

# Treatises and Technical Texts on Shipbuilding



## 02.01 Taxonomies – Part 1

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Last edited: June 2020

This course is an overview of a number of western texts and treatises on shipbuilding. It stems from a elective class I originally taught in the Nautical Archaeology Program at Texas A&M University.

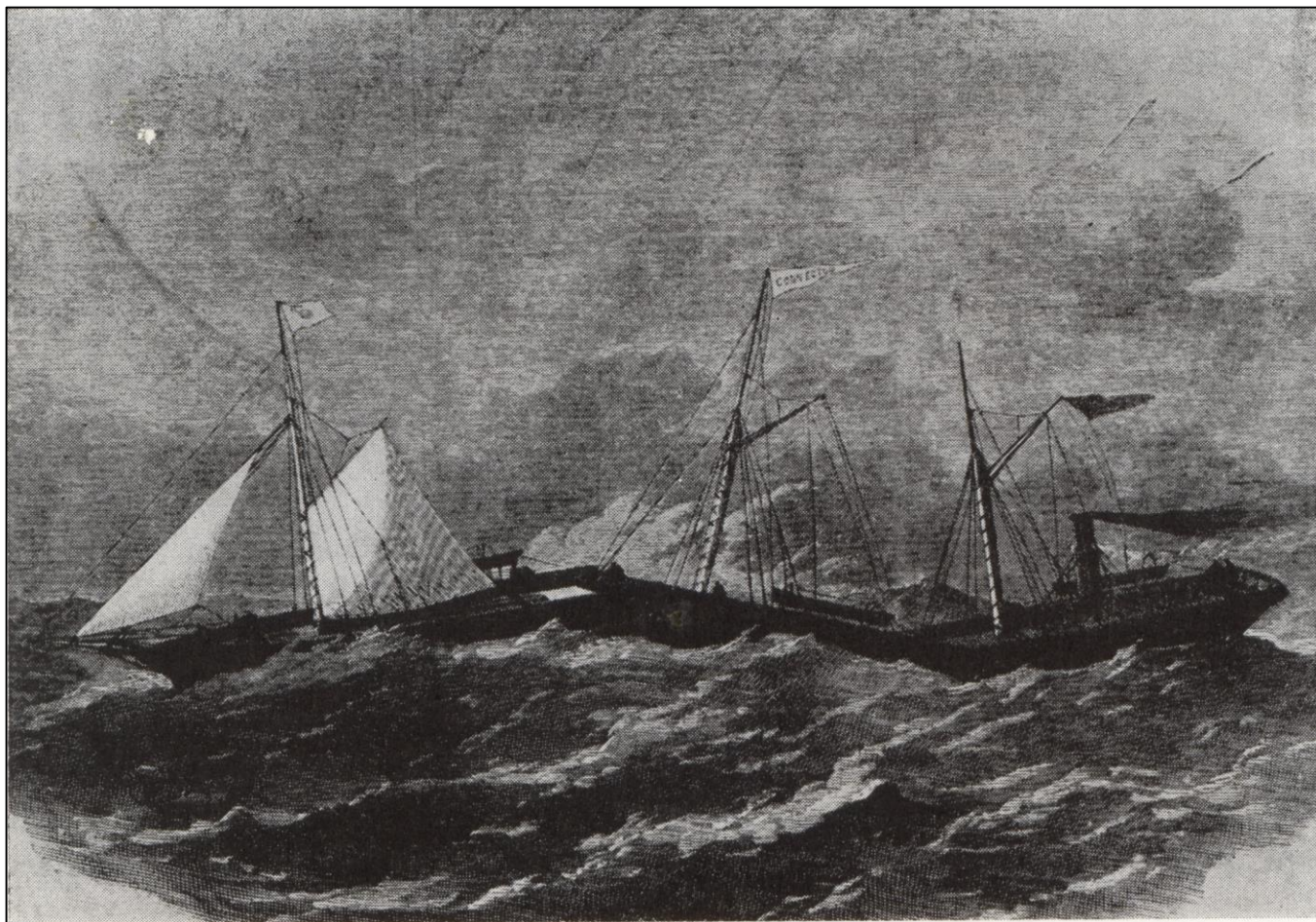
Some of the slides are original, some were taken from students' case studies, and some are new.

I expect these presentations to improve and change, and I welcome any input.

This class is organized by countries and chronologically. The first presentations are an introduction to the theme.



<http://blog.douglasbrooksboatbuilding.com/2018/>



**Taxonomies:**  
Dick Steffy,  
Eric Rieth,  
Sean McGrail,  
C. Hasslöf,  
Lucien Bash,  
Fred Hocker,  
Basil Greenhill,  
Patrice Pomey, and  
Piero Dell' Amico.



## **A. J. Richard Steffy**

Cargo carriers, warships, fishing craft, utility craft.

## **B. Sean McGrail**

Floats, Rafts, Boats;

## **C. Eric Rieth**

Floats, Rafts, Boats (dugouts, extended dugouts, assembled craft);

## **D. Hasslöf / Lucien Bash**

Shell-first, skeleton-first, things in between;

## **E. Lucien Bash / Fred Hocker**

Shell-first, skeleton-first, Bottom-first;

## **F. Basil Greenhill**

Rafts, Skin boats, Bark boats, Dugouts

## **G. Patrice Pomey**

Conception, Structural Principle, Construction Sequence;

