

ICOM COMMITTEE FOR CONSERVATION  
 WORKING GROUP ON WET ORGANIC ARCHAEOLOGICAL MATERIALS  
 NEWSLETTER NO 19 MARCH 1990

MESSAGE FROM THE CO-ORDINATOR

4th ICOM - Group on Wet Organic Archaeological Materials Conference

Bremerhaven. 20 - 24 August 1990

Final Announcement

This is the final circular regarding our WOAM 90-Conference.  
 Further information will be given only on request.

About 30 colleagues have so far returned provisional registrations, so the conference will take place! Approximately 26 papers have been announced dealing with a wide range of problems and materials.

Meeting Venue

The German Maritime Museum (Deutsches Schiffahrtsmuseum (DSM)) is situated in the center of Bremerhaven adjacent to the bank of the Weser estuary. It is about 20 minutes by foot from Bremerhaven Hauptbahnhof (central station or 5 minutes by taxi.

In August we still have warm weather (15 to 25 degrees centigrade). However, rain may occur at any time, so you should be prepared. There are many restaurants of all categories, with sea food being typical. Tips are included in the prices, but many people round off the bill giving up to 2 DM in additional tips, if they are satisfied. It is not necessary to tip taxi drivers.

On the week end before the conference (18-19 August) there is a Tall Ship's meeting in Bremerhaven, a spectacular event if there is some wind, with a sailing parade passing the town. So if you are interested...

Preliminary Programme

Monday, August 20	9:00-10:00	registration
	10:00-17:00	opening address, lectures
	18:00	reception
Tuesday, August 21	9:00-15:30	lectures
	16:00-17:30	visit conservation project
Wednesday, August 22	9:00-15:30	lectures
	16:00-17:00	WOAM business
	17:30-21:00	dinner excursion
Thursday, August 23	9:00-15:30	lectures

16:00-18:00	round table discussion, definition of future WOAM programme.
18:00	farewell drinks
Friday, August 24	8:00-20:00 sea floor excursion to the island of Neuwerk.

Conference language will be English

Excursions

For Wednesday evening I have planned a boat trip to !!J1!J!!!e a small landing place about 45 minutes away, where we can have dinner together. The shrimp is typical and good, other seafood or 'normal' food is also on the menu.

You will have to pay your dinner individually, but in order for me to hire the boat I must know who intends to come. So please mark "Dorum Shrimp Dinner" on the return sheet.

As a post conference excursion I suggest a carriage drive across the sea-floor to the island of Neuwerk. Four hours on the island will give you an opportunity to eat, drink, visit one of the most varied and beautiful collections of local amber and stroll over the ebb-tide seafloor, this is regarded as very healthy! Return will be by boat to Cuxhaven on the estuary of the river Elbe, where we part. From there trains and buses go back to Bremerhaven.

This excursion will cost approximately 60 DM per person which does not include food and drink.

The horse-carriages are very popular, so I need your registration before June 10th to make the necessary reservations. Please mark "Neuwerk Seafloor Excursion" on the return sheet.

And return the sheet!!!

Conference fee

The conference fee is 350 DM for registrations received before July 1st, 1990, 400 DM after July 1st, 1990.

Please transfer the fee to: Stadtische Sparkasse Bremerhaven, BLZ 292 500 00, Konto-nr. 1100 262 "ICOM-WOAM 90" or send a cheque payable to: Deutsches Schiffahrtsmuseum "ICOM-WOAM 90".

The conference fee will cover conference organization costs and the production of the conference proceedings in book form. Each participant will receive a copy of this publication.

### How to get to Bremerhaven

When coming to Bremerhaven you will have to arrive via Bremen. Bremen airport is served from several European and German airports and is about 15 minutes by taxi from the railway central station. From the central station trains leave for Bremerhaven about once an hour. Travel time varies from 30 to 50 minutes depending on the class of train. The trip distance is 62 km and the price is between 14 and 19 DM.

Bremerhaven is a young town, founded at the Weser estuary in the middle of the last century to house the new deep water harbour of the old Hanseatic town of Bremen. The river Vesper had become too shallow for modern ships to reach Bremen. Today the areas of the two towns form the Federal State of Bremen and are separated by the surrounding Lower Saxony.

### Accommodation

There are several hotels in several categories within walking distance of the Museum. Your accommodation is managed by the Bremerhaven Tourist Office (Städtisches Verkehrsamt), so please send your reservation order to them. They will confirm your reservation and send a map with the location of your hotel. Hotel prices include breakfast.

There is one special offer:

The "Hotel and Theaterplatz" is a very popular, good quality low price hotel. It is only 3 minutes from the Museum.

7 single rooms go for 50 DM per night

3 twin " " " 80 DM " "

3 twin " " " 100 DM " "

3x3-bed " " " 130 DM " "

All rooms have private WC and shower.

The manager refuses to cooperate with the Tourist Office, so you will have to phone him directly.

Mention the code-word "Conference DSM", and he will serve those coming first as long as there are rooms available. Mr. Finger will only confirm your reservation on request! So don't forget to ask for it. If he is fully booked, please turn to the Tourist Office.

"Hotel am Theaterplatz", Schleswiger Strabe 5, telephone: 0471-42620.

### Important Note!

If you book hotel category A you will most likely stay in "Nordsee-Hotel Naber" which is 3 minutes away. Make sure that you get the special rates arranged for "Conference participants DSM":

From August 19-24      single room 99 DM per night  
                                 twin/double 155 DM per night

for arrivals on  
August 17 or 18      single room 125 DM per night  
                                 twin/double 175 DM per night

This cost only applies for the night before August 19, 1990

All reservations should be made before June 10, 1990 if possible, as the good rooms may become scarce in the summer.

