

WOAM NEWSLETTER

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ICOM-CC WORKING GROUP

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1. FROM THE COORDINATOR

This is my first newsletter as coordinator and I am really delighted to have the opportunity to fill you on a few developments and projects before moving on to some of the news within the wet organic world. First, however, I would very much like to thank Tara Grant for her leadership in the last triennium. Tara has agreed to edit the proceedings of the Istanbul conference so we are still keeping her hard at work. The Istanbul proceedings are progressing well, despite some small delays and it is expected that they will be ready by October 2015.

COPYRIGHT FORMS

Emma Hocker has already been in touch with you about obtaining Copyright permission for your Istanbul conference contributions. ICOM-CC is asking all Coordinators and Assistant Coordinators to do this for publications. The new copyright forms will allow the papers not only to be published but also to be hosted on the ICOM-CC website at a later date, if desired. However, as the paper author you still retain many of your rights. If you submitted a paper for Publication and have not yet received one of these forms please contact Emma or myself directly.

We have scanned some of the harder to find WOAM proceedings and plan to eventually place the papers on the ICOM-CC website for free download. In order to do this, we will need to obtain Copyright agreements from authors, so you will hear more about this in the future. I have appended the copyright

agreement form to the back of this newsletter so that anyone who wishes to familiarize themselves with it may.

WOAM INTERIM MEETING

The 13th Triennial ICOM-CC Wet Organic Archaeological Materials meeting will be held in Florence from May 16th-21st. Marco Fioravanti is planning a wonderful conference and has sent pictures of the conference venue to whet everyone's appetite (see below). The venue is in the inner centre of the town, close to the Archaeological Museum of Florence where some of the social events will take place. Registration will open on November 1st, 2015 and early registration will be available until March 15, 2016. Additional information will be forthcoming. .



PEER REVIEWED PUBLICATIONS

As many of you will recall, at the past three interim meetings (Greenville and Istanbul) the topic of the publications came up. In Amsterdam, the question was raised whether a hybrid peer-reviewed/non-peer-reviewed publication would meet the needs of those working in museums and universities where peer-reviewed publications are used as benchmarks. We tried the hybrid idea for both the Greenville and the Istanbul publication with mixed results. The downside of our experiment was that because only some of the papers are peer-reviewed the publication can't really be counted as a peer-reviewed publication and it proved somewhat difficult to manage two different tracks and make sure that everything was advancing in tandem to the publication date. The upside was that we discovered that the process was more manageable than we thought—there had been initial concerns that it might overly slow the publication process down.

After additional discussion in Istanbul and at the ICOM, CC Triennial meeting in Melbourne, the WOAM coordinating team has therefore decided to move to an entirely peer-reviewed publication for the Florence WOAM meeting. We feel strongly that this is the right move for WOAM at this point. Peer-review is a widely accepted indicator of quality scholarship. As a group, we know the excellent work that is done by our members but this move will help to make the quality of our work more assessable by others.

What does this mean for WOAM members?

- For presenters, it means that if you would like to publish your paper or poster in the post-prints you will be asked to submit it a little earlier than usual. The papers will be due on March 30th 2016. This will allow the editorial team an opportunity to line up reviewers before the conference and begin the editing process so that the publication can be completed in a timely fashion. Papers that are not received by this date will be assumed to be for “oral presentation only” and will not be included in the post-print publication.
- For members, you may be approached to peer-review a paper from time to time. Please agree to do this. This effort, like any peer-review effort, will depend on the voluntary efforts and goodwill of all our members and supporters. However, we do promise to be cognizant of your time and other commitments and promise not to overwhelm anyone with a stack of papers to review.

For the Florence publication, each paper will be reviewed by two reviewers. They will be asked to assess the merits of the paper and to make suggestions regarding strengthening it, if necessary. The overarching goal is not to use peer-review as a method for shrinking the hefty tomes we have a reputation for producing but rather to use the process to make sure that we are producing the best publication we can and that the hard work of authors and presenters is recognized.

If you have any questions or concerns about the process, please feel free to email me or any of the Assistant Coordinators.

2. NEWS AND PROJECTS

IRON COMPOUND EXTRACTION FROM ORGANIC MATERIAL: RESULTS FROM AN INTERNATIONAL SURVEY TO GATHER THE CONSERVATOR'S EXPERIENCES.

