



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

Hélène Botcazou

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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

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## 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 Özsaıt-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>	

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# 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 north-west 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. THE *TARTANE*-TYPE VESSEL

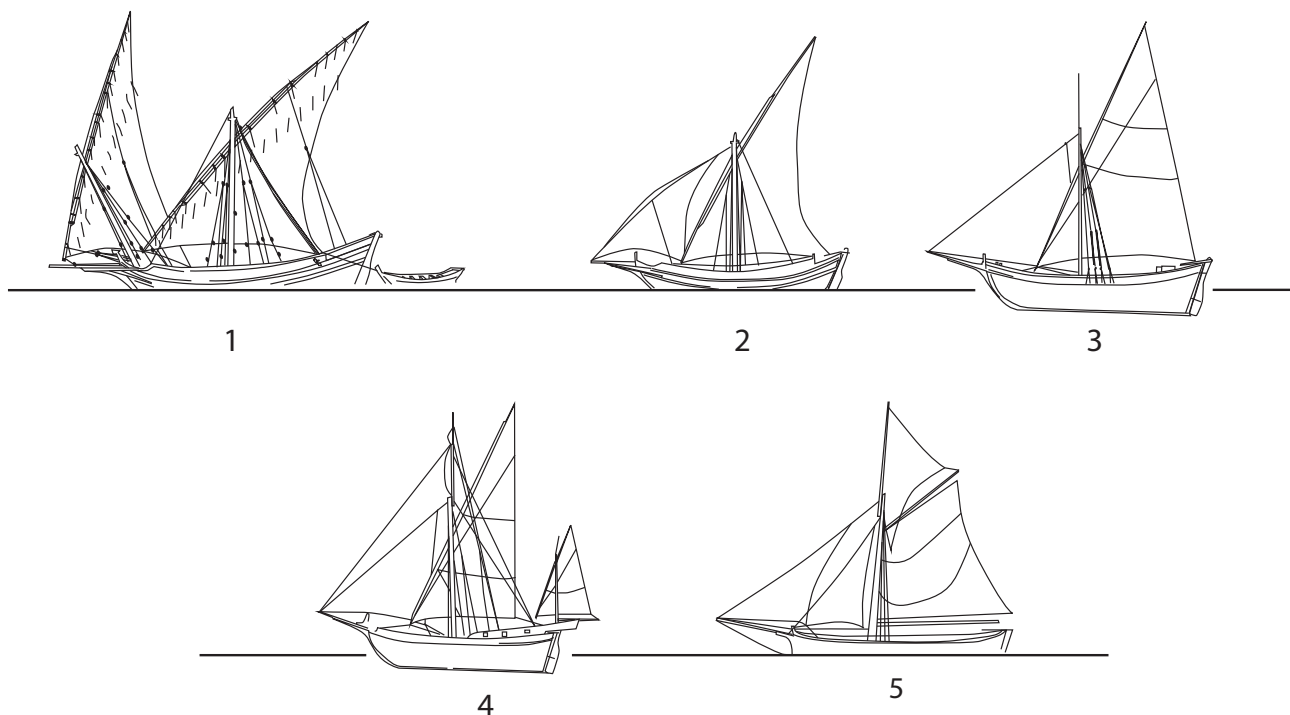
A comparison of the various drawings of *tartane*-type vessels allows us to follow the evolution of this type of ship and possibly the diversity of its regional adaptations (fig. 1).

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

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



**Fig. 1:** Evolution of the tartane-type of vessel (drawing H. Botcazou, AMU-LA3M, *Ipso 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>.

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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.
- JOUE 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.