### Proceeding to Dresden

At the moment there are 4 train connections every day to Dresden. It takes 10 hours from Bremen (!!). But things will change and air connections are being established. We will have to wait and see.

I look forward to another of those nice and relaxed waterlogged gatherings of those crazy wet organic archaeological materials enthusiasts.

Should you have any questions, problems, queries etc., don't hesitate to phone, fax or write to :

Per Hoffmann  
Deutsches Schifffahrtsmuseum  
D-285- Bremerhaven  
Germany

telephone  
telefax:

(0471)-4820762  
(0411)-48207-55

See you in Bremerhaven! Best Wishes!

Per

## NEWS FROM THE UNITED KINGDOM

### Research into the Conservation of the Charred Structural Timbers from Haddenham Long Barrow.

In October 1988 the Conservation Section of English Heritage and the Archaeology Department of Durham University set up a research project to investigate the nature and conservation requirements of timbers excavated from the Neolithic long barrow near Haddenham in Cambridgeshire. The project was funded by English Heritage and supervised by Dr. Chris Caple, lecturer in Archaeological Conservation at Durham University.

The long barrow was excavated by a team of archaeologists led by Dr. Ian Hodder of the Archaeology Department of Cambridge University. The excavation took place because the lowering of the Fenland water table had led to shrinkage of the peaty soil overlying the barrow, thus exposing it to plough damage.

As excavation proceeded, large structural timbers were revealed. These had the appearance of being charred, as they were black in colour and deeply fissured. Conservators from English Heritage were called in to help preserve the timbers while excavation continued. It emerged that the Neolithic barrow contained a timber mortuary structure, in a state of completeness that had not been matched by any previous excavation. The main part of the structure consisted of a roofed chamber, about 6 meters long by 1.5 meters wide by perhaps 1 meter high. The chamber was constructed of massive planks and posts made from oak. At one end of the chamber was a facade structure, made of smaller upright posts. After consideration, it was decided that English Heritage would fund the moulding and lifting of the timbers, in conjunction with the continuing excavation.

Further details of the archaeological excavation may be found in Hodder and Shand (1988), while the process of lifting the timbers has been published in Price and MacQueen (1988). The excavation of a Neolithic long barrow containing what may have been a similar timber structure was published by Vyner (1984), and this article contains some interesting reconstructions of the phases of that particular site.

Initial examination of samples from the timbers by optical microscopy confirmed that charring had taken place, the diagnostic features being the deep black colour, the glassy conchoidal fracture surfaces, the radial fissuring, and the slight distortion of the wood structure. These observations were later confirmed by electron microscopy.

Research was undertaken into the physical and chemical nature of the charring process in wood, and it was discovered that this was a process which is as yet imperfectly understood. However, it is agreed that chars are the solid product of pyrolysis processes, and consist mainly of aromatic carbon in a polymeric form, the polymer chains being clothed in hydrogen. The temperature of the pyrolysis process determines the proportion of carbon in the char; as most wood chars are produced between 300 C and 1000 C, they contain significant proportions of oxygen, nitrogen, and sulphur atoms, and thus have been termed pyropolymers (Jenkins and Kawamura 1916).

Research into the nature of the Haddenham char involved electron microscopy to reveal the changes in wood structure: X-ray diffraction, EDAX spectrometry, and atomic absorption spectrometry were used to characterize the salts deposited in the timbers by groundwater; light element analysis was undertaken to reveal the proportions of carbon, hydrogen, nitrogen, and oxygen in the char compared with samples charred in the lab and finally the potential of ESR spectrometry for indicating the temperature history of the char was investigated.

Research into the conservation options for the Haddenham timbers was aimed mainly at finding a safe method of drying them. Initial drying experiments had shown that the char suffered from dramatic shrinkage and cracking as it dried. In addition, the timbers were already deeply fractured, and their mechanical strength was not great. As the option of permanent damp storage for a structure of this size was considered untenable, it was felt that a conservation treatment should allow drying of the material without further damage, and increase mechanical strength to the point where the timbers could be handled to a certain extent.

Experiments using small samples of the charred timbers showed that damage due to shrinkage could be reduced by drying the samples very slowly in controlled environments where relative humidity was very gradually reduced. A variety of consolidants and humectants were applied to samples to see what effect they might have on the drying process. It was found that PEG 400 and PEG 4000, whether used singly or in combination, produced results superior to those produced by the application of materials such as acrylic resins and epoxy resins (after dewatering of the char as judged by degree of shrinkage and visual appearance of the samples). However, further work is required to determine whether materials such as PEGs are indeed suitable consolidants for charred archaeological timbers.

Further research into the nature of the chemical and physical interactions between chars and water, and chars and humectants and consolidants would be useful, as the implications for the conservation of charred archaeological materials are great. It is likely that much archaeological evidence consisting of charred organic materials is at present discarded due to difficulties in lifting, storing, and handling such evidence.

I would like to acknowledge the kind assistance provided by staff at English Heritage, Durham University, and other institutions, without which this research could not have been accomplished. In particular, I have to thank Dr. Chris Caple for his encouragement and advice throughout this project.

William Murray  
Antiquities Conservation Service  
Scottish Museums Council  
c/o Conservation Department  
National Museum of Antiquities of Scotland  
York Buildings, Queen Street,  
Edinburgh  
EH2 1JD

#### References

Jenkins, G. M., and Kawamura, K., (1976), Polymeric carbons-carbon fibre glass and char. Cambridge University press.

Hodder, I. and Shand, P., (1988), "The haddenham long barrow: an interim statement", Antiquity 62 349-353.

Price, J. and MacQueen, M., (1988), "Reflections on lifting Neolithic structures: a tale of two archaeological sites", Proceedings of the UKIC 30th Anniversary Conference, UKIC, London.

