



**HAL**  
open science

# The traditional ship construction in the gulf of Lion and the Ligurian sea: the tartane case study

Hélène Botcazou

► **To cite this version:**

Hélène Botcazou. The traditional ship construction in the gulf of Lion and the Ligurian sea: the tartane case study. *Archaeonautica*, 2021, Open Sea, Closed Sea. Local and Inter-Regional Traditions in Shipbuilding. Proceedings of the Fifteenth International Symposium on Boat and Ship Archaeology Marseilles 2018, 21, pp.347-349. hal-03478755

**HAL Id: hal-03478755**

**<https://hal.science/hal-03478755>**

Submitted on 14 Dec 2021

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

# Archaeonautica

21 | 2021

Open Sea | Closed Sea  
Local and Inter-Regional Traditions  
in Shipbuilding

Proceedings of the Fifteenth International Symposium  
on Boat and Ship Archaeology  
Marseilles 2018

*Edited by Giulia Boetto, Patrice Pomey and Pierre Poveda*

CNRS EDITIONS



# ARCHAEO NAUTICA

21 | 2021

OPEN SEA | CLOSED SEA  
LOCAL AND INTER-REGIONAL TRADITIONS IN SHIPBUILDING

PROCEEDINGS OF THE FIFTEENTH INTERNATIONAL SYMPOSIUM  
ON BOAT AND SHIP ARCHAEOLOGY  
MARSEILLES 2018

Edited by Giulia Boetto, Patrice Pomey and Pierre Poveda

MER FERMÉE | MER OUVERTE  
TRADITIONS LOCALES ET INTERRÉGIONALES DANS LA CONSTRUCTION  
NAVALE

ACTES DU QUINZIÈME COLLOQUE INTERNATIONAL  
D'ARCHÉOLOGIE NAVALE  
MARSEILLE 2018

Volume édité par Giulia Boetto, Patrice Pomey and Pierre Poveda

**CNRS ÉDITIONS**

15, rue Malebranche - 75005 Paris

***Pour toute information relative à la diffusion de nos ouvrages,  
merci de bien vouloir contacter  
notre service lecteurs:***

CNRS ÉDITIONS  
15, rue Malebranche, F-75005 PARIS  
Tél. : 01.53.10.27.00 - Fax: 01.53.10.27.27  
Courriel: [cnrseditions@cnrseditions.fr](mailto:cnrseditions@cnrseditions.fr)  
Site Internet : [www.cnrseditions.fr](http://www.cnrseditions.fr)

## CONTENTS

List of contributors.....	13
Preface .....	19
Keynote address: The Centre Camille Jullian: fifty years of maritime and nautical archaeology by Patrice Pomey.....	21

### OPEN SEA/CLOSED SEA - LOCAL AND INTER-REGIONAL TRADITIONS IN SHIPBUILDING

Innovation, institutions and migration: transfer of technology in Dutch shipbuilding, 500-1700 .....	33
<i>André F.L. van Holk</i>	
Finding <i>Scepter</i> : assessing European influences in early Swedish shipbuilding and evaluating new excavation techniques .....	47
<i>Jim Hansson</i>	
The shipwreck of the <i>Jeanne-Elisabeth</i> , a Swedish merchant ship lost off the French Mediterranean coast in 1755. Hull assembly: three different architectural traditions.....	47
<i>Marine Jaouen and Andrea Poletto</i>	
Baltic and east European shipbuilding influences in the Swedish Empire: tracing local and inter-regional shipbuilding traditions from the armed vessel <i>Bodekull</i> , built 1659-1661 and sunk 1678 .....	53
<i>Niklas Eriksson</i>	
National shipbuilding, international technology: technological exchange in 18 <sup>th</sup> century European shipyards .....	59
<i>Ida Christine Jorgensen</i>	
From Jonah to Jack Tar: the integration of whaleboats into the British Royal Navy .....	65
<i>Morgan Breene</i>	

Wooden shipbuilding in Cyprus from the late 19 <sup>th</sup> to the mid-20 <sup>th</sup> century.....	71
<i>Constantinos Nicolaou</i>	

### SHIP CONSTRUCTION

Hull characteristics of the Yenikapı 16 galley.....	79
<i>Ufuk Kocabaş and Işıl Özsait-Kocabaş</i>	

The hopper barges of Marseilles.....	83
<i>Xavier Corré</i>	

The Cossack boat of 1737 as an example of shipbuilding in the first half of the 18 <sup>th</sup> century .....	89
<i>Dimitri Kobaliia and Ksenia Yermolaieva</i>	

The Korshamn wreck: preliminary investigations of a Nordic clinker-carvel ‘hybrid’ from the late 12 <sup>th</sup> century, and some thoughts on medieval cargo handling.....	95
<i>Staffan von Arbin</i>	

Boa Vista 1: context and construction details of an early modern ship discovered in Lisbon, Portugal.....	101
<i>José Bettencourt, Gonçalo C. Lopes, Cristóvão Fonseca, Tiago Silva, Patrícia Carvalho and Inês Pinto Coelho</i>	

### INLAND SHIP CONSTRUCTION

Different kinds of repairs and maintenance on a 2 <sup>nd</sup> century AD wreck: the Lyon Saint-Georges 4 barge.....	107
<i>Marc Guyon and Laure Meunier</i>	

A Roman barge from the Kupa River at Kamensko, Croatia: evidence of a regional shipbuilding tradition of the Danube River Basin in southeastern Europe.....	115
<i>Giulia Boetto, Anton Divić and Krunoslav Zubčić</i>	

