.fi/INTERNAT/MoSS/registration/ and attached to this invitation (you can find the address on the backside of the form). **It is important to Register! The security guards will not let anyone enter the dockyard before 10.00 AM without prior registration.**

The registration has to be returned by the 30th of May 2004 to guarantee hotel accommodation.

Travel:
The participants will arrange their own travel to Portsmouth and back.

Lodging:
Lodging during the nights between the 4th and 6th of June, for the stay in Portsmouth, can be booked through MRAS. Please see the registration form.

Registration form

I will come to the MoSS Seminar "Monitoring and Safeguarding of Shipwrecks and Shipwreck Sites", Portsmouth the 5th - 6th of June 2004.

Name: .....

Address: .....

.....

.....

Phone: .....

Fax: .....

E-mail: .....

Lunch, coffee, etc. during the day of June 5th: **40 EUR**.

☐ *I would like to visit the National Maritime Museum Greenwich on Sunday June 6th.*

Accommodation

☐ *I don't need accommodation.*

MRAS will organize accommodation in Portsmouth.

Date of arrival: .....

Date of departure: .....

Number of rooms: .....

Price for room per night: **100 EUR**. Price includes breakfast.

Other

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example, in multimedia programs and movies.

Wrecks as a subject of computer modelling

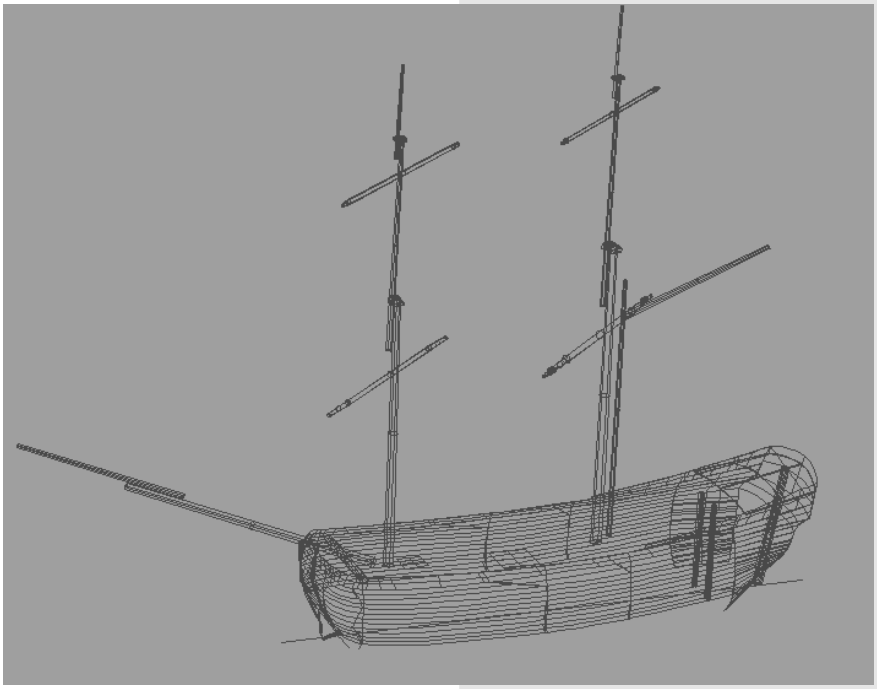
In underwater archaeology the use of computer based reconstructions and models started quite early on. The reason for this was simply that the commonest artefact, the boat or ship, was one of the most complex structures that man had built up to the 19th century. Therefore, the ship is also one of the most challenging artefacts to individually reconstruct.

Naturally, the greater the amount of physical evidence or hard facts that remain the easier it is to make a reconstruction; this applies to both collected data and the state of preservation. Since there are several different computer programs that are suitable for the reconstruction work, efforts have lately been concentrated on collecting the data in a digital form for its use in reconstruction. Photogrammetry, digital measuring systems and laser scanning have all been tried with varying degrees of success.

Reconstructing a ship means dealing with the hard facts produced by an excavation. With the help of the preserved parts one tries to reassemble the ship as it once was. Where there are not enough facts interpretation follows. Interpretation is usually based on both the facts obtained from the find and on other finds of the same type, in this case other shipwrecks of the same type.