## **H. Piero Dell'Amico**

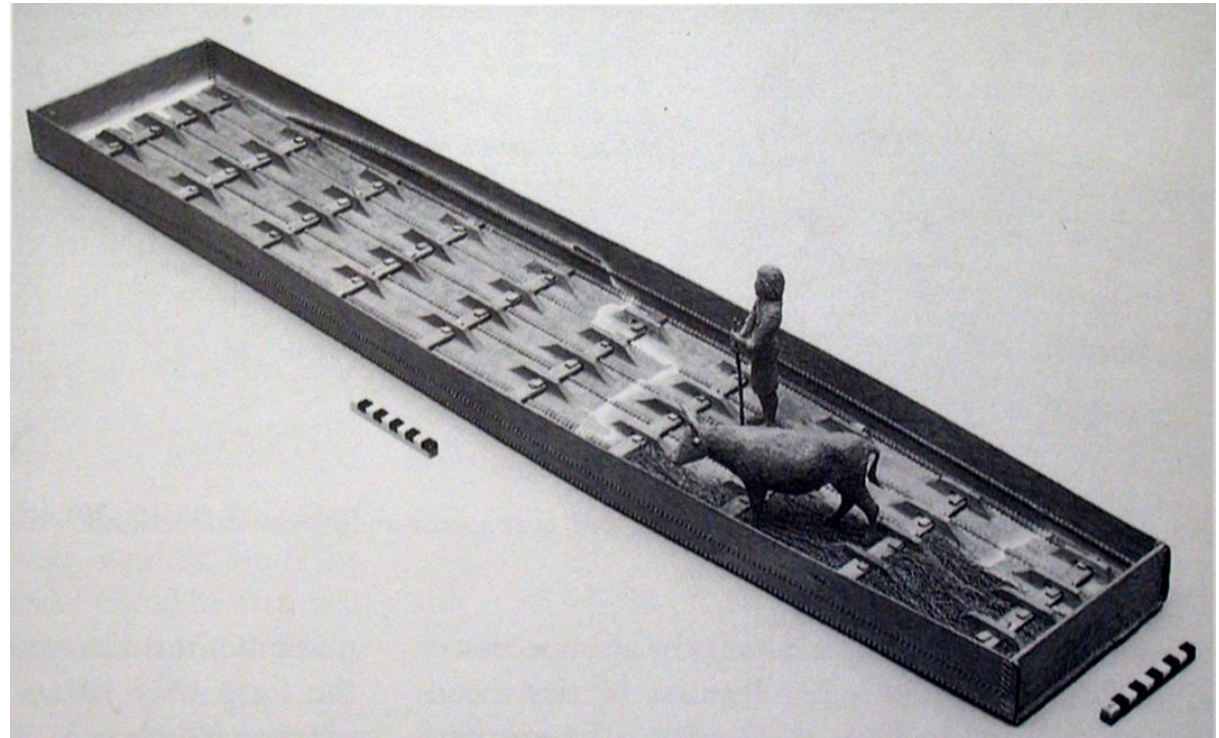
Oral tradition, Partially geometric methods, Geometric methods.

1. Cargo carriers,
2. Warships,
3. Fishing craft,
4. Utility craft.



<https://news.usni.org/2015/01/30/unique-ships-u-s-navy>

1. Cargo carriers: boxes, the ends are the price one has to pay to sail them; size is the most important feature; there are many trade offs (Venetian great galleys).





2. Warships: gun platforms, stability, sturdiness, speed, maneuverability.



3. Fishing craft: adaptation to the fishing techniques; as many examples as fishing communities.



4. Utility craft: diverse, cheap, good for experiments and introduction of new technologies.



A

Figure 10.1 Five stages in the building of a curach or *navog* in Co. Kerry. (Photos: National Museum of Ireland.)