Ships and boats of late prehistoric and Roman Nauportus. New evidence and some remarks on the transfer and innovation in the shipbuilding technologies on the northern fringes of the Mediterranean, 2 <sup>nd</sup> century BC – 1st century AD .....	123
<i>Andrej Gaspari</i>	

Structurally predominant bottoms in frame-first construction: the case of the <i>barque du Léman</i> .....	131
<i>Paul Bloesch</i>	

The assembly of hulls in Southeast Asian shipbuilding traditions: from lashings to treenails .....	137
<i>Pierre-Yves Manguin</i>	

The Penglai 3 shipwreck in context: Korean shipbuilding in late 14 <sup>th</sup> and early 15 <sup>th</sup> centuries .....	141
<i>Damien Peladan</i>	

## RECENT DISCOVERIES

A Roman ship scuttled near Salona in the Gulf of Kaštela, Croatia .....	147
<i>David Ruff, Irena Radić Rossi, Cemal Pulak and Nili Liphshitz</i>	

Initial construction evidence of the Bou Ferrer shipwreck, a large vessel of the Early Roman Empire .....	153
<i>Carlos de Juan and Franca Cibecchini</i>	

The Grande Passe 1 shipwreck, 2 <sup>nd</sup> century BC, Hyères, France: new data on its cargo, nautical equipment and wooden remains .....	161
<i>Alex Sabastia</i>	

The Ma'agan Mikhael B shipwreck: a summary of four excavation seasons .....	167
<i>Maayan Cohen, Michelle Creisher and Deborah Cvikel</i>	

A Byzantine period merchant ship from the Black Sea .....	175
<i>Kroum Batchvarov</i>	

The Paragan 1 shipwreck, Corsica: a 17 <sup>th</sup> -18 <sup>th</sup> century coaster.....	181
<i>Eric Rieth and Franca Cibecchini</i>	

The medieval shipwreck from Kalverev Syd, Denmark .....	187
<i>Mikkel H. Thomsen</i>	

The 'Big Ship' of Wismar: a well-preserved 12 <sup>th</sup> -century cargo vessel from the harbour of Wismar .....	193
<i>Massimiliano Ditta and Jens Auer</i>	

A recently discovered wreck with double planking in the Bay of Puck. Measurements, recording and positioning of the site with the use of a 3D photogrammetry model and a multibeam echosounder .....	199
<i>Tomasz Bednarz</i>	

A late 17 <sup>th</sup> -century ‘Double Dutch’ construction in the North Frisian Wadden Sea: the case of the Hörnum Odde wreck on the island of Sylt, Germany .....	205
<i>Daniel Zwick</i>	
The Fährdorf wreck: another large 12 <sup>th</sup> -century cargo ship in the Schlei, northern Germany.....	213
<i>Jonas Enzmann, Fritz Jürgens and Feiko Wilkes</i>	
Two ships under rocks: a glimpse into rural shipbuilding in western Pomerania.....	219
<i>Jens Auer</i>	

### NAUTICAL ETHNOGRAPHY

Sewn-plank construction techniques in the western Indian Ocean: evidence from the timbers of Al Baleed, Oman .....	225
<i>Alessandro Ghidoni</i>	
Bark canoes: sewing, lashing and folding .....	233
<i>Béat Arnold</i>	
Indigenous navigation in the Caribbean Basin: a historical, ethnoarchaeological and experimental approach to the Caribbean-Guyanese <i>kanawa</i> .....	239
<i>Benoît Bérard and Alexandra Biar</i>	

### STUDIES ON WOOD

An overview of three decades of dendrochronology applied to ancient Mediterranean shipwrecks in southeastern France .....	245
<i>Frédéric Guibal, Alba Ferreira Domínguez, Giulia Boetto, Lisa Shindo, Sandra Greck and Patrice Pomey</i>	
Preliminary results of the wood analyses of the Roman vessels of Caska, island of Pag, Croatia .....	251
<i>Alba Ferreira Domínguez, Frédéric Guibal, Giulia Boetto and Irena Radić Rossi</i>	
The Bremen-Cog: environmental issues .....	257
<i>Mike Belasus, Aoife Daly and Adolfo Miguel Martins</i>	
Timber supply for <i>Vasa</i> : new discoveries.....	263
<i>Aoife Daly</i>	
Ship timber from the Baltic with a special emphasis on wood from Old Prussia and Poland.....	269
<i>Maik-Jens Springmann</i>	



## EXPERIMENTAL ARCHAEOLOGY

Sailing Ma'agan Mikhael II.....	277
<i>Yochai Palzur and Deborah Cvikel</i>	
Reconstruction of the Byzantine shipwreck Yenikapı 12 .....	283
<i>Işıl Özsait-Kocabaş</i>	
The Oseberg ship: reflections on the choice of methodology when testing experimental archaeological reconstructions .....	289
<i>Vibeke Bischoff</i>	
The Skuldelev 3 reconstruction, <i>Roar Ege</i> : from reconstruction to retirement .....	295
<i>Martin Rodevad Dael and Triona Sørensen</i>	

## RESEARCH METHODS

The 5 <sup>th</sup> -century AD riverine boat of Santa Maria in Padovetere: 3D reconstruction of its shape and context.....	303
<i>Elisa Costa and Carlo Beltrame</i>	
An attempt to create a digital reconstruction of the Puck 2 wreck hull .....	309
<i>Paweł Litwinienko and Janusz Różycki</i>	
The Bremen-Cog: reconstructed one more time.....	315
<i>Pat Tanner and Mike Belasus</i>	
Computational fluid dynamics: floating a digital Barcode 02 .....	325
<i>Sarah Fawsitt and Lin Cecilie Hobberstad</i>	
Mass documentation of archaeological ship timbers: introducing a novel, time-efficient approach .....	331
<i>Thomas Van Damme, Massimiliano Ditta and Jens Auer</i>	