When it comes to reconstruction the Vrouw Maria is a special case. There is hardly any need to reconstruct her, since she is resting there on the seabed, almost complete. The problem is that most people can't see her there and even divers can only see her for a couple of meters at a time due to the bad visibility. In mathematical terms she therefore needs to be deconstructed on the seafloor so that she can be reassembled again in the computer. The fact that she is so well preserved means that there are fewer of the potential problems discussed in this article. The work has so far been restricted to measuring the visible parts of the hull in order to reconstruct the hull shape and for a reconstruction of the rig from the parts lying around the wreck. The part of the hull that lies hidden in the sediment (approx. 1,5-2 m) cannot be measured. Thanks to a lopsidedness of 4 degrees towards the starboard side it was possible to measure the upper part of the turn of the bilge. This will make it possible to calculate the shape of the bottom. Reconstructive help for that part is also provided by a couple of 18th century line drawings of snau ships that have survived.

Everything that is not based on actual measurements of the wreck will be clearly marked on the model. This is being done so that everyone can see what will be based on fact and what have been deduced. In addition a more traditional type of report will be written about how the reconstruction was undertaken and what the problems were which we had to solve.



The Vrouw Maria reconstructed: A working model of the Vrouw Maria.

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Hans Lennart Ohlsson

Who needs ship replicas, and what for?

The uniquely well-preserved wreck of the paddle steamer *Erik Nordevall* has rested on the bottom of lake Vättern since 1856. It is probably the last remaining of the first generation of steamships in Sweden. As a consequence of the nature of the construction of the hull, the depth of the site where it rests, and the costs of a salvage operation it will probably remain there for many years.
While waiting for the original ship to surface enthusiasts belonging to the Forsvik Shipyard Association (Föreningen Forsviks Varv) have started to build a full-scale replica of the ship.


The bow section and the stem post under construction (Photo: Carl Olof Cederlund).


The master shipwright and his colleagues discussing the lines of the ship on the frame floor. The hull of the replica under construction is in the background (Photo: Carl Olof Cederlund).

Building a full-scale replica or reconstruction can be a way of developing theories and illustrating facts collected during research or archaeological excavations. Although this can seem to be very simple, it is nonetheless a demanding and important task in this context. Scientific research is not always readily available to a wider audience. Dissertations, theories and papers normally circulate within a group of already "enthusiastic" experts. Thus, the replicas can act as a bridge and become an instrument to show recently obtained results to a much wider audience.
The building of full-scale replicas of historical ships has a long history in Europe. In 1893 a replica - called *The Viking* - of the wellknown Norwegian burial ship from Gokstad sailed across the Atlantic to the USA. The aim was to participate in the Chicago Fair that same year. The Viking was made using the measurements of the original burial ship from the 10th century, and then completed with fittings that were deemed as being suitable for the late 19th century idea of a Viking ship (The replica is today on display at The Chicago Museum of Natural History.) Since then several replicas have been built in northern Europe, mostly reconstructions of archaeological findings.

In 1998 the Naval Museum in Karlskrona launched the replica *Hiorten*. Its construction was based on a very simple drawing and the building specifications of a late 17th century one-masted ship. Despite the fact that it is equipped with modern navigation tools, safety equipment and has diesel engines it nevertheless gives us the image of a smaller sailing ship from this period. *Hiorten* helps us to explain and visualize a drawing, which for many people can be almost totally incomprehensible. While this could have been

done with a smaller model, a full scale copy gives us a chance to know more about what it was like to live on board and sail a ship during the 17th and 18th centuries. We do not need to add all the hardships that an able seaman encountered such as those connected with food, clothes, health and the command of time – which we can leave to the imagination.

A replica of the paddle steamer *Erik Nordevall* can be used in several important ways (hereafter referred to as the *Eric Nordevall II*.)

Initially the ship presents us with an image of a ship-type lost generations ago. Paddle steamers disappeared from Swedish waters during the late 19th century. They were the first vessels equipped with steam engines. Sweden is in the fortunate position of having several steam engine propelled ships still in use although none are equipped with paddle wheels. The *Eric Nordevall II* will add an additional steamer to this fleet and increase our understanding of the development of machine-propelled ships. It will also be the only one with a hull made of wood, a fact of particular interest.