## Irish *curach*



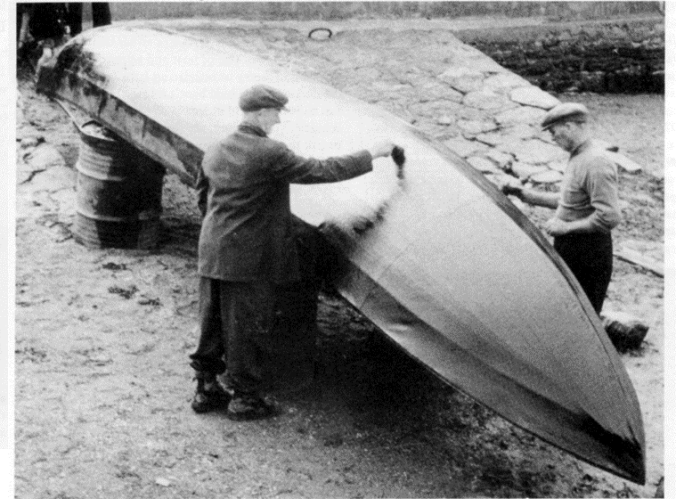
B



D



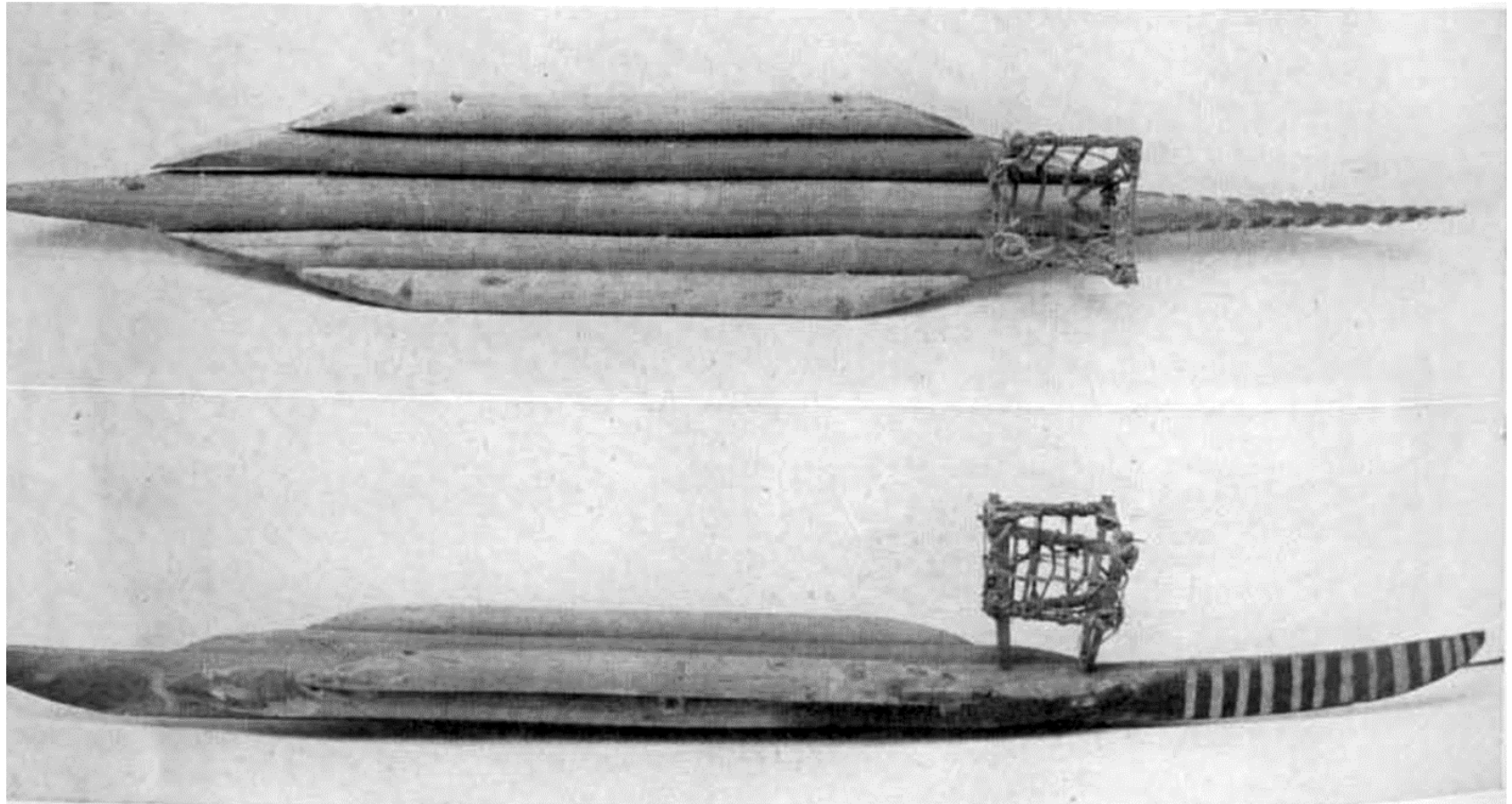
C



E



Log catamaran from the Solomon Islands boat:



## Ambatch canoe from Kenya:



## Bengal Boat:





1. Floats
2. Rafts
3. Boats



<https://www.caymancompass.com/2015/01/19/surfers-tell-of-cuban-migrants-rescue/>



Bouyancy applied:

1. Directly (on men): Floats.



Bouyancy applied:

2. Indirectly:

2.1. From individual elements: Rafts

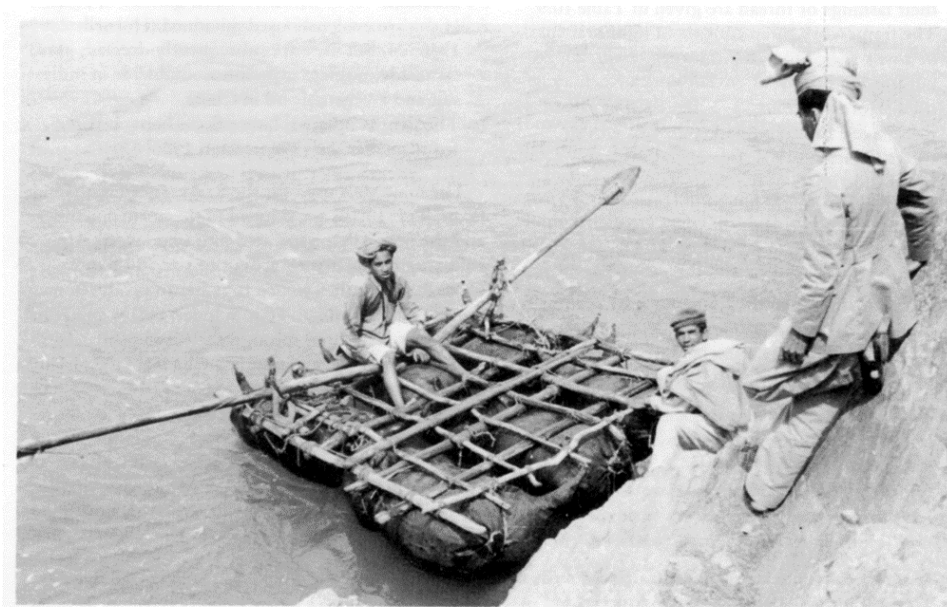
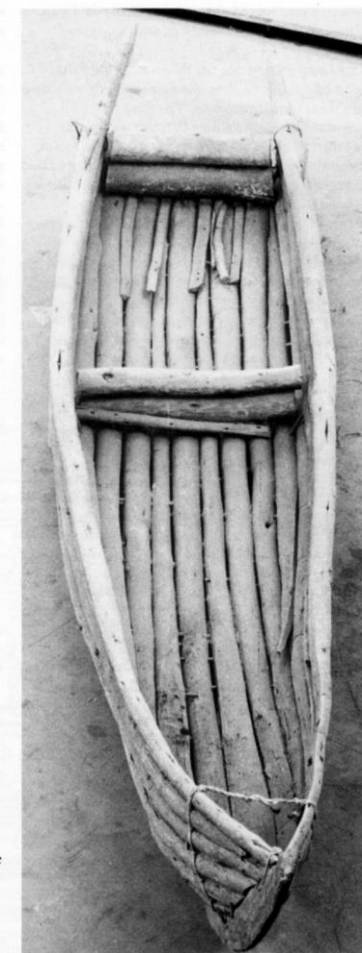


Figure 10.11 A twentieth-century hide float raft on the River Swat, northern Pakistan. (Photo: Basil Greenhill.)