## POSTERS

Artistic and symbolic elements of the Maltese <i>luzzu</i> .....	337
<i>Efthymia Akrivopoulou and Irene Muñoz</i>	
The 16 <sup>th</sup> -century pump from <i>Gagliana Grossa</i> : preliminary results of recording and analysis.....	341
<i>Katarina Batur and Irena Radić Rossi</i>	

What influenced British East Indiamen ship design? .....	345
<i>Kurt Bennett</i>	
Traditional ship construction in the Gulf of Lion and the Ligurian Sea: the <i>tartane</i> case study .....	347
<i>Hélène Botcazou</i>	
Ships of the western Indian Ocean in Persian manuscript paintings.....	351
<i>Michael J. de Ruyter</i>	
The Tallinn cog: smart conservation.....	355
<i>Eero Ehanti, Heikki Häyhä and Priit Lätti</i>	
Early modern reused ship timbers from Boqueirão do Duro, Lisbon, Portugal .....	357
<i>Gonçalo C. Lopes, José Bettencourt, Cristóvão Fonseca, Tiago Silva, Patrícia Carvalho and Inês Pinto Coelho</i>	
Ship shapes: digitising historic ship models.....	361
<i>John K. McCarthy and Wendy van Duivenvoorde</i>	
The size of wooden components in relation to the tonnage of Greek and Roman ships .....	365
<i>Emmanuel Nantet</i>	
The <i>Fougueux</i> (1785-1805): prototype of an 18 <sup>th</sup> –19 <sup>th</sup> century French construction method .....	369
<i>Nuria E. Rodríguez Mariscal, Nicolás C. Ciarlo, Milagros Alzaga García, Eric Rieth and Manuel Izaguirre Lacoste</i>	
Viking boats in medieval Russia from written and archaeological evidence .....	373
<i>Petr Sorokin</i>	
South and north: the linguistic mysteries of the <i>buss</i> .....	379
<i>Katrin Thier</i>	
Building cheaply and simply: flat-bottomed boats with cross-planked bottoms around the world .....	383
<i>Krzysztof Zamościński</i>	

## LIST OF CONTRIBUTORS

Akrivopoulou, Efthymia  
Independent researcher  
Greece  
efthymia.akr@gmail.com

Alzaga García, Milagros  
Andalusian Historical Heritage Institute (IAPH)  
Underwater Archeology Center  
Cadiz, Spain

Arbin von, Staffan  
Department of Historical Studies University of Gothenburg  
PO Box 200 SE-405 30 Gothenburg, Sweden  
staffan.arbin@gu.se

Arnold, Béat  
Archaeologist for the canton of Neuchâtel (retired)  
The Laténium, Park and Museum of Archaeology Neuchâtel,  
Switzerland  
beat.arnold47@gmail.com

Auer, Jens  
Landesamt für Kultur und Denkmalpflege  
Mecklenburg-Vorpommern Landesarchäologie  
Domhof 4/5  
19055 Schwerin, Germany  
j.auer@lakd-mv.de  
jensauer@gmail.com

Batchvarov, Kroum  
Associate Professor of Maritime Archaeology  
Department of Anthropology  
Maritime Studies Program  
University of Connecticut, Avery Point  
ACD116C, 1084 Shennecossett Road  
Groton CT 06340, USA  
kroum.batchvarov@uconn.edu

Batur, Katarina  
University of Zadar, Department of Archaeology  
Obala kralja Petra Krešimira IV. 2  
23000 Zadar, Croatia  
kbatur@unizd.hr

Bednarz, Tomasz  
National Maritime Museum Gdańsk, Poland  
t.bednarz@nmm.pl

Belasus, Mike  
Saxo-Institute  
University of Copenhagen  
Copenhagen, Denmark  
belasus@hum.ku.dk

Beltrame, Carlo  
Dipartimento di Studi Umanistici  
Università Ca' Foscari Venezia  
Venice, Italy  
beltrame@unive.it

Bennett, Kurt  
Archaeology, College of Humanities, Arts and Social Sciences  
Flinders University  
Adelaide, Australia  
kurt.bennett@flinders.edu.au

Bérard, Benoît  
Professor Pre-Columbian Archaeology  
Director research unit AIHP-GEODE Caraïbe (EA 929)  
Université des Antilles  
Campus de Schoelcher BP 7209  
97275 Schoelcher cedex, Martinique F.W.I.  
benoit.berard@univ-antilles.fr

Bettencourt, José  
Department of History of NOVA FCSH  
CHAM-Centro de Humanidades / CHAM-Centre  
for the Humanities  
NOVA FCSH – Uac  
Av. de Berna, 26 C  
1069-061 Lisboa, Portugal  
jbettencourt.cham@gmail.com

Biar, Alexandra  
Laboratoire Archéologie des Amériques (UMR 8096)  
44 rue de la Clef  
75005 Paris, France  
alexbiar@hotmail.com

Bischoff, Vibeke  
Viking Ship Museum in Roskilde  
Roskilde, Denmark  
vb@vikingeskibsmuseet.dk

Bloesch, Paul  
Schalerstrasse, 1, 4054 Basel, Switzerland  
bloesch.bs@bluewin.ch

Boetto, Giulia  
CNRS, Aix Marseille University, Centre Camille Jullian  
MMSH, 5 rue du Château de l'Horloge CS 90412  
13097 Aix-en-Provence France cedex 2  
boetto@mmsh.univ-aix.fr