#### Wet Archaeological Textile Research

Current projects being carried out at the Manchester Ancient Textile Unit of the University of Manchester (U.K) include two studies concerning yet archaeological textile materials. Both studies are comparative in nature. The first study addresses the drying of ancient textiles. Both textiles recovered from damp/wet/frozen burial environments and non-wet textiles subjected to yet cleaning are the subject of the study. Research samples are drawn from naturally-aged and artificial archaeological fabrics. Drying methods include air drying, solvent drying and freeze-drying with and without pre-drying treatment using a protecting agent.

The second study is investigating methods of creating artificial wet archaeological textile materials from modern fabrics for use as research material in archaeological textile conservation studies. Fabric types include wool, silk, cotton and linen. These methods concentrate on ageing by biodeterioration including soil burial and "waterlogging". The ageing is carried out for a series of increasing periods of time. Traditional physico-chemical accelerated ageing methods, e.g., moist oven, are also being carried out on the same fabrics.. This pilot study is providing a comparative range of type and degree of degradation for basic natural-fibre ancient textiles.

E. Peacock  
Textiles  
UMIST  
PO Box 88  
Manchester M60 1QD  
United Kingdom

#### Request for Assistance

I would like to ask for assistance in establishing the distribution of the Wharf Borer, (*Naccerdes melanura*).

The organism is currently under investigation as part of a Ph.D thesis at Portsmouth Polytechnic.

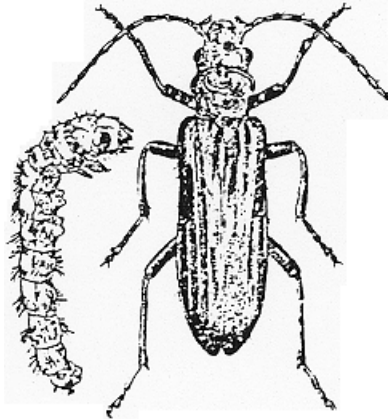
Narcedes larvae are frequently associated with the attack of damp timber used in the construction of ports and waterways. The timbers attacked by this organism often show signs of fungal attack.

The larva is greyish-white in colouration and may be up to 30mm in length. It has a large head with pitch black or brown mouthparts. The larvae may bore tunnels several centimetres in length, usually in decayed timber. Evidence of burrowing can be seen in the form of large piles of frass around the infested timber. A diagrammatic representation of a larva can be seen below.

The adult organisms emerge in spring and summer through oval flight holes 5mm in diameter. The adult is 6-12mm in length and red-brown in colour with the tips of the wing covers black (see diagrammatic representation).

If any organism fitting this description is found could you please fill out the following questionnaire and return it to:

A. J. Pitman  
Portsmouth Polytechnic  
School of Biological Sciences  
King Henry Building, King Henry 1 Street  
Portsmouth PO1 2DY  
U. K



#### QUESTIONNAIRE

- 1) At what locality was the organism found?
- 2) Into what species of timber was the organism boring?
- 3) Was there any evidence of fungal degradation on the timber?
- 4) Was the timber wet or damp?
- 5) Was the timber archaeological in nature?
- 6) Was the timber located near the coast or waterway?
- 7) Has your Company/Organization ever encountered this organism on a previous occasion?
- 8) Is there any information available regarding this organism available in your Company/Organization records?
- 9) If possible could a sample of the wood and organism be sent to: the Polytechnic? It would be preferable if the wood is placed in a sealed polyethylene bag as soon as possible following removal from the site, so a moisture content analysis can be established.

Thank You

#### NEWS FROM WEST GERMANY

While excavating the last meter of a 15 meter deep building pit for the construction of a new hotel, workers came upon a wooden boat in the centre of Bremen/Germany. A conservator of the local museum was watching the excavation, and she did a brave job in fending off caterpillars, cranes and legions of concrete pouring workers long enough to get the ship archaeologist from the German Maritime Museum into the pit. The find could be identified by its ceramic fragments as an early medieval river barge, dated to the 9th century AD. Some 12 meters were exposed, 5 to 10 meters being cut off by the concrete wall lining the pit (what a pity!). The barge consists of J heavy planks on each side, clinker built with Jc. dowels and fastened to the flat bottom via L-shaped transition planks adzed to a beautiful curvature.

A word from the director of our museum authorized the construction firm to lift the barge and bring it to Bremerhaven, some 60 kilometers from Bremen. Within two days a gang of carpenters built a system of tailor made supports under the ship, connected them with longitudinal girders, cut the boat from the concrete wall and lifted the cradle onto a lorry. Plywood boards on top of rock-wool mats made excellent shock-absorbers. During the entire operation the ship did not move one centimetre.

It is impressive to see experts perform their job and breathtaking: The bill came immediately - 12,000 DM (ca. \$6000 US). There went this years excavation funds.

Now the "Bremen Barge" stands in a tent with a sprinkler - system mounted around it. Sprinkler nozzles as used in fire extinguishing systems proved to be the best. There is still no place to put it, no money to build a tank, purchase PEG or install a heating system. The same old situation. Perhaps it could be a candidate for a sugar-treatment, to become the Bremen Candy Barge? Experiments are in progress. Has anyone yet treated large, two quality oak timbers with sucrose? Please let me know.

Per Hoffmann  
German Maritime Museum  
D-2850 Bremerhaven  
Germany

## NEWS FROM AUSTRALIA

### Victoria Archaeological Survey

#### Waterlogged Wicker Conservation

Included in the cargo of the William Salthouse were numerous organics, including wicker baskets. Maggie Baron (Victoria Archaeological Survey) and Anne Wright (Museum of Victoria and ex Victoria Archaeological Survey) have undertaken a preliminary assessment of treatments using PEG 400 plus 3350. The work shows some promise which will be published in an in-house VAS Publication next year and will send a more detailed project which will hopefully be ready for the ICOM Conference in August 1990. They would welcome any details relating to similar conservation treatments.