The *Eric Nordevall II* will make it possible for the general public to travel on a paddle steamer, some as ordinary crewmembers, some as individuals with a deeper knowledge and understanding of the machinery, and others simply as passengers. This will also be a very important task for this replica.

The above-mentioned fleet of old steamers requires crewmembers with specific knowledge about steam engines. The two engines of the *Eric Nordevall II* will be built from the original drawings of 1835. These are first generation marine engines, of a type emanating from the British mining industry in the 18th century, the so-called sidelever engines. No chief, no engineer and no stoker have been educated in the use of such a machine in Sweden for over 150 years. The original *Erik Nordevall* had an early 19th century type of boiler, which is included in the drawings of the engines. How this is going to be reconstructed in the replica is at present under consideration as the original is of a rather primitive character, which is unacceptable in terms of today's safety regulations.

The raising of frames on the keel in the fore section of the hull (Photo: Carl Olof Cederlund).

The captain onboard the *Eric Nordevall II* will have the responsibility of manoeuvring a ship of a special type and with peculiarities no living captain has experienced, or been trained or educated to face in any naval academy. The lack of a direct stream from the propeller to the rudder probably gives the vessel steering qualities comparable to that of a sailing ship. The ship will need speed to be steered, a speed that it is not possible to reach in the locks, in the narrower parts of the Göta Canal or in the ports along it. The captain will also have to deal with the fact that he will be on a bridge just above the machinery and his helmsman will be on the aft deck of the ship, surrounded by passengers. The orders will have to be shouted over the crowded deck to the helmsman or down to the engineers in the hold.

For those on shore the view of the *Nordevall II* will be more than just picturesque. The sound of the wheels working in water, the orders being shouted by the captain, the smell of the smoke rising from the funnel, as well as the passengers and cargo on deck will give the impression of travel and trade in the 1830s or the 1840s. The *Eric Nordevall II* en route on the Göta Canal between Stockholm and Gothenburg will allow us to participate in a reconstruction of what it was like to travel using canals and inland waters in the early 19th century. The steamers were the first real passenger ships. They were comfortable, followed a timetable and provided the passengers with both food and accommodation, either in the male or female saloons, or in nice, separate cabins.

It has been more than 100 years since a paddle steamer travelled on the Göta canal. The canal itself has been declared a part of the Swedish National Heritage but the ships for which it was built have not. The *Eric Nordevall II* will therefore complete the historical picture of the canal as a historical monument, with locks, bridges, buildings and a cultural and natural environment running along it.

We hope that the visualisation achieved through the building of a full-scale replica of the original *Erik Nordevall* which is on the bottom of lake Vättern, and therefore unreachable for most of us, will increase the interest in, and awareness of, the importance of safeguarding this unique wreck for the future.

Kalle Salonen

The Model of Vrouw Maria - A Combination of Arts and Science

The model of the wreck of the Vrouw Maria differs from all the other models I have made for the reason that there were practically no accurate measurements of the wreck when I began the work; only a few basic measurements had been taken. Normally, model making is based on precise drawings that in turn are based on many exact measurements. But it was so important for the research of the wreck of the Vrouw Maria to have a model that I had to start working although there were no real drawings to work from.

Gathering information

The first step in all model making is to collect information. It is vital to have as much versatile information about the original object as possible. I got facts on the Vrouw Maria not only from various drawings, videotapes, and photographs, but I also dived to the wreck and studied the object myself. My first drawings of the Vrouw Maria were mainly sketches of the wreck and they acted as maps when we made plans for the dives. Over the course of time and several dives, we obtained new pieces of information that were based on the divers' observations. And whenever we had the chance, we took accurate and detailed measurements of the wreck. By fitting these pieces of information together and by watching videotapes and studying photographs, the pieces gradually started to form a whole. Finally, after many sketches, I managed to draw everything together and make two clear pictures of the ship. One is of the side of the ship and the other shows the ship from above. In addition to these, I drew some perspective pictures that help in establishing the different parts of the wreck in space.