Botcazou, Hélène  
Ipso Facto, Marseille, France  
Aix Marseille University, CNRS, LA3M, Aix-en-Provence  
helene.botcazou@ipsufacto.coop

Breene, Morgan  
Oriol College  
OX1 4EW Oxford, UK  
morgan.breene@history.ox.ac.uk  
morgan\_breene@my.uri.edu

Carvalho, Patrícia  
CHAM-Centro de Humanidades / CHAM-Centre  
for the Humanities  
NOVA FCsH – Uac  
Av. de Berna, 26 C, 1069-061 Lisboa, Portugal  
patriciasanchescarvalho@gmail.com

Ciarlo, Nicolás C.  
National Scientific and Technical Research Council (CONICET)  
Institute of Archaeology, School of Philosophy & Letters  
University of Buenos Aires  
Argentina  
nciarlo1701@gmail.com

Cibecchini, Franca  
Département des Recherches Archéologiques Subaquatiques et  
Sous-Marines (DRASSM), Aix Marseille University, CNRS,  
Ministère de la Culture, Centre Camille Jullian  
Marseille, France  
franca.cibecchini@culture.gouv.fr

Cohen, Maayan  
Department of Maritime Civilizations and Leon Recanati  
Institute for Maritime Studies  
University of Haifa  
Abba Khoushy Avenue 199 3498838 Haifa, Israel  
maayancohen8@gmail.com

Corré, Xavier  
Musée d'Histoire de Marseille / Musée des Docks Romains  
2 Rue Henri Barbusse  
13001 Marseille, France  
xcorre@marseille.fr

Costa, Elisa  
Dipartimento di Studi Umanistici  
Università Ca' Foscari Venezia  
Venice, Italy  
elisa.costa@unive.it

Creisher, Michelle  
Department of Maritime Civilizations and Leon Recanati  
Institute for Maritime Studies  
University of Haifa  
Abba Khoushy Avenue 199 3498838 Haifa, Israel  
m.creisher@gmail.com

Cvikel, Deborah  
Department of Maritime Civilizations and Leon Recanati  
Institute for Maritime Studies  
University of Haifa  
Abba Khoushy Avenue 199 3498838 Haifa, Israel  
dcvikel@research.haifa.ac.il

Dael, Martin Rodevad  
Viking Ship Museum in Roskilde  
Roskilde, Denmark  
md@vikingskibsmuseet.dk

Daly, Aoife  
Associate Professor, Saxo Institute, University of Copenhagen  
Karen Blixens Plads 8  
2300 Copenhagen S, Denmark  
aoife.daly@hum.ku.dk  
dendro@dendro.dk

De Juan, Carlos  
Dirección General de Patrimonio y Cultura  
Generalitat Valenciana  
Valencia, Spain  
arqueologiadelmar@gmail.com

De Ruyter, Michael J.  
Archaeology, College of Humanities, Arts and Social Sciences  
Flinders University  
Adelaide, Australia  
mick.deruyter@flinders.edu.au

Ditta, Massimiliano  
Stavanger Maritime Museum Musegata 16  
4010 Stavanger, Norway  
massimiliano.ditta@museumstavanger.no  
massimiliano.ditta@outlook.com

Divić, Anton  
Aix Marseille University, CNRS, Centre Camille Jullian  
Aix-en-Provence, France  
University of Zagreb, Croatia  
antondivic@gmail.com

Ehanti, Eero  
For Our Generation OÜ  
Pikaliiva tn 90/2-32  
Tallinn, harju maakond, 13516, Estonia  
eero.ehanti@gmail.com

Enzmann, Jonas  
Lower Saxony Institute for Historical Coastal Research  
Viktoriastr. 26/28  
26382 Wilhelmshaven, Germany  
jonas.enzmann@nihk.de

Eriksson, Niklas  
Associate Professor  
Department of Archaeology and Classical Studies Stockholm  
University  
SE-10691 Stockholm, Sweden  
niklas.eriksson@ark.su.se

Fawsitt, Sarah  
Maritime archaeologist  
Documentation Laboratory  
Norwegian Maritime Museum  
Oslo, Norway  
sarah.fawsitt@marmuseum.no

Ferreira Domínguez, Alba  
Aix Marseille University, CNRS, Centre Camille Jullian  
MMSH, 5 rue du Château de l'Horloge CS 90412  
13097 Aix-en-Provence France cedex 2  
albaferreiradominguez@gmail.com

Fonseca, Cristóvão  
CHAM-Centro de Humanidades / CHAM-Centre  
for the Humanities  
NOVA FCsH – UAc  
Av. de Berna, 26 C, 1069-061 Lisboa, Portugal  
cristovaofonseca@fcsh.unl.pt

Gaspari, Andrej  
University of Ljubljana, Faculty of Arts, Department  
of Archaeology  
Aškerčeva 2  
1000 Ljubljana, Slovenia  
andrej.gaspari@ff.uni-lj.si

Ghidoni, Alessandro  
Department of Arab and Islamic studies  
Exeter University, UK  
alessandroghidoni@hotmail.com

Greck, Sandra  
Association Arkaeos  
59 Boulevard Camille Flammarion  
13001 Marseille, France  
sandragreck@arkaeos.fr

Guibal, Frédéric  
Aix Marseille University, Avignon Université, CNRS, IRD, IMBE  
Europôle Méditerranéen de l'Arbois  
13545 Aix-en-Provence, France  
frederic.guibal@imbe.fr

Guyon, Marc  
Institut National de Recherches Archéologiques Préventives,  
Aix Marseille University, CNRS, INRAP, Centre Camille Jullian  
marc.guyon@inrap.fr