Bouyancy applied:

2. Indirectly:

2.1. From individual elements: Rafts



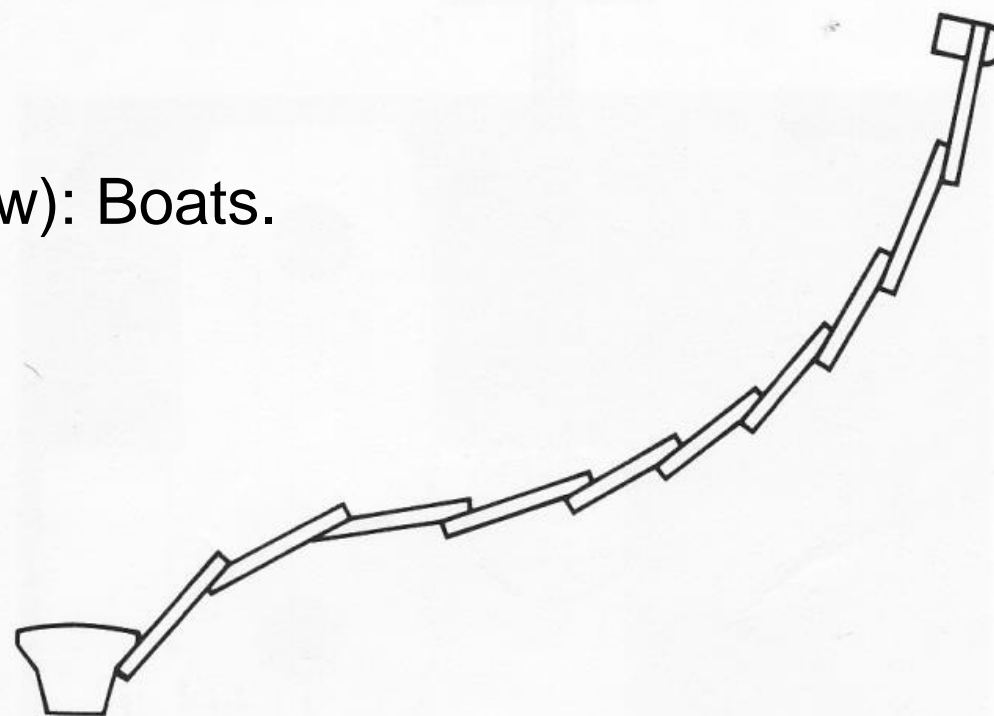
*Figure 5.2* A boat-shaped log raft from Lobito Bay, Angola. (Photo: NMM Greenwich.)

Bouyancy applied:

2. Indirectly:

2.2. From whole vessel (hollow): Boats.

2.2.1. Watertight shell;



*Figure 8.3* Half-section of a clinker-built boat showing how the required section is obtained by varying the angle of bevel along the upper (and sometimes lower) edge of the planking. After McKee, 1983.

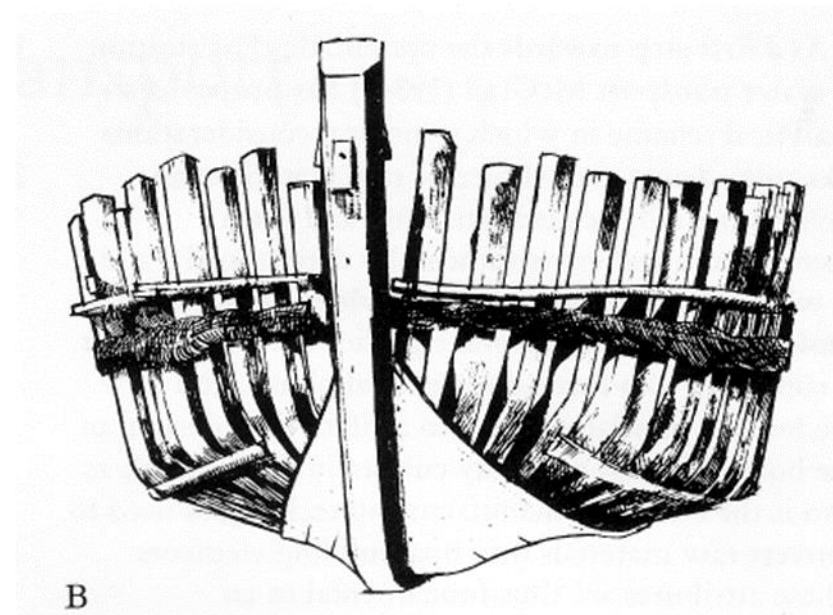


Bouyancy applied:

