

Historia marítima y de la navegación en el Caribe e Iberoamérica I

Especialización en Patrimonio Cultural Sumergido

Cohorte 2019

Part 1

Shipbuilding in the Iberian Peninsula

Filipe Castro

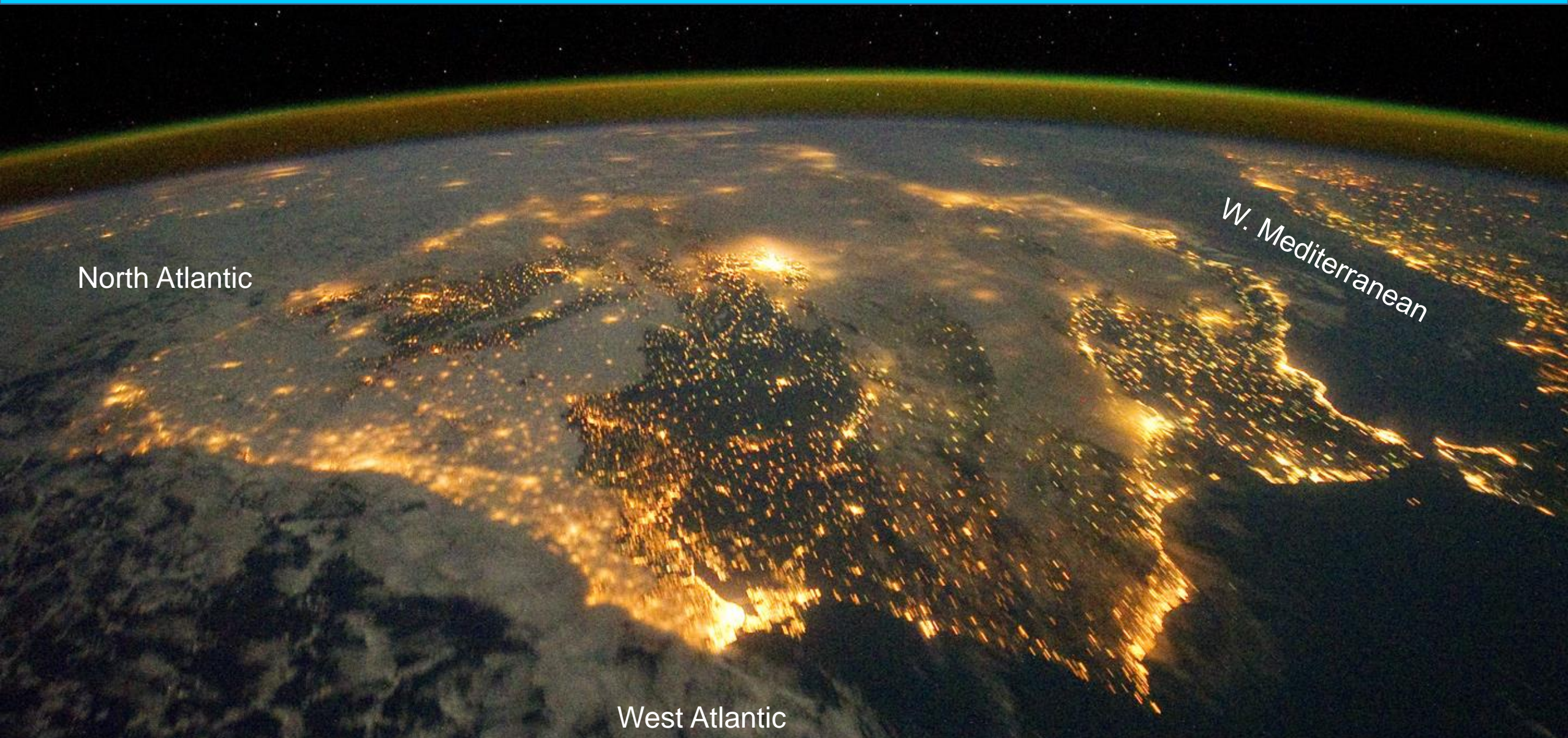
Bogotá, April 2019



Iberian Peninsula



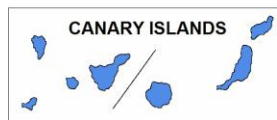
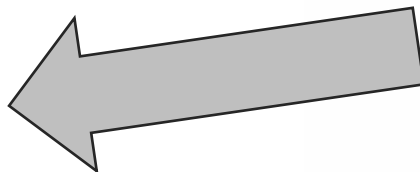
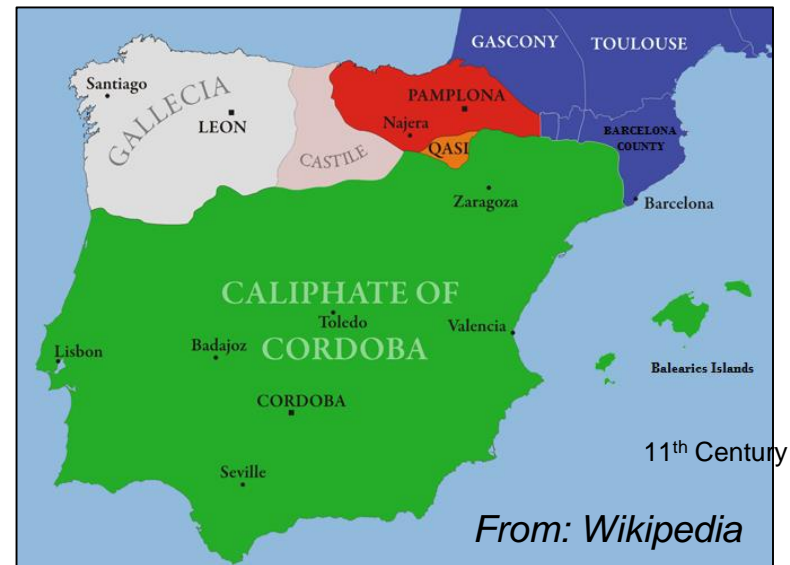
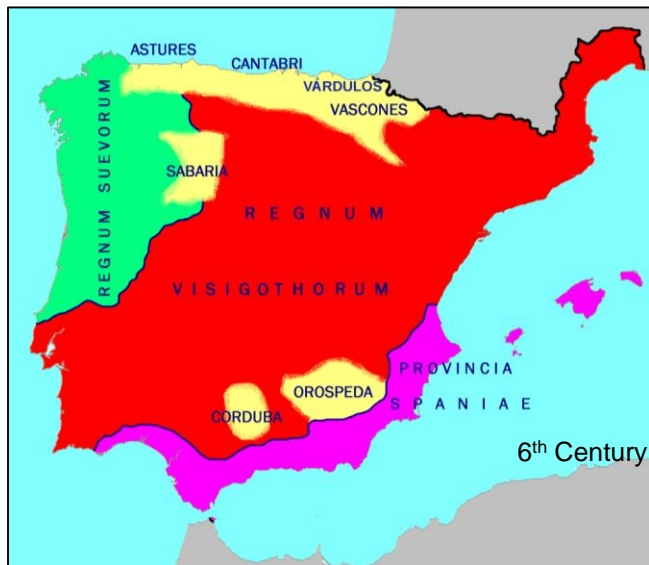
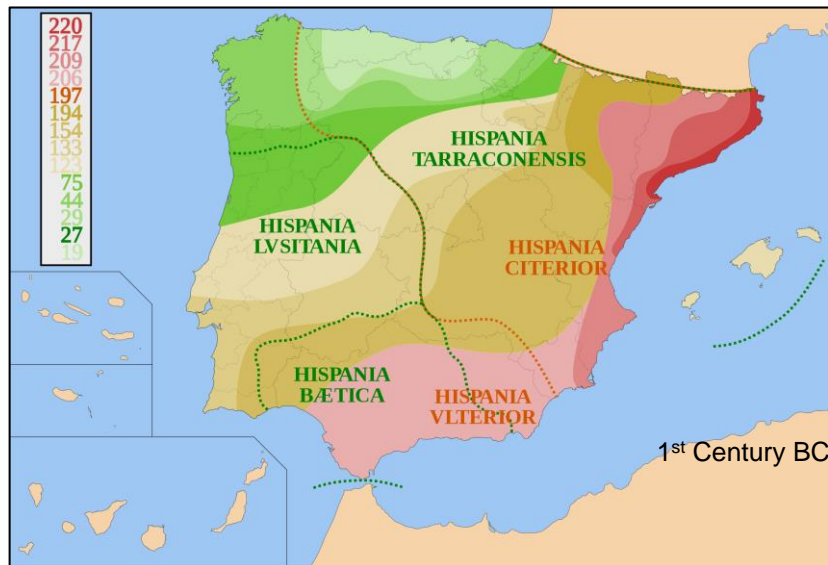
Most of the population lives on the coast



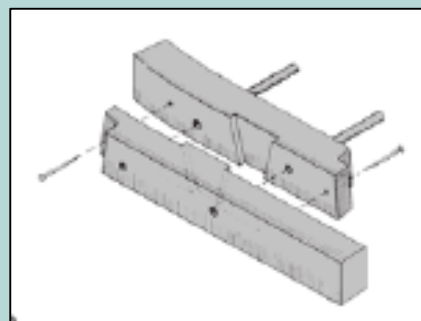
North Atlantic

W. Mediterranean

West Atlantic



Regions



carvel; □ iron nails; dovetail joints

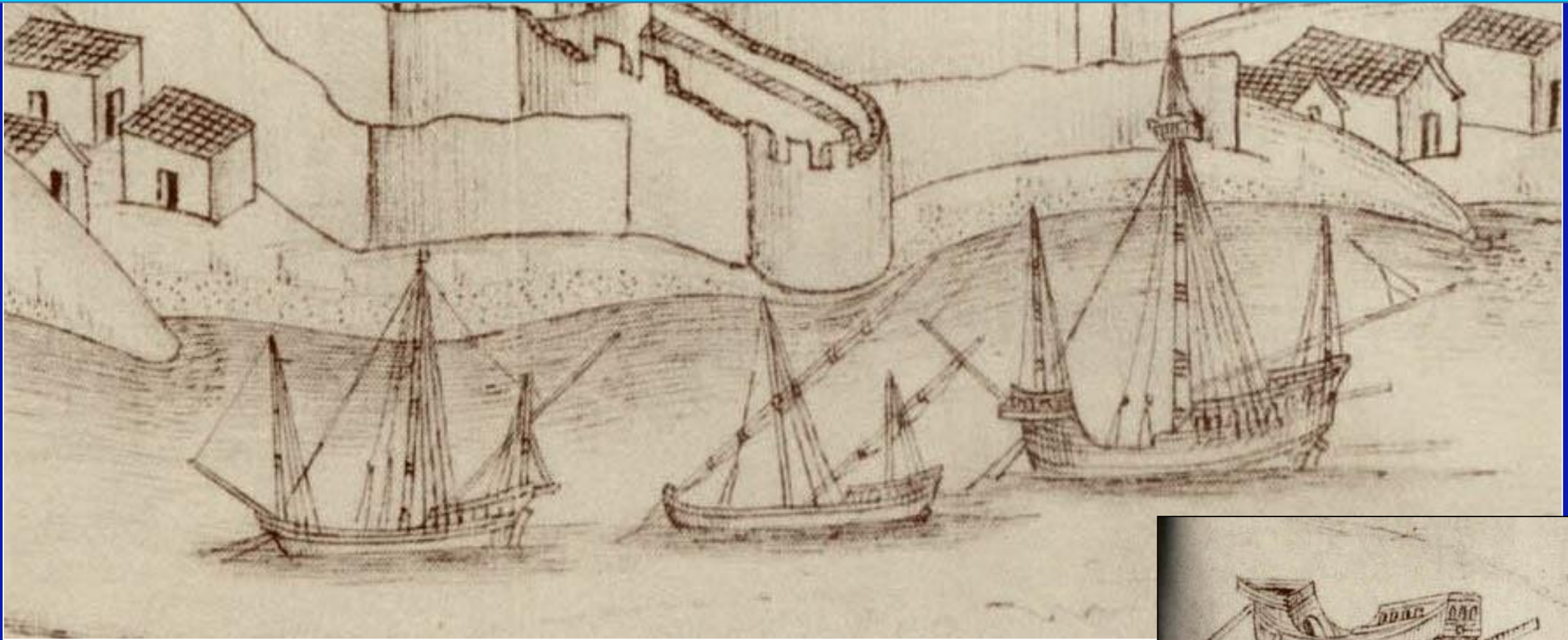
carvel; □ iron nails;
dovetail joints

Lapstrake and carvel; □ iron nails
and treenails

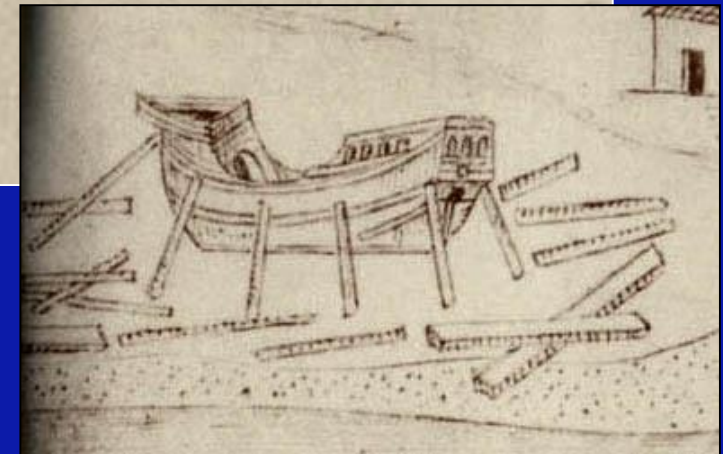
carvel; □ and ø iron nails;
hook scarves

Regional languages

Galician	Basque	Catalan
Western Dialect	Biscayan	Balearic
Central Dialect	Gipuzkoan	Central Catalan
Eastern Dialect	Upper Navarrese	Western Catalan
Astur-Leonese		Northern Valencian
Extremaduran		Central Valencian
Western Dialect		Southern Valencian
Castilian		
Northern Dialect		
Southern Dialect		
Cross Dialect		
Southern Dialect		
Portuguese	Aranese	



We don't know much about the Iberian oceangoing ships of the 15th century...



We don't know much about the ships of the 14th century!





Maestro de la conquista de Mallorca. Retablo de Santa Ursula. Iglesia de San Francisco, siglo XIII. Palma de Mallorca.

We don't know much about the ships of the 13th century!



The issues are:

Lots of structural solutions;
 Lots of upper works' shapes;
 Lots of propulsion solutions...



Tower of Pisa, 1200s?



Sandro Botticelli, 1480s



Fra Angelico, 1448.

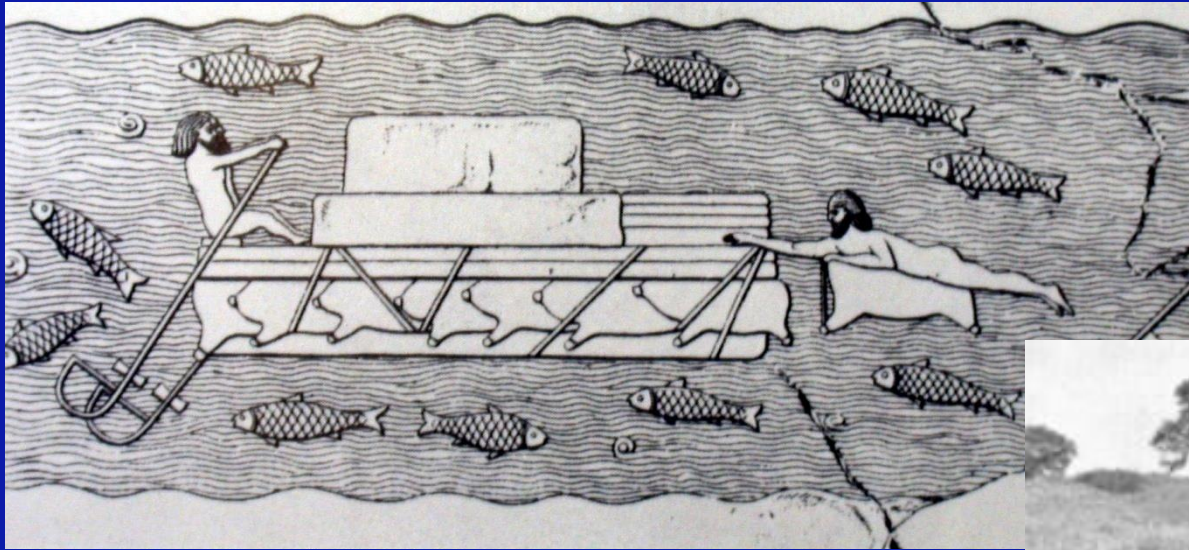


Ambrogio Lorenzetti, 1332.

Domenico Ghirlandaio, 1488.



Iberian Peninsula: In the beginning (first decades of the first century AD) Strabo refers rafts, skin craft, and dugout canoes.

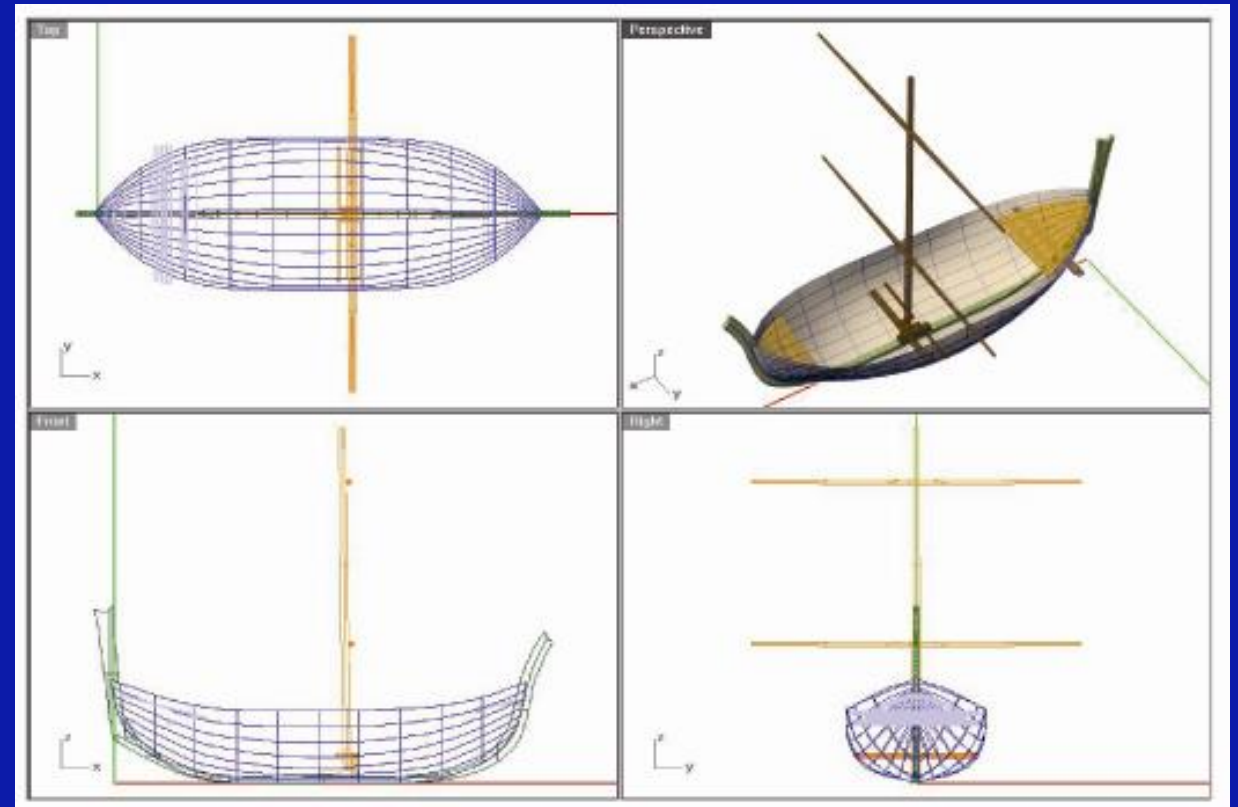
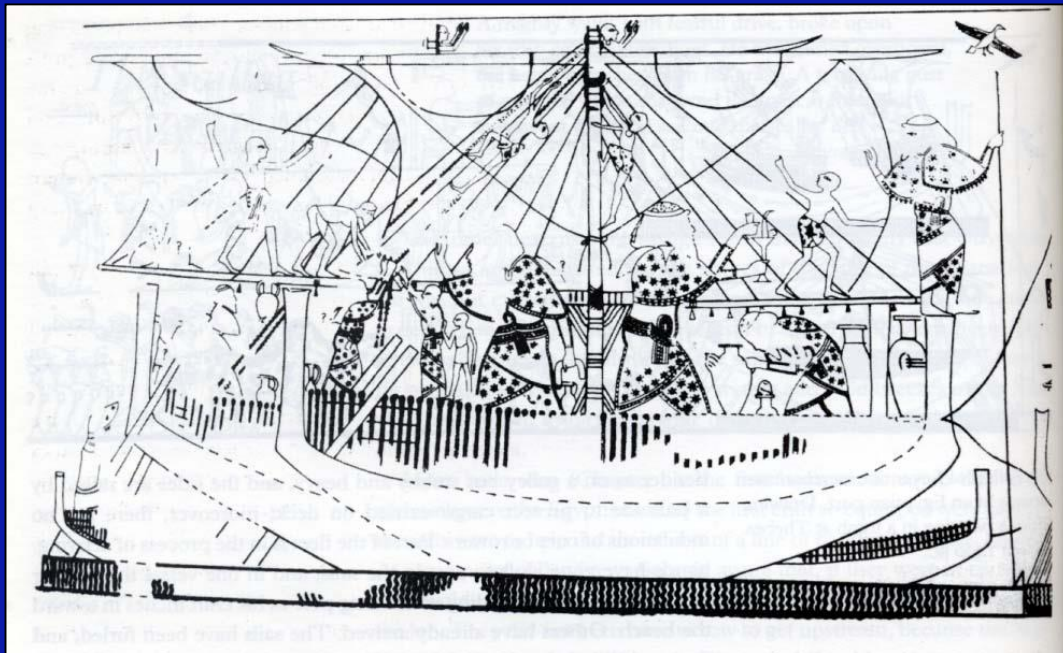


Pre-Roman dugout (3rd Century BC)
found in Rio Lima, Portugal.

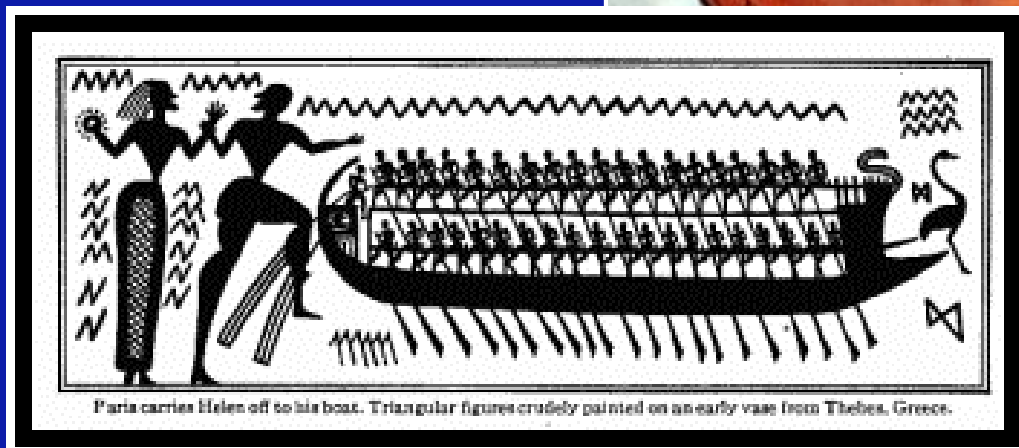
The diversity of the Iberian cultures and populations encompasses the influences of the many visitors and invaders, which have established colonies and factories on this territory:
Phoenicians, Greeks, Carthaginians, Romans, Byzantines, Goths and Arabs.



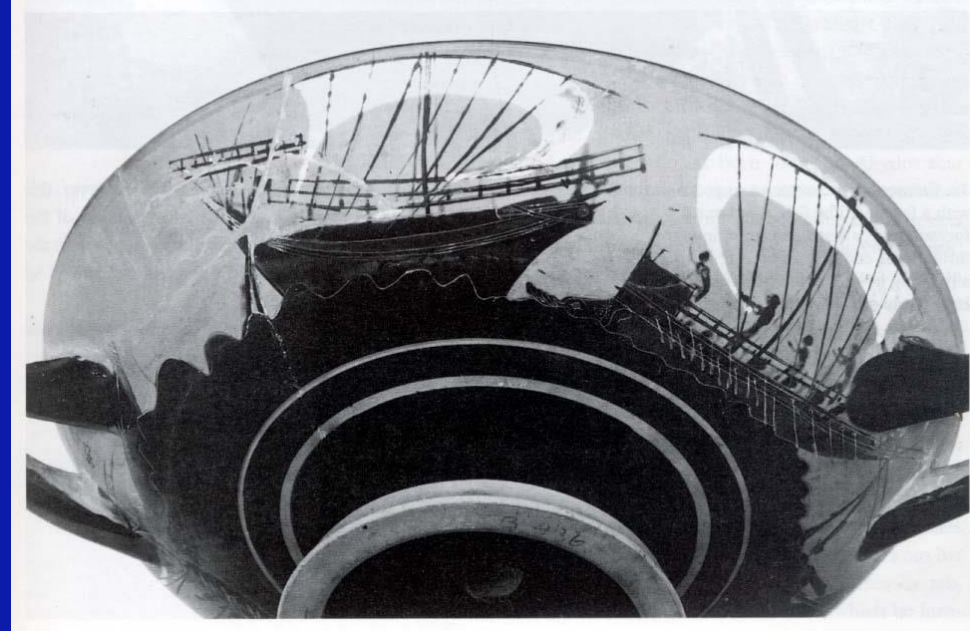
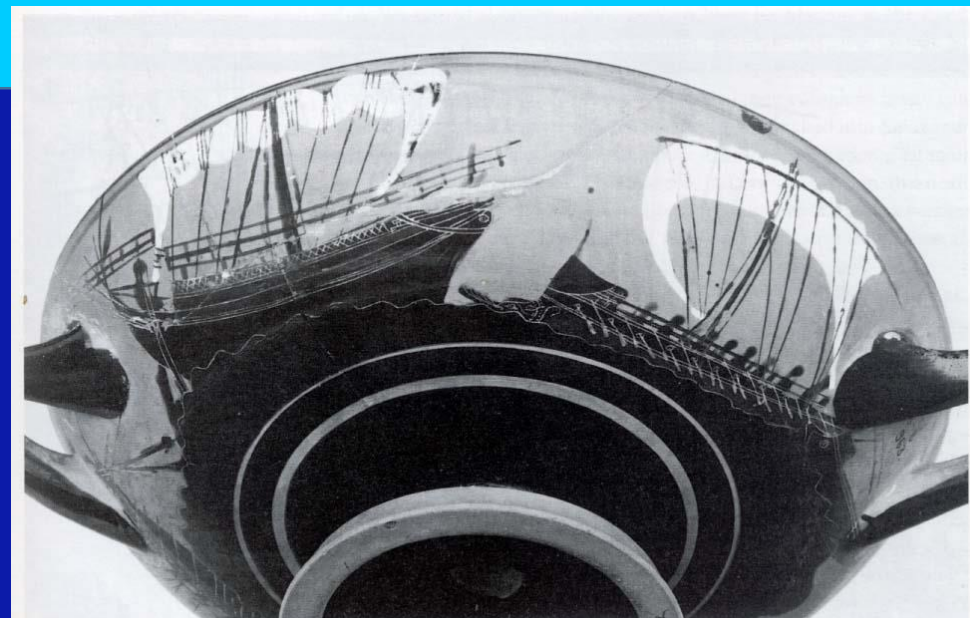
We know that the shores of Southern Spain and Portugal were visited by Phoenician merchants during the first millennium BC, perhaps sailing on their sturdy shell-first built vessels, with large mortise and tenon joints, similar to the ones found on the 1400 BC Uluburun ship.