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Context

It is well established that iron compounds (oxides and sulfides) damage organic materials (waterlogged or dried wood, bones, textiles...). To limit this, extraction treatments are carried out to remove the iron compounds from the objects (such as, electrophoresis and the use of complexing agents). Many conservators use different protocols and chemicals to extract iron compounds. Therefore and according to the material, it is difficult to define a single extraction process for each material. All the parameters depend on the artifact, its degradation, the conservator's experience and feedback from previous experiments.

Survey Goals

The 2013 international survey sought to gather information about conservators' experience with the extraction process in order to understanding their expectations concerning efficacy and usefulness. The aim was to shed light on the different and numerous decision-making steps used to treat organic objects impregnated with iron compounds.

Conclusions about the survey.

The main treatments used were chemical methods: using complexing, reducing or oxidizing agents. However, there is no standard process. To treat waterlogged wood, EDTA (5-10% aq), di- or tri-ammonium citrate (2% or 3-5%), citric acid (1-3%), sodium dithionite mixed with tri or di-ammonium citrate, either with or without PEG 400 (5%/2%-5%), DTPA (10-20mM) and EDDHMA may be used. Sodium persulfate was also tested to oxidize iron sulfide before extraction with a complexing agent (EDTA 3.7%w) on a textile-iron composite object.

Parameters. All the chemicals were used at **different pHs**. EDTA and citric acid are used respectively in slightly and highly acidic pH. The use of dithionite leads to a decrease in pH (down to ~3.8) during the treatment. DTPA and di- or tri-ammonium citrate are used at a neutral pH, contrary to EDDHMA for which an alkaline pH is required. Concerning sodium persulfate, its pH is initially slightly acidic (~6) but must decrease to initiate the reaction.

We know that the duration of treatment depends upon the object (size, material, etc.) but in fact the timescale is subject to huge variations. It is an empirical parameter, and cannot be accurately predetermined for a given treatment. According to the chemicals used, the length of extraction treatments may range from just **a few hours, to one month, several months or even several years**. And for some respondents, the duration of treatment, particularly for those using DTPA, was considered too long (several months or years depending on the object).

Concerning the end of treatment, some conservators used analytic techniques to quantify the concentration of iron extracted from objects (SAA, IC ICP), but **there was no clear definition of the optimum quantity of iron to be removed**. In extraction treatments as a whole, the processes used do not lead to a complete extraction (just a surface extraction can be observed) and the question of how much iron compound should appropriately be removed remains undefined. According to one conservator, the end of the treatment is defined as being when the iron concentration reaches 10 mg/L in solution.

Commonly, visual assessment was used to define the efficiency of an extraction treatment (color of the natural wood, natural appearance of the wood). But **the lack of knowledge about the impact on the organic materials by extraction processes** is clearly a limit; although the feedback (some years after treatment) on extraction processes carried out by conservators confirmed their efficiency.

Chemicals used. Objects treated with a combination of **sodium persulfate/EDTA** provided good results in terms of visual aspect: the wood, initially black, turned brown. However, sodium persulfate requires a dangerously low pH to be effective. The use of this chemical therefore should be considered with care; it requires safety precautions and the use of protective equipment. This chemical, combined with EDTA was also tested on a composite organic cartridge (textile and iron corrosion products). According to the conservator in charge of this object, the persulfate caused a whitening and swelling of fibers. However, this chemical was considered to be efficient in terms making the object's surface more flexible and more readable. **EDTA and citric acid** seemed to give good results. The resulting visual appearance was generally considered satisfactory by conservators. These chemicals are affordable, easily obtained and, moreover, they are not hazardous. **Di-ammonium citrate** caused a whitening of the surface of the object. It has also been observed that this treatment has a limited effect (on the surface only) and that after a week the solution gives off an unpleasant odor. However, other conservators considered this chemical effective, combining better aesthetic qualities, a decrease in the risk of the formation of pyrite (as well as other iron compounds and sulfuric acid), and an overall good surface appearance. **Sodium dithionite** can produce toxic vapors (sulfur dioxide) in acidic conditions. It was observed that this reducing agent removes iron oxides rapidly. However, dithionite can cause bleaching of the wood surface if the pH decreases below 5. Although the addition of sodium dithionite may considerably improve the dissolution rate, it would be necessary to maintain constant control over the treatment parameters to avoid a severe decrease in pH. Another conservator proposed a **mixture of di-ammonium citrate / sodium dithionite and PEG 400** to remove iron oxides from waterlogged wood. In spite of the "excellent almost total removal of iron oxides", very little sulfur was extracted. The appearance of the wood became more natural and the artifact seemed to be more stable post-treatment. **EDDHMA and DTPA** both provided adequate extraction and samples were found to be stable five years after treatment. However, these chemicals were used on samples which had been already impregnated with PEG and then dried. Moreover, samples were re-wetted. Although it improved the visual aspect of the wood and provides sufficient extraction, the use of EDDHMA requires a long-term treatment. DTPA worked well at neutral pH and conservators observed low risks with regard to environment and health and safety. Another conservator also used DTPA to treat waterlogged archaeological softwood. However, this conservator pointed out the unknown effect of this chemical on organic materials and the long duration of the treatment (several years).