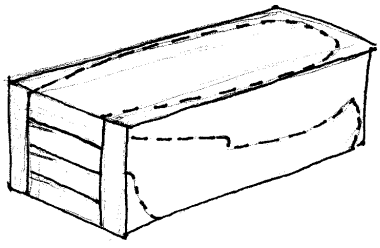
Next I had to decide what the scale of the model would be. Both the materials and the use of the model determine the scale. The hull was not made of a balsa plank since I simply could not find one anywhere. I had to make a plank by gluing many small boards together. The wood was therefore not as easily workable as it should have been because the wood was soft and the joints were much harder. To avoid having the joints come up from the surface, I had to grind the wood extremely carefully. Since the aim was to have a model that would give a general idea of the wreck instead of showing every little detail I had to compromise between the measurements and my own personal views. However, I managed to insert some lifelike details in places that usually interest the audience.

I wanted to be especially precise in the most noticeable details, such as the windlass and the parts that have fallen down from the rigging. From the very beginning I suspected that the first model would not be the last. There will be other, more precise models when we get new pieces of information. The fact that there will be several models of this wreck gave me the opportunity of making the first one more like a characterization of the vessel type instead of an exact model for scientific purposes.

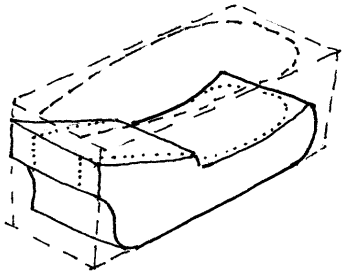
Constructing the model

First I glued together six balsa boards (100 by 22 by 500 millimetres) to have a plank that would become the hull. With the help of my drawings I then sketched the profile of the hull on the wood (following the railing) and then

A scale model of the E. Nordevall built in connection with the building of the full-scale replica (Photo: Carl Olof Cederlund).

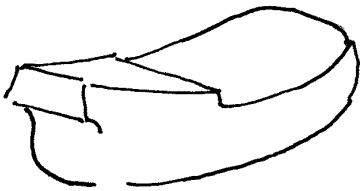


1. Sawing the side profile.



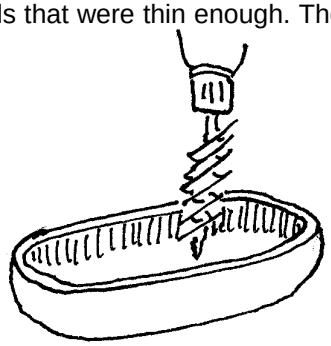
2. Sawing the upper profile.

cut off the extra pieces.
Next was the deck; I first cut off everything above the deck level and then, with the help of my drawings that show the wreck from above, I made the hull the right shape. I had already decided at an early stage that I would not start guessing what the wreck would look like in those places where sediment covers everything and that is why the model only shows those parts of the wreck that are above the sea bed.

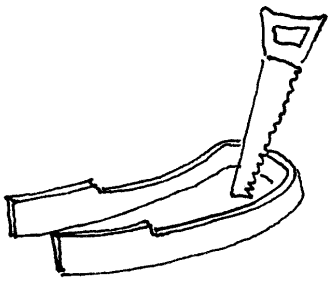


3. Giving the hull the right shape.

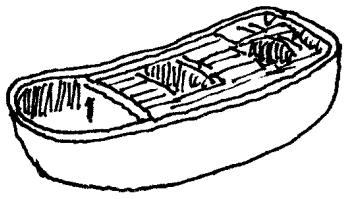
The hold and the captain's cabin were made by chiselling and drilling. Then I set the deck beams and deck planks. The railing was made from that piece of wood that was left over when I cut off the spare wood above the deck level. I cut off the inner parts of this piece of wood so that I finally had walls that were thin enough. These