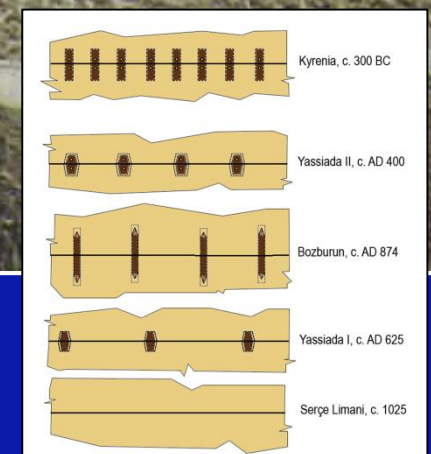
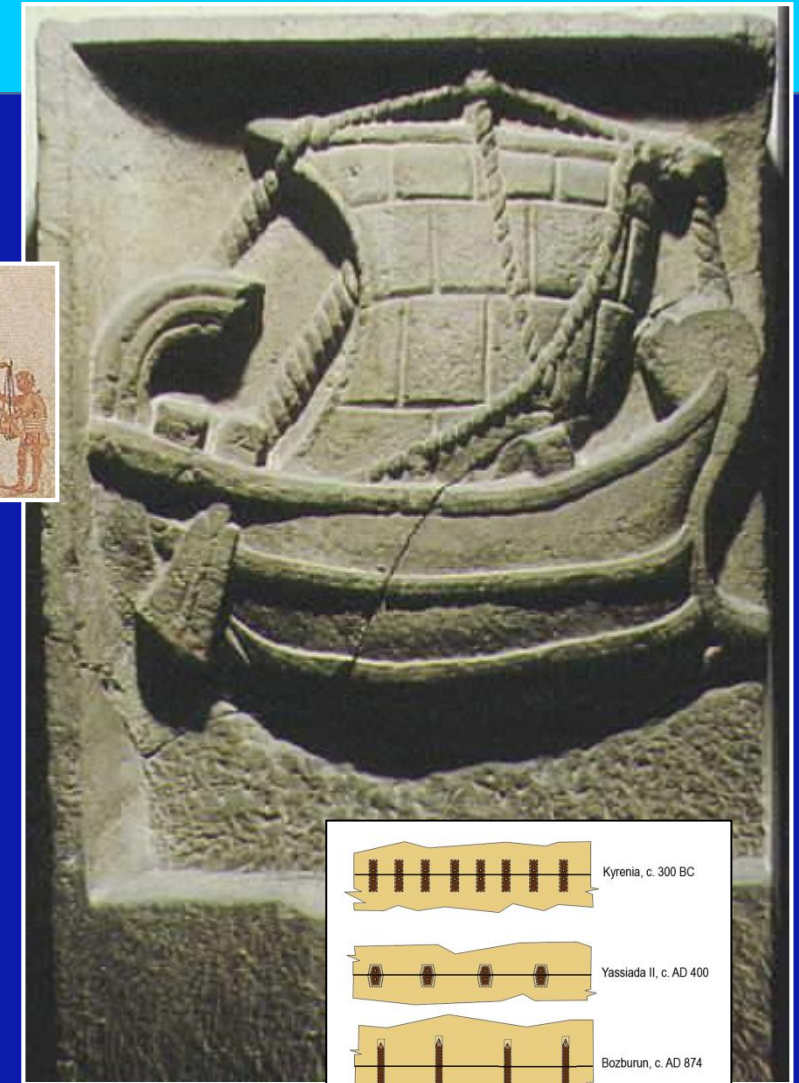
They were followed by Greek sailors, possibly traveling on sewn boats.



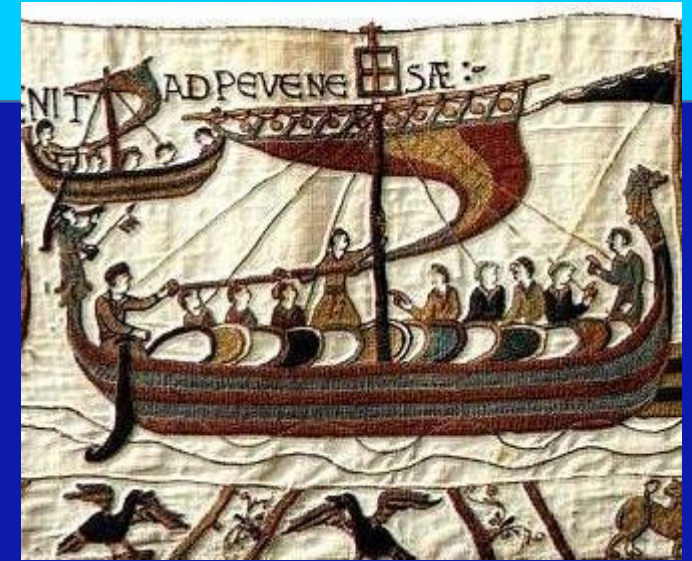
Paris carries Helen off to his boat. Triangular figures crudely painted on an early vase from Thebes, Greece.



And by Carthaginian and Roman ships, with shell based hulls built with mortise and tenon joints.



During the Middle Ages the and northern and western Iberian shores were regularly visited by northern craft.



The coasts of Portugal and Spain harbored several crusader fleets and the *Reconquista* encompassed several naval blockades. Arab warships had helped the Arab conquest, fought Viking invaders and sacked coastal villages with regularity since the Christian leaders started the push against the Muslim rule.



All this cultural diversity translated into a rich shipbuilding tradition.

The watercraft of northern Spain has a strong northern component. José Luis Casado Soto found documents that describe northern galleys as lapstrakes, all the way into Galicia.

By the 16th century, however, the San Juan shipwreck proves that Basque ships and boats were built skeleton first, with carvel planking.

Again, Casado Soto found documents that describe *pinazas* “caulked” and lapstrake in a northern harbor, in the 16th century.



16th century albaola

In Galicia, today's *dornas* are lapstrakes, built under a clear northern influence, and so are the bottom-based *barcos rabelos* from the Douro River, in the north of Portugal, built with flush laid planks on the bottom and lapstrake sides.



Octavio Lixa Filgueiras suggested that some of the craft that could be found on the Douro River region were built with northern influence, perhaps from the Germanic Suevi people, which invaded the Iberian Peninsula between AD 407 and 409, together with other Germanic tribes, the Vandals and Alans.



Viking mast step arrangement



The Portuguese *moliceiros* (Aveiro) have bows that suggest a Mediterranean influence and rudders that have parallels in Denmark.



Xarolo: transversal bar connected to the rudder and controlled by a cable.
Below: 14th century Danish fishing boat.



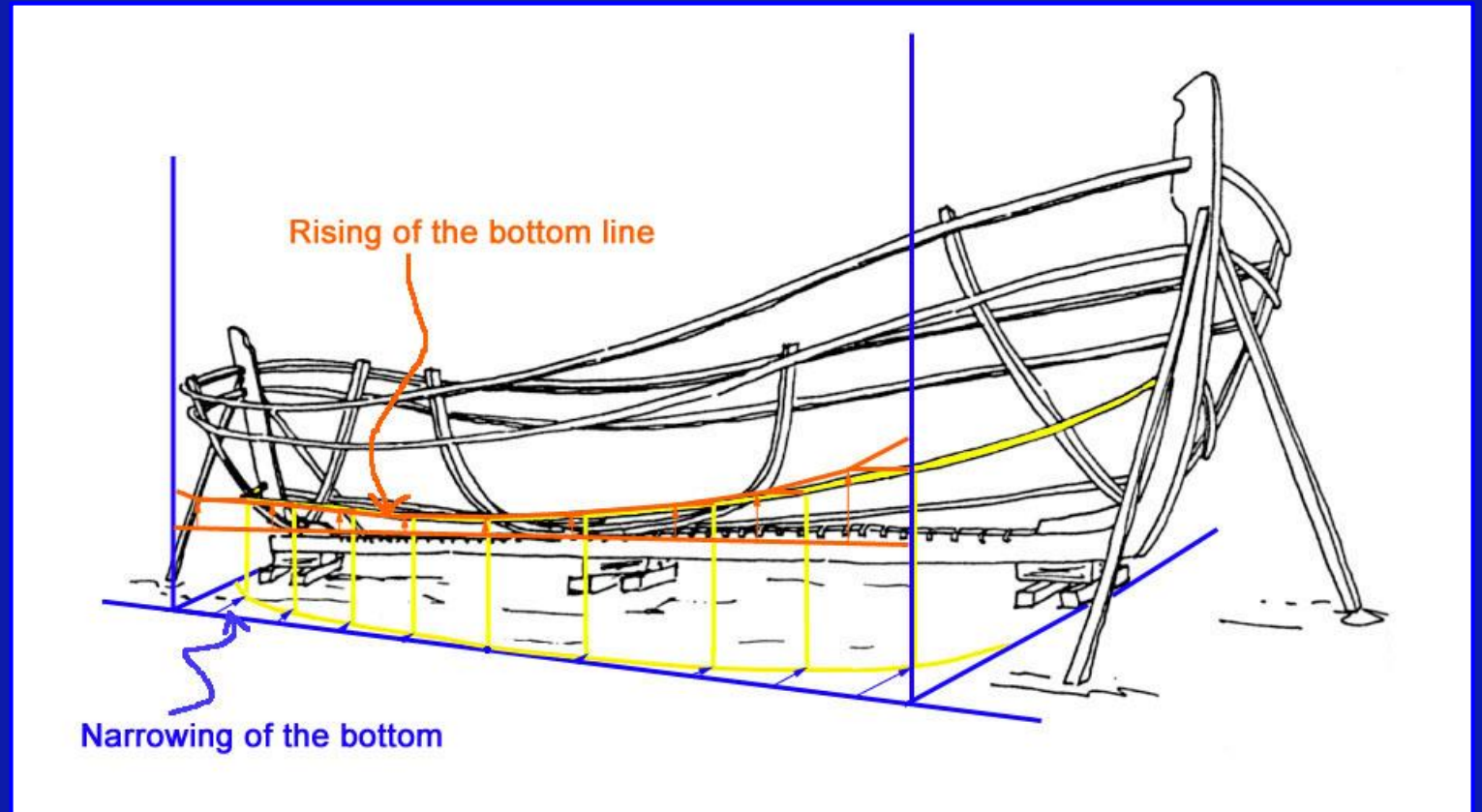
A black and white photograph showing two dugout canoes resting on a grassy field. The canoe in the foreground is light-colored, possibly painted, and has the text "S. L. LINDEN 1914" written on its side. It is positioned horizontally. Behind it, another canoe is visible, which is dark and appears to be made of a single piece of wood. This second canoe is also positioned horizontally. The background is a flat, grassy area under a light sky.

At least from the 13th century onwards, some of Iberian's Christian rulers hired Italian shipwrights and sailors to built and man their fleets.

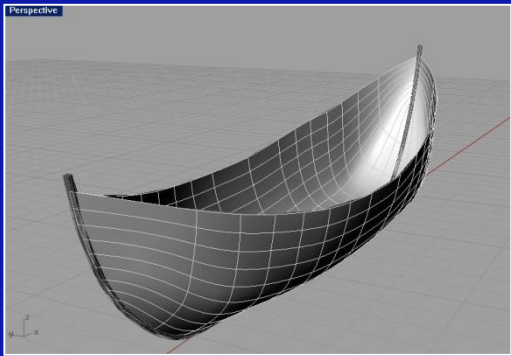


Pietro da Eboli (1170? – 1220?)

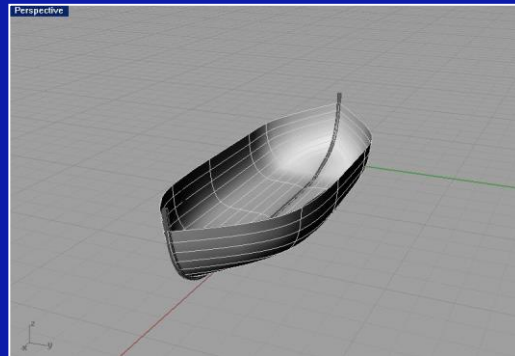
The ships of the Discoveries seem to have been conceived according to Italian (Greek? Byzantine?) formulas.



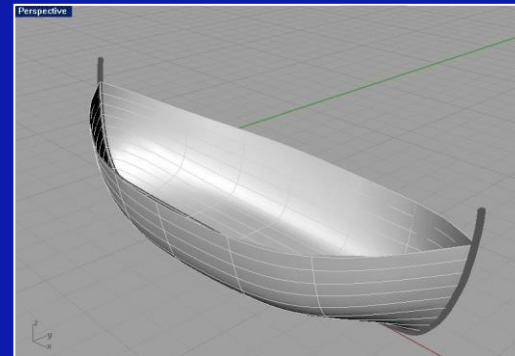
We have a small number of Mediterranean shipwrecks that illustrate the evolution of hull design in this area and suggest a certain homogeneity in their design and operation.



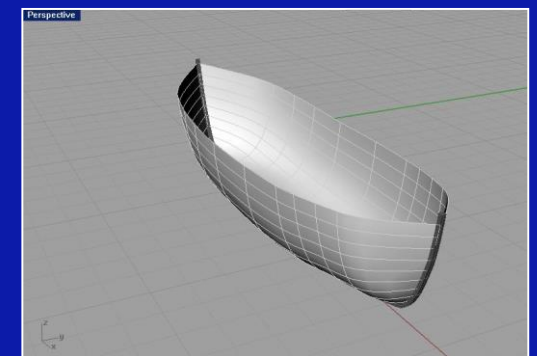
Yassiada c. AD 625



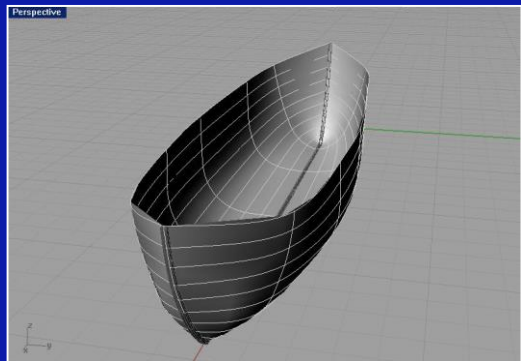
Bozburun c. AD 874



Serçe Limanı c. AD 1025



Culip 6 c. AD 1300



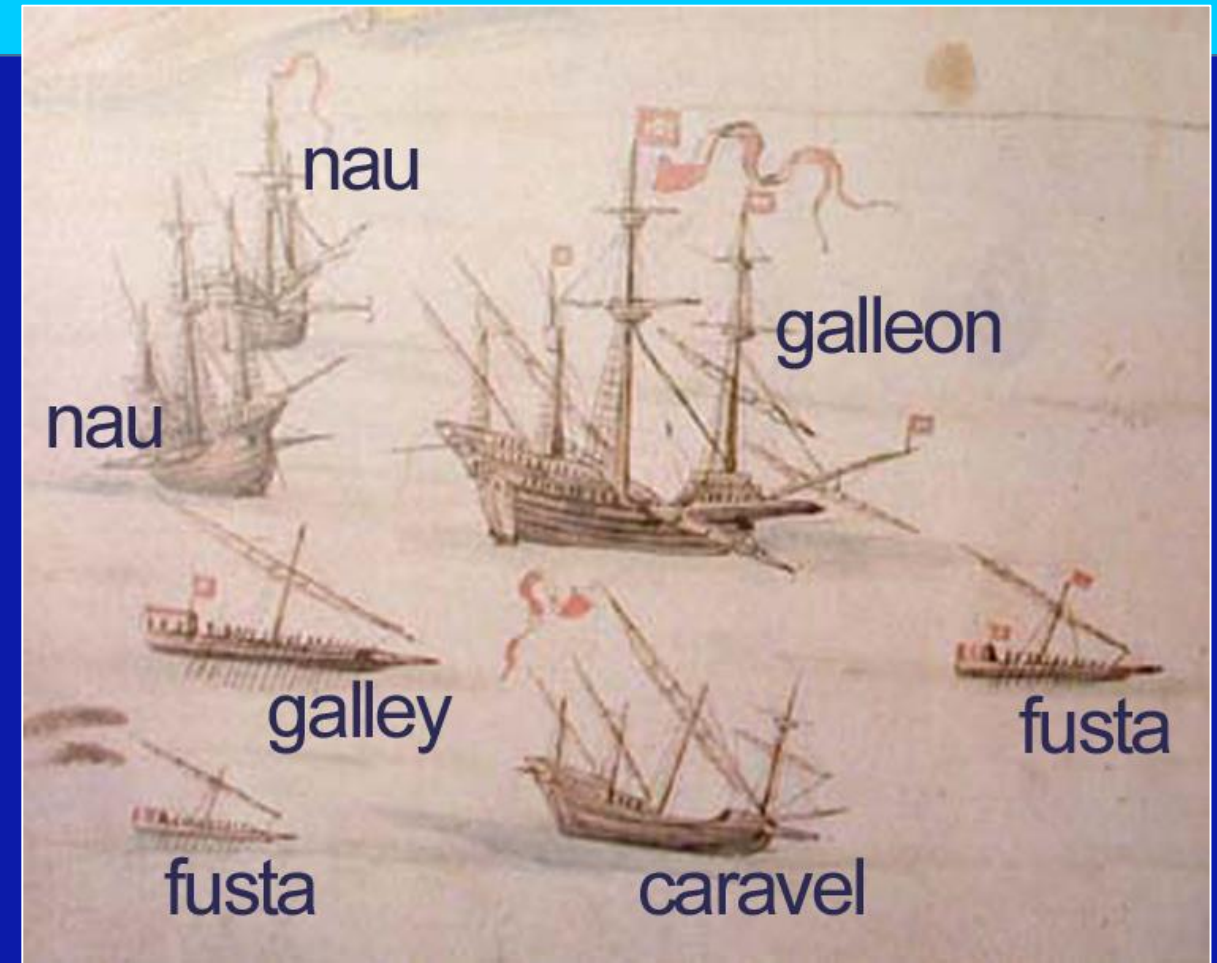
Contarina 1 c. AD 1300



Logonovo c. AD 1400

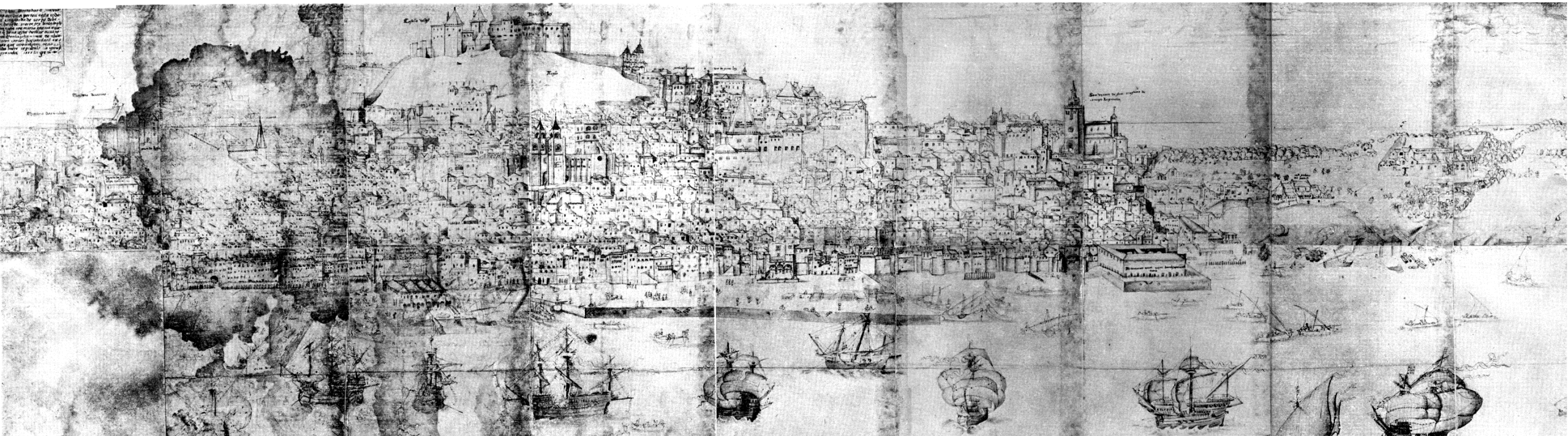
Braudel: The Mediterranean shores vibrate with the same frequency.

How do we make sense of this process of conception, construction, operation, and evolution of European ships through time?

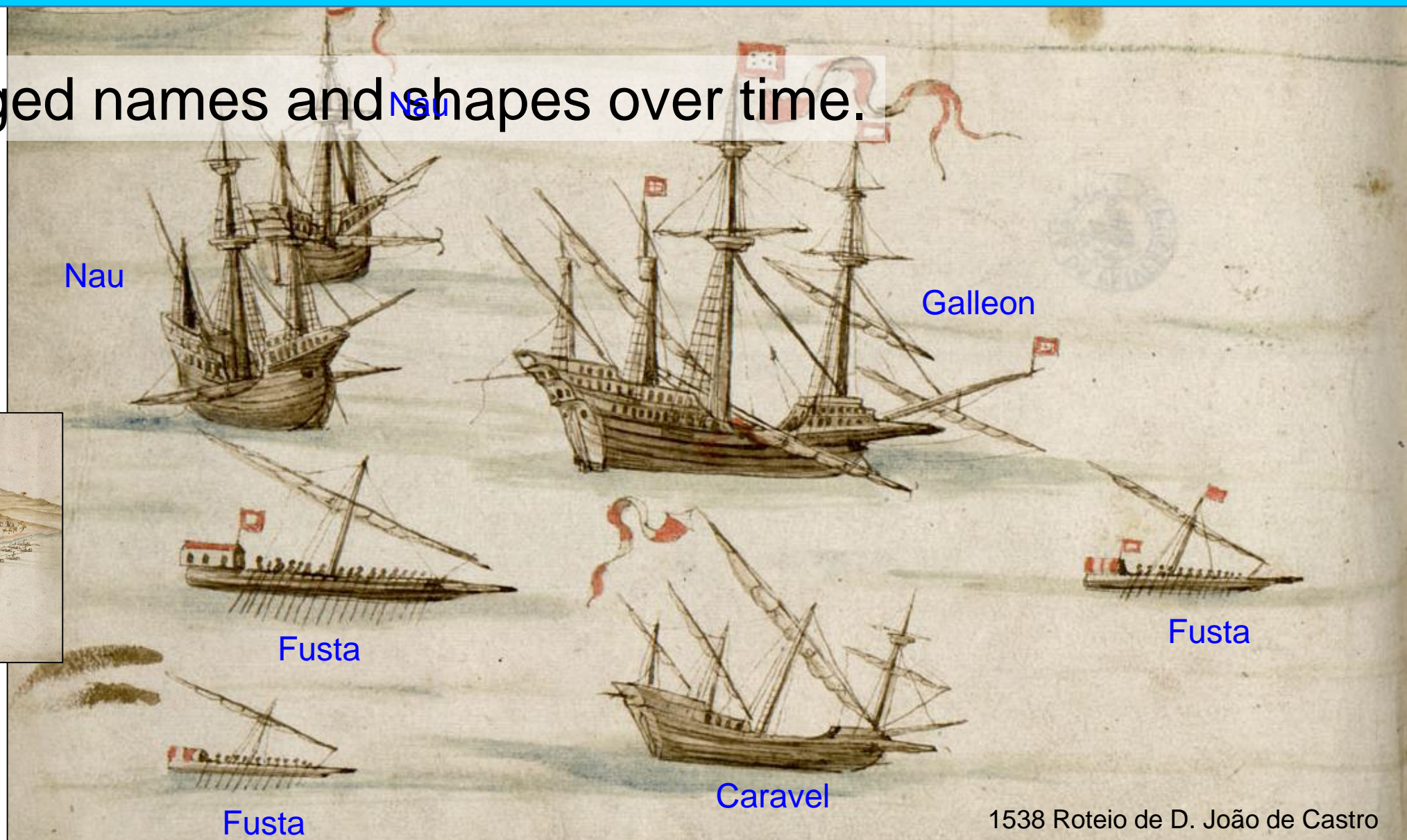


Portugal is a good example.

