S. 3. 3. MATERIAL UNDERSTANDINGS OF THE SEA

Chair: Sam Robinson
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Half hull shipmodels of the Rijksmuseum (Amsterdam, The Netherlands): studying their production, provenance and function through interdisciplinary research

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Abstract
The maritime collection of the Rijksmuseum contains around 300 half hull shipmodels, transferred from the Department of the Navy to the Rijksmuseum from 1883 on. Despite the great number of half models in existence, little is known about their production in the Netherlands. As a result, most of the half models in the Rijksmuseum collection cannot be attributed to a specific dockyard, are not associated with actual ships, and have therefore been assigned broad production date ranges. This paper describes how systematic technical research can contribute to the knowledge about half models and their possible role in the Dutch maritime shipbuilding industry.

A half model is a scale model from the starboard or portside half of a ship hull, mounted on a wooden backboard. In the 18th and 19th centuries half models were produced on ship wharfs all over the Netherlands. They are constructed in wood, polychromed and finished with a transparent varnish. Sometimes a label is attached to the backboard, with information on the scale, name and provenance of the model.

The production of half models in the Netherlands flourished in the late 18th century, half a century after the introduction of ship-design drawings. However, it is not clear whether the models were built after the drawings, or if the drawings were made based on the models.

The aim of this research was to gain insights into the function, provenance and dating of the half models. Visual inspection and tool traces recording were used to study the construction process, and dendrochronological research was used to date the models and establish their potential production shipyard. By clustering the models according to stylistic features, materials and tool traces, as well as dendrochronological data, we have been able to attribute groups of them to specific shipyards and to connect some of them to actual ships. This paper shares the preliminary results of this fascinating research.

Halfmodel of a 68-gun ship of the line, NG-MC-272-2, h. 34,3 cm × b. 125,1 cm × d. 14,5 cm, collection Rijksmuseum, photo Rijksmuseum

Keywords

Half models; Shipbuilding; Maritime History; Dendrochronology; Museum Collections

Biographies

Tirza Mol

After completing a Master degree in psychology at the University of Amsterdam in 1994, Tirza Mol started a more practical study in cabinet making and boatbuilding. She graduated at the Wood and Furniture College [Hout en Meubilerings College] in Amsterdam with a self constructed Venetian gondola. After several years of work as a gondolier, cabinet maker and art handler, Tirza decided to join both practical and academical skills in Conservation Studies at the University of Antwerp. During her studies she did interships with the Kröller-Müller Museum and the Rijksmuseum Amsterdam. In July 2017 she obtained her master's degree magna cum laude. Since 2018 she is assistant furniture and shipmodel conservator at Rijksmuseum.

Jeroen ter Brugge

Jeroen ter Brugge is curator of the maritime collections at the Rijksmuseum Amsterdam. He studied (prehistoric) archaeology at Leiden University, with elective courses in medieval archaeology, dendrochronology and toponomy at the University of Amsterdam and wood identification at the Rijksherbarium in Leiden. He worked as city archaeologist of Vlaardingen, archaeologist for the province of Utrecht at the State Service for Archaeological Research, director of the Fisheries Museum in Vlaardingen, head of collections and curator of the academic program at the Maritime Museum Rotterdam. He currently works on a PhD research on the Dutch shipbuilding industry between 1870-1914.

Marta Domínguez-Delmás

Dr. Marta Domínguez-Delmás is a dendrochronologist with a multidisciplinary background in Forestry (BSc, MSc) and Cultural Heritage (MA, PhD), and a long track record researching

(pre)historical wood from archaeological sites, historic buildings, shipwrecks, and art objects. Her research interests focus on how humans have used, worked, managed, and traded timber resources since ancient times. The improvement of methods for provenancing historical wood and the combination of imaging techniques and AI to retrieve data from wooden art objects are also at the core of her interests. She has made important contributions to the field of dendroarchaeology in Europe and has recently expanded her portfolio working with Egyptian coffins. Currently she works as Research Associate at the University of Amsterdam with her NWO-funded project 'Wood for Goods' (https://www.nwo.nl/projecten/016veni195502-0).