4. Hollow out the hull.

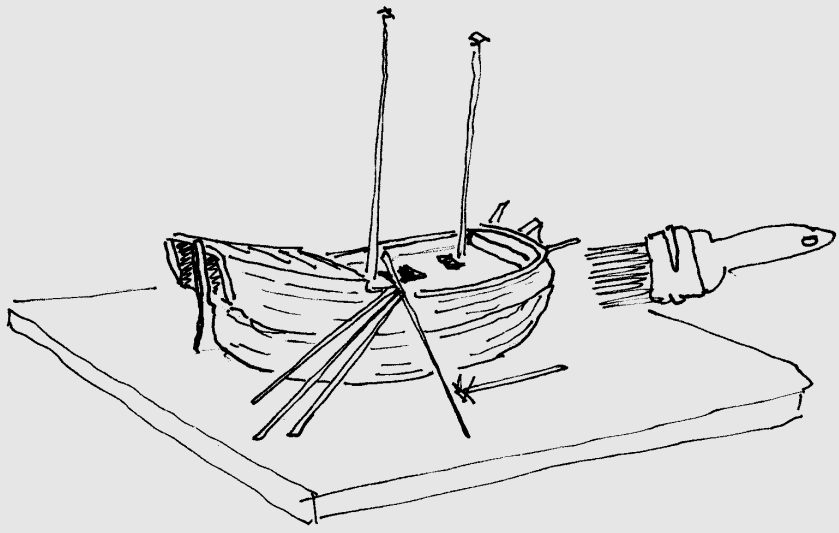


5. Making the gunwale.



6. Making the deck.

walls became both the railing and the bulkheads of the captain's cabin.
Next I started adding details. I studied videotapes and photographs and whenever I found new points and items I included them in the model. The masts and the rigging were made of pine instead of balsa because the model must wear well even during transport and cleaning. For the covering I used thin layers of filler and paint. In the paint I managed to add some details, such as the side planks, by scraping the surface lightly. The silt on the wreck and inside the hold as well as the seabed was made of watery filler. The plants around the wreck are sawing waste. When painting the hull, I used oil colours. In the blue parts I applied black stain that became blue after I diluted it with lots of water.
The wreck lies on its keel at the bottom of the sea and leans on its starboard side. The stem is a bit higher up than the stern. The sea bottom, the bedrock, was made of polystyrene because this plastic is very light and workable. The polystyrene plates, which are two centimetres thick, were cut to the right shape and then the model was placed between them in its correct position. The bedrock was finished with light layers of filler and stain.
As I already mentioned, I know that this won't be the last model of the wreck of the Vrouw Maria. When we get more information, we will construct a new model that will be based on exact measurements. The existing model is as accurate as possible and I hope it gives the audience a sense of the wreck's characteristics and shows how intact the ship is. The model displays the wreck as a diver sees it.
Millimetres are not that essential when the aim is to show a ship for which time stopped because of unfortunate events.



7. Placing the gunwale and making the details.

Carl Olof Cederlund

Visualisation through Participation

Scuba divers are the only group of people today who visit and study the under water world in large numbers. They are also the only ones who can now experience up close the remains of our maritime past under water, as for example in the case of old shipwrecks. In relation to this, it is important for those who care for our submerged cultural resources, to meet and integrate the scuba divers' interest and to help stimulate and further it in the right direction.

Since the 1950s scuba diving has been an expanding activity in the North-western part of Europe, attracting a growing number of amateur divers, who in all probability can be counted in the hundreds of thousands. Although it is laymen who mainly participate, scuba diving is nevertheless one of the most important partners for maritime archaeology, both generally and scientifically. The most important contribution of the scuba divers has been and still is to report the finding of old shipwrecks and other things under water. However, the effects of scuba diving are not always so positive. Frequent visits by growing numbers of scuba divers to wreck sites have resulted in both direct damage and also a successive wearing down of ship remains.

Interaction and exchange with scuba divers

The organizations concerned with the care of ancient monuments saw quite early on the necessity of having contact with and the potential for cooperation with scuba divers during the wreck diving they undertook. It was recognized that finds from shipwrecks were being salvaged and sometimes sold on the open antiques market. Moreover, it was also recognised that shipwrecks were being damaged through wreck diving. On the other hand, there was also contact made by many scuba divers who were interested in cooperating, both with regards to the investigation and the care of esp. old shipwrecks. Cooperation between scuba divers and marine archaeological organisations was enacted in different ways in the various European countries, as can be exemplified by the nations represented in the MoSS project: In the Scandinavian countries the development has been fairly similar. In Sweden a scuba diving club in Gothenburg in cooperation with the Maritime museum there in 1950 formulated and then worked on an extensive program for the survey, registration, investigation and care of marine archaeological remains on the Swedish west coast and inland waters. The Swedish National Maritime Museum in Stockholm started a manifold form of interaction with scuba divers a few years after the founding of the Swedish scuba divers' union in 1958. This comprised both courses in marine archaeology, offers to take part in underwater search and surveys and excavations. A council to enable continuous contacts and exchanges of opinion on topics such as marine archaeology and wreck diving was also founded.