2. Indirectly:

2.2. From whole vessel (hollow): Boats.

2.2.2. Water-proofed frame.



## Planking: Edge-joining

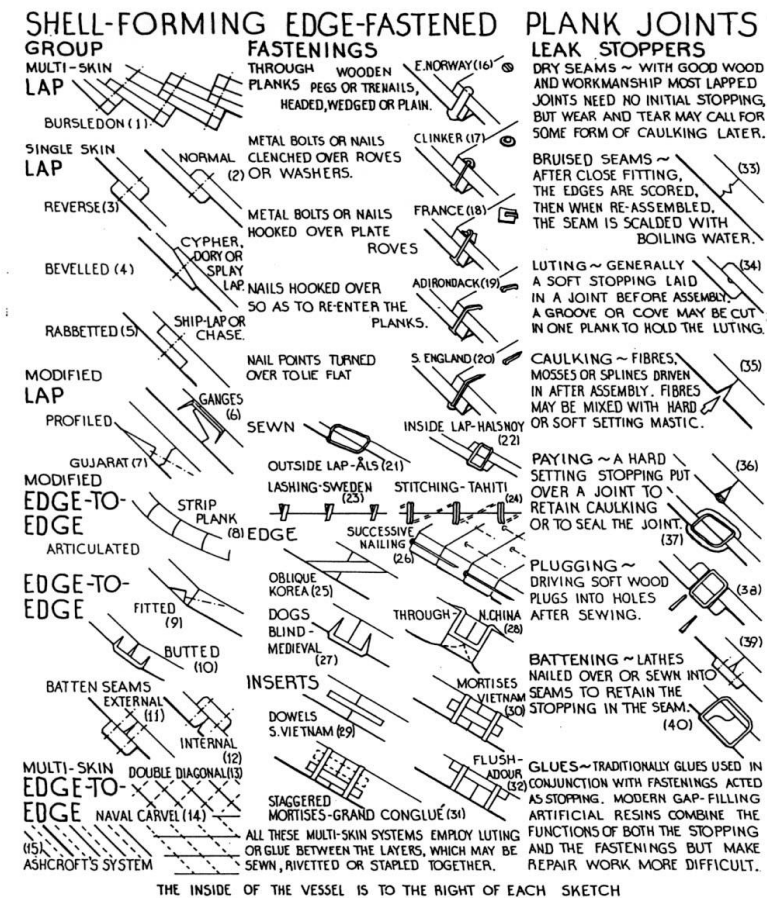


Figure 26 Some different kinds of edge-joining.

Eric McKee

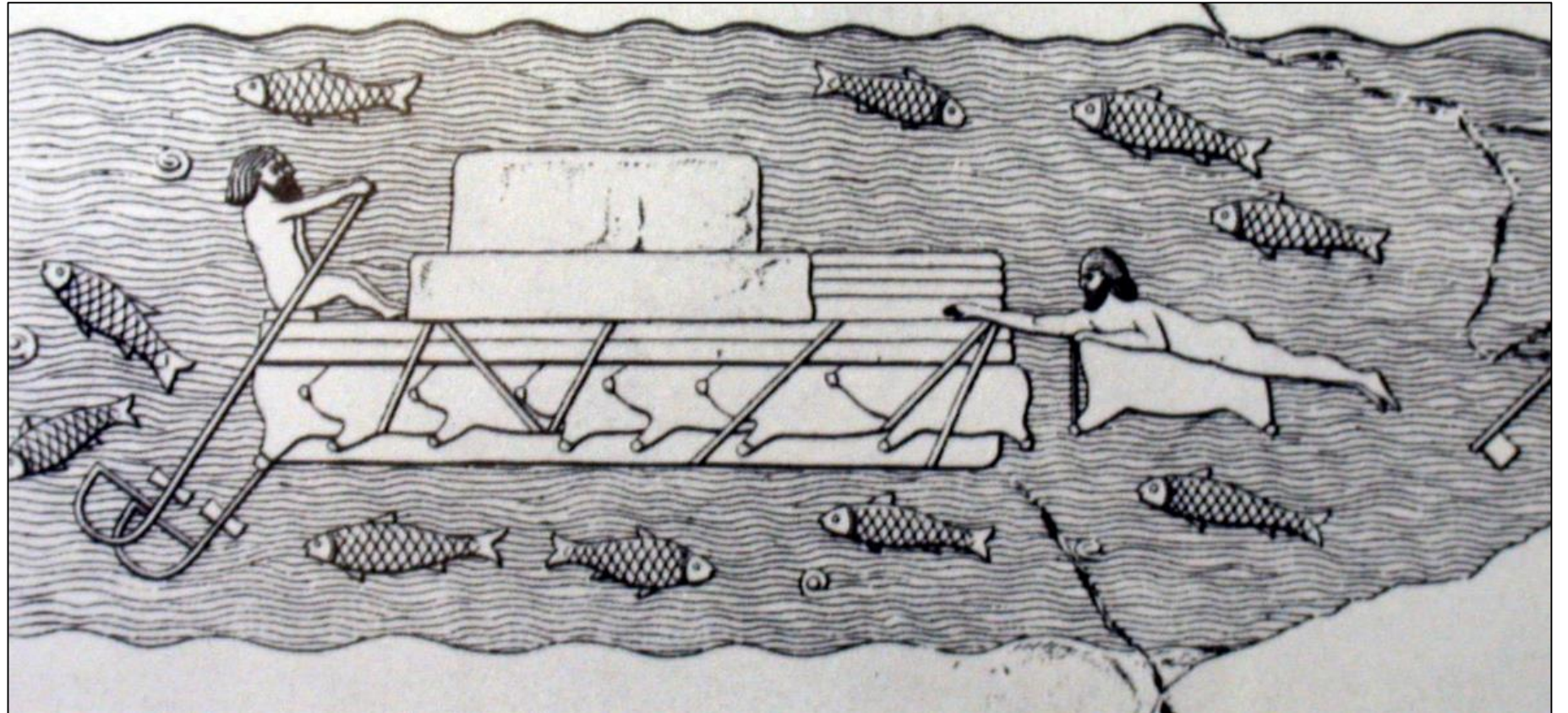
1. Floats,
2. Rafts,
3. Boats:
  - 3.1. Dugouts,
  - 3.2. Extended dugouts,
  - 3.3. Assembled craft.