Hansson, Jim  
Swedish National Maritime and Transport Museums  
P.O. Box 27131  
SE-102 52 Stockholm, Sweden  
jim.hansson@maritima.se

Häyhä, Heikki  
For Our Generation OÜ  
Pikaliiva tn 90/2-32  
Tallinn, harju maakond, 13516, Estonia  
heikkih9@gmail.com

Hobberstad, Lin Cecilie  
Maritime archaeologist  
Documentation Laboratory  
Norwegian Maritime Museum  
Oslo, Norway  
lin.hobberstad@marmuseum.no

Holk van, André F.L.  
Batavialand Oostvaardersdijk 01-13  
Postbus 119  
8200 AC Lelystad, Netherlands  
andre.vanholk@batavialand.nl

Izaguirre Lacoste, Manuel †  
Historical-Artistic and Museum Heritage Service  
Provincial Council of Gipuzkoa  
Gipuzkoa, Spain

Jaouen, Marine  
Département des Recherches Archéologiques Subaquatiques et  
Sous-Marines (DRASSM)  
Ministère de la Culture  
Marseille, France  
marine.jaouen@culture.gouv.fr

Jorgensen, Ida Christine  
University of Portsmouth  
Portsmouth, UK  
idachrjorgensen@gmail.com

Jürgens, Fritz  
Institute of Pre- and Protohistoric Archaeology  
Christian-Albrecht University Kiel  
Johanna-Mestorf-Str. 2-6  
24118 Kiel, Germany  
f.juergens@ufg.uni-kiel.de

Kobaliia, Dimitri  
Head of Archaeology Department  
National Reserve « Khortytzia »  
Zaporizhzhia, Ukraine  
kobalia72@gmail.com

Kocabaş, Ufuk  
İstanbul University, Faculty of Letters  
Division of Conservation of Marine Archaeological Objects  
Ordu Caddesi  
34459 Laleli-İstanbul, Turkey  
ufukkocabas@gmail.com

Lätti, Priit  
Estonian Maritime Museum  
Vesilennuki 1, 10415 Tallinn, Estonia  
priit@meremuseum.ee

Lipshitz, Nili †  
Tel Aviv University

Litwinienko, Paweł  
Underwater Archaeology Department  
National Maritime Museum  
Ołowianka 9-13  
80-751 Gdańsk, Poland  
p.litwinienko@nmm.pl

Lopes, Gonçalo C.  
CHAM-Centro de Humanidades / CHAM-Centre  
for the Humanities  
NOVA FCsH – UAc  
Av. de Berna, 26 C, 1069-061  
Lisboa, Portugal  
goncaloncl@gmail.com

McCarthy, John K.  
Archaeology, College of Humanities, Arts and Social Sciences  
Flinders University  
Adelaide, Australia  
john.mccarthy@flinders.edu.au

Manguin, Pierre-Yves  
Ecole française d'Extrême-Orient  
Paris, France  
Pierre-yves.manguin@efeo.net

Martins, Adolfo Miguel  
University of Wales Trinity Saint David  
Lampeter, UK  
adolfo.miguel.martins@gmail.com

Meunier, Laure  
Conservator, independent researcher IFIRES, France  
laure-ifires@ouvaton.org

Muñoz, Irene  
Independent researcher  
Spain  
ire22714@gmail.com

Nantet, Emmanuel  
Department of Maritime Civilizations and Leon Recanati  
Institute for Maritime Studies  
University of Haifa  
Abba Khoushy Avenue 199 3498838 Haifa, Israel  
enantet@univ.haifa.ac.il

Nicolaou, Constantinos  
Department of History and Archaeology  
University of Cyprus  
Nicosia, Cyprus  
lefkolla@gmail.com

Özsait-Kocabaş, Işıl  
İstanbul University, Faculty of Letters  
Division of Conservation of Marine Archaeological Objects  
Ordu Caddesi  
34459 Laleli-İstanbul, Turkey  
isilozsait@gmail.com

Palzur, Yochai  
Department of Maritime Civilizations and Leon Recanati  
Institute for Maritime Studies  
University of Haifa  
Abba Khoushy Avenue 199 3498838 Haifa, Israel  
yochai22@gmail.com

Peladan, Damien  
Université de Paris  
Paris, France  
damien.peladan@gmail.com

Pinto Coelho, Inês  
CHAM-Centro de Humanidades / CHAM-Centre for the  
Humanities  
NOVA FCsH – UAc  
Av. de Berna, 26 C, 1069-061 Lisboa, Portugal  
inespintocoelho@fcsh.unl.pt

Poletto, Andrea  
Independent researcher  
Genova, Italy  
andreapoletto504@gmail.com

Pomey, Patrice †  
CNRS, Aix Marseille University, Centre Camille Jullian  
MMSH, 5 rue du Château de l'Horloge CS 90412  
13097 Aix-en-Provence France cedex 2

Pulak, Cemal  
Texas A&M University  
College Station, TX, USA  
pulak@tamu.edu

Radić Rossi, Irena  
University of Zadar, Department of Archaeology  
Obala kralja Petra Krešimira IV. 2  
23 000 Zadar, Croatia  
irradic@unizd.hr

Rieth, Eric  
National Centre for Scientific Research (CNRS)  
Laboratory of Western Medieval Research of Paris (LAMOP),  
University Paris 1  
National Maritime Museum Paris, France  
eric.rieth.cnrs@gmail.com

Rodríguez Mariscal, Nuria E.  
Andalusian Historical Heritage Institute (IAPH)  
Underwater Archeology Center  
Cadiz, Spain  
nuria.rodriguez.mariscal@juntadeandalucia.es