In Finland a similar situation developed: in 1956, when the Finnish scuba divers' union was founded, several museums were contacted to start some form of marine archaeological cooperation. In 1957 the first major diving camp was organized. In 1960 the Finnish Archaeological Commission entered into this cooperative agreement and the "Svensksund committee" was established in cooperation between the commission and the scuba divers. The task of the committee was the organizing of under water archaeological excavations on the wreck of the Russian frigate, *St Nikolaij*, sunk in the battle of Svensksund in 1790. From this time major field investigations were undertaken with the scuba divers as participants.

Because diving in the coastal waters of the Baltic Sea in the areas of the German Democratic Republic was

A group of scuba divers preparing a recording dive on the wreck of the brig Severn on the island of Soparklubben in the southern part of Stockholm archipelago in the early 1990s. The Severn was originally a British brig, which sank here in 1832. The scuba divers participated in a course on marine archaeology at the Marine Archaeological Center in the town of Nynäshamn (Photo: Carl Olof Cederlund).

something that only the military forces were allowed to do, systematic research on this underwater heritage only became possible after the political changes in Germany from 1989/1990. In the investigations being done by the archaeological state service more than 70 sports-divers are now involved, who are organised in a non-profit and non-governmental society (The State Association of Underwater Archaeology of Mecklenburg-Vorpommern).

In the Netherlands - as the last example - systematic under water archaeological research was taken up in the middle of the 1970s. In 1978 the STOA (Stichting onderwater archeologie, Engl: Foundation for underwater archaeology) was founded for the integration of scuba divers in under water archaeological work. The NISA when established cooperated closely with scuba divers until 1995. New safety regulations for under water archaeological work which were introduced at that time diminished the possibilities for this cooperation, a development, which was also evident in other nations. The scuba divers are today organized in the LWAOW (Landelijke Werkgroep Archeologie Onder Water, Engl: National Working Group for Underwater Archaeology), which has close connections with the NISA. The members of the former are "the eyes and ears" of the latter, reporting new sites and doing non-destructive field work.

Since the end of the 1970s the general situation has become more diverse as a result of the introduction of commercial organizations for the provision and management of courses in scuba diving, which has also expanded the market for scuba diving and diving activity, not least wreck diving, which today is an expanding part of the tourist industry. This makes it necessary for the national authorities to widen and develop the various forms of cooperation they have with scuba divers and their organizations in order to strengthen awareness of the under water cultural heritage, and its safeguarding.

Divers from the LWAOW preparing for an underwater survey.

Marine archaeological under water parks

Today only one marine archaeological park exists in Northern Europe, the one organized by the Finnish Maritime Museum at the site of the wreck of the Swedish naval ship *Kronprins Gustav Adolf*, sunk outside Helsinki in 1788 in the war between Russia and Sweden. The site at a 19 to 20 m depth is secure for diving. Mooring boys have been placed at the site to allow divers' boats to moor, preventing anchoring on the wreck. Divers can view the wreck while following a leading line with twelve information boards. There is also an Internet site*****, a brochure and a diver's map of the wreck in plastic for under water use. Several videotapes of the wreck have been made and one exhibition held. An information board is to be erected on land with information for the non-diving public. The site was researched extensively before the park was opened.

Founding a park at an ancient under water monument has been shown to raise awareness about under water cultural heritage. It should be emphasized that it is also important to establish similar arrangements in the waters of the other European nations in order to meet the demand to have sites for wreck diving available for scuba divers, which give information about and an insight into ship history and maritime archaeology.