<https://offgridquest.com/diy/homemade-boats-you-can-make-yourself?start=3>



## 1. Floats





## 1. Floats



Ox-Hide  
Ravi River  
Kashmir

## 1. Floats

### Tandem floats, India

Inverted pots



Tin cans





## 2. Rafts

<http://blog.douglasbrooksboatbuilding.com/2018/>

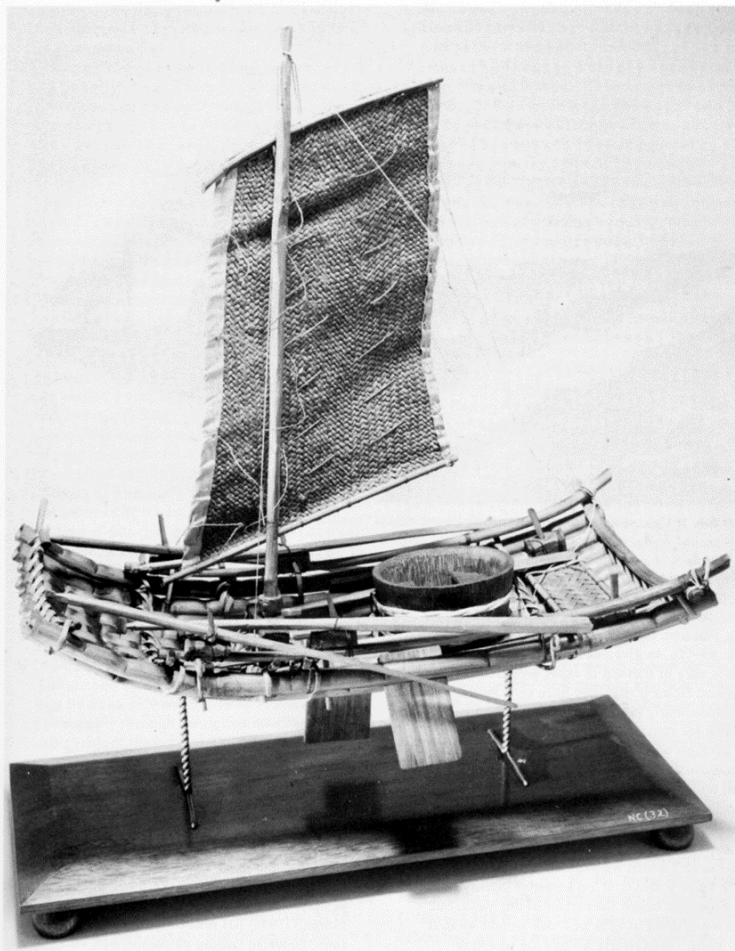


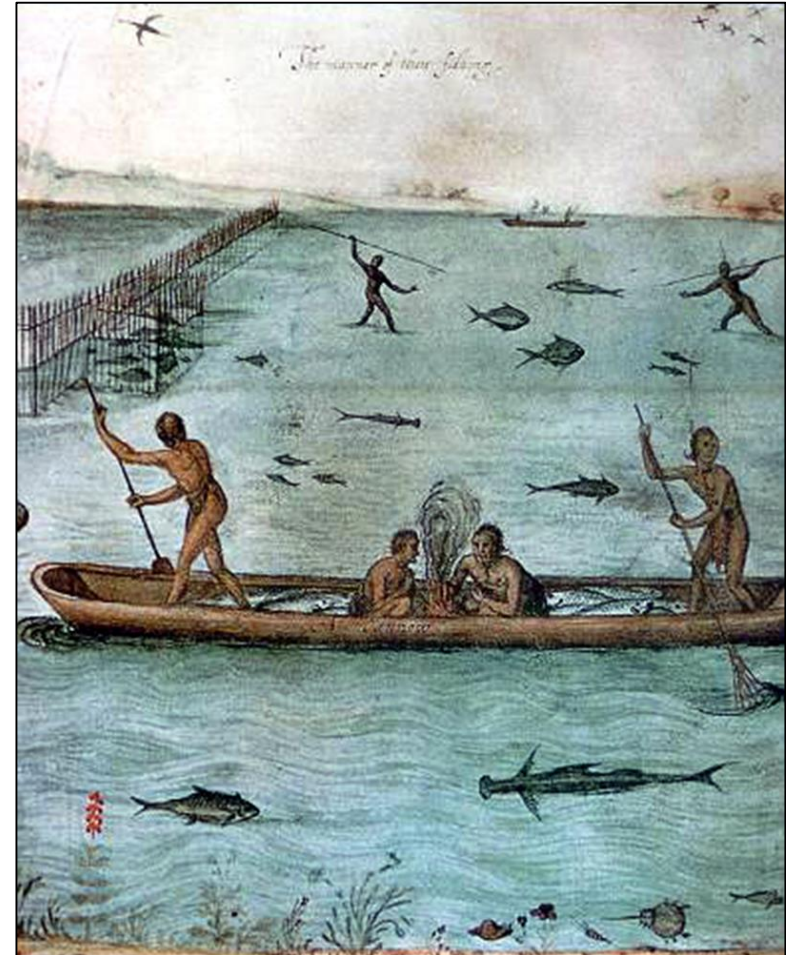
Figure 5.3 Model of a log raft from Taiwan (Formosa). (Photo: NMM Greenwich.)