Please forward all relevant correspondence to Maggie Baron at the following address:

Victoria Archaeological Survey  
PO Box 262  
Albert Park VIC 3206  
AUSTRALIA  
Fax Number (03) 696-2947

### Western Australian Maritime Museum

Research is continuing into a variety of conservation problems.

Peter Brooke and Ian Macleod have been investigating the removal of iron corrosion products from degraded oak samples. Core sampling, Eh and pH profiling, cyclic voltammetry and atomic absorption spectrometry have all been used to gain an insight into both the nature of the corrosion products, factors affecting their removal from oak and mechanisms by which this removal can be enhanced.

An evaluation of standard treatments of waterlogged rope is being carried out by Nikki King Smith and Ian Godfrey. Rope samples were treated with eight different impregnation solutions ranging from single consolidants (e.g., Klnel G; PEG 1500) to more complex solutions (e.g., PEG 400/ethulose 400/glycerol). Parameters being used to determine the effectiveness of treatment include tensile strength, colour (chroma-meter) and flexibility.

The use of Fourier Transform - Infra-red (FT-IR) spectroscopy as an aid in the analysis of waterlogged wood and Leather is being investigated by Vicki Richards and Ian Godfrey. This technique has been used by other scientists to gauge the degree of degradation of wood. In the present study it is being applied to supplement this earlier work and *also* to develop procedures that may be used to quantify the Level of impregnation (without the need for extraction).

An investigation into the nature of pitch samples that were found on wreck sites off the Western Australian coastline has been carried out by Emil Ghisalberti (University of WA) and Ian Godfrey. Pitch samples from the Verquide Draeck (1656), the Rapid (1811), the Belinda (1824), the Eglinton (1852) and the Fanny Nicholson (1872) were analyzed by carbon-13 and proton nuclear magnetic resonance spectroscopic techniques. Information concerning the chemical nature of these pitches, their provenance and likely preparation techniques were able to be deduced from the spectra produced. Stockholm tar (retorted pine resin) was identified on the Verquide Draeck, the Rapid and the Eglinton, coal tar on the Fanny Nicholson and a mixture of Stockholm tar and coal tar on the Belinda. The results of this work will be published in the near future.

The treatment and consolidation of acid and degraded oak timbers from the Batavia is being investigated by Vicki Richards.

The treatments applied to the conservation of the archaeological timbers from the Batavia are well documented. Stabilization of acidic conserved Batavia timbers has caused many problems since the early 1980's.

The outer and inner stern sections were and continue to be in good condition with average surface pH range between 5.10 and 6.60. The timbers from the outer and inner port side were treated with gaseous ammonia to reduce the previous acidity caused essentially by oxidation of iron sulphides to acidic sulphates such as sulphuric acid. This treatment converted the acidic iron sulphates to iron oxy hydroxides and less acidic ammonium iron sulphates. The average surface pH range is 4.10 to 4.50 and the timbers possess the characteristic red/brown colouring. The major problem with these timbers is not the acidity but the friable surfaces rendering the wood fragile. These timbers are in urgent need of consolidation.

The problem timbers are those with surface pH ranges of 1.0 to 3.0. These timbers are in very poor condition, powdery and covered with grey white minerals with some yellow crystalline sulphide solids. Samples of these timbers will be immersed in deacidifying solutions to test the extent and stability of the deacidification or demineralization procedures. The solutions are listed below.

2% Na <sub>2</sub> CO <sub>3</sub>	)	
0.025M tannic acid	)	
2% NaOH	)	in 70% PEG 1500
2% Ca(OH) <sub>2</sub>	)	in deionized H <sub>2</sub> O
14% ammonia solution	)	

0.025 tannic acid in butanol/toluene  
14% ammonia solution in butanol/toluene  
2% imidazole in ethanol/butanol  
2% methyl magnesium carbonate solution

We would welcome any comments relevant to this work. Correspondence should be sent care of the address below.

Western Australian Maritime Museum  
Cliff Street  
Fremantle WA 6160  
AUSTRALIA

#### NEWS FROM BERMUDA

Bermuda, by nature of its geographical location is the source of many a shipwreck; its hazardous reefs catching navigators unaware, is they took bearings from the Island, the last point of land before heading east across the Atlantic. Bermuda was first colonized in 1609 when survivors from the wrecked ship, Sea Venture flagship of the English fleet sent to bring supplies to the starving settlements of Virginia, found a haven in its rich waters and sub-tropical climate. According to the Spanish historian, R. Barreiro- Meiro, in his paper "Las Isles Bermudas y Juan Bermuda" (Madrid: Instituto Historicode Maritima, 1970), the name "Bermuda", however, is believed to have originated from Juan Bermudez,- captain of the Spanish ship, La Garza, who probably discovered the Islands as early as 1505. What happened, then, in the intervening 104 years?

There are many questions to be answered about the fascinating period between the first sighting and colonization. With the forthcoming 500th anniversary of Columbus' discovery (If the New World, to be commemorated in 1992, world-wide attention will be focused on aspects of this Colombian era. The Bermuda Maritime Museum is currently conducting a major research project, entitled, "Bermuda in the Age of Exploration, 1492-1609", and through archival research and underwater archaeology, our aim is to increase our knowledge of this crucial period of European exploration and expansion into the Americas.

Over the past three years, the Museum has carried out archaeological excavations to re-examine what are believed to be sixteenth century wrecks. The first of these was the San Pedro, a Spanish ship wrecked in 1595, which had been extensively salvaged in the past. A number of artifacts were found but little remained of the ship's hull. Our next project was to examine a shipwreck referred to as the New Old Spaniard, supposedly wrecked in 1560. However, investigations into the hull remains suggest that it is a rare example of a transitional period in seventeenth century Dutch shipbuilding.