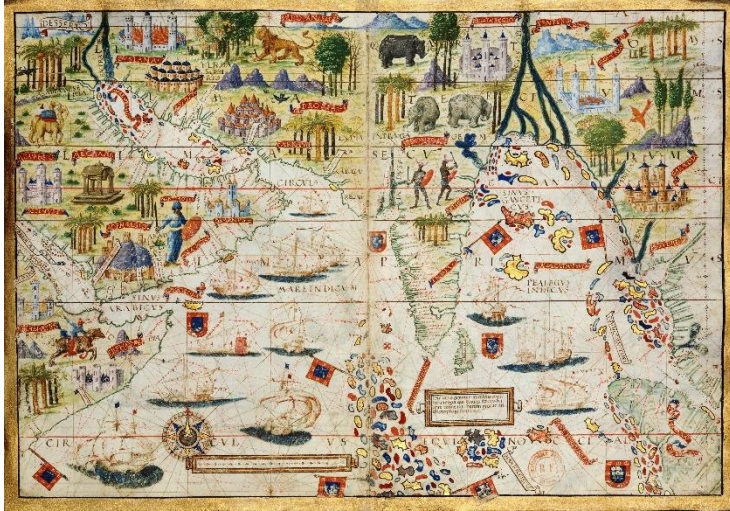
Evidence suggests that there was a diversity of local boats in every harbor, but that in spite of the diversity of their names, oceangoing ships were built according to a small number of models, mainly caravels, merchantmen, and galleons.



Types changed names and shapes over time.

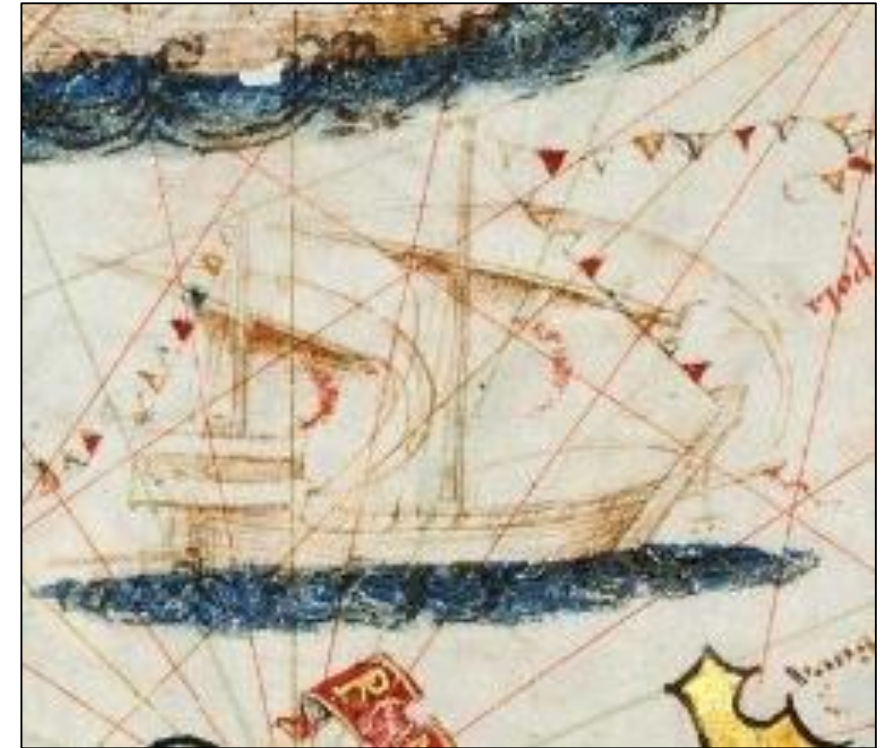
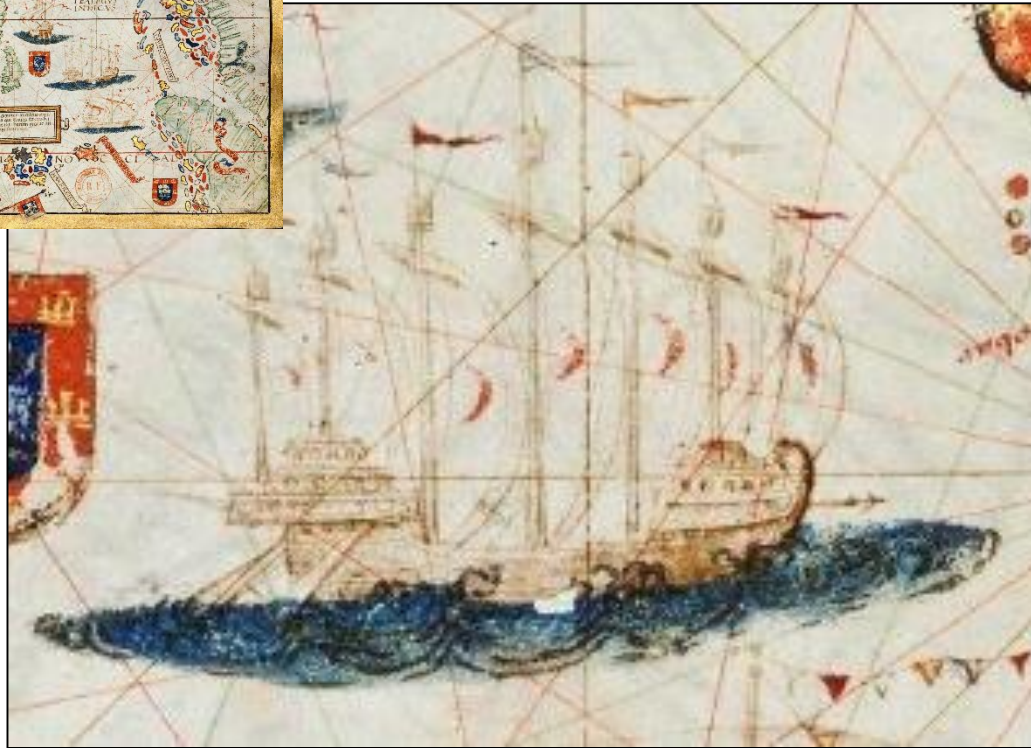


1538 Roteiro de D. João de Castro



Pedro and Jorge Reinel
Miller Atlas, 1519

In Asia the Portuguese used all sorts of local ships, sometimes modified and adapted to their needs and tastes.



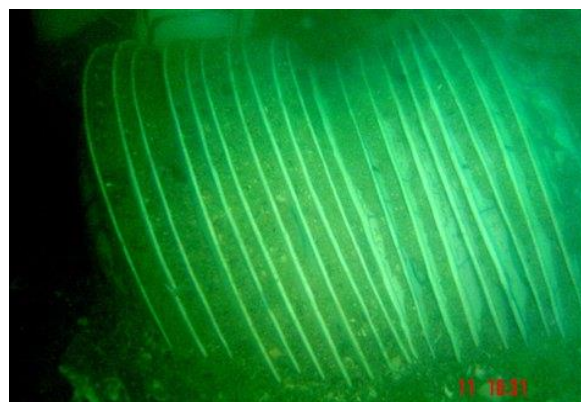
Badly understood, these representations of Asian ships in the Indian Ocean have Ottoman flags. The one on the right looks like what would be called a dhow in the western world.

Jan Huyghen van
 Linschoten (1563-1611)
 was the Portuguese
 viceroy secretary in Goa
 (1583-1588) and visited
 many places in the Estado
 da India.



Impressionistic view of an oared vessel with 11 banks.

Unfortunately, the descriptions of the Asian ships used by the Portuguese are scarce and not very informative, and no shipwreck has been studied so far.



Wan Li shipwreck. Malaysia. Found in 1998 and salvaged by treasure hunters, it is said to be a Portuguese ship built in Asia...

In oceanic voyages, however, the three most common ship types were naus, caravels and galleons.



The best scholar on this subject is José Virgílio Pissarra:



Galleons seem to have been built by Portuguese shipwrights at least since 1518, one in Cochin (Kochi) and one in Panane (Ponnani), probably adapted from Italian models.

Portuguese fleet in the Indian Ocean: a large galleon in front, a small three-masted ship with a beak head, 10 oared vessels (galleys and fustas?), a nau and a war caravel.

Before 1518 there are several references to Italian galleons, but the author knows of no certain iconography and no dimensions from this period.





Iconography is scarce but consistent. The earliest Portuguese image may be a small ship in the background of the 1517 prayer book of King Manuel I.



With four masts and the typical beak head, this may be the earliest representation of a galleon in Portugal.

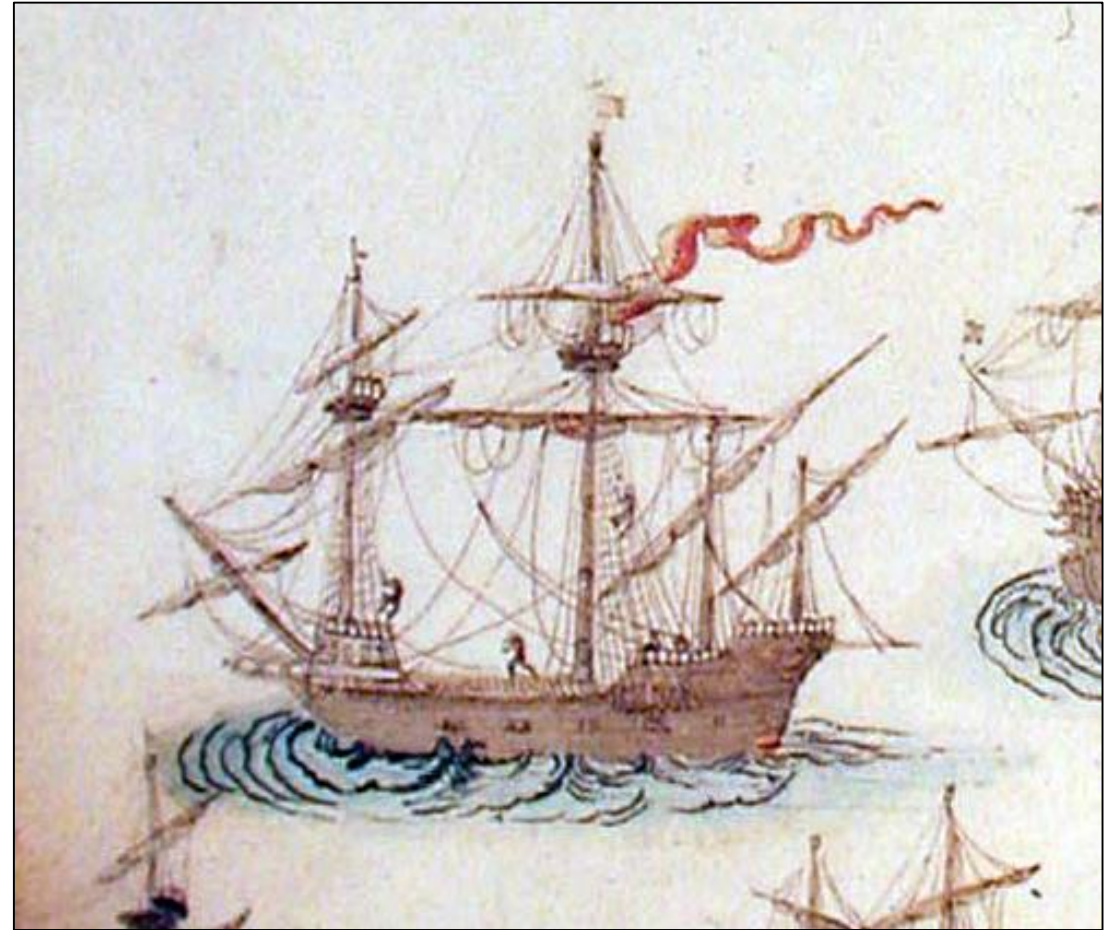
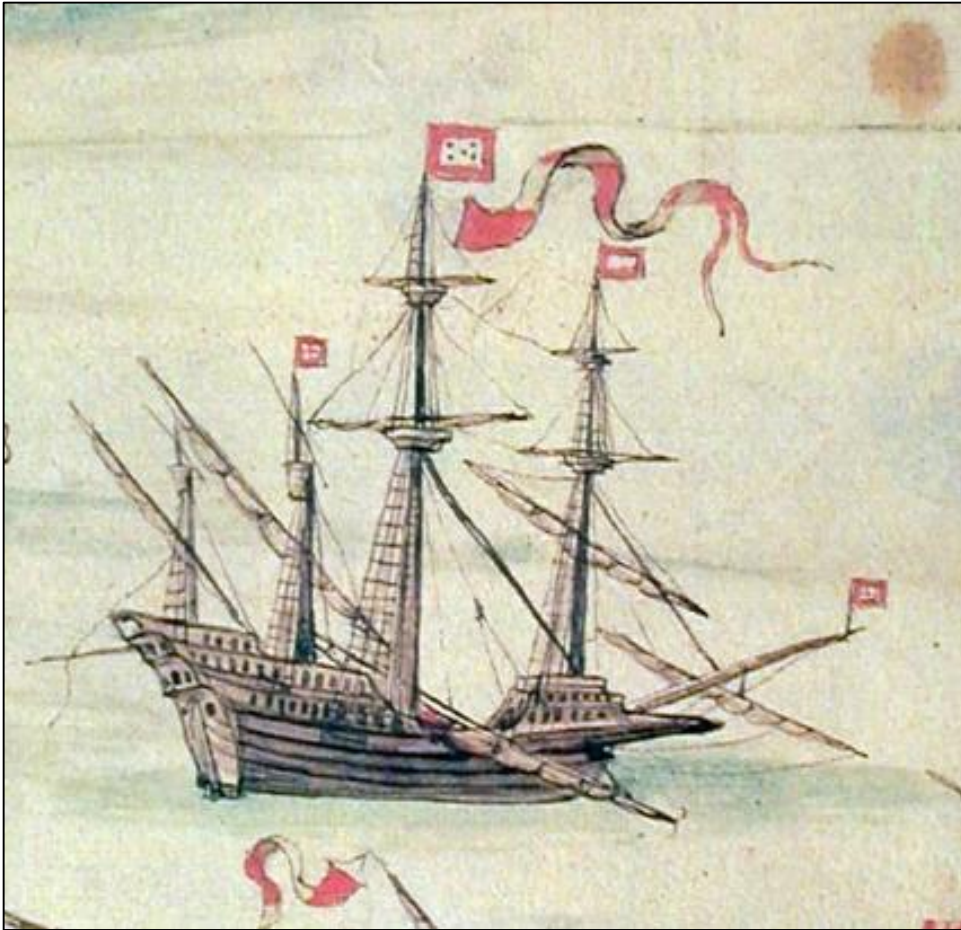


In this period naus tend to be represented with three masts and a characteristic raised forecastle almost at the same angle as the bowsprit.

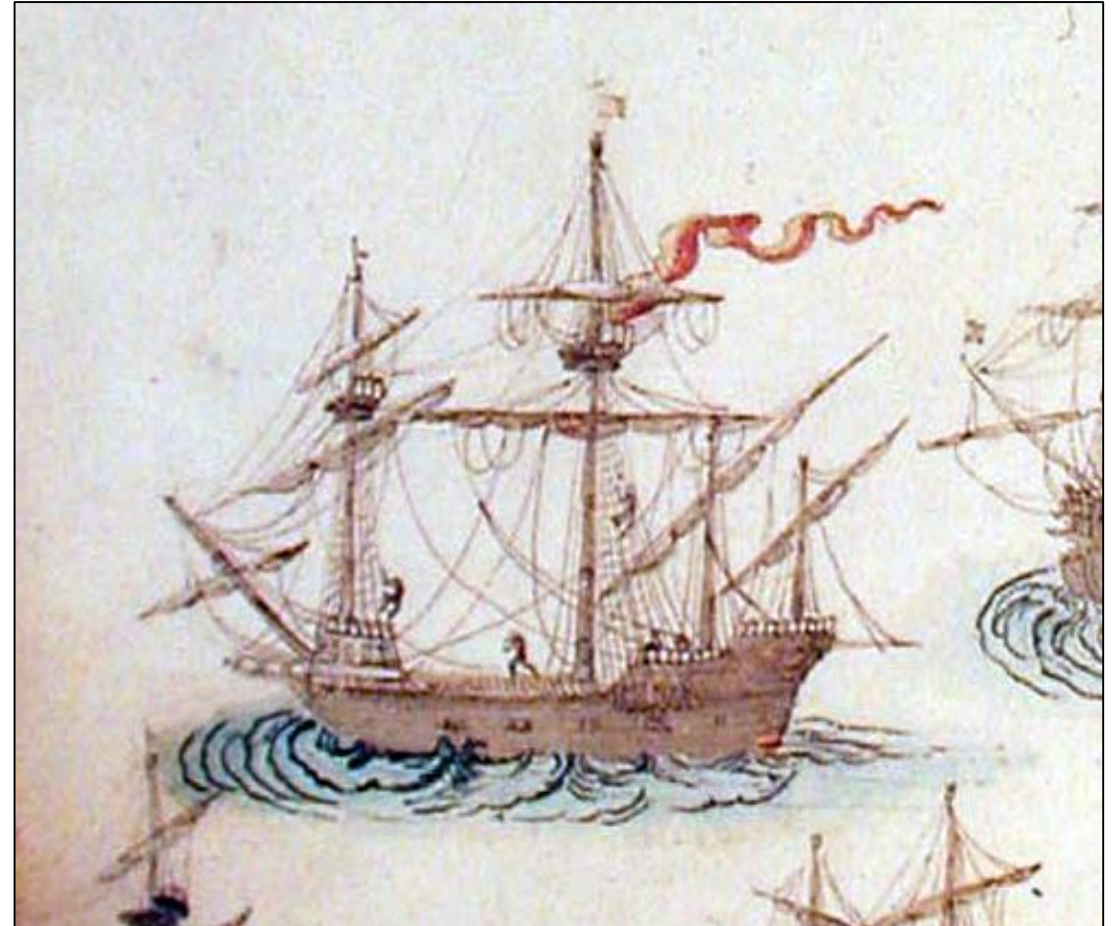
The only archaeological site of a galleon known to the author is that of the Ngomeni shipwreck, in Malindi, Kenya, tentatively identified as Vasco da Gama's 1524 galleon *S. Jorge*, under study by my friend and colleague Caesar Bitu.



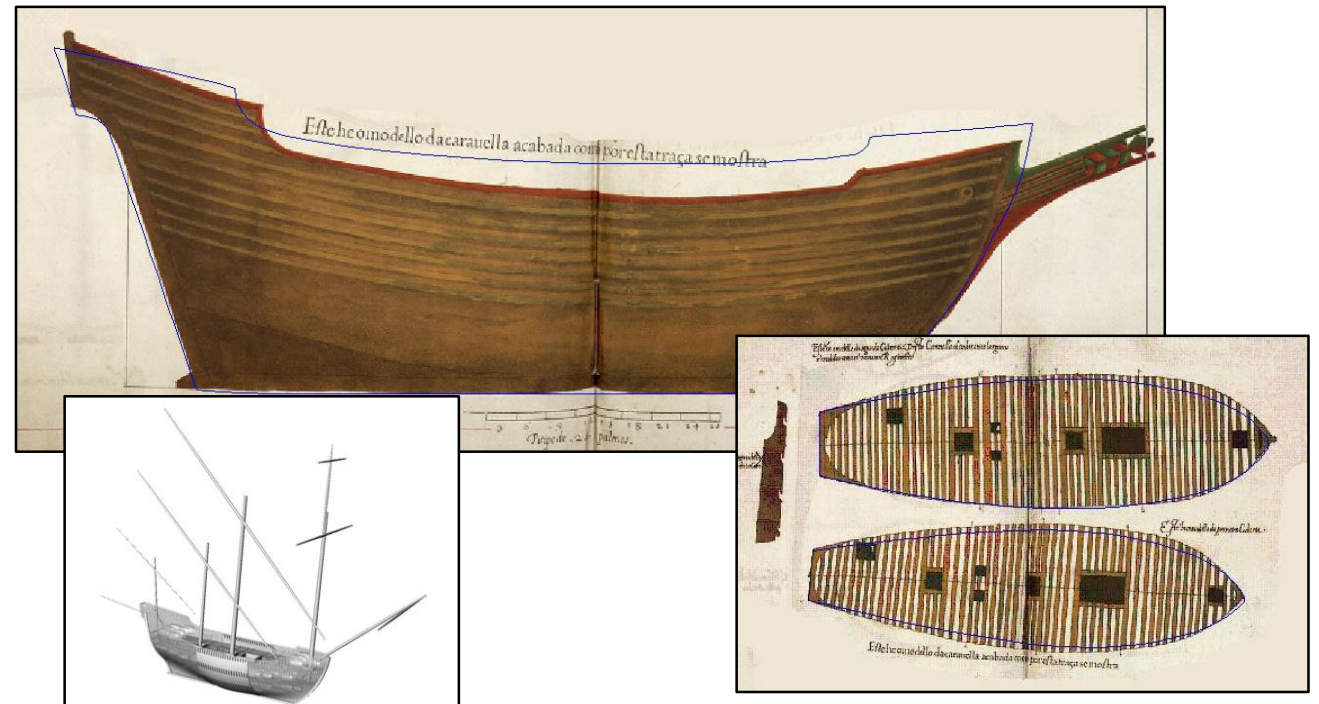
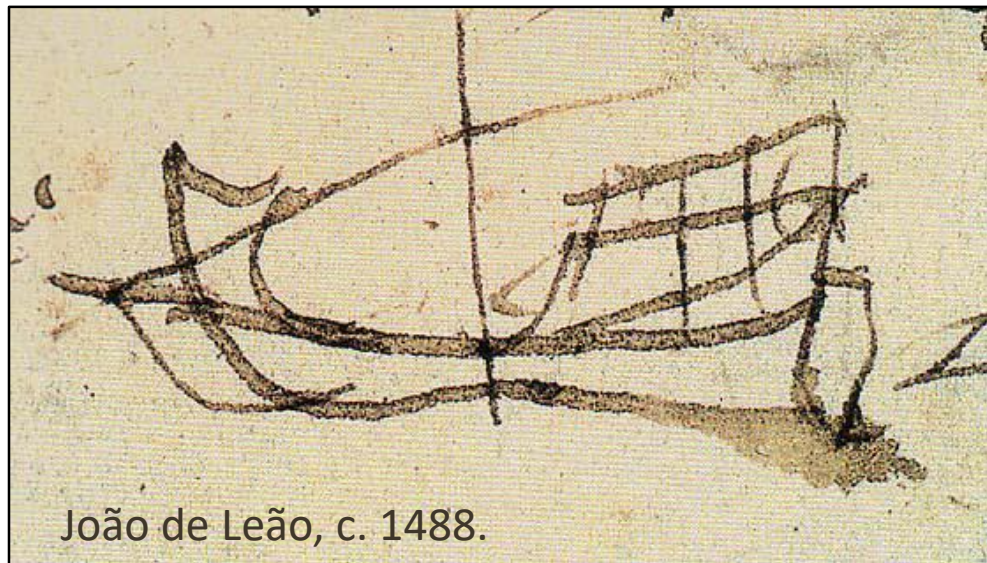
A third galleon built in India soon after was 38.5 m long, with a beam between 8 and 10 m, and 3.8 m of depth in hold. We don't know how many decks this galleon had.



The most conspicuous differences between naus and galleons are the beak head, the bonaventure mast, and the lower castles.



Nobody knows what the caravels of the 1440s, 1460s, and 1480s looked like. There were many types of lateen-rigged boats and ships in the 15th century, some with stern castles.

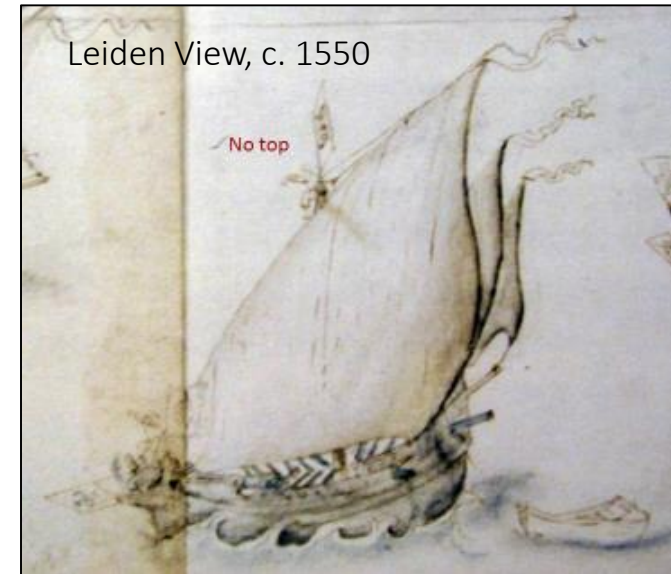
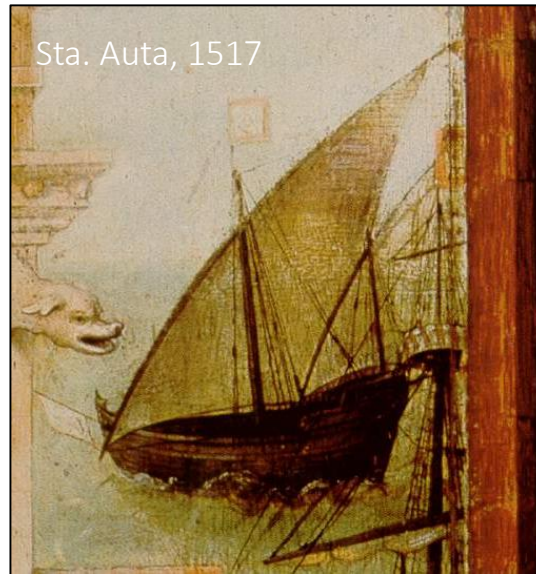


Again, the name caravel seems to come from Italy, in the 12th century. They are first mentioned in Portugal in the chart of the city of Gaia (1255).



Detail from a View of Lisbon (c. 1550). Leiden University Library.