Conclusions. Although none of the participating conservators used exactly the same extraction process, certain criteria were generally looked for in an efficient treatment. Factors which facilitate treatments, such as the affordability of chemicals, the readiness with which they are available, and their safety of use were the main common characteristics.

Acknowledgements. We would like to thank ICOM WOAM, in particular Tara Grant, for helping to disseminate the results of this project. The authors are sincerely grateful to Amandine Colson for her valuable assistance in helping us translate the questionnaire. We would also like to thank all the participating conservators and scientists for sharing their experiences.

For related information please check out:

Pele, C *et al.* 2015. "Iron Removal from Waterlogged Wood: Extraction by Electrophoresis and Chemical Treatments". *Studies in Conservation* 60 (3): 155-171.

LATEST NEWS FROM YENIKAPI SHIPWRECKS

Namık Kılıç

Thirty-seven medieval shipwrecks, dating from between the 5th and 11th centuries, have been uncovered by the salvage excavations under the supervision of the Istanbul Archaeology Museums

Directorate in Istanbul-Turkey. The conservation work on 31 of these shipwrecks has been implemented by the Istanbul University's Department of Conservation of Marine Archaeological Objects.

Following the removal the shipwrecks from the excavation site, they were transported to stainless steel tanks with capacities of 40 tons of water for the desalination process. During the desalination process, EXOCIDE 1012 was used against biological activity. In order to determine the chemical and physical deterioration of the wood and wood species, samples were taken and analysed. The impregnation solution type was determined according to data from these analyses. PEG (polyethylene glycol) and, Kauramin (melamine formaldehyde) were applied to the Yenikapı shipwrecks. The conservation process of YK 2, YK 3, YK 6, YK 7, YK 9, YK 12, and YK 30 shipwrecks with PEG is in progress; the conservation process of YK 8 and YK 26 shipwrecks, the timbers of YK 16, and the boughs in YK 9 shipwreck with Kauramin is also still progressing. Following the PEG impregnation procedure of YK 1, some timbers of the shipwreck were freeze-dried. Freeze-drying was used for the first time in Turkey by the İstanbul University scientists at the Ship Conservation and Reconstruction Laboratory. Also, the treatment of the YK36 shipwreck with Kauramin has been completed.



1. YK 36 was treated with Kauramin



2. Preparing timbers of YK 1 for freeze drying



3. Putting the timbers of YK 1 in freeze dryer

CONSERVATION OF TWO MEDIEVAL DUGOUT CANOES

Contributed by João Coelho, Centro Nacional de Arqueologia Náutica e Subaquática (CNANS), Direcção-Geral do Património Cultural, Portugal

In order to display one of the two medieval wooden dugout canoes (canoe 1 – 11th cent. and canoe 2 – 8th cent.) recovered from the Lima river (north of Portugal), at the “Time salvaged from the sea” exhibition, that is taking place in the Museu Nacional de Arqueologia, Portugal (<http://www.museuarqueologia.pt/?a=2&x=3&i=96>), these vessels were impregnated by the two-step PEG method (PEG 400 + PEG 4000) prior to freeze-drying.

Impregnation was carried out in the Centro Nacional de Arqueologia Náutica e Subaquática, (Portugal) whilst freeze-drying took place at the laboratory of Museo Nacional de Arqueología Subaquática - ARQUA (Cartagena, Spain). A protocol was signed for that purpose between the Direcção-Geral do Património Cultural, represented by the Museu Nacional de Arqueologia, and the Subdirección General de Museos Estatales.

Apart from the support given by the ARQUA for the second stage of the treatment, the impregnation work had the scientific support from Dr. Khoi Tran (ARC-Nucléart Conservation Centre, Grenoble, France).



Dugout canoe 2, from Geraz do Lima, Portugal (Photo: José Paulo Ruas).