This last year, work began on another possible sixteenth century wreck. Work is still in the early stages, but there exists substantial hull remains, exhibiting characteristics associated with construction techniques of this period. Next years field season should enlighten us still further.

An inevitable result of these archaeological investigations has been the discovery of thousands of artifacts ranging from ceramic sherds, both of coarse and fine earthenware, articles of ship's rigging, wooden barrel staves and witheys, iron ship fastenings, lead musket shot, organic remains such as coconut shell, rope, olive pits, a curious prune-like substance, tar-like resins and even a fragment of South American turtle shell. Our somewhat primitive conservation laboratory dealt with a number of these finds for the first few years but has now been superseded by a brand new purpose-built laboratory, paid for entirely by a single donation. Named after its sponsor, The Corange Laboratory should be fully operational by summer 1990, in time to deal with the next influx of finds from our excavations.

In order to keep up with the workload, the museum relies heavily on volunteers, especially over the summer months. If anyone reading this article is interested in helping in 1990, please contact the Conservator, Emma Titford at the address below. The work might be particularly suited to students of conservation.

Emma Titford  
Conservator  
Bermuda Maritime Museum  
P.O. BOX MA 273  
Mangrove Bay, MABX  
BERMUDA

## NEWS FROM CANADA

### THE CONSERVATION ASSESSMENT OF SUBMERGED HISTORICAL RESOURCES

The conservation assessment of submerged historical resources is a part of archaeological conservation that is still fairly new and unknown in Canada and in other parts of the world. We are already familiar with the conservator-diver's contribution on underwater archaeological sites in providing technical support (i.e., developing safe and effective methods of excavating and recovering artifacts, underwater moulding of ship features, sampling of ship timbers for dendrochronology, etc.) but not of their involvement in evaluating new sites.

For the past few years, the Marine Archaeological Unit of the Historical Research Branch, Canadian Parks Service, has requested the participation of the Historic Resource Conservation Branch in the evaluation of new sites. Consequently, conservator-divers of the Wet Organic Materials Laboratory (W.O.M. Lab) have taken part in various marine surveys across the country to examine historical remains (shipwrecks, dock structures, etc.) in newly established National Marine Parks. Our task was to evaluate the state of preservation of the historical remains, to identify the factors that are adversely affecting the short and long term survival of the sites and to make recommendations on how to best utilize these historical resources.

For the past two field seasons, the W.O.M. Lab has been occupied working at the Fathom Five National Marine Park, Tobermory, Ontario. In this marine park, about 27 shipwrecks, from the 19th century, are resting at different depths varying from 2 to 40 metres. The work on these sites consisted of doing conservation assessments of about 15 of the 27 shipwrecks and taking samples of the different materials. After each field season at Tobermory, a report was written in which the conservation assessment of the shipwrecks and the sampling procedures were described. Also, recommendations about divers safety and factors harmful to the sites (boat traffic, divers, etc.) were identified with the wish that the information in these reports will help to better evaluate and protect this site.

Marthe Carrier  
Senior Conservation Technician  
Wet Organic Materials Laboratory  
Historic Resource Conservation Branch  
Canadian Parks Service  
Environment Canada

Lorne Murdock along with several other specialists from the USA and Mexico, were invited by the Getty Conservation Institute in May 1989 to participate in meetings with the Colombian Government in Bogota and Cartagena to advise on the proposed recovery of the 18th century galleon, 'San Jose'. The 'San Jose' was sunk during a naval engagement with the British off Cartagena, Columbia in 1708 and presently rests in approximately 230 meters of water. Lorne along with Mrs. Marta de la Torre and Mr. Nicholas Stanley Price of the Getty Conservation Institute reviewed the Colombian's proposals for recovering the vessel and advised on the conservation, storage and display requirements of such a major undertaking. As of this date we have no knowledge if the Colombian Government has proceeded with the project.

Lorne D. Murdock  
Senior Archaeological Conservator  
Wet Organic Materials Laboratory  
Historic Resource Conservation Laboratory  
Canadian Parks Service  
Environment Canada  
1550 Liverpool Court  
Ottawa, Ontario  
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CANADA

## NEWS FROM NORWAY

### The International Comparative Wood Project - The Long Term Storage

A summary of the project and the results of the International Comparative study for Treatment of Waterlogged Wood was given in Newsletter number 16 by Dr. David Grattan of the Canadian Conservation Institute. I will now give additional information in regards to the long term storage of the wood samples in the project.

All the wood samples, as of October 1989 have arrived in Norway. The 105 samples which will be stored in perpetuity at the University of Trondheim will undergo their next phase in the program, which includes the following:

- The routine monitoring of radial, tangential and longitudinal dimensional changes.
- The recording of weight changes
- The development of cracks
- Colour assessments



The samples will be stored in 50% relative humidity, at 18 degrees centigrade. All the reports, slides and relevant information have been sorted and filed. The samples, which have been conserved by 15 different methods present a very good survey of the results of the project.

I invite you all to Trondheim to study the project. As well, you are invited to look at the methods and the results of the conservation of wet organic archaeological materials i.e., wood, leather, textiles and bone at the Conservation Laboratory here in Trondheim.

Roar Saeterhaug  
University of Trondheim  
Vitenskapsmuseet  
7004 Trondheim  
NORWAY

## NEWS FROM KOREA

### Mokpo Conservation Center

Many times fishermen off the coast of Jeungdo Island would find ceramic wares lodged in their nets. Upon receiving a report of these discoveries in 1976, the Cultural Properties Maintenance Office along with a team of scuba divers from the Korean Navy set out to investigate these finds. Surprisingly, a tremendous amount of artifacts associated with a 14th century ship were located.