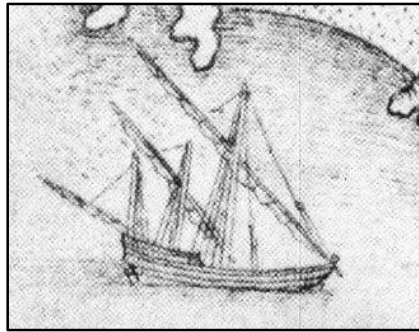
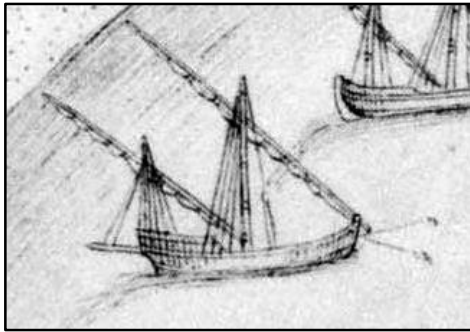
Caíque (1960s)
Col. Seixas, Museu de Marinha, Lisboa



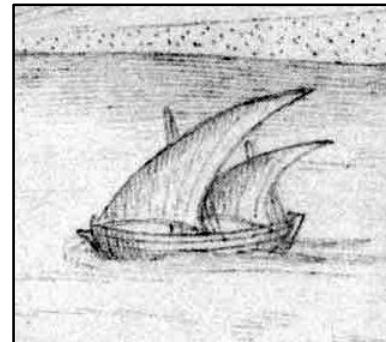
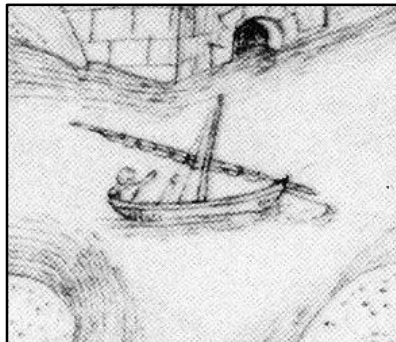
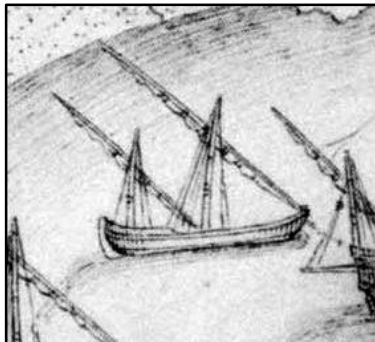
The caravels mentioned by the chroniclers, from the mid-15th century onwards, engaged in the exploration of the Atlantic are also unknown to us. Alvise Cadamosto mentions eyes painted on these vessels' bows.

It looks like small caravels with 2 or 3 masts, with lateen sails, endured over one century without much change.

Caravels?



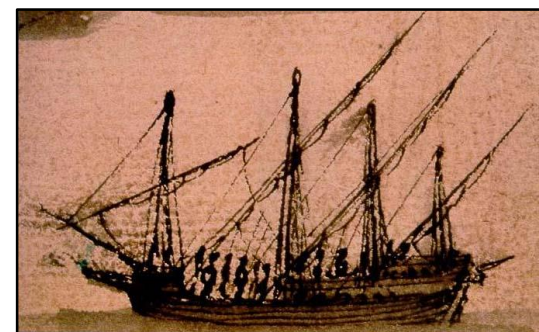
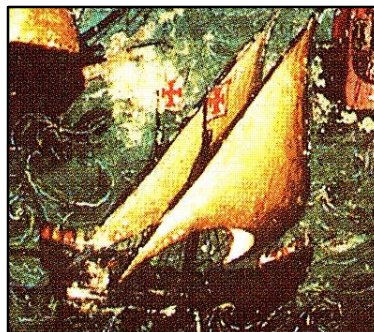
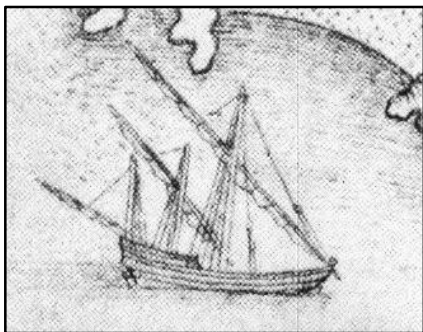
Other lateeners:



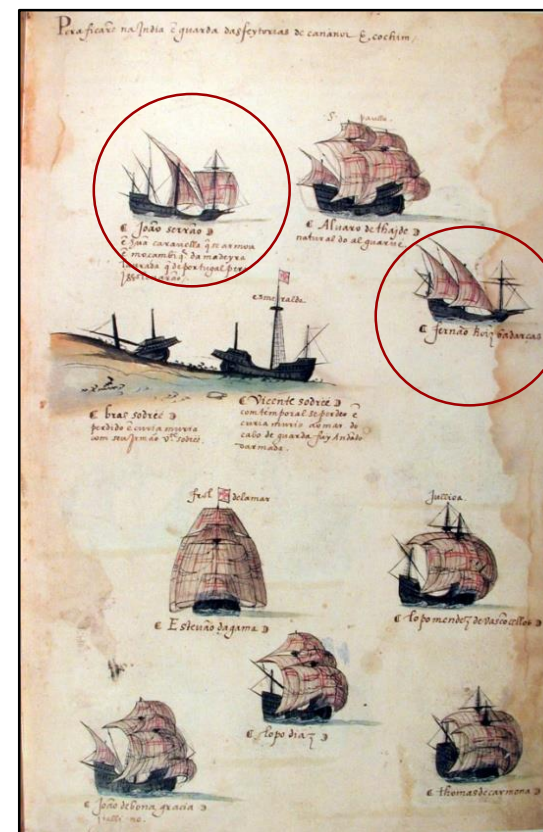
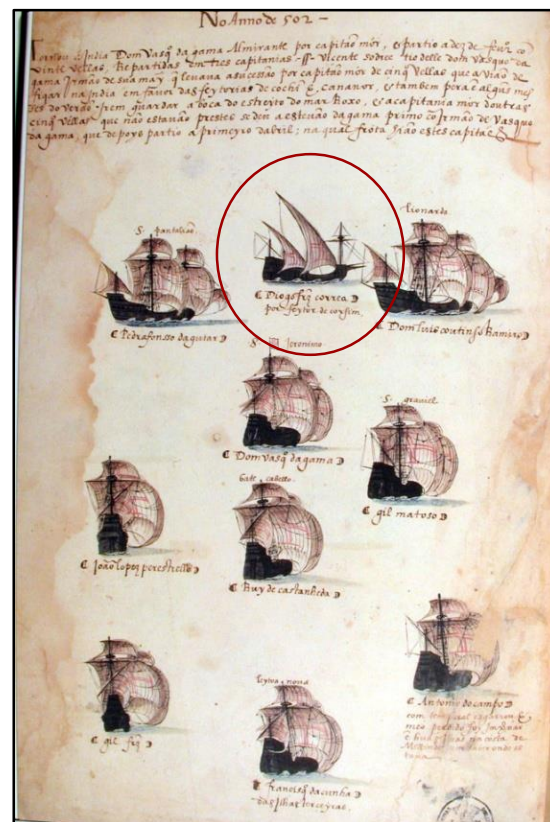
Duarte d'Armas, c. 1509

It seems that in the 16th century there were several types of caravels:

1. *Caravelas latinas* (15-16th centuries)
2. *Caravelas redondas* (15-16th century)
3. *Caravelas de Alfama* (16th century)
4. *Caravelas de armada* (16th century)
5. *Caravelões* (16th century)

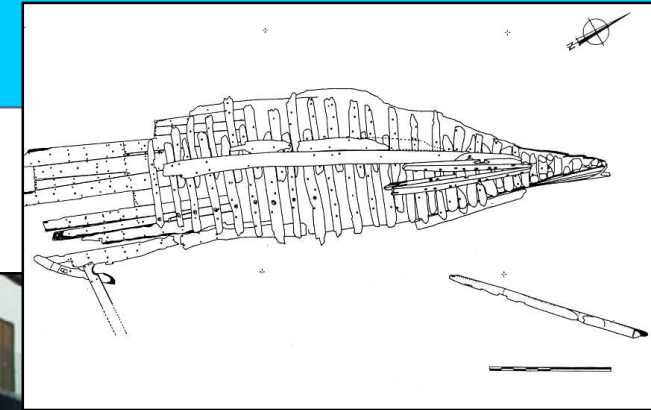
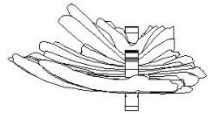
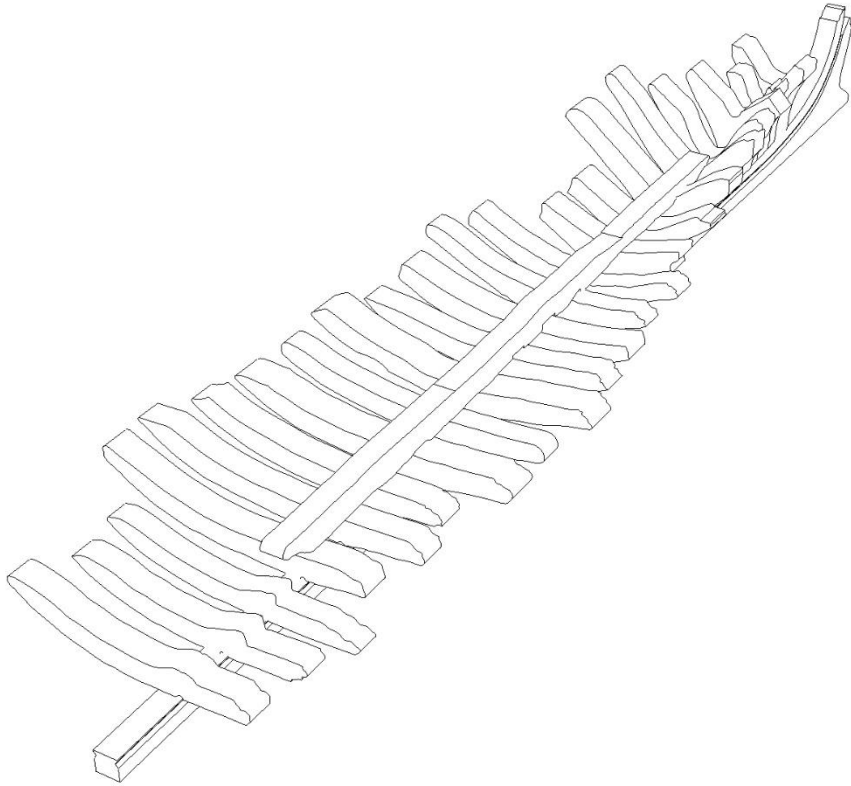
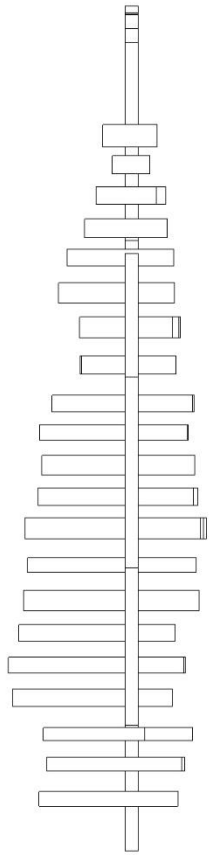


Gaspar Correia says that Vasco da Gama sailed to India in 1502 with “*cinco caravelas latinas, que mandou muito bem concertar*” and “*iam com velas redondas armadas, para com elas navegarem quando cumprisse*”. He does not mention how many masts these hips had, and the representations we have date to around 1565...



Memória das Armadas

There are four (although remotely) possible caravel shipwrecks:



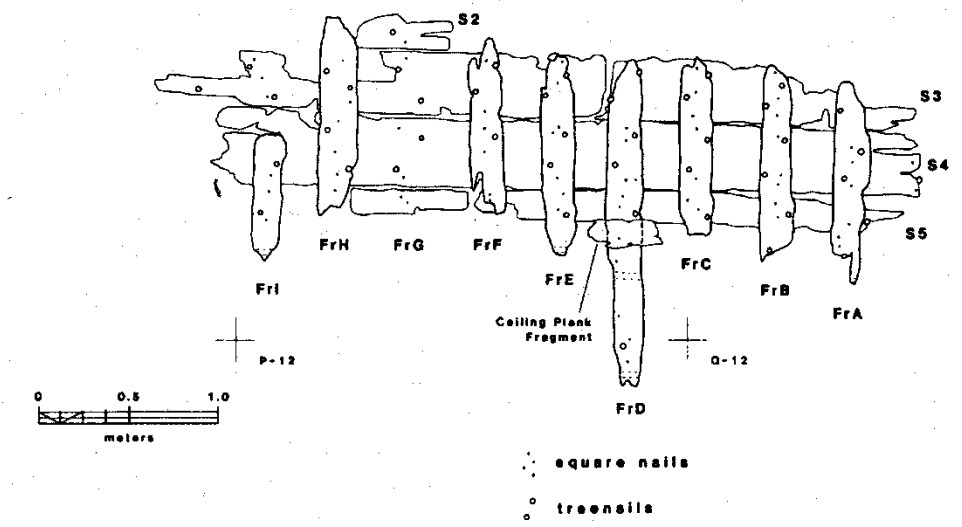
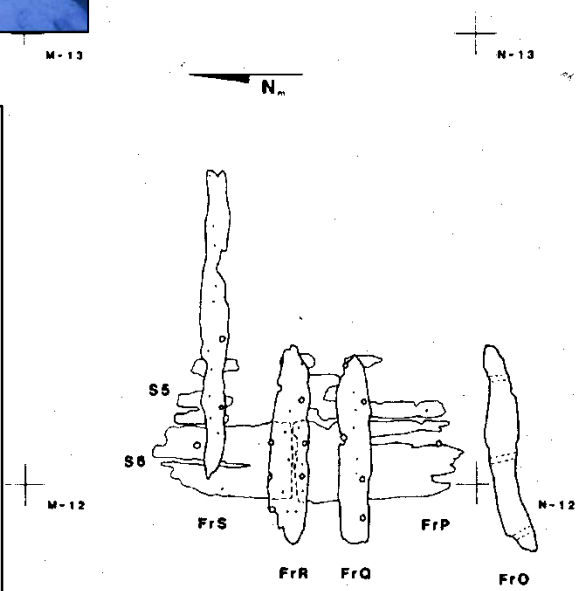
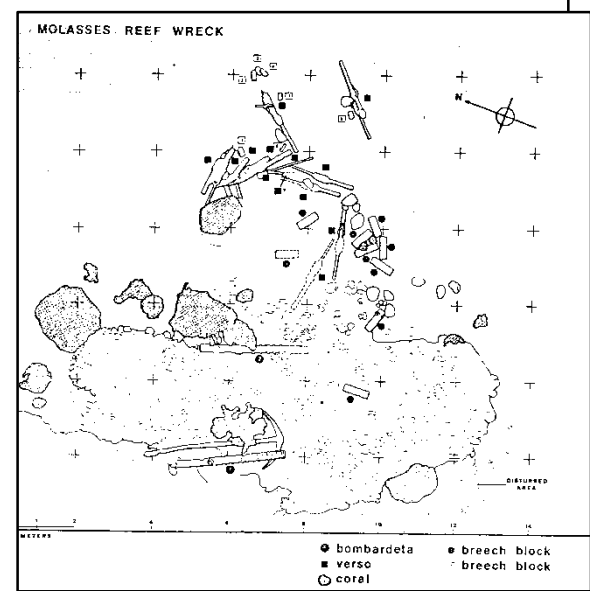
Aveiro A Shipwreck, c. 1450



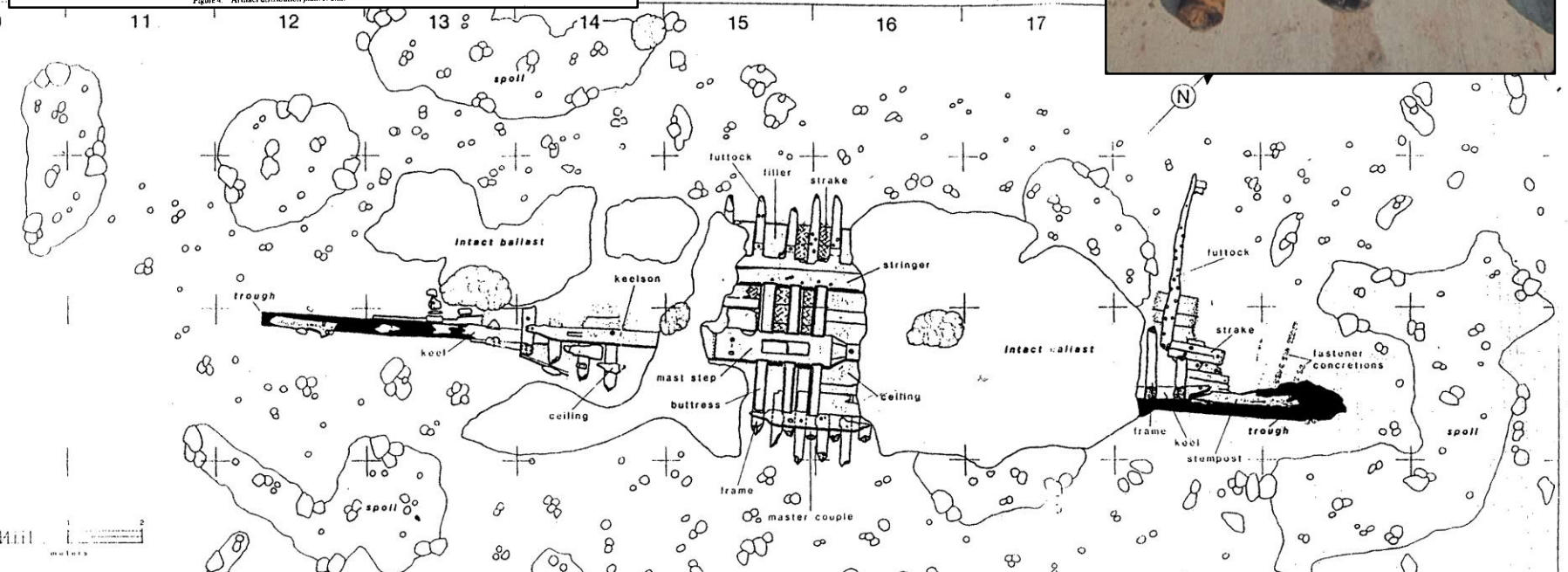
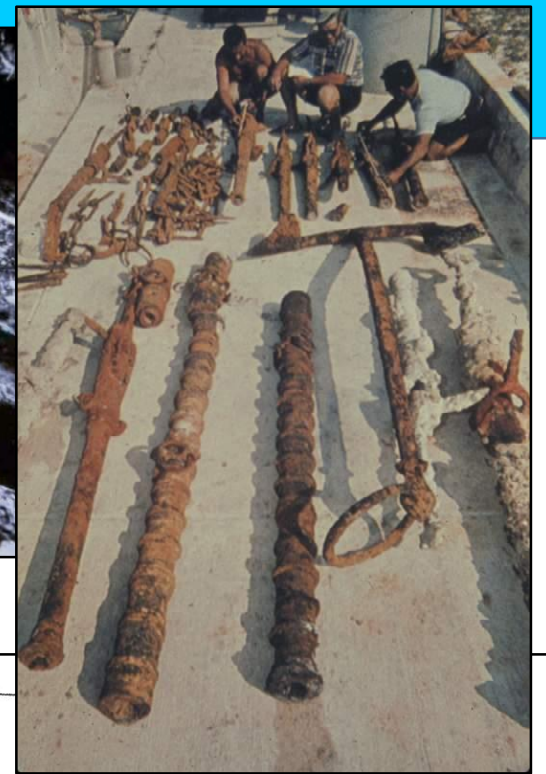
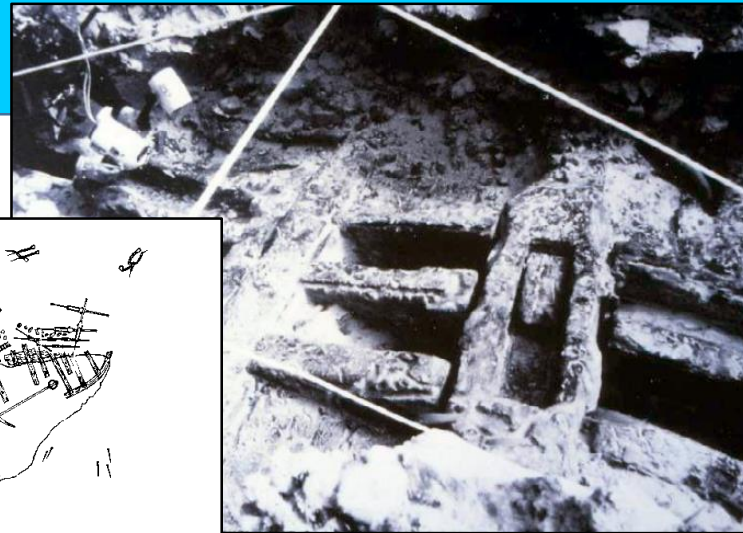
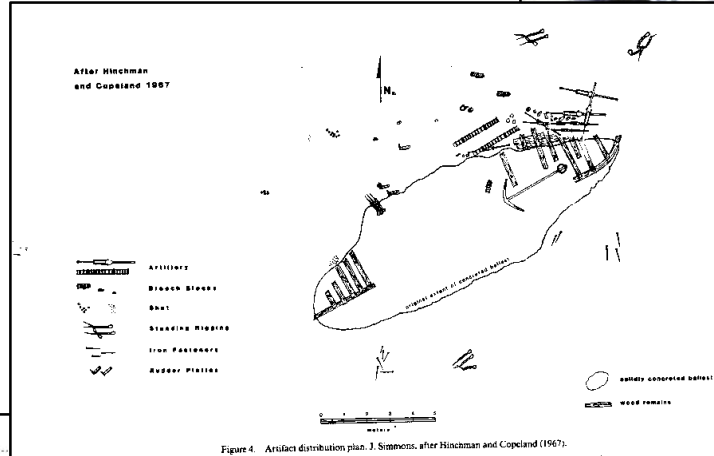
Molasses Reef Shipwreck, c. 1520:



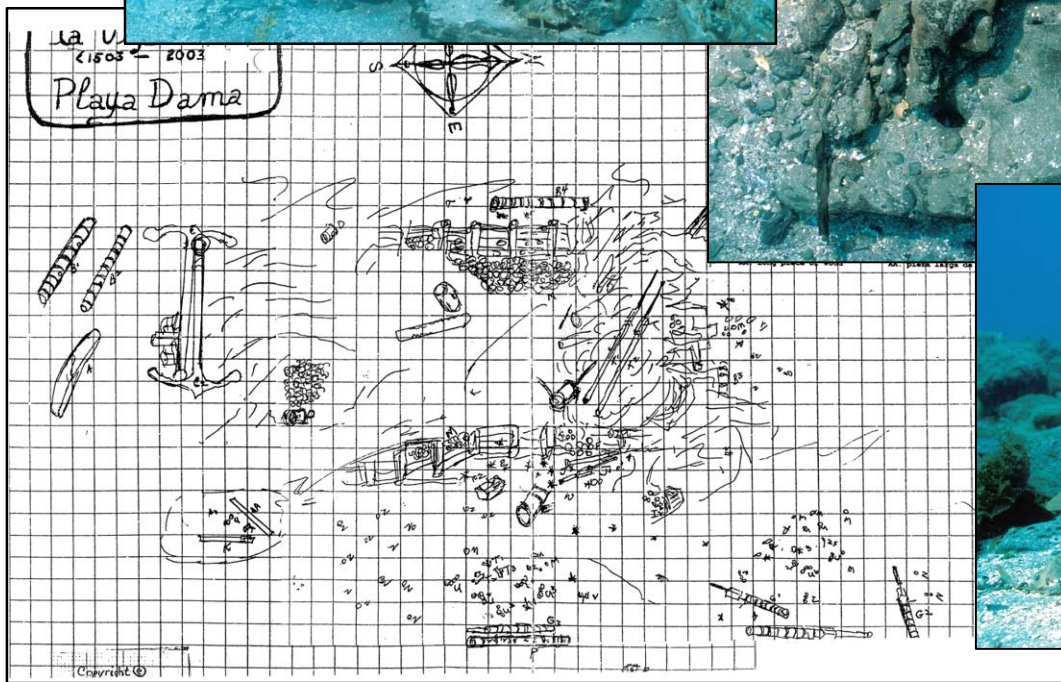
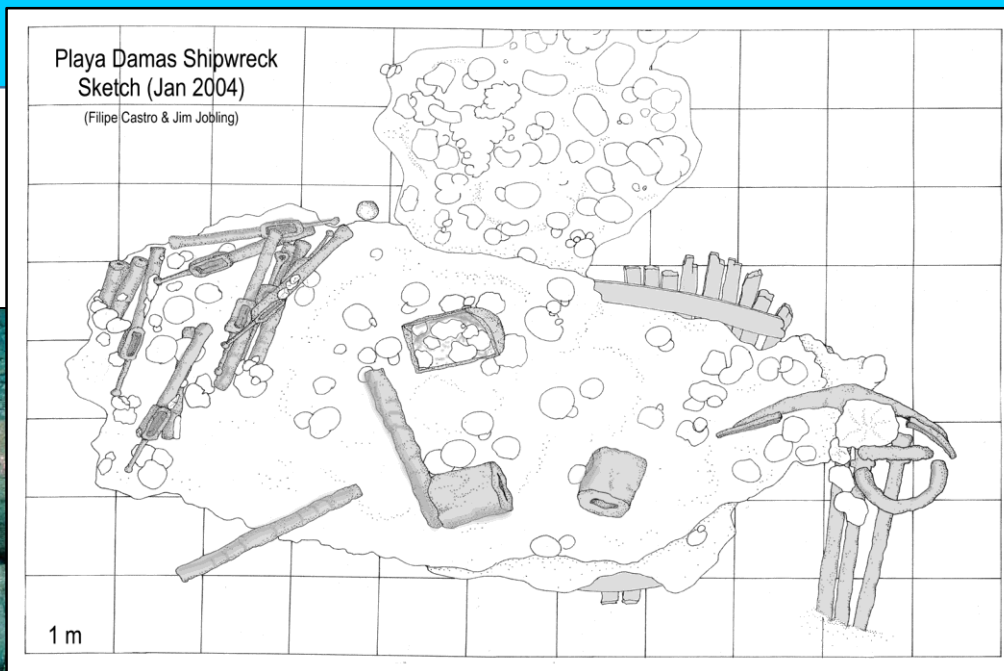
MOLASSES REEF WRECK
Preliminary Wood Plan



Highborn Cay Shipwreck, c. 1520



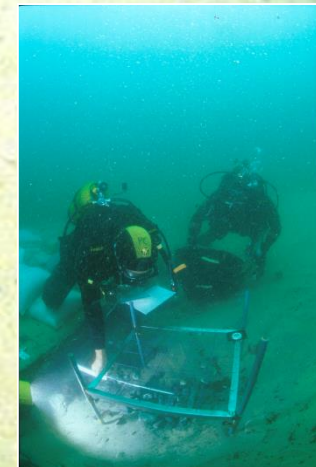
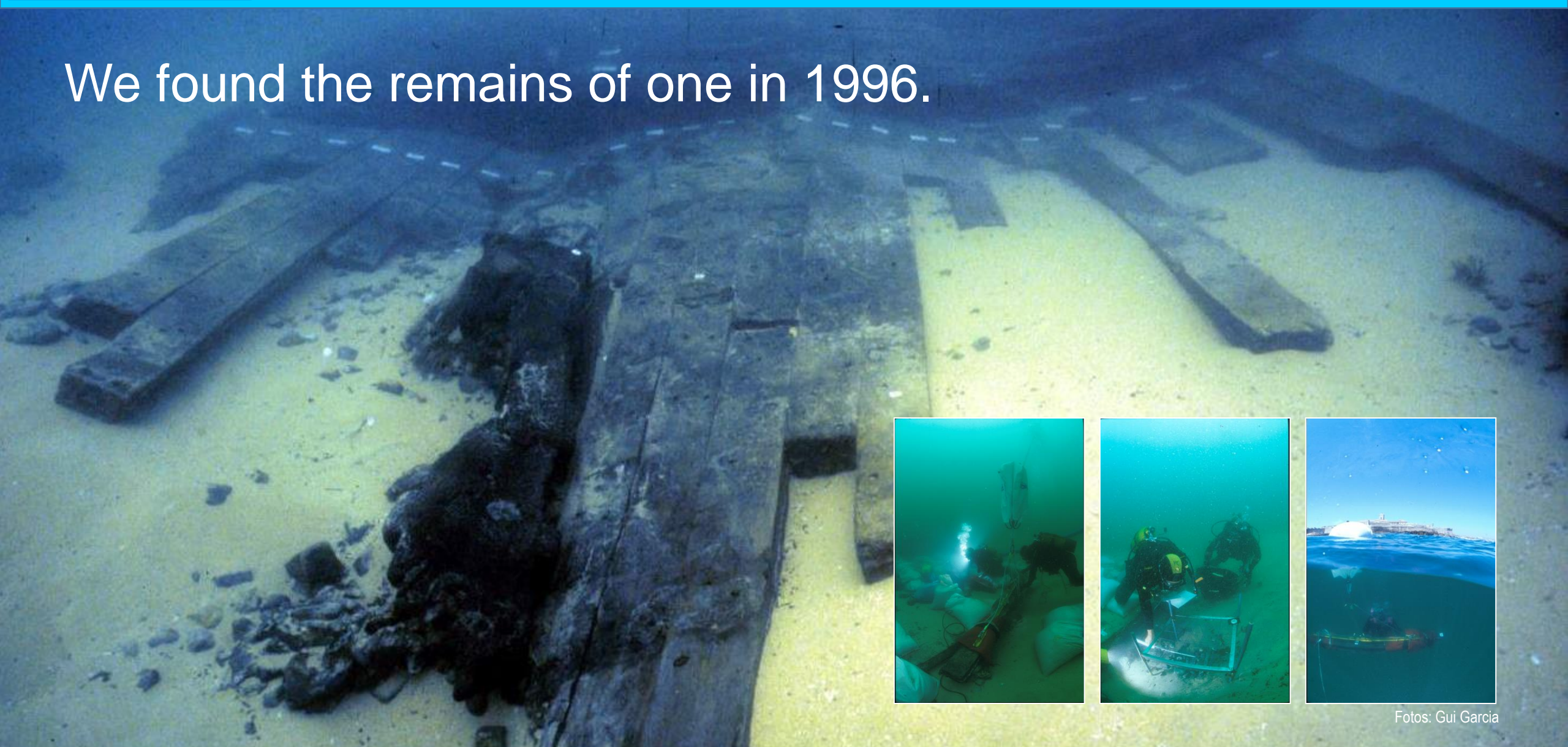
Playa Damas Shipwreck, c. 1530





These cargo ships were the working horses of the India Route.