3. COLLEAGUE'S CORNER

COMPOSITE SAMPLES SOUGHT

In January 2016, Virginie Ternisien a conservator at the Warren Lasch Conservation Center (WLCC) in South Carolina, U.S.A., home of the *H. L. Hunley* (1864) submarine project, will begin a PhD program at the School of Archaeology, Paris 1 Panthéon-Sorbonne University, in collaboration with Arc'Antique, a conservation and research laboratory in Nantes, France.

Her PhD research will study the desalination (removal of chlorides) of marine archaeological iron-wood composite artifacts in near neutral solutions under electrolysis. She is currently in search of iron-wood composite artifacts recovered from the same marine archaeological site. The iron part should still be partially metallic. Some artifacts will be destroyed to conduct elementary analysis. Investigation of the artifacts will be carried out at Arc'Antique and the WLCC laboratories.

If you have artifacts/samples that you are willing to make available to her for this research, or if you have any comments or suggestions, please contact her by email: virginie.ternisien@gmail.com or phone: T +1 [\(843\)-730-5092](tel:(843)-730-5092)

DISASTER RESPONSE AND RECOVERY PUBLICATION

A complimentary publication is now available for all ICOM-CC members:

The publication, "Stabilization Processing. Multi-Organizational Co-Operative Project for Preserving and

Restoring Cultural Assets Damaged by Tsunami on March 11th, 2011”, was published by ICOM Japan, the Japanese Association of Museums, and The Committee for the Multi-Organizational Co-Operative Project for Preserving and Restoring Cultural Assets Damaged by Tsunami on March 11th, 2011. The work addresses damage to cultural heritage in east Japan as a result of the earthquake and subsequent tsunami in March 2011.

You can order it by contacting: guidebook2015@tnm.jp with subject line: "Order of a copy of the book", by downloading a copy of the order form from the ICOM-CC website:

<http://www.icom-cc.org/54/document/stabilization-processing-multi-organizational-co-operative-project-for-preserving-and-restoring-cultural-assets-damaged-by-tsunami-on-march-11th-2011/?id=1358>

This is a printed book and will be shipped to you free of charge.

RECENT STUDENT THESES

Several of this year’s graduating Bachelors students in object conservation at the Department of Conservation, University of Gothenburg, Sweden, have undertaken final graduating projects in topics that might be of interest to members of WOAM.

These are:

- Emma K. Emanuelsson, “Pyrit i arkeologiska benförmål – ett dolt problem? Undersökning och skadeinventering av järn och svavel i arkeologiska ben- och benhornförmål” / *“Pyrite in Archaeological Bone Objects – a Hidden Problem? An Investigation of Iron and Sulphur in Archaeological Objects of Bone and Antler”*, in Swedish.
- Åke Henrik-Klemens, “Urlakning av järn ur arkeologiskt trä med dietylentrifaminpentaetansyra (DTPA): undersökning av koncentrationens påverkan på extraktionstakten” / *“Iron Extraction from Archeological Wood: A Study of the Effect of Diethylene Triamine Pentaacetic Acid (DTPA) Concentration on the Extraction Rate”*, in Swedish.
- Sigurid Thorgeirsdottir, “Desalination of Archaeological Composite Objects Consisting of Wrought Iron and Wood/Bone. With Focus on the Iron Component”, in English.
- Irma Wetterstrand, “Reversible Modification of Flexural Rigidity on Dry Archaeological Leather from Wet Anaerobic Burial Sites: an Herbal Method”, in English.

For further information about these theses & projects, please contact: conservation@conservation.gu.se
Elizabeth Peacock writes that “some of the theses are in Swedish, but the students have excellent English; so, they could still be contacted if there is interest.”

WG9 OF CENTC 346 ON STANDARDS ON WATERLOGGED WOODS

CEN is the European public organization that is in charge of developing European Standards. Its work is organised into Technical Committees, one of which CENTC346 is on Preservation of Cultural Heritage. Within this Technical Committee a Working Group on Waterlogged Wood was initiated in 2013. (It held its kick off meeting in Istanbul during the last WOAM Conference.)

The Working Group is now working on two different standards projects: one on guidelines for the management of waterlogged wood on terrestrial sites of archaeological significance and the second on

the characterization of waterlogged wood. For further information, please apply to Jim Spiggs or Kristiane Straetkvern .

CONDITION.2015: CONSERVATION AND DIGITIZATION CONFERENCE

The international conference, Condition.2015, took place at the National Maritime Museum in Gdańsk, Poland, between 19th and 22nd May 2015.