From this time on a large scale underwater excavation, which attracted world wide attention was carried out for a period of 9 years. The preliminary research indicated the ship timbers had been severely degraded and could not retain their shape without conservation. Therefore, the Korean Government established the Mokpo Conservation Center in October, 1981. The center was to be responsible for all conservation of the ships waterlogged wood.

The conservation building encompasses 900 square meters of floor space, as well, it has two large pools with heaters that can be used for PEG impregnation baths. There are now 12 full time staff concentrating on the conservation and restoration of ancient shipwrecks. Besides the Shinan ship, we are treating the Wando ship (ca. 11th century; Koryo dynasty), and a wooden bridge structure (Shilla dynasty). The center is now responsible for the conservation of all the archaeological waterlogged wood which is excavated in Korea.

## Underwater Excavation

The marine archaeological excavation was carried out at Shinan which is located in the south-western coast of the Korean peninsula. The work was carried out with the close cooperation of the Korean Navy for over 9 years, during the summer months from 1976 to 1984. The shipwreck with its cargo was lying in 20 meters of water. The high speed of the current and the low visibility created many difficulties, it was found to be much more dangerous than originally anticipated. As a result of the excavation the following was retrieved, ceramic ware, Chinese coins, the crew's daily necessities and all the ship's timbers. A total of 20,691 artifacts weighing 28 tons were recovered. The ship was identified as a Chinese vessel of the 11th century (Yuan dynasty) by deciphering the chronological letters which were written on wooden tags. This was the first underwater excavation in Korea and took 9,800 person days, as well, 3,500 hours of diving time.

At the close of the Shinan expedition another underwater excavation was carried out, this time on the Wando island coast. The Wando ship that was discovered sunk around the 11th century (Koryo dynasty) and is considered an important find in which to study the construction of the traditional Korean boat. A total of 30,645 artifacts were recovered on this particular wreck site.

### The Shinan Ship Structure

- 1) V-shaped cross section with a large keel.
- 2) 7 bulkheads across the hull throughout the length of the vessel.
- 3) a rabbeted-clinker joint
- 4) a blunted stem and transom stern
- 5) two masts
- 6) thin wooden sheathing used to retard marine growth
- 7) constructed of Chinese red-pine and fastened with iron nails.

The approximate dimensions of the ship are:

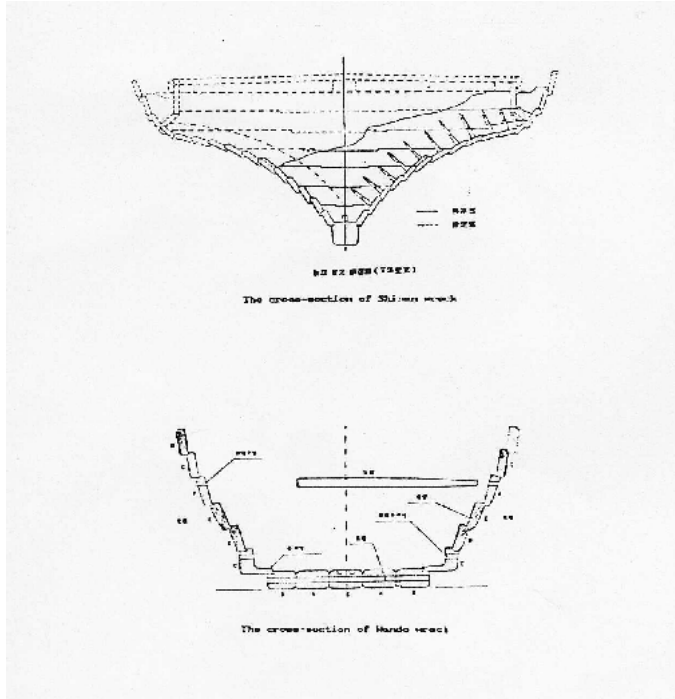
± length (max.)	: ca. 32 meters
± breadth (max.)	: ca. 10 meters
± depth (at amidship)	: ca. 3.5 meters
± tonnage	: ca. 200 tons

The Wando Ship structure

- 1) flat bottom structure (without keel)
- 2) a rabbeted clinker joint
- 3) a blunt stem and transom stern
- 4) one mast
- 5) employed a burning-off method to retard marine growth
- 6) constructed of Korean red-pine and fastened with trenails

The approximate dimensions of the ship are

± length (max.)	: ca. 9 meters
± breadth (max.)	: ca. 3.5 meters
± depth (at amidship)	: ca. 1.7 meters
± tonnage	: ca. 10 tons



Conservation of the Timbers

Most of the ships timbers are now in PEG treatment solutions. The remaining timbers are being stored in a water bath. Many of the small fragments and heavily degraded wood have been treated with PEG 4000. The results of this treatment for these particular objects was considered satisfactory.

In the case of the large timbers a one step PEG treatment was considered not enough to stabilize them because of the various degrees of degradation. Therefore, a multi step PEG treatment was introduced; low molecular weight PEG to stabilize the less degraded areas and a high molecular weight PEG for the heavily degraded areas.

The first part of the treatment entails placing the timbers into an initial aqueous solution of 5% PEG 400 at room temperature. After a period of time the initial treatment solution is discarded due to small particles of mud and other materials which cause the solution to become quite dark and smell badly. It is felt that if the original solution is not changed the timbers will change to an undesirable dark colour after the treatment has been completed. Following this the solution is increased by 5% increments of PEG 400 every 3 to 4 months until a total of 20% is reached.

One of our greatest difficulties is the removal of iron corrosion products which were located around the area of nail holes, as well, on various other surfaces of the timber. We initially removed the corrosion products carefully by mechanical means and also with a 5% solution of E.D.T.A, however, this was found not to be very effective.