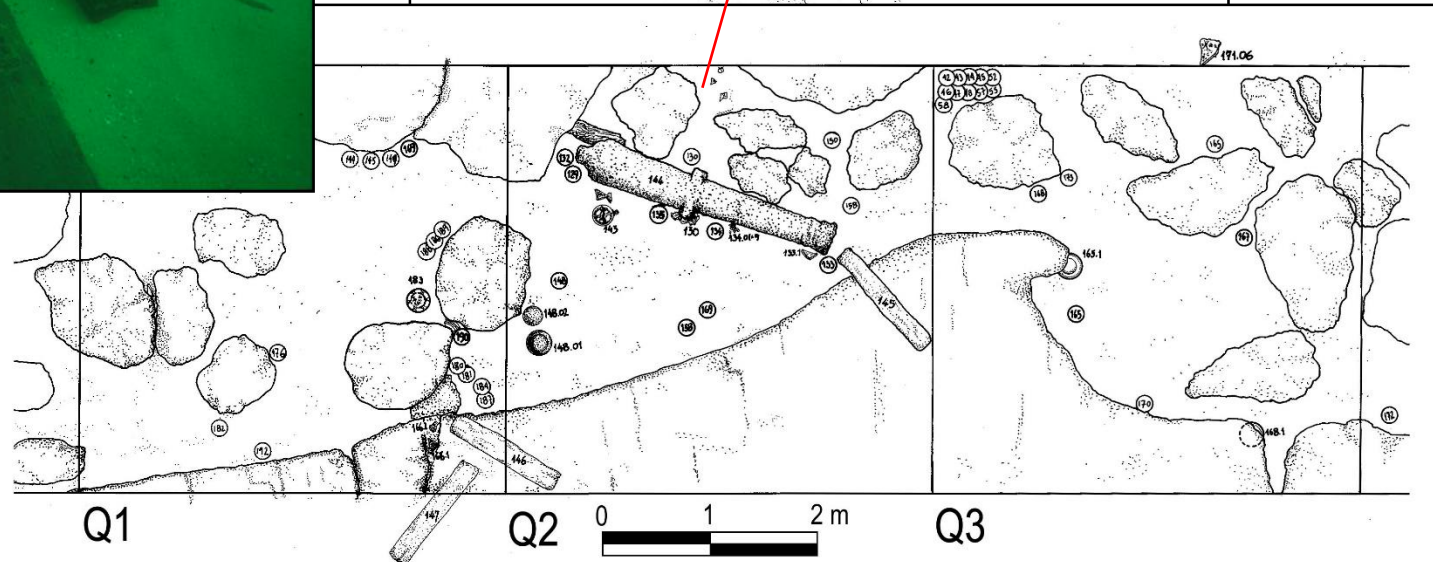
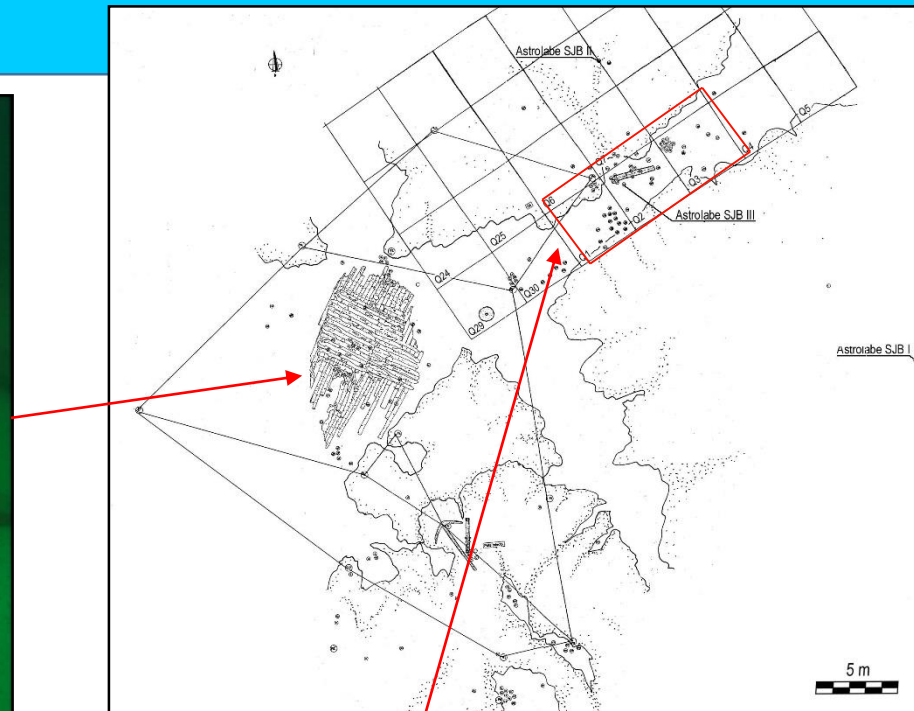
We found the remains of one in 1996.

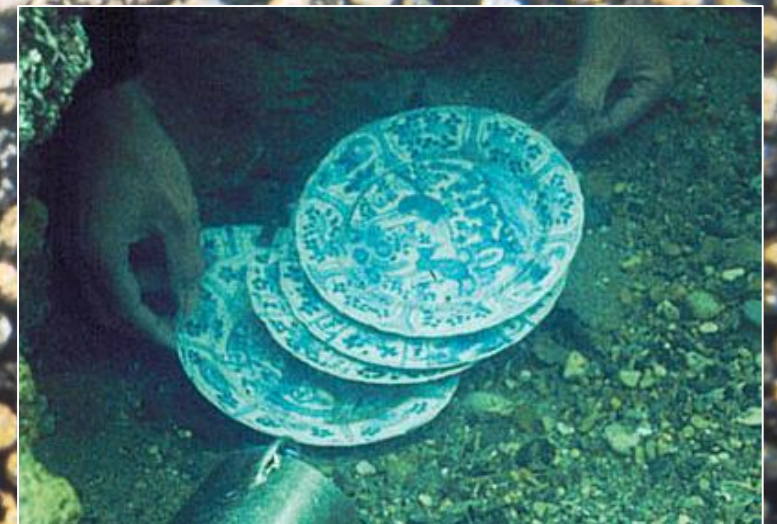


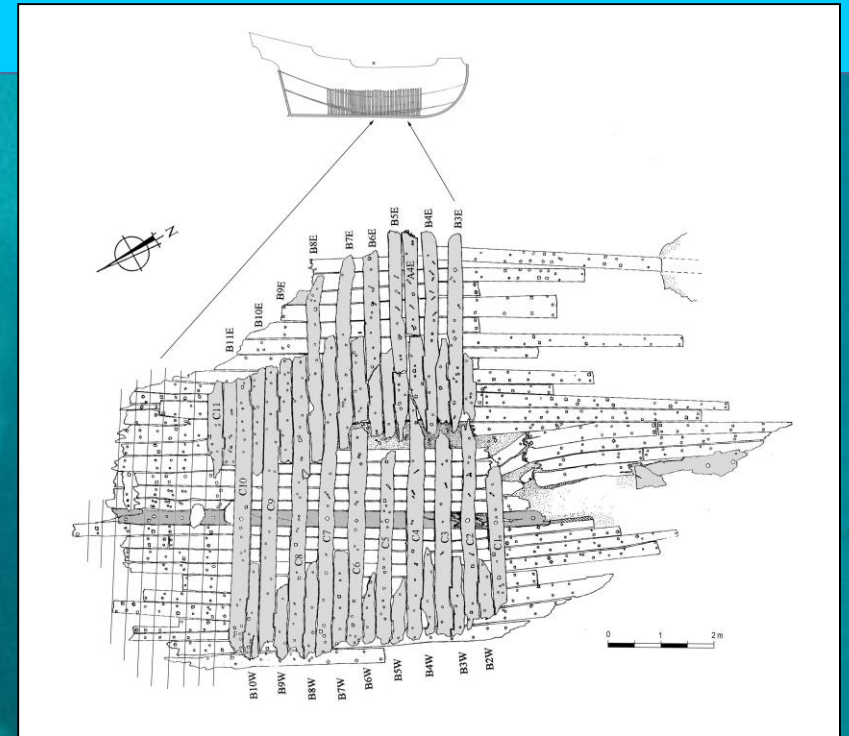
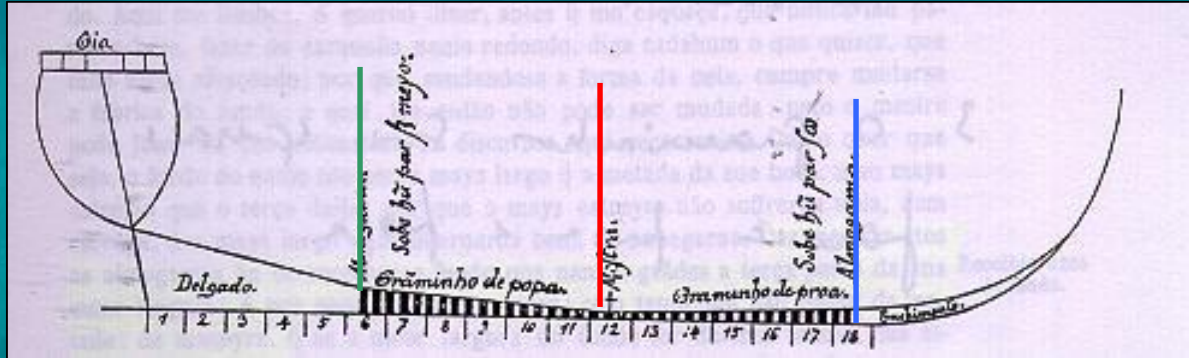
Fotos: Gui Garcia

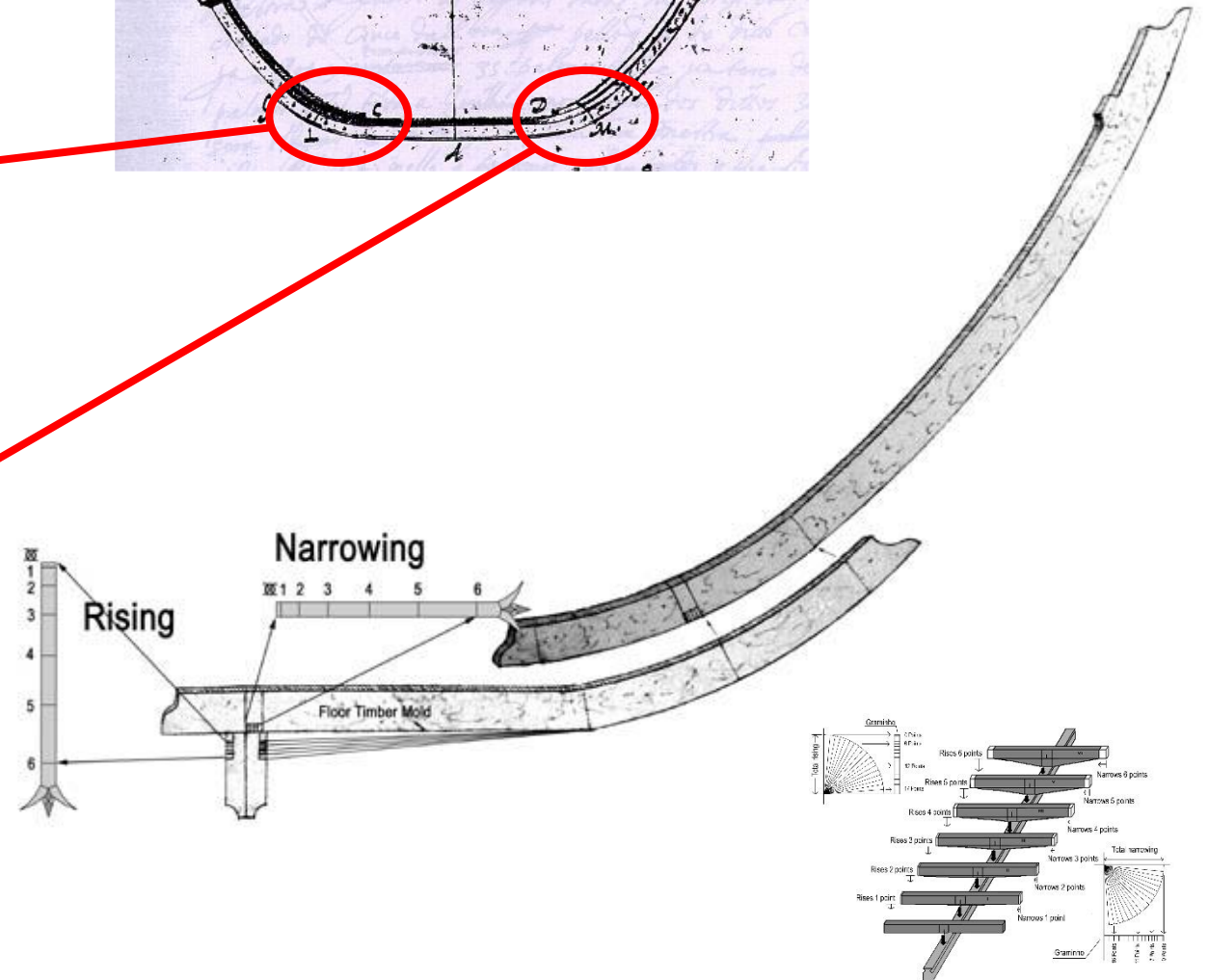
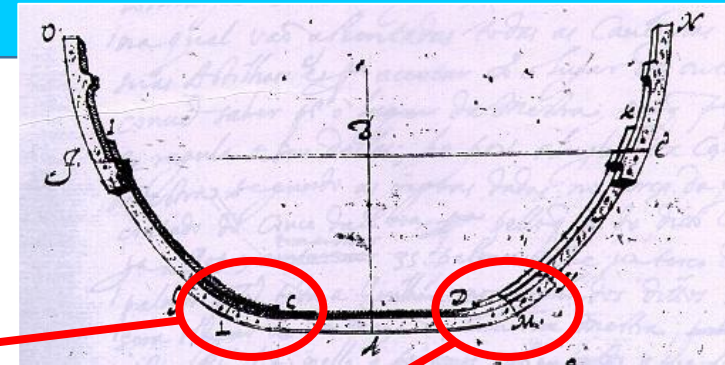


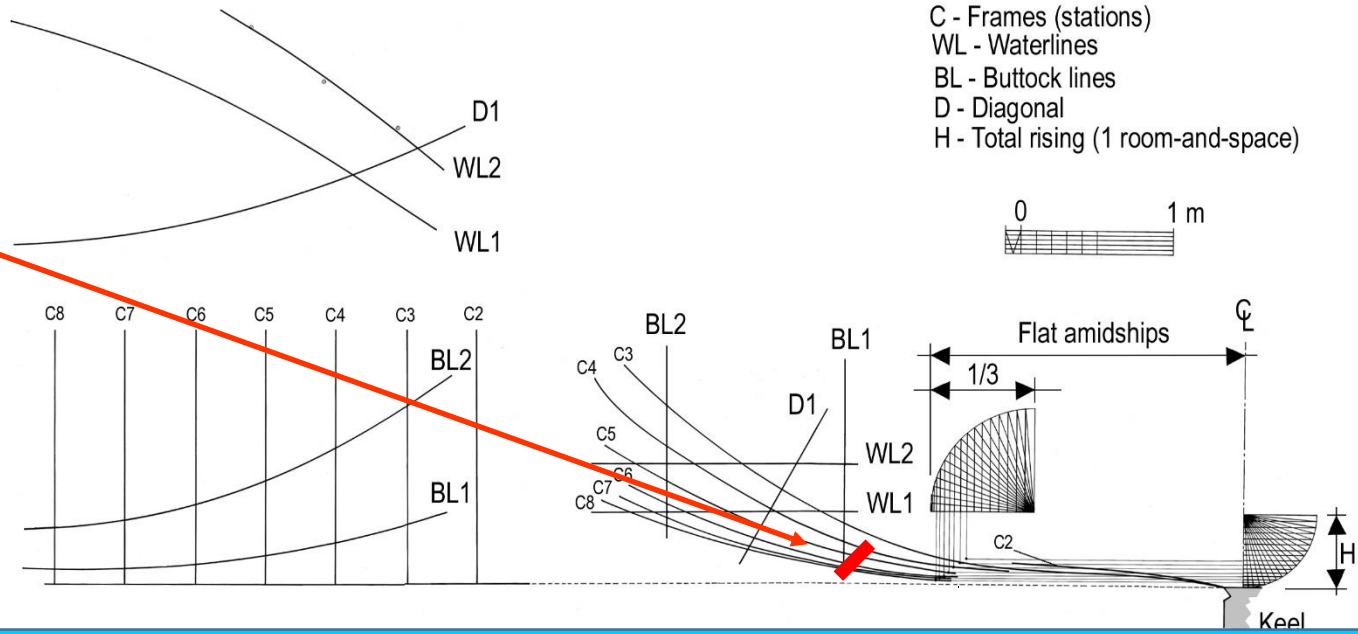
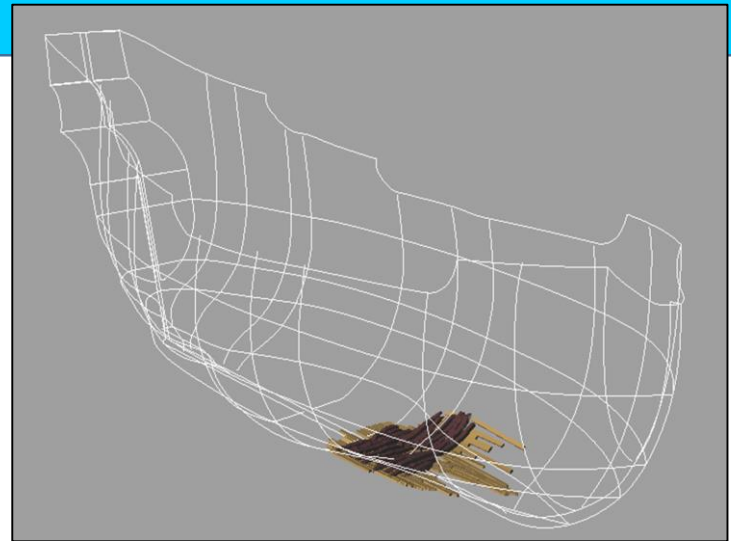
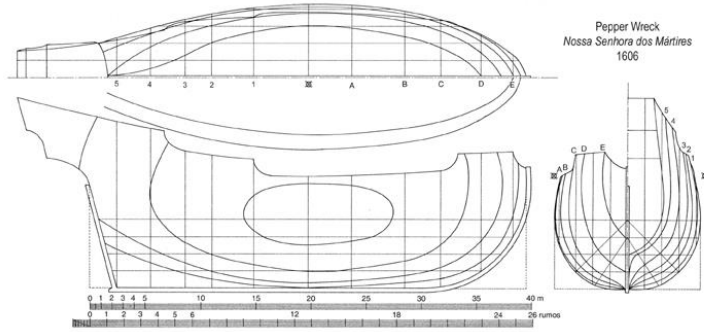
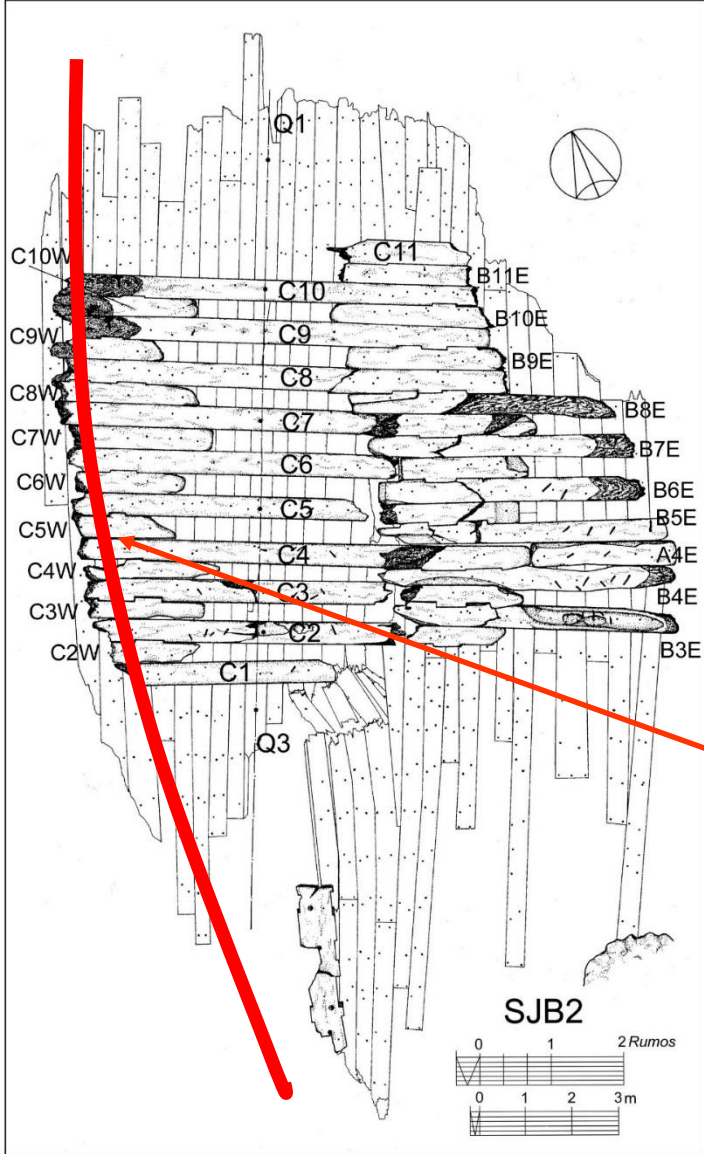
Pepper Wreck