The first two days were devoted to research and conservation of wet archaeological objects, mainly wood but also leather, textile and metal. Main subjects: conservation of wrecks from the sea, different methods of wood conservation, problems of iron and sulfur in wood and new materials for conservation. The last two days were devoted to digitization and aspects of photography, photogrammetry and 3D documentation.

The conference program can be read here: <https://condition2015.nmm.pl/program/>.



Participants in the Condition.2015 conference

3. CONFERENCES AND COURSES

13th ICOM-CC Wet Organic Archaeological Materials Conference (WOAM) May 16-21, 2016 in Florence, Italy

ICOM-CC's Wet Organic Archaeological Materials Working Group (WOAM) exists to: disseminate scientific research in the field of wet organic archaeological materials; to promote the application of new materials and technologies for conservation, investigate new tools for analysis and documentation; present relevant case studies in the conservation of wet organic archaeological materials; identify further areas of research and to facilitate networking for future collaborative activities.

For the 2013-2016 Triennial period, WOAM established a particular focus on the following subjects:

- The ethics and practicalities of treating waterlogged materials, especially large structures or large assemblages.
- Documentation and characterization techniques for recording and assessing wet organics.
- *In situ* preservation of wet organic archaeological materials and sites?
- New treatment techniques and continued review of established methods, for example Kauramin, PEG, Sugars, Alum etc. In particular, we welcome studies that address the long-term performance and stability of treatments, especially those that reassess the condition of the materials treated as part of the International Comparative Wood Study and currently stored in Trondheim.
- The treatment of composite materials.
- The treatment of non-wood organics.
- The display and storage of waterlogged (and previously waterlogged) organics.
- The role of sulfur and other contaminants in the deterioration of wood and other organics and ways to mitigate these effects.

Although papers and posters addressing these subjects are most welcome, the list is not inclusive and we encourage all original submissions covering topics relevant to the analysis, treatment, study and care of wet organic archaeological materials for consideration.

Please submit abstracts for papers or posters to: ewilliams@cwf.org. They are due **by September 15, 2015**. Abstracts should be a minimum of 250 words and a maximum of 500 words. They must contain the title, author(s) name and contact details as well as the body of the abstract. They should not contain images or graphs.

Key Dates to remember:

Sept 15, 2015: Submission of abstracts for papers or posters

October 30, 2015 Notification of speakers and authors

March 30, 2016: Submission of all papers and posters for inclusion in conference post-print.

WOAM will be transferring to an entirely peer-reviewed publication for the Florence post-prints. Please note, due to firm publisher cut-off dates, papers not received by March 30, 2016 cannot be included in the published Florence Proceedings.

Call for Papers:

Wet Wood Conservation Colloquium

May 12th to 14th, 2016

accompanying the major exhibition on the
UNESCO World Heritage '4.000 years lake dwellings'
in the Baroque monastery of
Bad Schussenried (Upper Swabia, Germany)

International conference covering research, projects, and reviews of the state of the art in conservation of wood and other wet organic finds.

The conference is scheduled shortly before the Interim Meeting of the ICOM-CC WOAM Group from May 16th to 21st, 2016, in Florence/Italy to allow visitors from overseas to take part in both events. It is part of the annual series of Stuttgart objects conservation colloquia with varying themes. For the latest conference 2015, see: www.objektrestaurierung.abk-stuttgart.de/glass-deterioration .

Conference language: English

Renowned invited speakers will review the state of research in their fields.

We do not expect exclusivity: you're free to offer work which will or has already been reported elsewhere. To submit a contribution, e-mail a short abstract (300-400 words) to gerhard.eggert@abk-stuttgart.de As a number of participants will also take part at the WOAM meeting please do not submit anything which you plan to present there.

Deadline: Sept. 30th, 2015

Notification of acceptance: Oct. 31st, 2015

Submission of extended abstracts due: Jan. 31st, 2016

We do not publish full papers, but print an extended abstracts booklet with ISBN number (max. 2.000 words per contribution, b/w illustrations possible, every figure counts as 100 words). We will also put this online on the conference webpage for free download.

Conference organizers:

State Academy of Art and Design Stuttgart, Objects Conservation
Landesamt für Denkmalpflege Baden-Württemberg

in collaboration with:

ICOM-CC Wet Organic Archaeological Materials Working Group
UNESCO World Heritage Prehistoric Lake Dwellings

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Authors: _____

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