Rózycki, Janusz  
Underwater Archaeology Department  
National Maritime Museum  
Ołowianka 9-13  
80-751 Gdańsk, Poland  
j.rozycki@nmm.pl

Ruff, David  
Texas A&M University  
College Station, TX, USA  
daveruff@aggienetwork.com

Sabastia, Alex  
Institut National de Recherches Archéologiques Préventives,  
Aix Marseille University, CNRS, INRAP, Centre Camille  
Jullian  
alex.sabastia@inrap.fr

Shindo, Lisa  
CNRS, Aix Marseille University, Centre Camille Jullian  
MMSH, 5 rue du Château de l'Horloge CS 90412  
13097 Aix-en-Provence France cedex 2  
shindo.lisa@gmail.com

Silva, Tiago  
CHAM-Centro de Humanidades / CHAM-Centre  
for the Humanities  
NOVA FCsH – UAc  
Av. de Berna, 26 C, 1069-061  
Lisboa, Portugal  
toiago@gmail.com

Sørensen, Tróna  
Viking Ship Museum in Roskilde  
Roskilde, Denmark  
trs@vikingskibsmuseet.dk

Sorokin, Petr  
Senior Researcher  
The Institute of the History of Material Culture  
Russian Academy of Science  
Dvorzovaja nab. 18  
191186 St. Petersburg, Russia  
petrsorokin@yandex.ru

Springmann, Maik-Jens  
Technical State Museum  
Mecklenburg-Western Pomerania  
Zum Festpl. 3, 23966 Wismar, Germany  
springmann@phantechnikum.de

Tanner, Pat  
Centre for Maritime Archaeology  
University of Southampton  
Southampton, UK  
Pat.Tanner@soton.ac.uk

Thier, Katrin  
Oxford English Dictionary  
Oxford, UK  
kthier@nexus.ox.ac.uk

Thomsen, Mikkel H.  
Viking Ship Museum in Roskilde  
Roskilde, Denmark  
mht@vikingskibsmuseet.dk

Van Damme, Thomas  
Ubi3D, Korte Gasthuisstraat 26  
2000 Antwerp, Belgium  
thomas.van.damme@outlook.com

van Duivenvoorde, Wendy  
Archaeology, College of Humanities, Arts and Social Sciences  
Flinders University  
Adelaide, Australia  
wendy.vanduienvoorde@flinders.edu.au

Wilkes, Feiko  
Institute of Pre- and Protohistoric Archaeology Christian-  
Albrecht University Kiel  
Johanna-Mestorf-Str. 2-6  
24118 Kiel, Germany  
feiko.wilkes@gmail.com

Yermolaieva, Ksenia  
National Reserve «Khortytzia»  
Zaporizhzhia, Ukraine  
evaermola@gmail.com

Zamościński, Krzysztof  
National Maritime Museum  
Gdańsk, Poland  
k.zamoscinski@nmm.pl

Zubčić, Krunoslav  
Croatian Conservation Institute  
Department of Underwater Archaeology  
Zagreb, Croatia  
kzubcic@h-r-z.hr

Zwick, Daniel  
State Archaeology Department of Schleswig-Holstein  
Archäologisches Landesamt Schleswig-Holstein  
Brockdorff-Rantzau-Str. 70  
24837 Schleswig, Germany  
d.zwick@archaeologia-navalis.org

# TRADITIONAL SHIP CONSTRUCTION IN THE GULF OF LION AND THE LIGURIAN SEA: THE *TARTANE* CASE STUDY

Hélène BOTCAZOU

## Abstract

This article deals with a type of coaster from the northwest Mediterranean called *tartane*. This emblematic coaster is generally presented as the most commonly utilised boat for cargo transport from the 16<sup>th</sup> century until the end of sailing ship coastal trade in this area at the very beginning of the 20<sup>th</sup> century. Although it is often described as a wide-bottom one-masted lateen ship, we can count at least four different rigging systems in various iconographic resources portraying *tartanes*, dating from 1679 to the very first decades of the 20<sup>th</sup> century. These diverse rigging systems reveal some developments to and influences on the *tartane*-type vessel, and they add complexity to our vision of a maritime cultural landscape in a coherent sailing space that includes the Gulf of Lion and Liguria.

## Keywords

Corsica, lateen rigging, naval architecture, 17<sup>th</sup>-20<sup>th</sup> century, *tartane*, western Mediterranean,

## Résumé

Cet article traite d'un type de caboteur à voile de la Méditerranée nord-occidentale appelé *tartane*. Ce caboteur emblématique est généralement présenté comme le bateau le plus utilisé pour le transport de marchandises du xvi<sup>e</sup> siècle jusqu'à la fin du commerce côtier par voiliers dans cette zone, au tout début du xx<sup>e</sup> siècle. Bien qu'il soit souvent décrit comme un navire à voile latine à large fond, on peut compter au moins quatre systèmes de gréement différents dans diverses sources iconographiques représentant des *tartanes*, de 1679 aux toutes premières décennies du xx<sup>e</sup> siècle. Ces divers systèmes de gréement mettent en évidence un certain nombre de développements et d'influences sur le navire de type *tartane* et ils ajoutent de la complexité à notre vision d'un paysage culturel maritime inscrit dans un espace de navigation cohérent qui comprend le golfe du Lion et la Ligurie.