Paul van Duin

Paul van Duin has been head of Furniture conservation at the Rijksmuseum since 1989. He studied psychology in Utrecht before developing an interest in furniture conservation. From 1984-1989, he was a furniture conservator at the Royal Collection in London. His main interests are 17th-century marquetry, construction of furniture, historical interiors and Japanese lacquerwork. He was the Rijksmuseum project manager for designing and building the Ateliergebouw. He was one of the coordinators of the Science4Arts research project Climate-4Wood, which seeks to establish a safe and sustainable museum climate for wooden panels. Financed by NWO, the Netherlands Science Foundation, this interdisciplinary project is a collaboration with Eindhoven University of Technology, Delft University of Technology and the Cultural Heritage Agency of the Netherlands.

The Nautical Astrolabe: a new data by maritime archaeology and social approach.

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Abstract
The nautical astrolabe is an emblematic artefact of ocean navigation in the 16th-18th centuries. Many examples survive around the world, known from archaeological excavations and public and private collections. A first synthesis, published in 2015 by F. Castro, N. Budsberg, J. Jobling and A. Passen, The Astrolabe Project, presents the inventory of 205 astrolabes found throughout the planet, from the United States to Sweden, from Japan to Italy. This synthesis enabled researchers to identify lacunae in our knowledge regarding the use, the fabrication and the commercial distribution networks of this high-seas navigational instrument over 200 years. These lacunae subsist even though historical authors described methods of calculating latitude from the height of celestial bodies, measured by nautical astrolabes, including G. Fournier in 1643 in his Hydrographie (Livre X).
Maritime archaeology, combined with a social approach, can henceforth bring new data on this unique instrument. From a typological perspective, the identification of well-defined groups also shows their chronological sequence. French and Portuguese workshops appear as major fabrication centres for nautical astrolabes. We may consider this vast subject from three points of view: first, we may build a chrono-typology of presently known astrolabes; second, we retrace the fabrication networks to discover how they supplied sailors with these tools; and finally, we see both the utilitarian and ostentatious dimensions of astrolabes in the instrumentum of ship's captains.

Keywords
Astrolabe, Maritime & Social Archaeology, Shipwrecks, Modern seafaring

Biography
Filipe Castro is a researcher at História, Territórios e Comunidades, Center for Functional Ecology, University of Coimbra. From 2001-2021 he was the director of the Ship Reconstructing Laboratory at Texas A&M University and is the author of A Nau de Portugal (2003) and Pepper Wreck, a Portuguese Indiaman at the Mouth of the Tagus River (2005). His main research interest is the history of Iberian shipbuilding.

Gaëlle Dieulefet is an professor in modern and contemporary archaeology in the Department of the History of Art and Archaeology at the Université de Nantes, UMR 6566 CReAAH,

France. She specializes in maritime archaeology and material culture. Her ongoing research is on the navigation routes and consumption practices of French sailors in the North Atlantic.

Brad Loewen is a full professor of historical and maritime archaeology at the Université de Montréal, Canada. His research fields cover many aspects of underwater and land archaeology and material culture. A major ongoing project investigates Basques fishers and Indigenous peoples in the maritime setting of the Gulf of Saint Lawrence.

Belinho 1 Shipwreck: A probable 16th century ship lost at Esposende, Portugal

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Abstract

In the winter of 2014 João Sá, Luís Calheiros, Alexandre Sá, and Emanuel Sá communicated the finding of an important set of ship timbers and artefacts washed ashore after a storm in Belinho beach, in the coast of Esposende. The Cultural Division of the City Hall of Esposende (CME) took care of the artifact collection, and, together with the finders visited the site regularly and collected and recorded the finds.

In the summer of 2015 a multidisciplinary team, funded by the CME and a European Union Marie Curie Grant, recorded - using CAD 3D software - and cataloged the timbers that had washed ashore until that date. Currently in course, this study aims to identify, record and analyze evidence of forest practice and its relation to the shipbuilding industry during the Iberian Age of Discoveries.

Between 2015 and 2017, successive storms resulted in more wreckage being washed ashore, creating new challenges. This situation led to the implementation of a joint project with CME's Cultural Division, the Institute of Archeology and Paleo Sciences from Universidade Nova of Lisboa, and Texas A&M University ShipLAB, in cooperation with the finders.

In 2017, both geophysical surveys carried out off the coast and recognition diving made it possible to identify and geo-referencing until 2018 an anchor, four bronze and several iron cannons, ship timbers, and artefacts in the context of the shipwreck.