The timbers after steeping in the 20% solution of PEG 400 are transferred to a second treatment bath (which is heated) containing a 25% solution of PEG 4000. The solution is increased with an additional 5% PEG 4000 every 2 to 3 months until a 70% to 80% total is reached. The temperature for the treatment solution is increased slowly up to 40 degrees centigrade and maintained. As you can see the intervals for the PEG 4000 part of the two step treatment are slightly shorter than the PEG 400 step.

In total we have 6 tanks varying in size, all of which can be heated. Their dimensions are as follows: 12m x 1.5m x 1m, 1m x 1.5m x 1m (3 tanks), 6m x 1m x 1m and 2m x 1m x 1m. Approximately 30% of the tanks volume can be filled with timbers, the remaining is filled with treatment solution.

We think the aim of waterlogged wood conservation is not only retaining dimensional stabilization but in also restoring the initial strength of the object. By our compression tests, PEG 4000 treated samples were found to be 8 times higher than the untreated ones in compression perpendicular to the grain. The first group of the Shinan ships timbers that were treated remain in a 15% PEG 4000 solution, therefore we can n't report on the results at this time.

The Korean government is now constructing a new archaeological Maritime Museum that will be opened in October, 1992. At the new museum the Shinan ship will be gradually reassembled as the conservation of the timbers are completed. This work will be carried out in full view of the public.

Kwang-nam Choi and  
Kim, Yonq-han  
Mokpo Conservation Centre  
31 Yonghai-dong  
Mokpo, Geonnam  
KOREA

(Editors Note: I wish to my Korean colleagues for any mistakes found in this translation).

## BOOKS

### Conservation of Wet Wood and Metal

The proceedings of the ICOM Conservation Working Groups on Wet Organic Archaeological Materials (WOAM) and Metals Conference, Fremantle 1987, Ian MacLeod ed., are now ready for purchase.

For five days in September 1987 the Western Australian Maritime Museum was host to 33 waterlogged wood and metals enthusiasts meeting for their 3rd triennial conference. The beautifully restored. Old Bond Stores in Fremantle harbour now housing the maritime Museum and its conservation laboratories formed a suitable background for lively lectures, discussions and intensive exchanges of experience in the field of conservation of waterlogged organic materials and metals. The proceedings of this conference compile the 16 papers presented at the conference. These include research results and case studies concerning the conservation of wet wood, rope, metals, a sunken iron ship and composite objects of metals and organics, the questions and answers following them and a panel discussion. A second part of the book, edited by David W. Grattan, presents the results and the evaluation of a three year international comparative study of conservation methods for waterlogged wood. Twenty six different treatment programmes were tested by laboratories in Canada, France, Britain, West Germany, Norway, Australia, Japan, the Netherlands and Austria.. This study is the most ambitious and comprehensive comparative study in the field and has helped a great deal to clarify which results can be expected from the different treatment methods. The test samples are now on permanent display in the Archaeological Department of the University of Trondheim, Norway.

The book announced here is compulsory reading for any conservator dealing with waterlogged archaeological objects, big or small, as are the proceedings of the previous two meetings of the WOAM Working Group. It has 287 pages and sells for \$20.00 US or \$23.00 Canadian. Copies of this publication can be ordered from:

Thomas Daley, Assistant Coordinator ICOM-WOAM Group,  
Historic Resource Conservation Branch  
1550 Liverpool Court  
Ottawa, Ontario  
K1A 0H3  
CANADA  
telephone # (613) 993-2125  
FAX # 001-613-993-9196

Please make all cheques payable to: ICOM-WWWG. American cheques must be written on U.S accounts only.

### Feagle of the Wetlands Bogs, Bodies and Lake-Dwellers A World Survey

By: Bryony and John Coles

The world's wetlands are unique environments: from inland bogs and lakes to coastal marshes, they are rich not just in Wildlife, but in human life and history as well. For thousands of years people have exploited wetland resources, quarrying bog iron or building lake-dwellings-and for thousands of years the wetlands have preserved remnants of this ancient way of life, trapping unwary travellers or overloaded carts in the treacherous bog, and drowning whole villages. But now these landscapes are under serious threat from drainage and peat-cutting.

This timely book IS the first to describe for the general reader the extraordinary archaeological wealth of the wetlands worldwide-and reveals just how much we stand to lose if this heritage is destroyed.

People of the Wetlands tells the story from the discovery of the first bog bodies and lake-dwellings more than a century ago to today's scientific excavations, chiefly in Europe and North America, but increasingly all round the world. The mystery of the bog bodies is fully explored: some individuals met an accidental death, but how many-like Lindow Han, recently unearthed in England-were murdered or sacrificed? Also discussed in detail are the revolutionary results of the new tree-ring chrology, which allows prehistoric lake-dwellings and villages to be dated with a precision once reserved for ancient Egypt or Rome. Above all, wetland archaeology excels in revealing to us details about ancient life: how early farmers wore straw sandals and enjoyed birch-bark chewing gum, how they adorned their houses with patterned textiles, and how they erected wooden god-dollies beside their roadways across the fens to ward off evil spirits.

The book is available from, The Museum Bookshop Ltd, 36 Great Russell Street, London WC1, UK.

## Archaeological Wood

### Properties, Chemistry and Preservation

edited by Roger M Rowell, US Department of Agriculture and R. James Barbour., Forintek Canada Corporation.

Series: Advances in Chemistry Series No. 225 - Developed from a symposium. sponsored by the Cellulose, Paper and textile Division at the 196th National Meeting of the American Chemical Society, Los Angeles, California., September 25 - 30, 1988.

Audience: Conservators, wood-oriented scientists, archaeologists

Level: Graduate and professional.