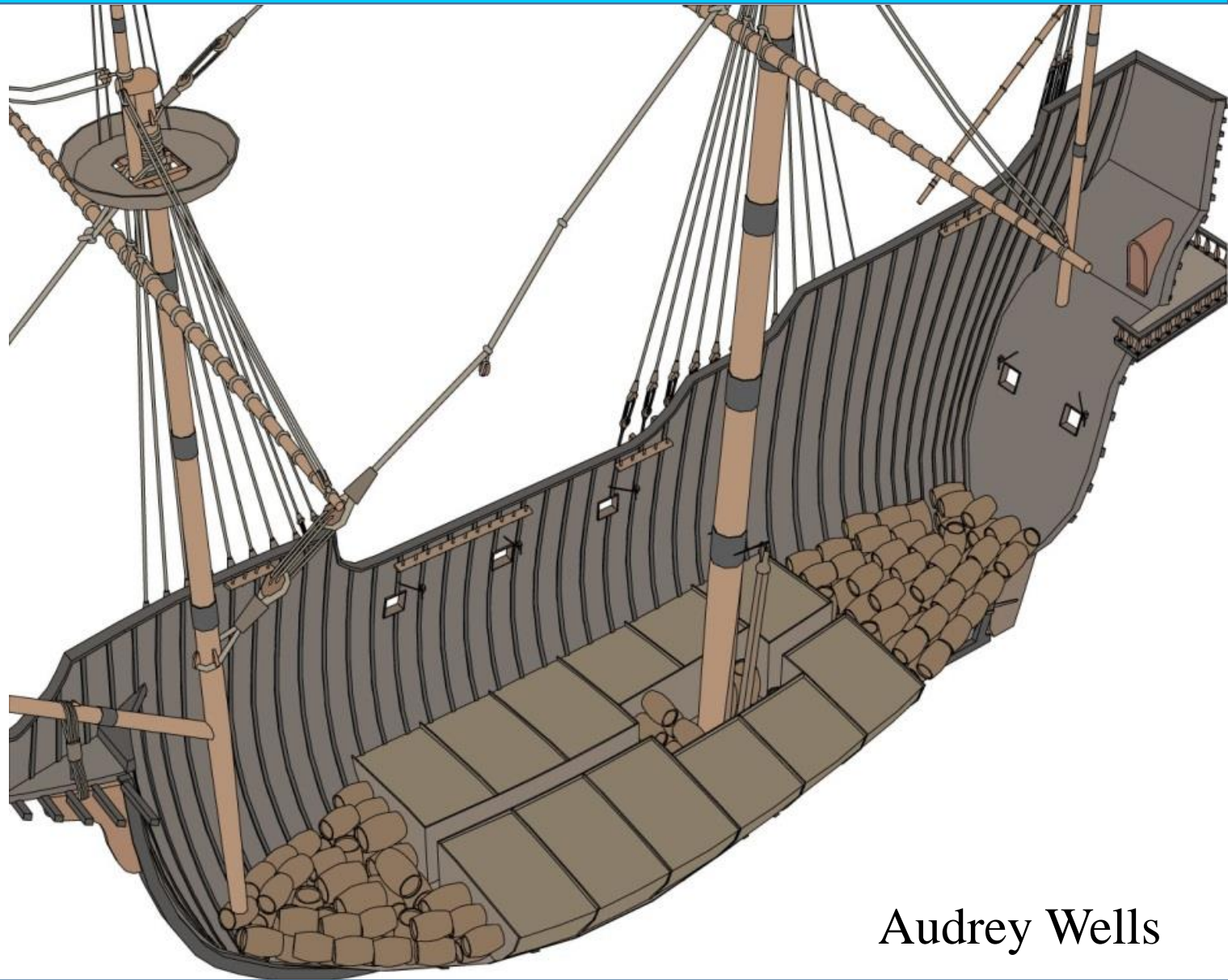




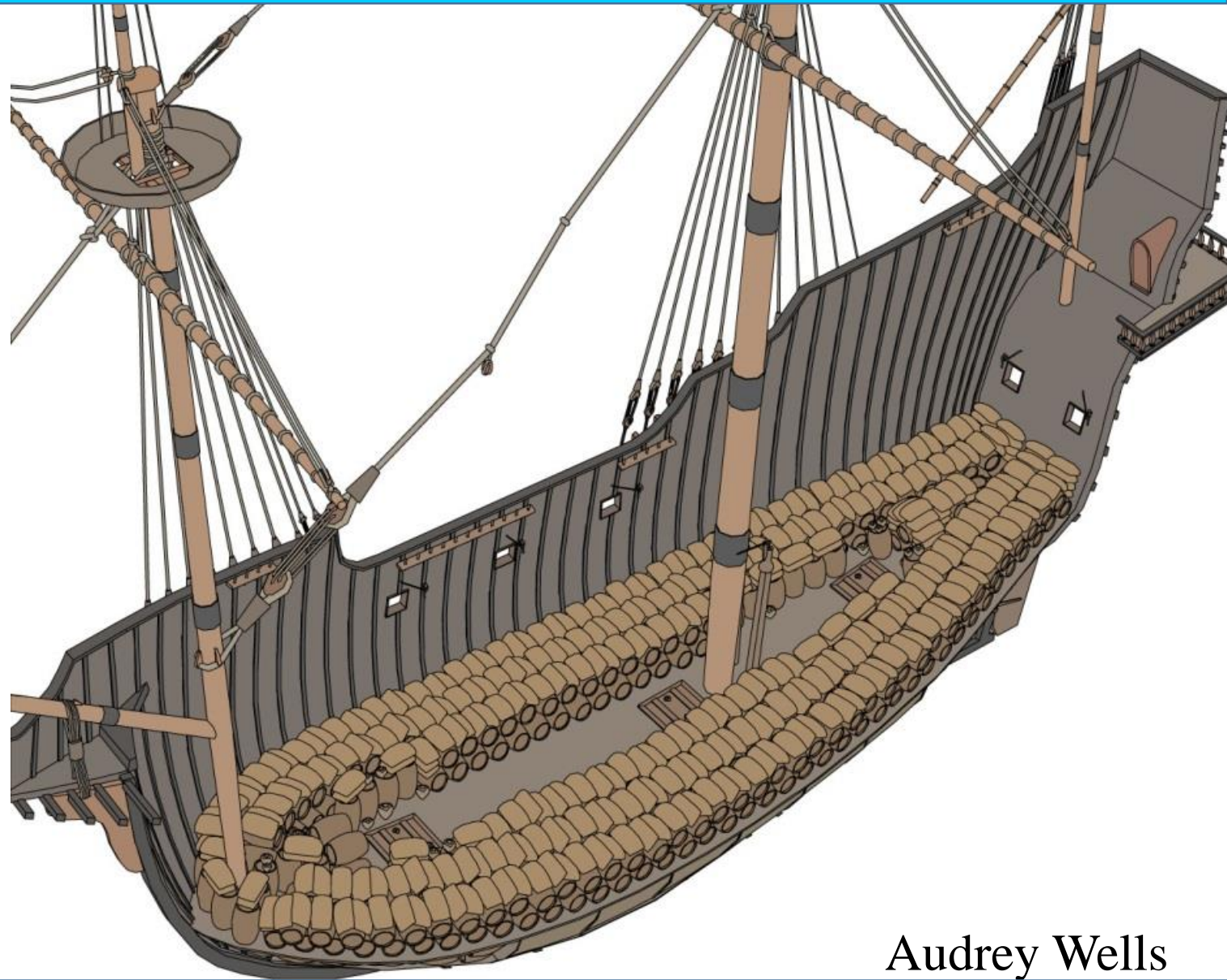




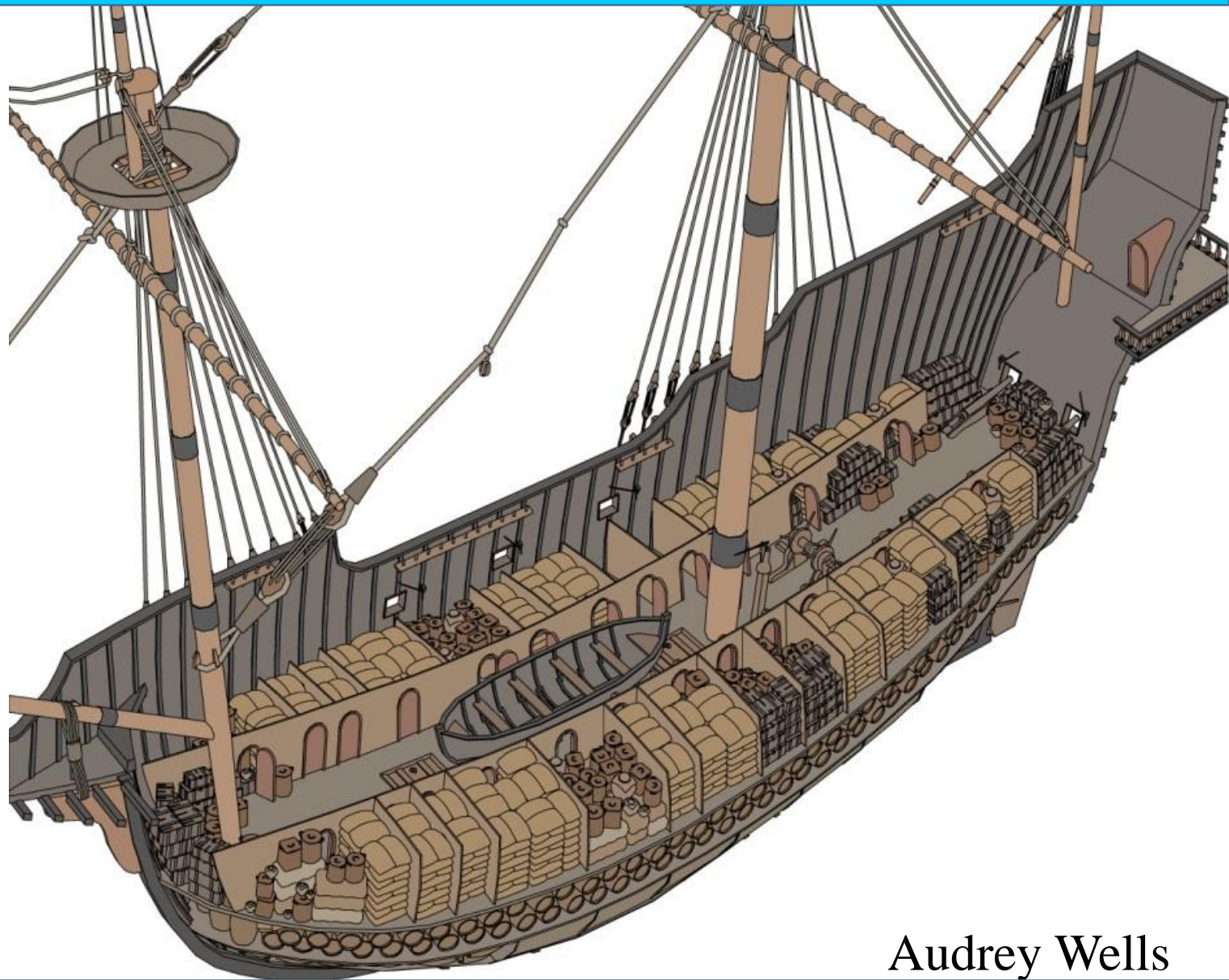




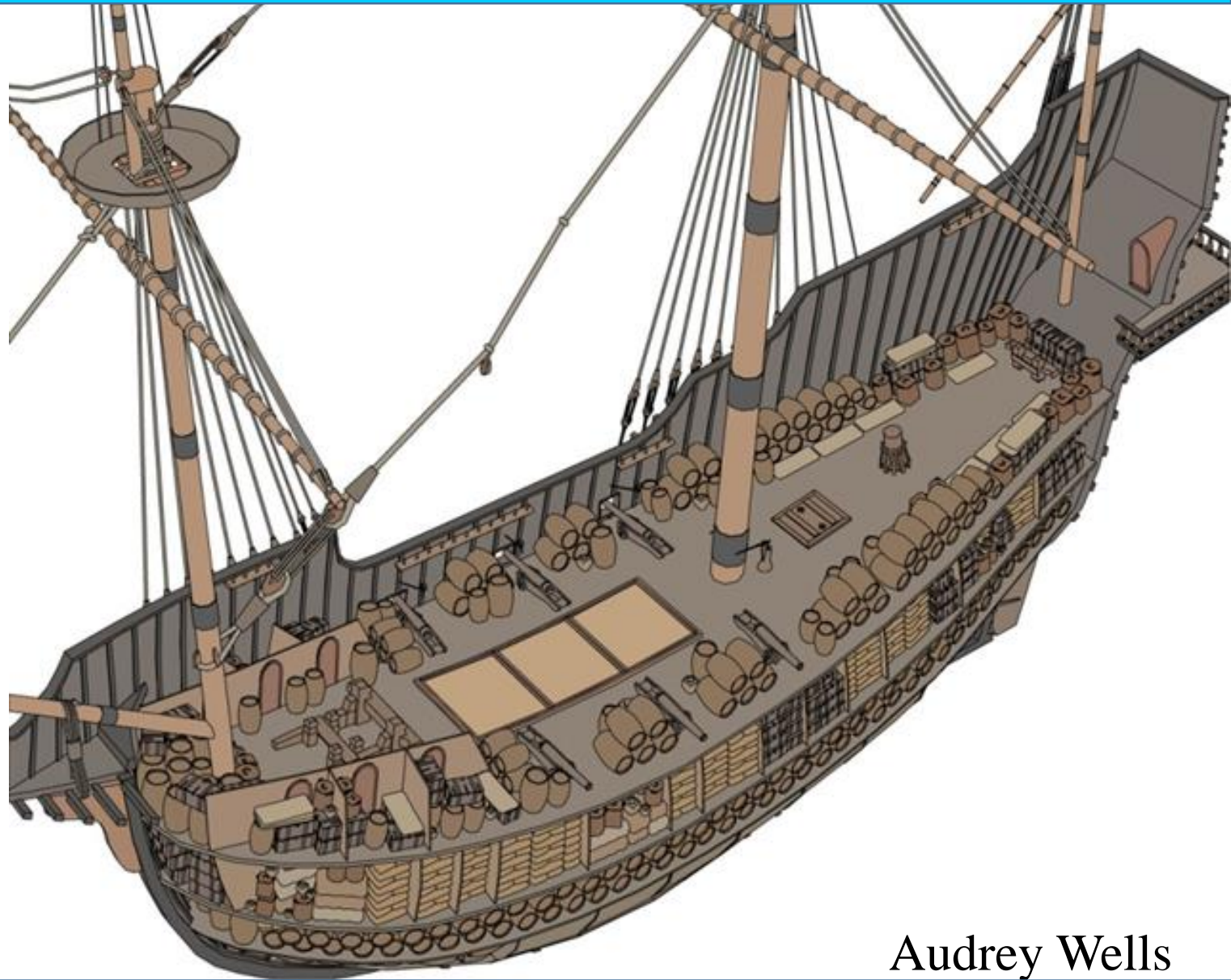
Audrey Wells



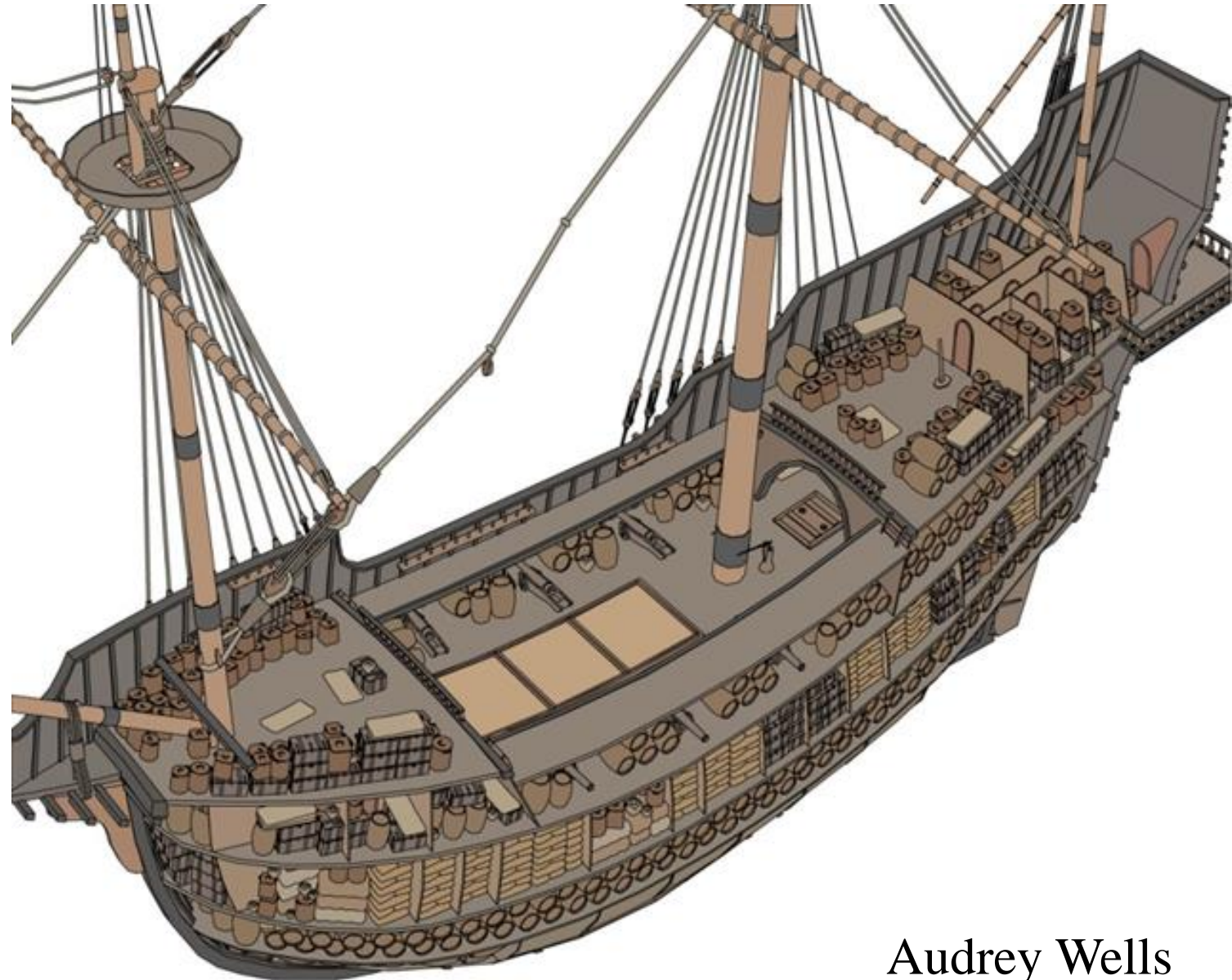
Audrey Wells



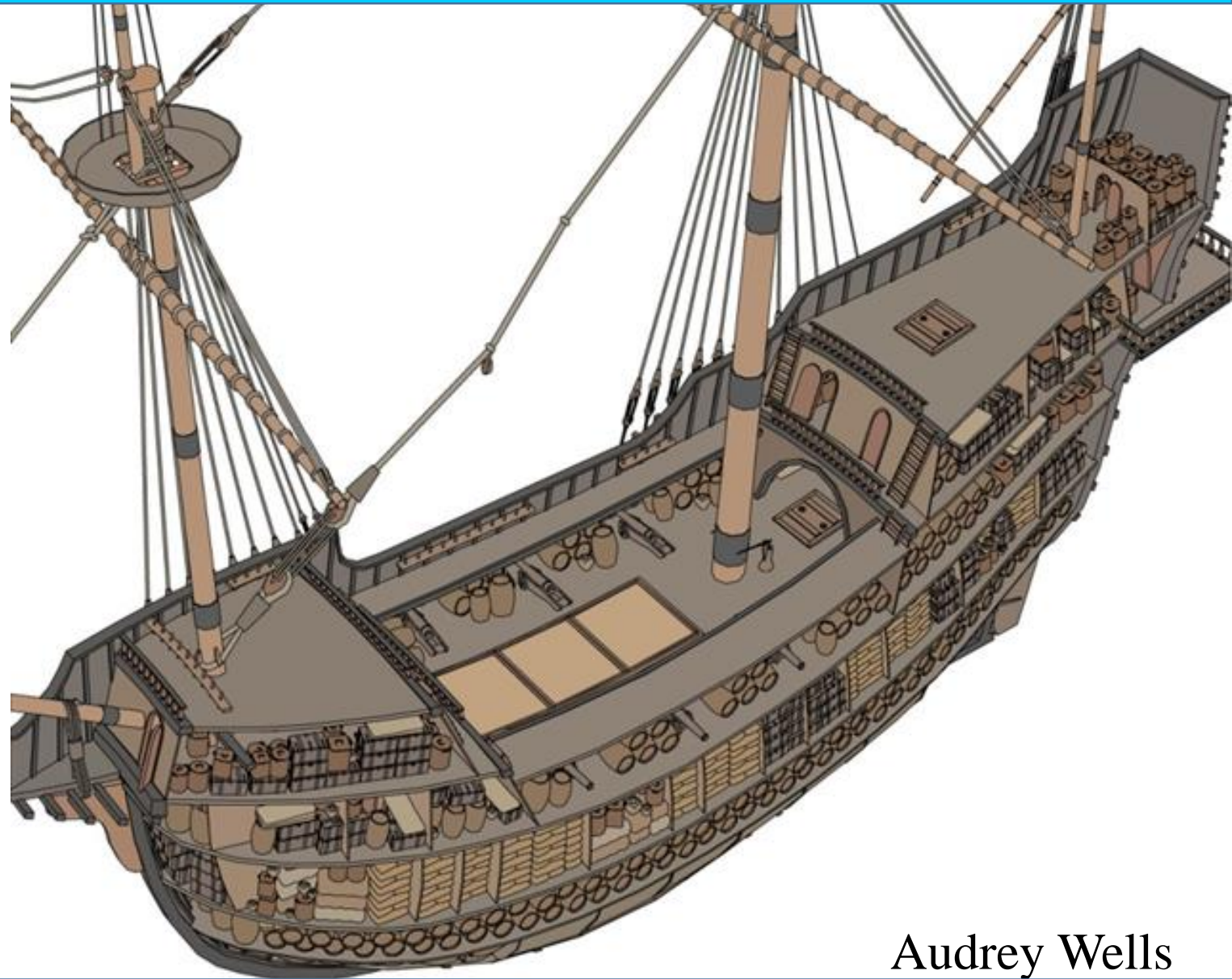
Audrey Wells



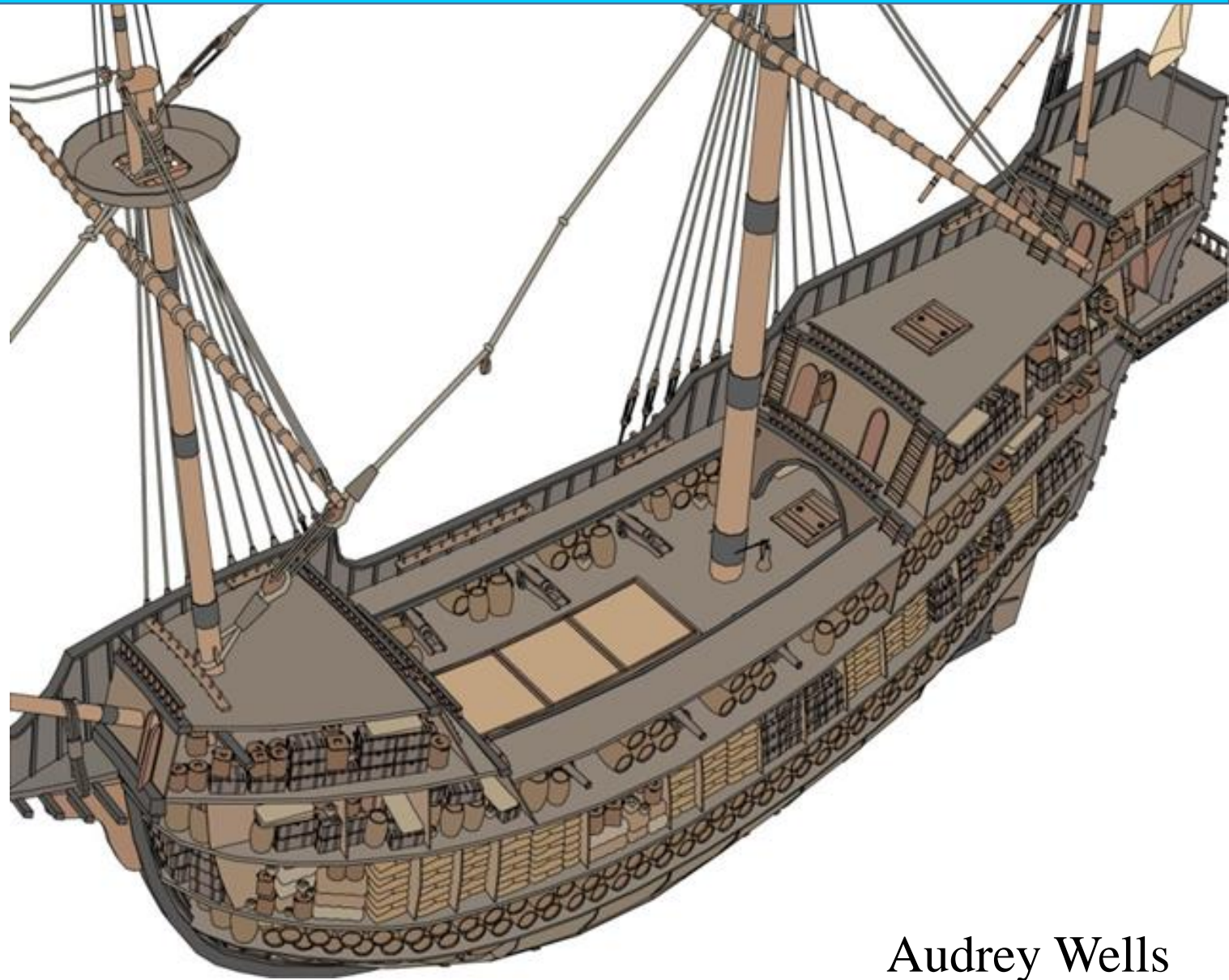
Audrey Wells



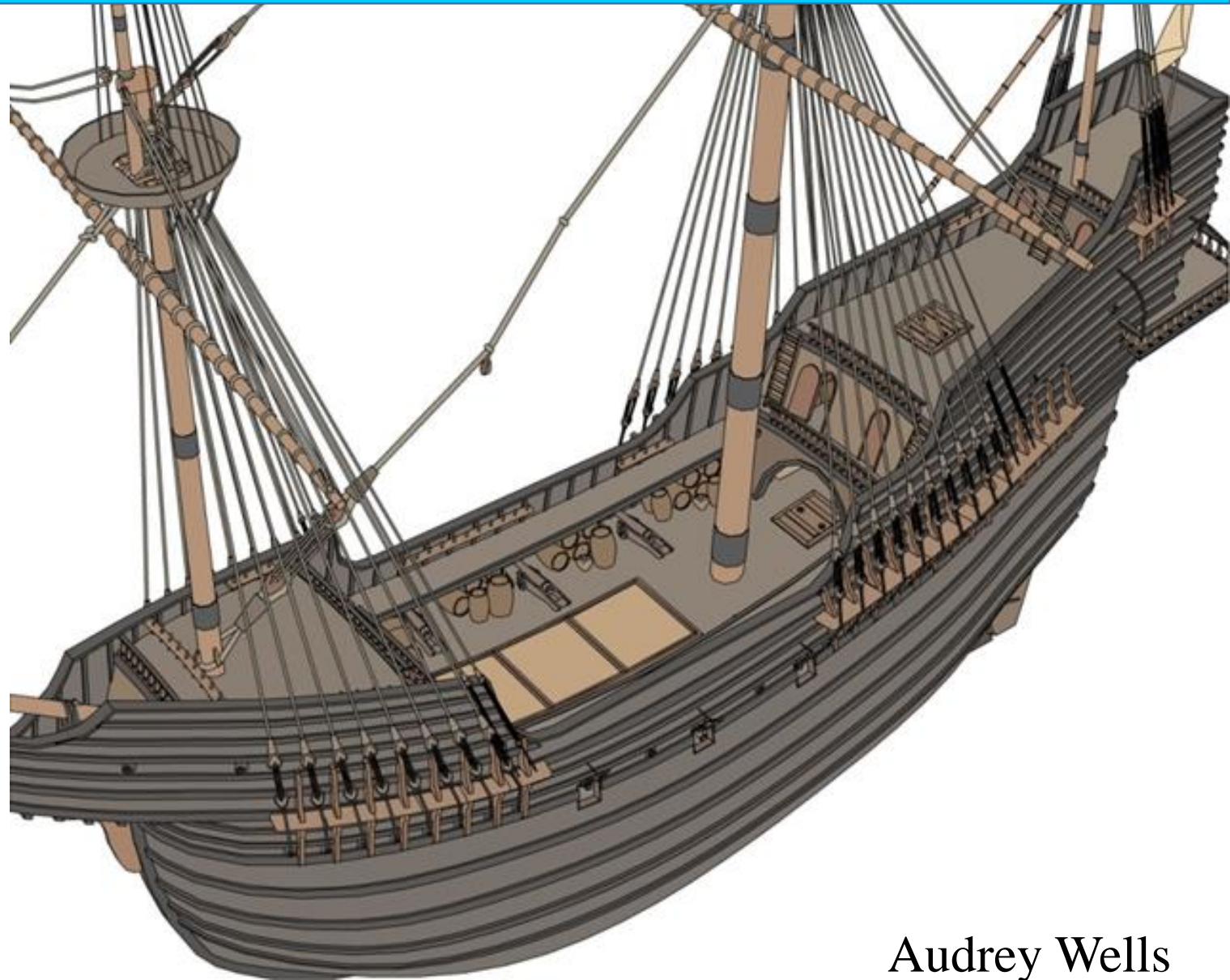
Audrey Wells



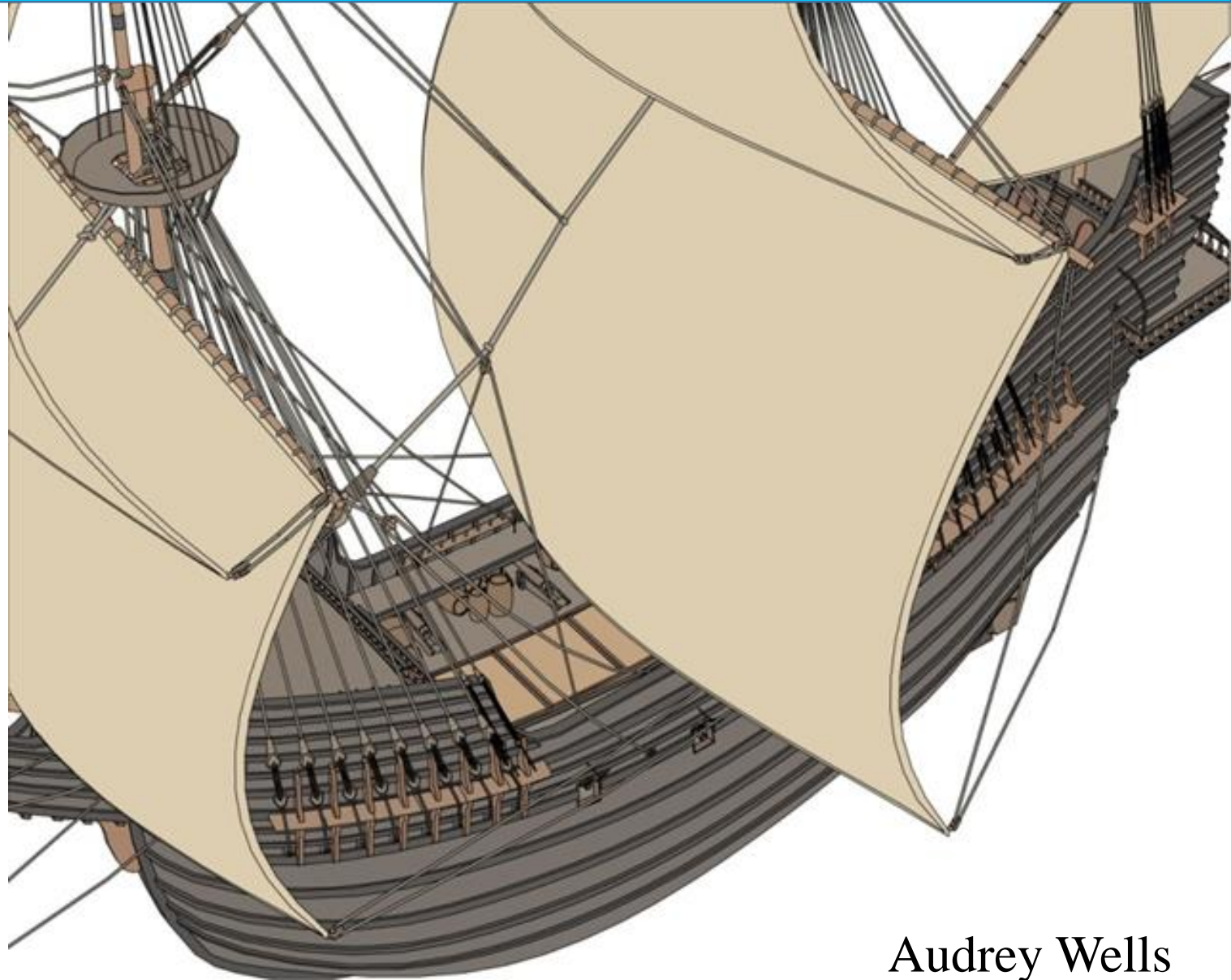
Audrey Wells



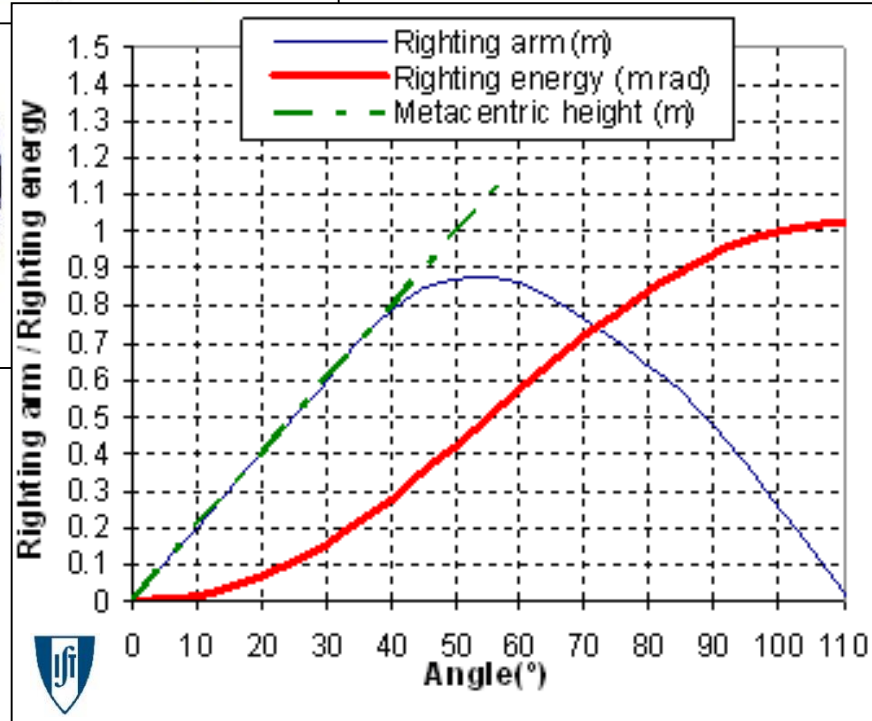
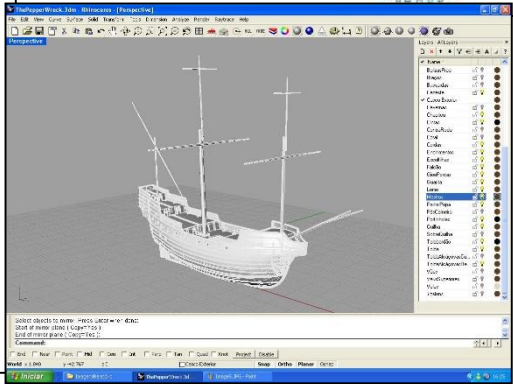
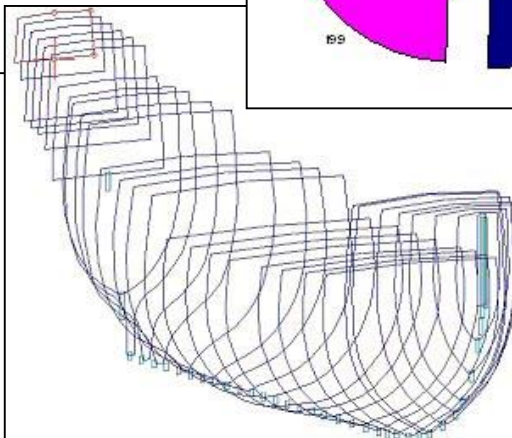