(This text is composed of contributions by Riikka Alvik and Sallamaria Tikkanen, the latter on under water parks, and Stefan Wessman on scuba diving co-operation in Finland, Carl Olof Cederlund for Sweden, Hauke Jöns for Germany and Rob Oosting for the Netherlands.)

***** http://www.nba.fi/en/mmf_park

what is MoSS?





The MoSS project is based on four shipwrecks, all of which are of great significance from a European point of view and show a diversity of intercultural relationships throughout a long period of history. The wrecks are located in Netherlands, Germany, Sweden, and Finland, and they represent different vessel types. The oldest of the wrecks is dated to the 13th century whereas the youngest is from the middle of the 19th century. The wrecks are in different kinds of underwater environments; in sea, lake, and brackish waters, and the conditions on the sites are both stable and unstable. The wrecks have preserved extremely well; two of them are almost intact.

The MoSS project has three main themes: monitoring, safeguarding and visualizing shipwrecks. The first theme includes monitoring the condition of the wrecks, or in other words doing research on the degradation of shipwrecks under water. The aim of this theme is to develop and improve the methods used in monitoring the physical and environmental conditions of shipwrecks. The second theme is safeguarding, which aims at outlining and developing models to protect shipwrecks so that also the needs of different public groups are taken into account. The third theme is visualizing. The four shipwreck sites will be made physically visible using underwater and other images. The project will be advertised multilingually to the European public.

The MoSS project will consist also of fieldwork, Internet site, publications, posters, leaflets, reports, articles, meetings, and seminars. One of the objectives is to produce information not only to the general public but also to the experts in the area of protecting the cultural heritage. The aim is to awaken European peoples' interest to our common underwater cultural heritage and to have the general public participate in protecting the heritage. The wrecks of the project - ships that sailed on European waters - act as examples of maritime history as they tell us about the many local and international dimensions of the European culture.

The MoSS project is organized by The Maritime Museum of Finland (coordinator), The Mary Rose Archaeological Services Ltd. (United Kingdom), The National Service for Archaeological Heritage: Netherlands Institute for Ship- and Underwater Archaeology ROB/NISA (the Netherlands), The National Museum of Denmark/Centre for Maritime Archaeology (Denmark), The Department for Preservation of Archaeological Sites and Monuments / Archaeological State Museum of Mecklenburg-Vorpommern (Germany), and Södertörns högskola – University College (Sweden).

The MoSS Project is the first international shipwreck project that European Community Culture 2000 Programme funds. The European Community Culture 2000 Programme is a programme that supports international cultural cooperation projects that involve organizers from several countries. The objectives are among other things to encourage cooperation, to promote the common European cultural heritage, and to disseminate the knowledge of the history and culture of the peoples of Europe. In 2001, it was the first time projects on subaquatic archaeology were especially called to take part in the program.

meetings & seminars

Meetings:

The project meetings are staged for discussion within the project and are mainly held by the representatives of the different nations in the project. At the meetings the participants discuss about the general issues of the project, the research work done at the sites and evaluating the methods and results of it. Important matters are also how the information is going to be published and used within the different themes of the project. There are also subgroups for the different themes in the project. The next meeting will be held in Helsinki, Finland and will be arranged by The Maritime Museum of Finland.

Seminars:

Maritime archaeology and history scholars, experts, practitioners and people interested in underwater cultural heritage from all around the world are invited to these open seminars to hear and discuss about the themes and the results of the project.

The third seminar of the MoSS-project will be held in Portsmouth, UK on the 5th and the 6th of June 2004. The aims of the seminar are monitoring, safeguarding and managing the shipwreck sites. More detailed information will be available during spring 2004 in our Internet site www.mossproject.com and the forthcoming newsletters.

Publisher:
The National Board of Antiquities
PL 913, FIN-00101
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Editor:
Carl Olof Cederlund
Phone +46 8 608 4201
carl-olof.cederlund@sh.se

Theme coordinator:
Hauke Jöns
Phone +49 3867 8805
Haukejoens@aol.com

Language checking:
Andrew Stickley, MA
Phone +46 8 608 4148
andrew.stickley@sh.se

Layout:
Vesa Hautsalo
Phone +358 9 4050 9072
vesa.hautsalo@nba.fi

MoSS *newsletter*

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