## Mots-clés

Corse, gréement latin, architecture navale, xvii<sup>e</sup> - xx<sup>e</sup> siècle, *tartane*, Méditerranée nord-occidentale

This paper presents an overview of the evolution of the *tartane*-type vessel, which was the most emblematic and widespread coaster along the southern coasts of France, from Provence to Languedoc. This case study is part of the author's PhD research focused on the architectural and functional systems of coasters sailing along Corsica's coast between the 16<sup>th</sup> and the 20<sup>th</sup> century<sup>1</sup>. Indeed, this island is strategically situated within a specific maritime transport zone sailed by a large number of coasters coming from different regions of the northwest Mediterranean basin. Thus, alongside the coasters of Corsican origin, this research also takes into consideration the coasters of Catalonia, the south coast of France, Liguria and Sardinia.

At the core of our research is the collection of a complete 'catalogue' composed of ship representations in paintings, stamps, photographs, and archival and bibliographical descriptions, along with other information from current underwater archaeological excavations conducted on the coast of Corsica. The aim is to describe the characteristics of the different coasters and identify adaptations to their environment and to the local societies that built them. We also try to present the differences and similarities in the coasters' building traditions in the different regions covered by our research.

1. This research was supervised by Nicolas Faucherre (LA3M, AMU, CNRS, Aix-en-Provence) and Eric Rieth (LAMOP, CNRS, Paris).

## 1. THE *TARTANE*-TYPE VESSEL

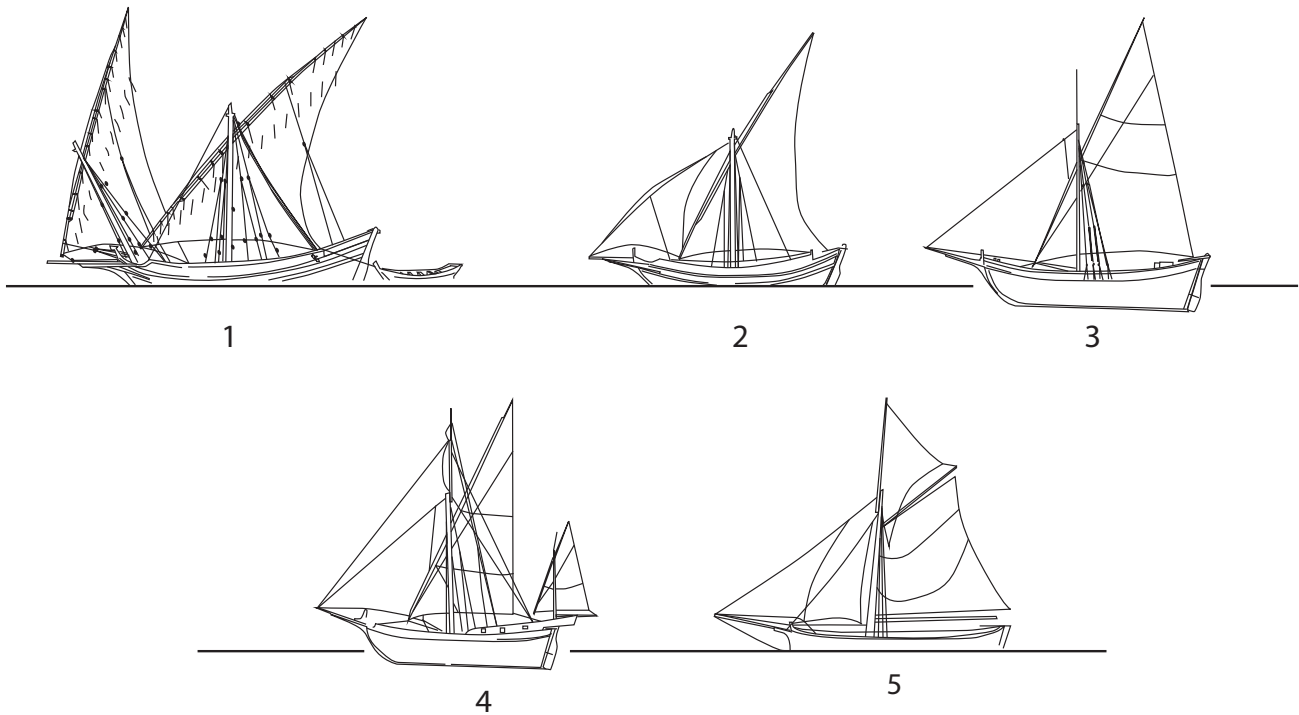
A comparison of the various drawings of *tartane*-type vessels allows us to follow the evolution of this type of ship and possibly the diversity of its regional adaptations (fig. 1).

The *tartane* generally corresponds to a one or two mast ship that has an average tonnage around 70 tonnes, though it can displace from 25 to 100 tonnes for the largest. Its wide bottom is easily recognisable, as well as its lateen rigging. As an example, the *Tartane Provençale from 1789*, drawn by Admiral Pâris (Pâris 1882), the first French maritime ethnographer and curator of the National Maritime Museum between 1871 and 1893, measured 12.90 m long, 3.20 m wide, with a draught of 2.30 m (fig. 1.3).

It seems that the first *tartanes* appeared in the 16<sup>th</sup> century (De Nicolò 2012) in Provence, southern France. The last of them was used in L'Estaque, Marseille, to transport tiles (Damonte 1990).