It is difficult to date this site – designated Belinho 1 – at such a preliminary stage of the project. Over 700 artifacts were recovered, between fragments and complete of pewter objects, copper alloy artefacts, sheets of lead and stone cannon balls. Part of these artifacts suggests a late sixteenth or early seventeenth century data, while the armament seems to suggest a date nearer the middle of the sixteenth century.

A shipwreck record in this area was recently found in archives, the ship *Nossa Senhora da Rosa*, lost in 1577 "through Esposende", coming from the Canary Islands to Vila do Conde with a load of wine and pitch. The Belinho 1 shipwreck seems to be larger, however, and its cargo may have originated in the North of Europe.

Keywords
Nautical Archaeology; Shipwreck; Archaeological survey; Geophysics; Age of Discoveries

Biography

Alexandre Monteiro
Alexandre Monteiro is a nautical archaeologist who specializes in post-medieval Iberian shipbuilding and teaches Maritime and Contemporary Archaeology at Lisbon NOVA University. He has conducted archaeological surveys and digs in Portugal, Australia, Sharjah and Oman and has done archival and historical research regarding underwater cultural heritage of several countries.

Ana Almeida
Ana Almeida is an archaeologist, coordinator of the Cultural Heritage and Archeology Services at Esposende City Council and of the Interpretive Center of St. Lawrence. She has a degree in History, variant of Archaeology from the University of Coimbra and a Master of Management of Cultural Heritage from the Portuguese Catholic University. Currently she is responsible for several archaeological programs and projects.

Filipe Castro
Filipe Castro is a Professor of Anthropology, holds the Frederick R. Mayer II Fellowship of Nautical Archaeology, and is the Director of the Ship Reconstruction Laboratory at Texas A&M University. He has a degree in civil engineering from Lisbon's Instituto Superior Técnico, a Master of Business Administration from the Catholic University of Lisbon, and a PhD in Anthropology from Texas A&M University. He has conducted field work in several countries and his main interests are the history of wooden shipbuilding technology and European seafaring in the late medieval and early modern periods.

Ivone Magalhães
Ivone Magalhães is an archaeologist and museologist, coordinator of the Museum Network of the Sea of Esposende and of the Municipal Museum of Esposende. She has a degree in History, variant of Archaeology from the University of Oporto and has carried out archaeological surveys on traditional vessels and shipbuilding in Ibero-Atlantic tradition in northern Portugal and Galicia.

Maria João Santos
Maria João Santos is an archaeologist researcher assistant at Instituto de Arqueologia e Paleociências of Nova University of Lisbon, with a scholarship Researcher at European RIA ProjectiMARECulture H2020-SC6-CULT-COOP-2016 iMARECULTURE. She is graduate in Archaeology from the Faculdade de Ciências Sociais e Humanas of Lisbon NOVA University (FCSH-UNL), and currently is a MA student in Archaeology at the FCSH-UNL.

Tânia Manuel Casimiro

Tânia Manuel Casimiro is an archaeologist and material culture specialist, has a degree in History and Archaeology from the FCSH – NOVA University of Lisbon, a Masters in Artefact Studies at the University College of London and a PhD in Archaeology from NOVA University of Lisbon where she works as a researcher. She has a special interest in material culture production, trade, and consumption and what commodities can tell us about past generations.

Miguel Martins

Miguel Martins is a Marie Curie Fellow within the ForSEAdiscovery Project undertaking research to contribute to: an inventory of key-construction features found in previously researched Spanish shipwrecks; analyse excavated Spanish ship timber assemblages: select a limited number of demonstration Spanish shipwreck sites for a potential survey and dendrochronology analysis; survey and sample selected sites, carry out ring-width analysis and supply subsamples to others; synthesise results and assess best practice; and, collation of archaeological information on timber usage in Spanish ships. Miguel has been working in Maritime Archaeology for some years especially within the Portuguese Heritage Agency, Nova University (FCSH-IAP) and the University Autonoma of Lisbon. In these institutions, he is linked with projects that involve developing knowledge of shipbuilding methods, recovering artefacts from underwater, recording new findings and producing data for future projects. As a maritime archaeologist, his interests are related to the development of wooden shipbuilding methods in the Iberian Peninsula. As a PhD student at the University of Wales Trinity Saint David, (UK), his research is related to the development of approaches to 3D reconstruction of past forestry practice/timber usage, by analysing timber from 15th to 18th centuries Iberian shipwrecks.