Scope: Archaeological Wood is the first book to combine chemistry with techniques of preserving archaeological wood. Among the topics discussed in its 17 chapters are the chemical composition of wood and changes brought about by the decay process, biopredators, radiation curing, freeze- drying, chemical preservation techniques, museum environments, the ethics of conservation and value systems for choosing among the qualities of wood that can be preserved. This volume provides understanding, from a scientific perspective, of archaeological wood, its properties, its chemistry and its preservation.

Pubdate: December 1989

Other information: U..S. and Canada \$79.95, ISBN 0-8412-1623-1, clothbound, 473 pp. + index, illustrated, indexed LC 89-39451

Order From: American Chemical Society Distribution Office, Dept. 390, 1155 Sixteenth Street, N.W. Washington., D.C. 20036. Phone (202) 872-4600, customers in the United States may call (800) ACS-558 toll free and may charge to any major credit card.

### "Problems of the Conservation of Waterlogged Wood"

This book was published by the National Maritime Museum in 1975, being the proceedings of a conference held in 1973. These books will be distributed for the cost of postage (three international reply coupons). Please contact W.A Oddy, Keeper of Conservation, The British Museum, Department of Conservation, London WC1B 3DG, UK, telephone 01-636 1555 or FAX 01-323 8480.

## GENERAL

### Calendar Call

Are you an accomplished doodler? A would-be illustrator? A conservation trivia expert? Now is your chance for international fame! The executive of the International Institute for Conservation-Canadian Group (IIC-CG) has decided to publish a conservation calendar for the year 1991.

We would like the calendar to have an international flavour and are thus soliciting drawings and information from around the world. Each calendar page will be faced by a black ink drawing/cartoon which we hope will depict a light-hearted approach to the profession. The format is as follows: 19cm x 25cm, (7.5" x 10"); horizontal format; no grey tones except cross-hatching and stippling. In addition to the 12 large illustrations, any small sketches or conservation-related information received will be considered, e.g., famous dates in conservation; conference dates; training information.

All submissions become the property of the IIC-CG. The deadline is May 31, 1990. We are waiting to hear from you! Please contact Mary Laidlaw by writing: Mary Laidlaw, IIC-CG, P.O. Box 9195, Ottawa, Ontario, Canada, K1G 3T9, ENVOY: CINC.IIC.CAN. or phoning the Canadian Parks Service at (613) 993-2125 or FAX: (613) 993-9796.

### CONFERENCES

IIC-CG 16th ANNUAL MEETING  
21-28 MAY 1990  
QUEBEC CITY (CANADA)

The International Institute for the Conservation of Artistic and Historic Works - Canadian Group will hold its 16th annual meeting, 22-27 May 1990, in Old Quebec.

The pre-conference workshop theme will be 'Museum Architecture and Conservation. The workshop will be held May 22-24 1990 at the Musee de la civilisation. The conference itself will deal with various aspects of conservation and take place May 25-27 at the Old Seminary. Registration fees for members will be \$125.00 Canadian for the 1st event and \$75.00 Canadian for the second. Non-members fees are to be determined.

Anyone with a professional interest in cultural property management and conservation or museum architecture may attend.

Inquiries concerning the workshop may be directed to Sylvie Marcil (tel. 418-644-2110) and those concerning the conference to Claude Payer (tel.. 418-646-6531). Written inquiries should be addressed to: IIC-GC Congress 1990, C.P. 155, Succ. B, Quebec City, Quebec, G1K 7A6. FAX: (418) 646-9705.

Editor's Note

ATTENTION ALL ICOM WOAM NEWSLETTER SUBSCRIBERS

.In an attempt to save on unnecessary printing and mailing costs for the Newsletter, I am once again requesting that everyone please fill in the enclosed application form in order to receive future copies of the Newsletter. Those that have previously subscribed thank you and please ignore the form. Unless you return your application, 2nd and final notice by July 1, 1990 I will assume that you are no longer interested in receiving the Newsletter.

For your submissions to be placed in the next newsletter please send them to me or Per Hoffmann by the end of August 1990.

Thank you

Thomas Daley  
Archaeological Conservator  
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CANADA

Telephone (613) 993-2125  
FAX number (613) 993-9796

ICOM COMMITTEE FOR CONSERVATION  
WORKING GROUP ON WET ORGANIC ARCHAEOLOGICAL MATERIALS

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SECOND AND FINAL NOTICE

EVERYONE WHO HAS ALREADY SUBSCRIBED, THANK YOU AND PLEASE IGNORE

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RETURN TO: Tom Daley  
Assistant Coordinator  
c/o Historic Resource Conservation Branch  
1550 Liverpool Court  
OTTAWA, ONTARIO, CANADA K1A 0H3

Hotel Reservation Form

4th ICOM-WOAM conference Bremerhaven, 20 - 24 August 1990

Prices are per room and night,  
include breakfast, and are in DM

	category			
	A	B	C	D
single room				
without bath/shower	----	41-46	37-40	30-36
with bath/shower	71-140	61-75	45-65	----
twin room				
without bath/shower	---	81-90	69-80	58-68
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please book for me (mark "x")

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(please indicate if you will arrive after 6 p.m.)

date:..... signature: .....

please return this form before June 10, 1990 to:

Städtisches Verkehrsamt  
 Im Stadtstudio  
 Columbus Center  
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 Germany Telephone: 0471-5902243

You will receive a proof of your reservation after this deadline

The Verkehrsamt only acts as intermediary and cannot take on any liability.

At the 4th ICOM-WOAM Conference in Bremerhaven I will take part in the

Dorum Shrimp Dinner	(number of persons)
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DATE: ..... signature: .....

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 Deutsches Schiffahrtsmuseum  
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Fax: 0471-4820755

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