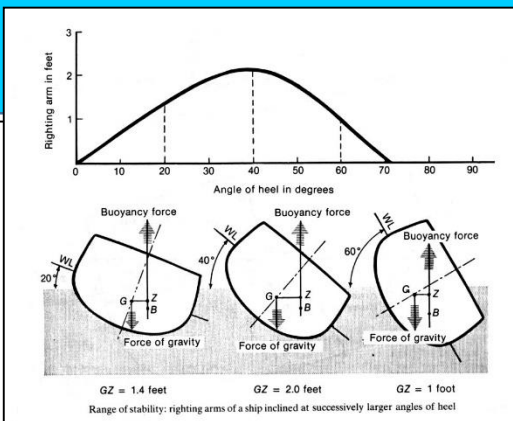
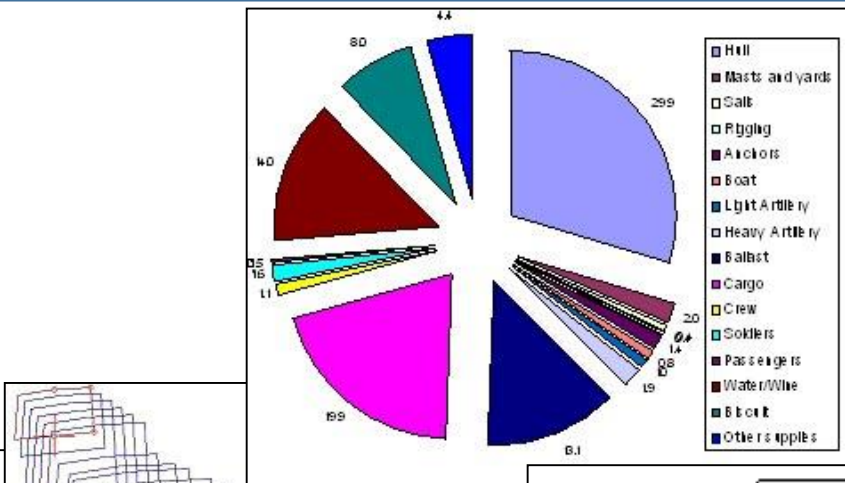
Audrey Wells

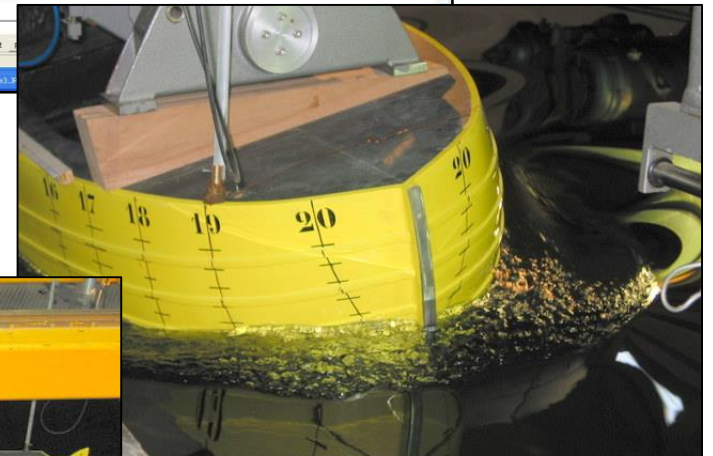
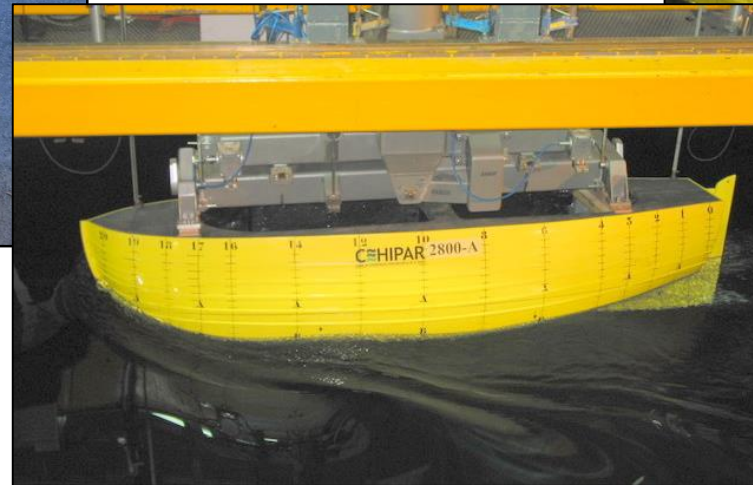
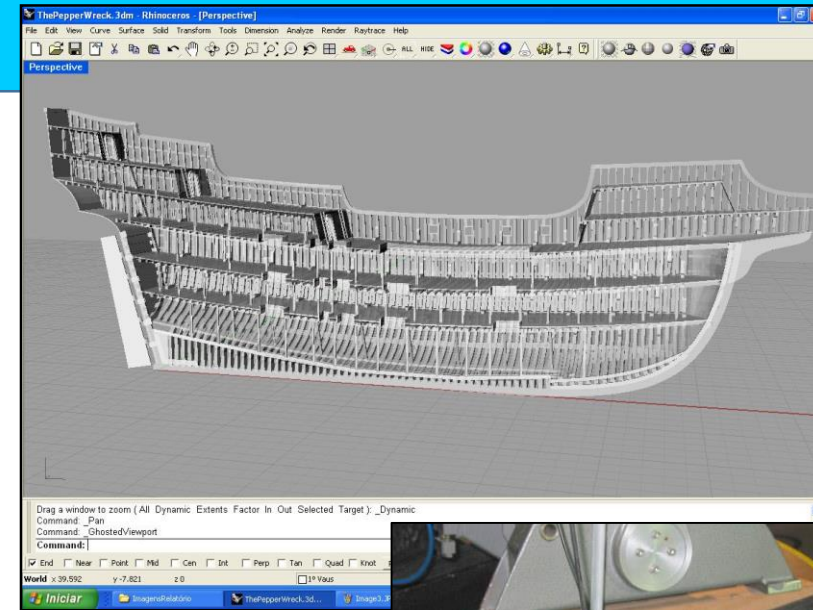
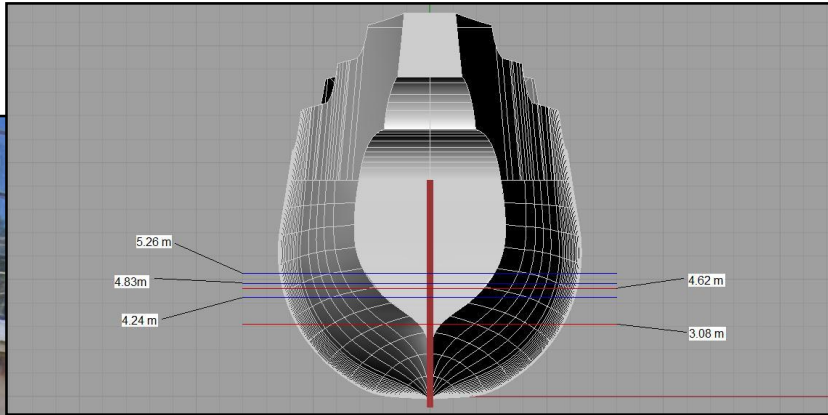
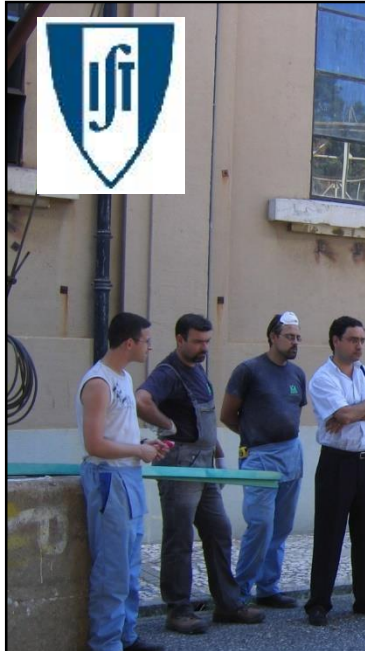


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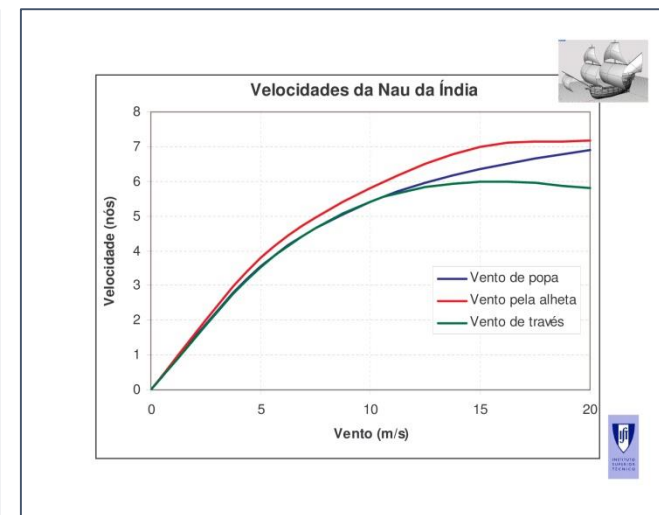
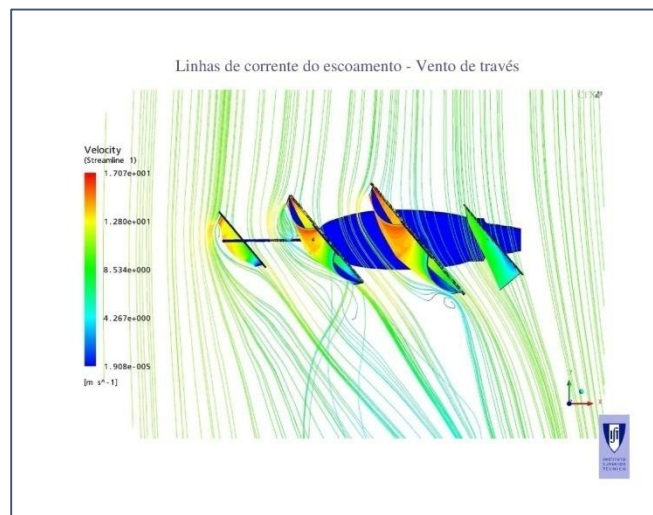
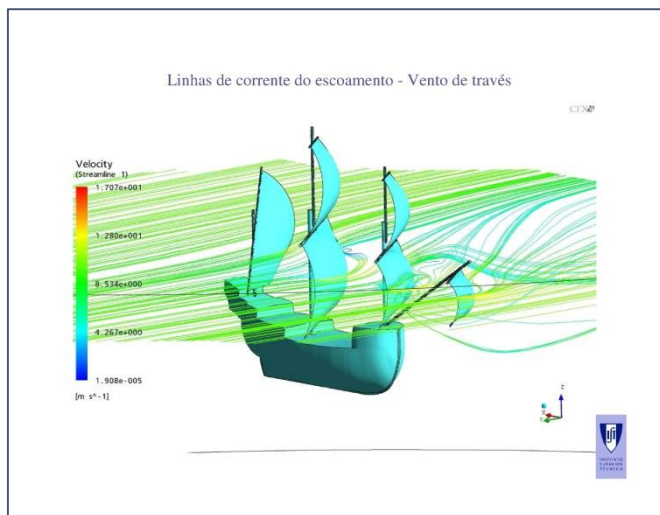
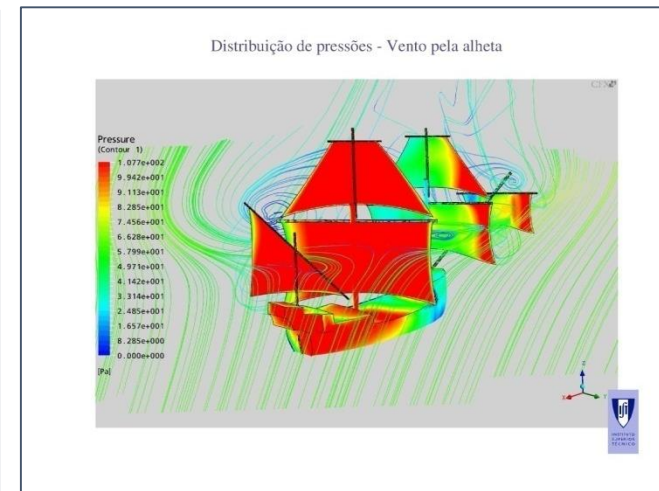
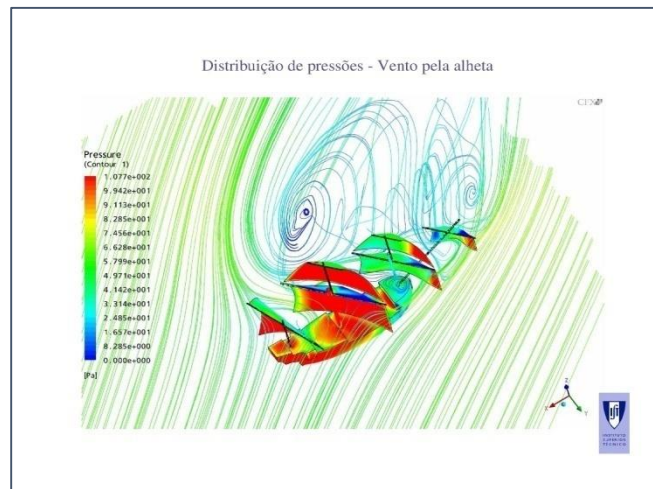
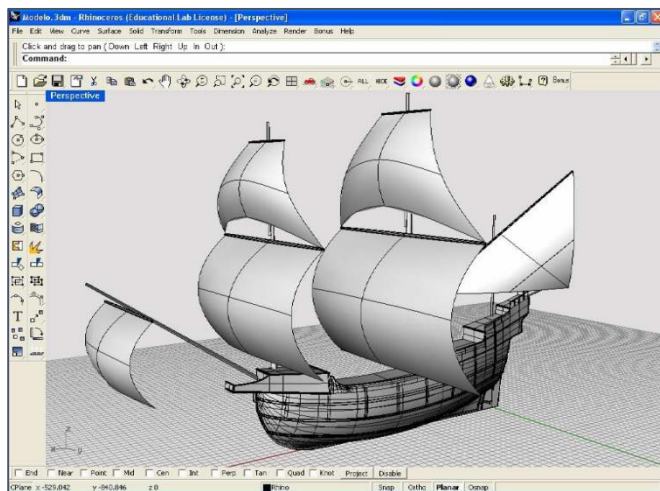
Audrey Wells