During the 17<sup>th</sup> and 18<sup>th</sup> century, *tartanes* for hauling cargo had a greater rigging, composed of a main mast (*mestre*), which was a lateen mast situated a little beyond the master frame, and a fore mast (*trinquet*) with a 25° inclination (fig. 1.1). This fore mast gradually disappeared during the 18<sup>th</sup> century. Ships like the *Tartane Provençale* of 1789 drawn by Admiral Pâris tend to adopt some of the features of the one-masted *tartane* used for fishing or transporting ballast as drawn by Jouve in 1679





**Fig. 1:** Evolution of the tartane-type of vessel (drawing H. Botcazou, AMU-LA3M, *Ipsa Facto*): 1. Tartane de négoce under sail (from Jouve 1679a, pl. 19-20); 2. Tartane de pêche under sail (from Jouve 1679b, pl. 16); 3. Tartane provençale, 1789 (from Pâris 1882, pl. 4); 4. Tartane "L'Albanaise" of the 18<sup>th</sup> century (French National Maritime Museum, Paris, model inv. 5.CP.9. – PH. 32579); 5. Tartane marseillaise, beginning of the 20<sup>th</sup> century (based on a photograph by Hubert Poilroux)

(Jouve 1679). Here, a large jib called *polacre* replaces the fore mast (fig. 1.2).

Another type of *tartane* is represented by the *Albanaise*, a model from the 18<sup>th</sup> century held in the French National Maritime Museum in Paris (fig. 1.4). It is a lateen-rigged boat with a main mast and a mizzen (*méjane*) situated at the stern of the boat. The mizzen is balanced at the bow by a *polacre* (Pâris 1882). This type of rig can be related to both the Italian *bovo* and *pareggia* vessels that were in use in the 19<sup>th</sup> century, especially between Corsica and Liguria, and to the Spanish *balancelles* from Catalonia.

During the transition from the 19<sup>th</sup> to 20<sup>th</sup> century, the surviving *tartanes* are of the one-masted type. The yard of the lateen sail (*antenne*) becomes more rigid and is topped up so that the triangle of sail situated in front of the mast is reduced. We often see a triangular topsail rigged to a topmast attached above the lateen one. The front part of the yard will slowly disappear to look like a fore and aft rig, and a large jib is used beyond the main mast (fig. 1.5). This system demands less effort and people for handling. It allows the division of the sails, which are as a result lighter to use. This organisation is cleverly complemented by a curtain sail (*voile à rideau*), which allows easy furling of the main sail without lowering the gaff (Burlet 1988).

The one-masted *tartane* with a lateen rig was related to fishing activities from at least the 17<sup>th</sup> century (fig. 1.2). The term *tartane* is also the name of a specific net. These boats were involved in pair-trawling (*pêche aux boeufs*). The last versions of these vessels were still in use in the first half of the 20<sup>th</sup> century in the harbour of Sète in Languedoc. André Aversa, a local

traditional boat builder, witnessed the changes in technology during his life, and testified that he adapted the original shape of the *bateaux boeufs*, a *tartane*-like fishing boat, to the engine and to the new nets that are now hauled in from the rear of the boat. Little by little the sail disappeared and, with the engine, a transom appeared (Vigne 2003).

## 2. CONCLUSION

This ongoing research has led us to understand that the *tartane*-type vessel, which seemed at first sight to correspond to a very distinctive type of coaster, effectively reflects a varied range of successive adaptations over time. The rigging of the *tartane* has been successively modified to answer the needs of the local populations: it has influenced other types of coasters (e.g. the *bateaux boeufs* of Sète); and it has itself been influenced by external practices. The fore-and-aft coaster from the first decades of the 20<sup>th</sup> century, for example, sheds light on this last case. The successive adaptation of the rigging of the *tartane* corresponds to the global evolution of the lateen rig. The big two-masted *tartane* from the 17<sup>th</sup> century abandons the fore mast in the subsequent century, and then follows two different paths. The first is inherited from the one-masted fishing or ballast ship, and will later be influenced by the Atlantic fore-and-aft rigging. The second corresponds to a widespread rigging from Catalonia to Liguria, composed of two masts (a main and a mizzen) and a jib. This efficient balanced rigging was also used to fit the *bovi* and *paregge*,

both types abandoned at the end of the 19<sup>th</sup> century in Liguria, Corsica and Provence.

Although iconographic and archival research provides information on the rigs and superstructures of ships that have now disappeared, it does not offer much data on architectural building details. However, this research opens new perspectives for the study of the structural and technical systems of the often forgotten small to medium size Mediterranean merchant

vessels, and brings fresh insight to the archaeological data gathered from past and ongoing archaeological research<sup>2</sup>.

---

2. In particular to the current project led by Franca Cibecchini (Drassm) at Paragan (southern Corsica) where a coaster has been under excavation since 2016 (see Rieth, Cibecchini in this volume). This fieldwork is part of a larger research programme led by Eric Rieth (CNRS) on the architectural signatures of traditional Mediterranean shipbuilding.

## REFERENCES

- BURLET R.  
1988 La voile latine, *Neptunia* 171, p. 11-21.
- DAMONTE L.  
1990 Les derniers voiliers ayant fréquenté la rade de Marseille, *Neptunia* 179, p. 25-31.
- DE NICOLÒ M. L.  
2012 Recherches sur l'histoire de la pêche en Méditerranée: Tartanes de Provence, tartanes de Vénétie, trabacs, modèles adriatiques pour la pêche à la traîne et le petit cabotage (XVII<sup>e</sup> au XVIII<sup>e</sup> siècles), *Cahiers de la Méditerranée* 84, p. 309-323.
- JOUBE J.  
1679 *Desseins de tous les bastiments qui naviguent sur la Méditerranée*, Marseille.
- PÂRIS F.-E.  
1882 *Souvenirs de marine conservés ou Collection de plans ou dessins de navires et de bateaux anciens et modernes, existants ou disparus: avec les éléments numériques nécessaires à leur construction*, Paris, Gauthier-Villars.
- VIGNE B.  
2003 Un siècle de construction navale à Sète; les mémoires d'André Aversa, charpentier de marine, *Le Chasse-Marée* 162, p. 46-54.