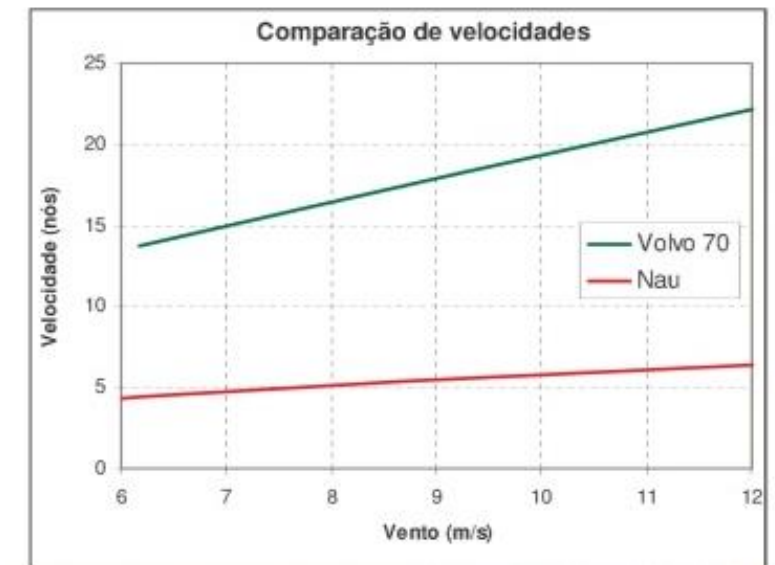
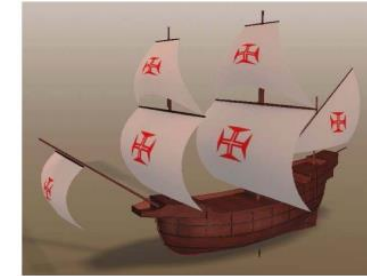
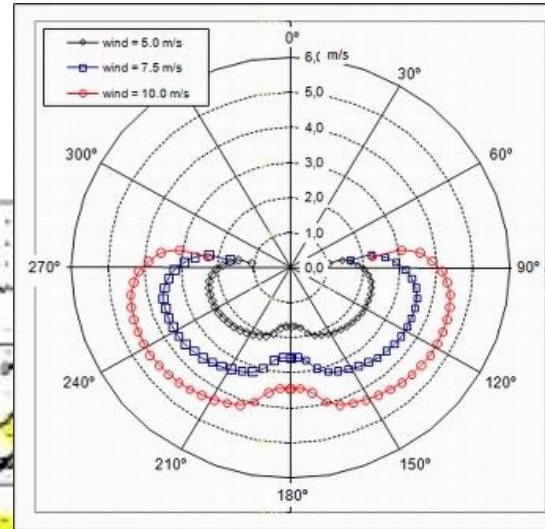
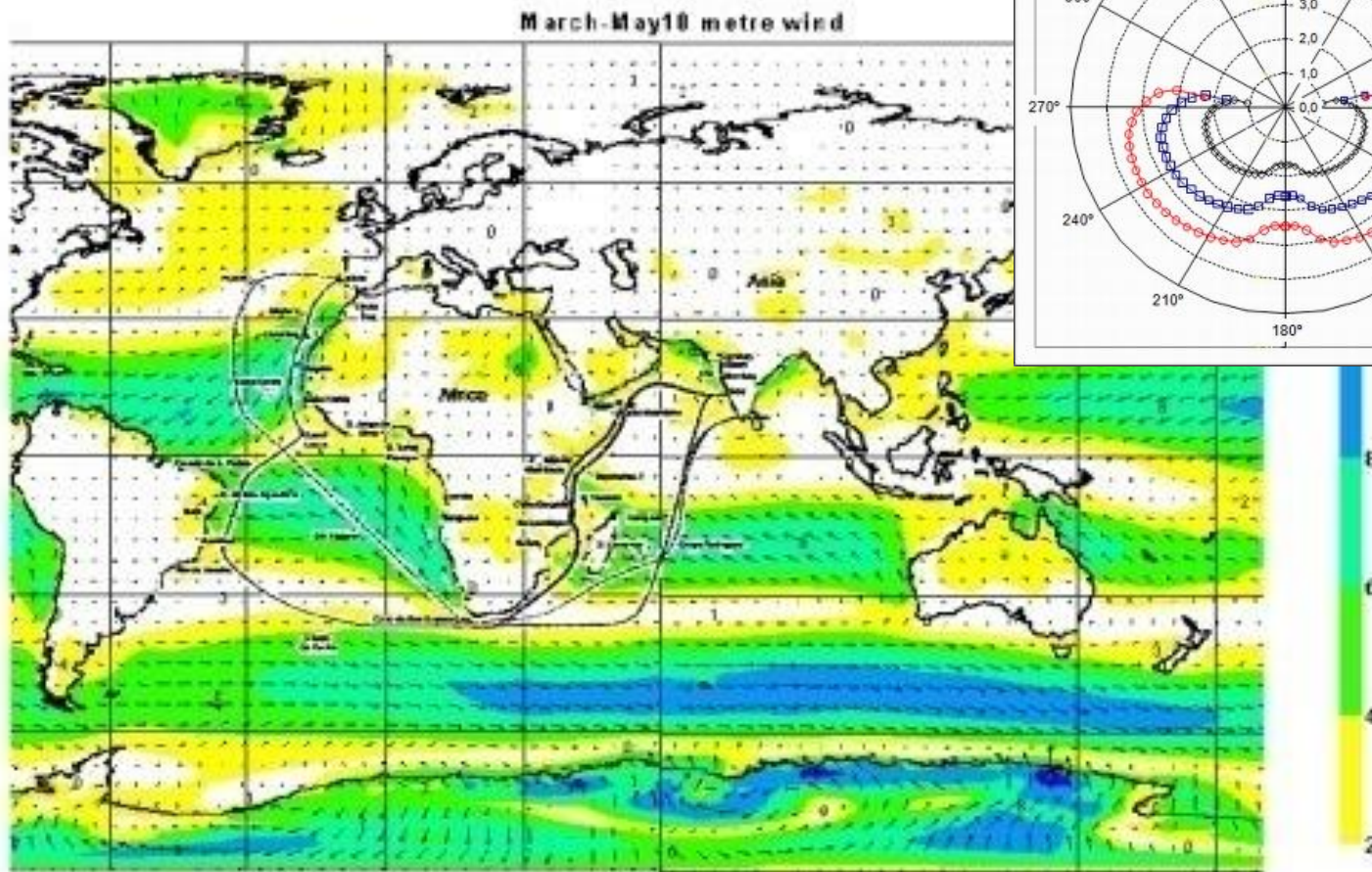


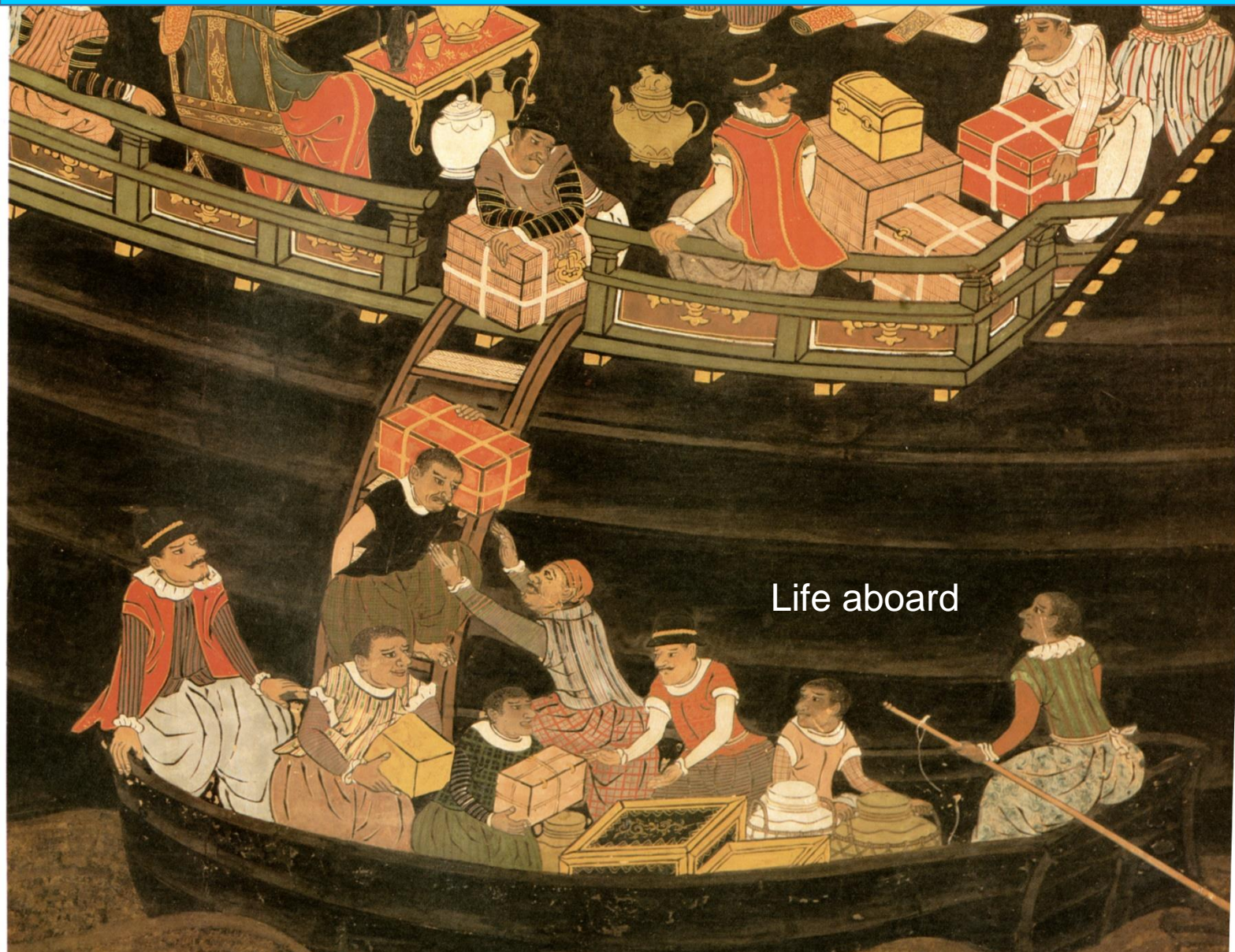
Performance under sail



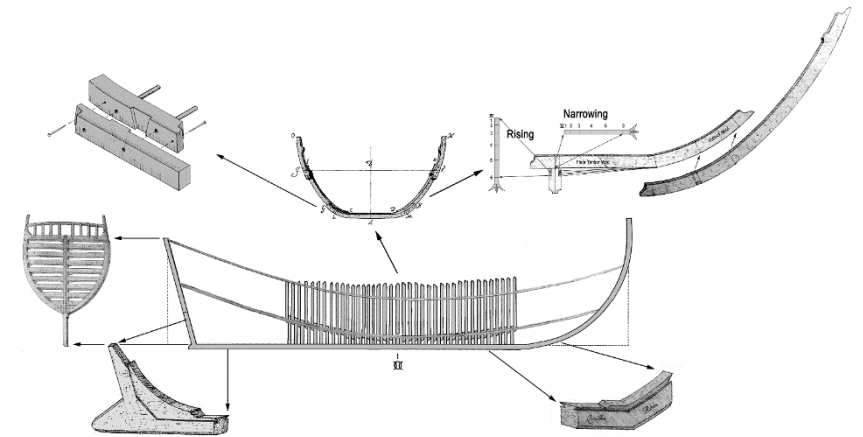
Nuno Fonseca - IST, SAEN

Our model sailed from Lisbon in March and arrived in India six months later, like the historical ships.

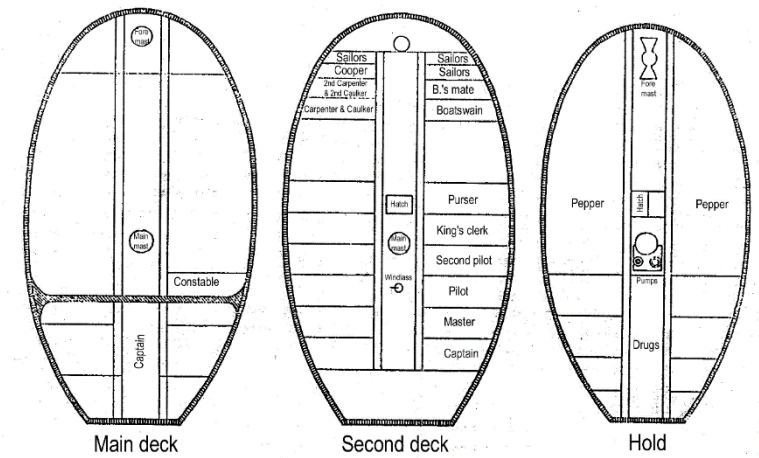




Life aboard



How it was inhabited

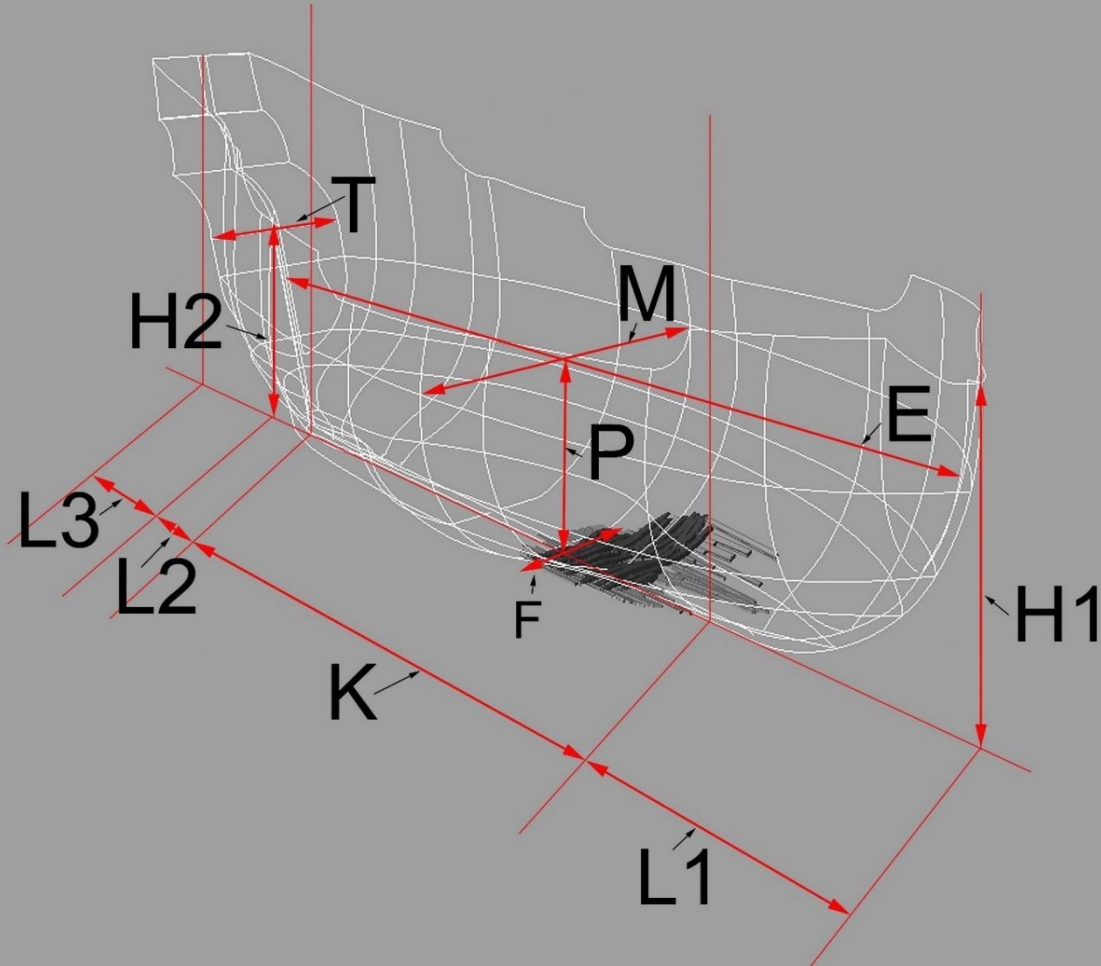
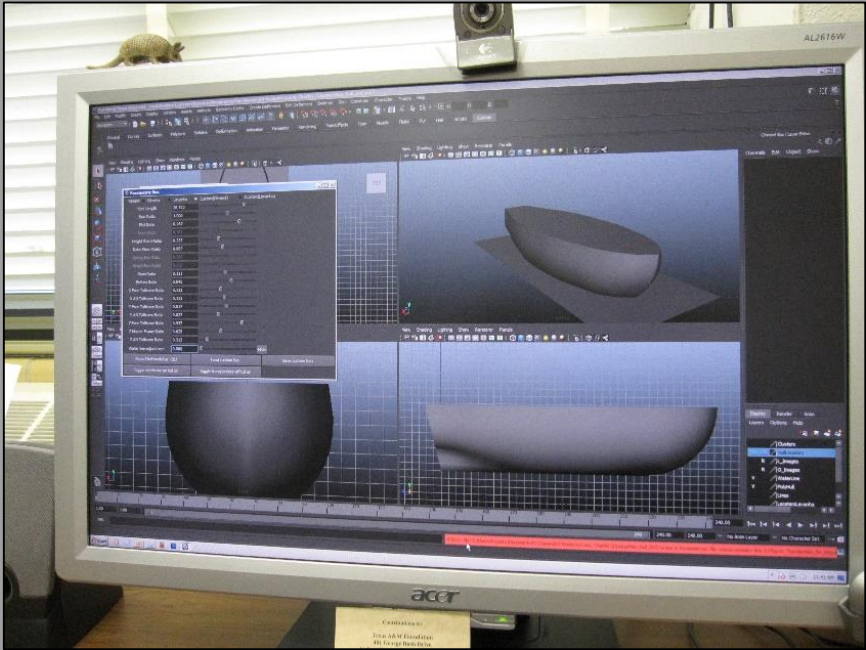


We are far from understanding the boundaries between these ship types and the reasons why Form and function (minus regional idiosyncrasies) are closely associated and tend to converge within cultural areas.



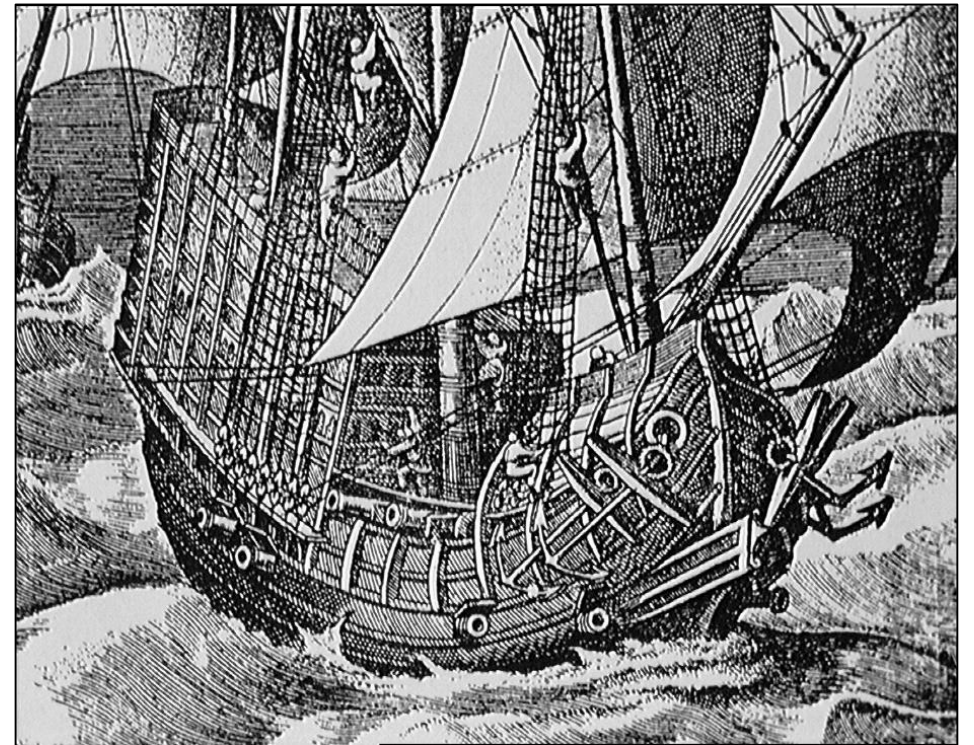
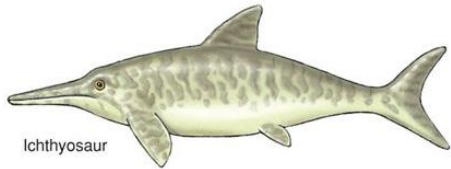
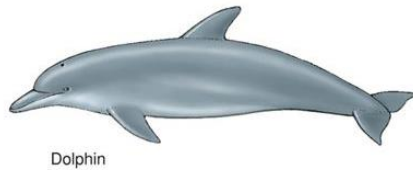
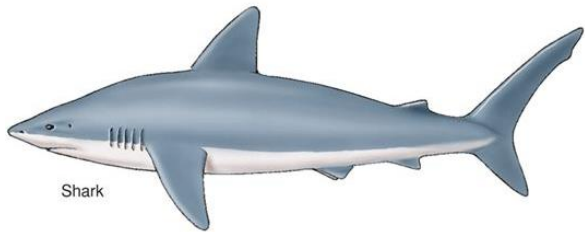
Bernd y Hilla Becher

When we have data about ship's proportions, we see that there are patterns that can be identified and manipulated.



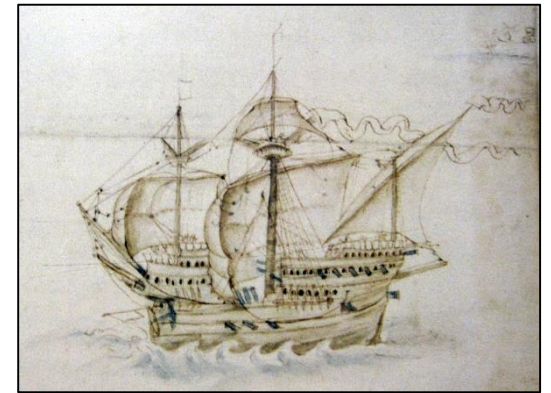
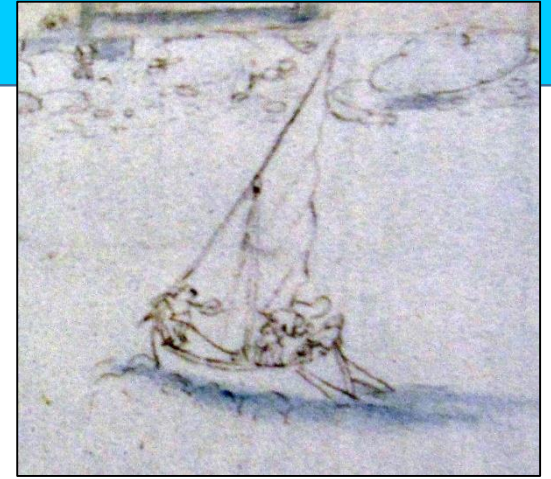
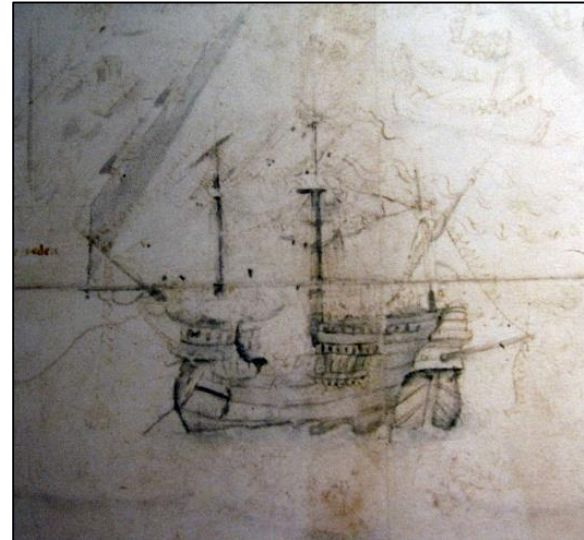
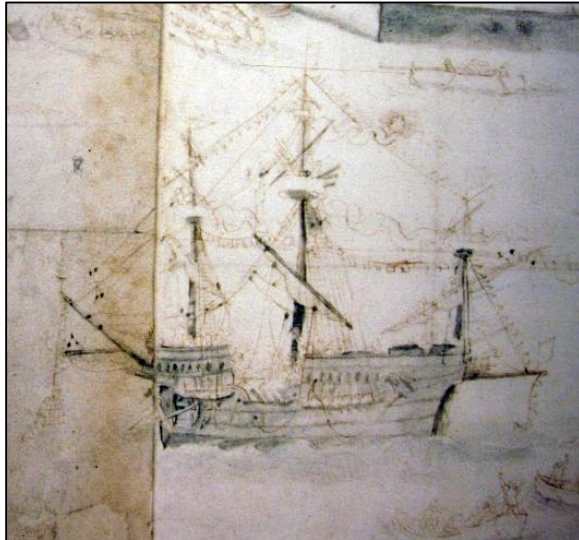
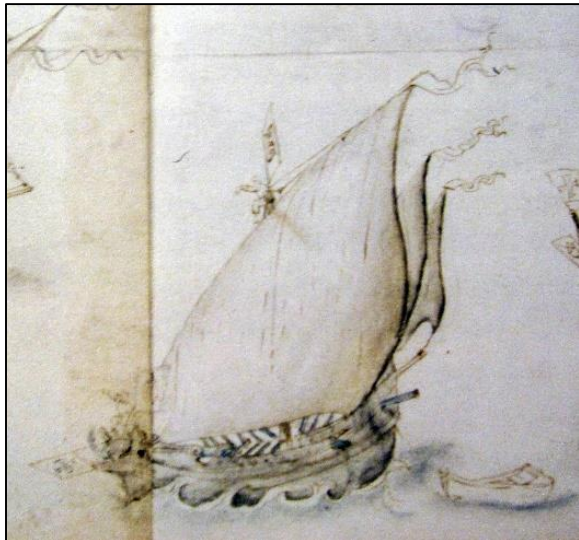
The North Atlantic, Iberian Peninsula, and Mediterranean had distinct shipbuilding traditions, but the 16th century was a century of contact and technological convergence. In the 1570s a Portuguese priest named Fernando Oliveira wrote that *hulks* and *carracks* were the *naus* built in the north and south of Europe.

In biology this is called **convergent evolution**:

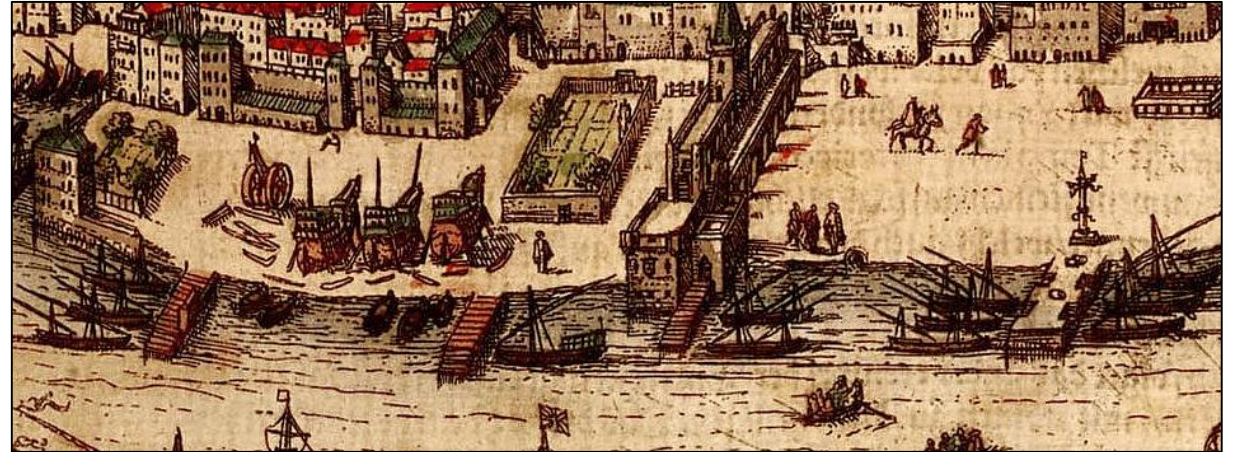


This study entails two parallel investigations:

- a) The study of vernacular shipbuilding in order to better understand ship types;
- b) The study of proportional relations between scantlings and ship sizes.



Built in the nexus of two cultures, Iberian ships are hybrids that incorporate northern and southern construction solutions, adapted to the sea routes of the Americas, Africa, and Asia.



We only have a small sample of the diversity of watercraft that sailed the planet during the 16th and 17th centuries.

Questions?