### 3. Boats:

#### 3.1. Dugouts,





3. Boats:  
3.2. Extended dugouts,

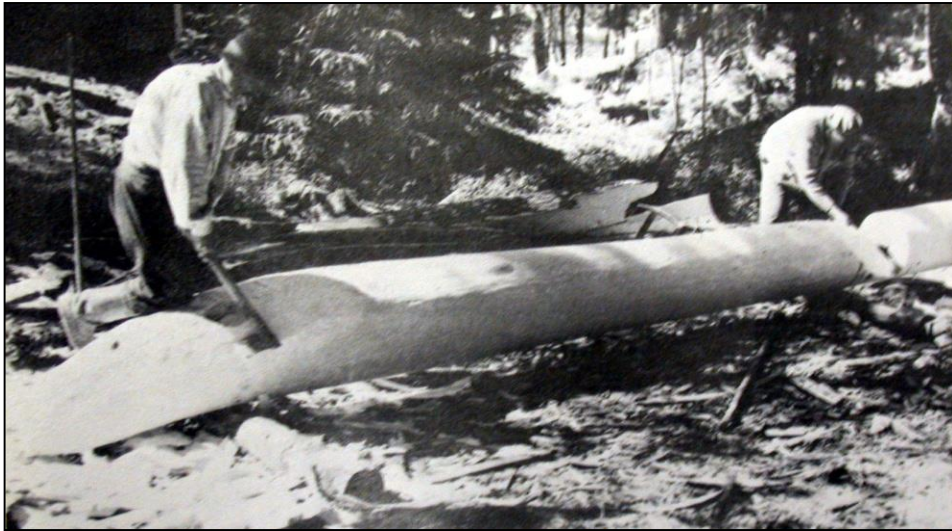


1



2

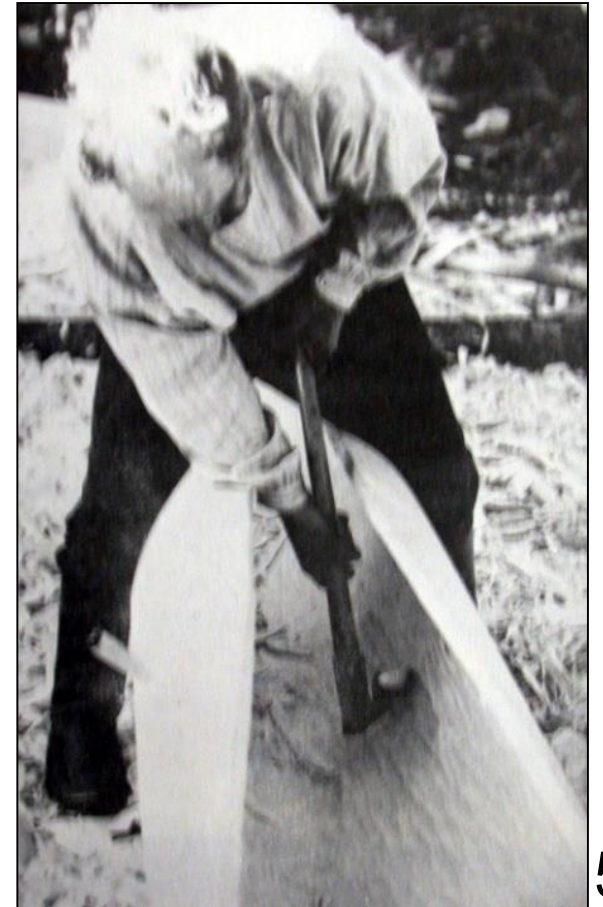
## 3. Boats: 3.2. Extended dugouts,



3



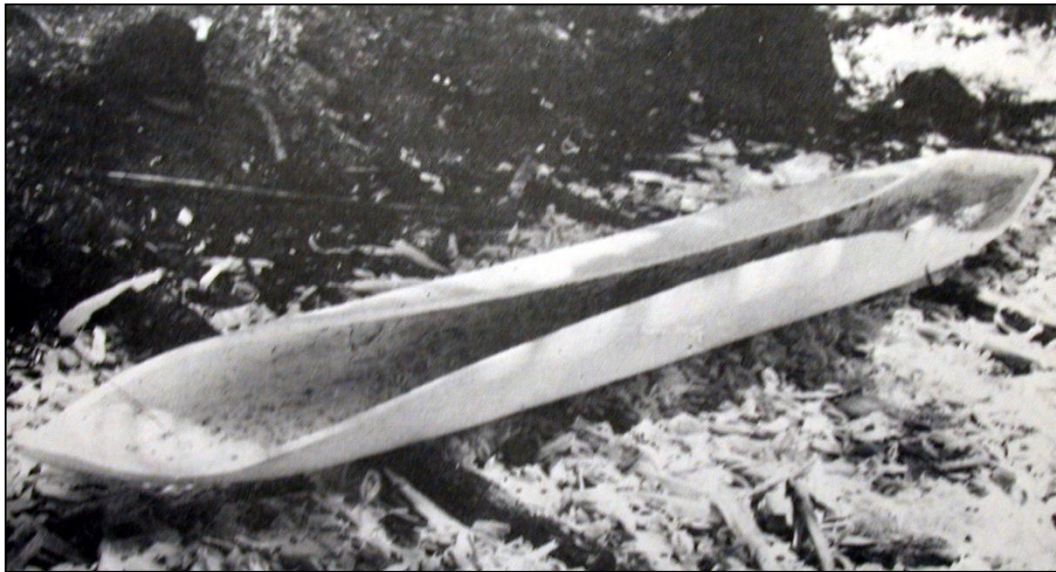
4



5



3. Boats:  
3.2. Extended dugouts,



6



7



8



### 3. Boats:

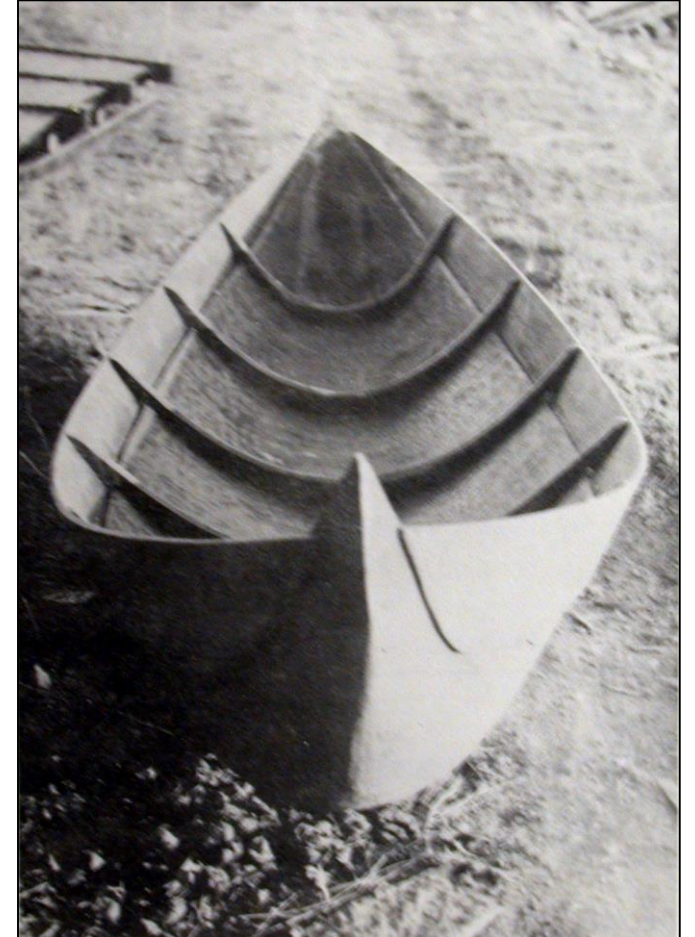
#### 3.2. Extended dugouts,



9



10



11



3. Boats:  
3.3. Assembled craft.



### 3. Boats:

#### 3.3. Assembled craft.





Hasslöf / Bash:

1. Shell-first (based) vessels
2. Frame-first (based) vessels
3. Things in between...

Hasslöf's\* taxonomy (structure):

1. Shell-first (based) vessels
2. Frame-first (based) vessels
3. Bottom-first (based) vessels

\* and Lucien Bash, and Fred Hocker.



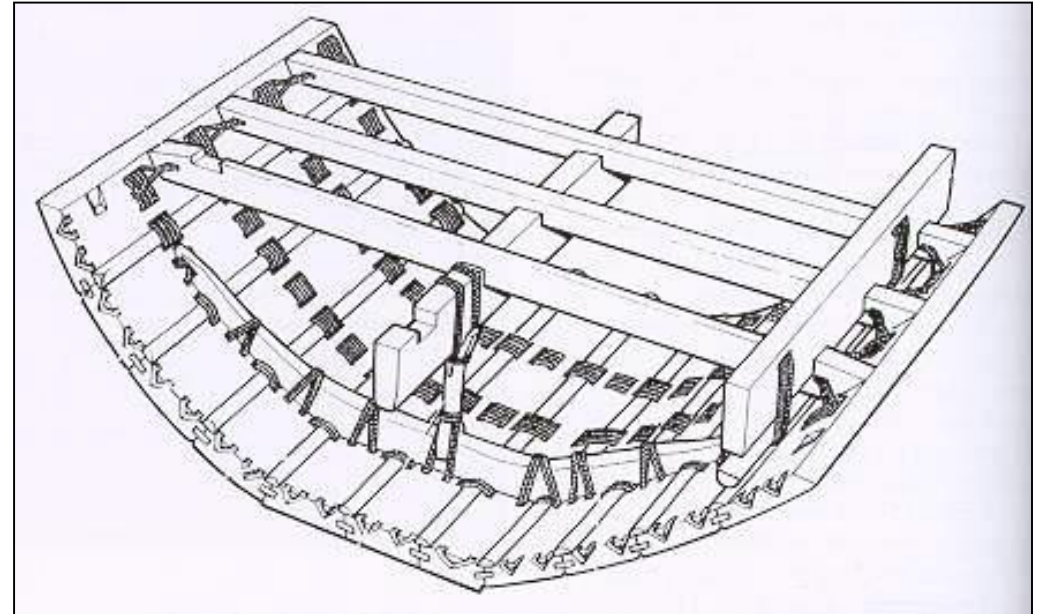
<http://forum.woodenboat.com/showthread.php?230891-very-odd-boats>

## 1. Shell-based vessels

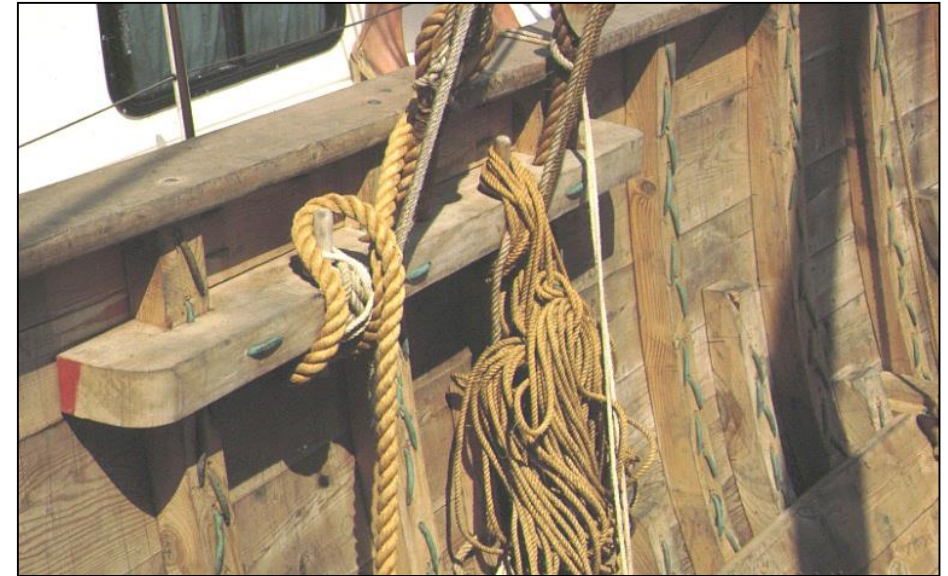
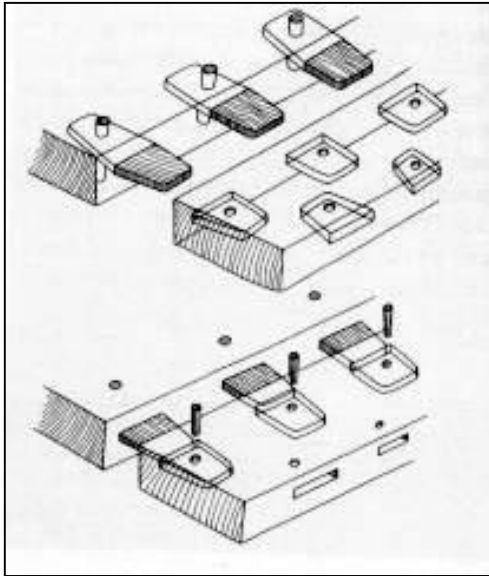




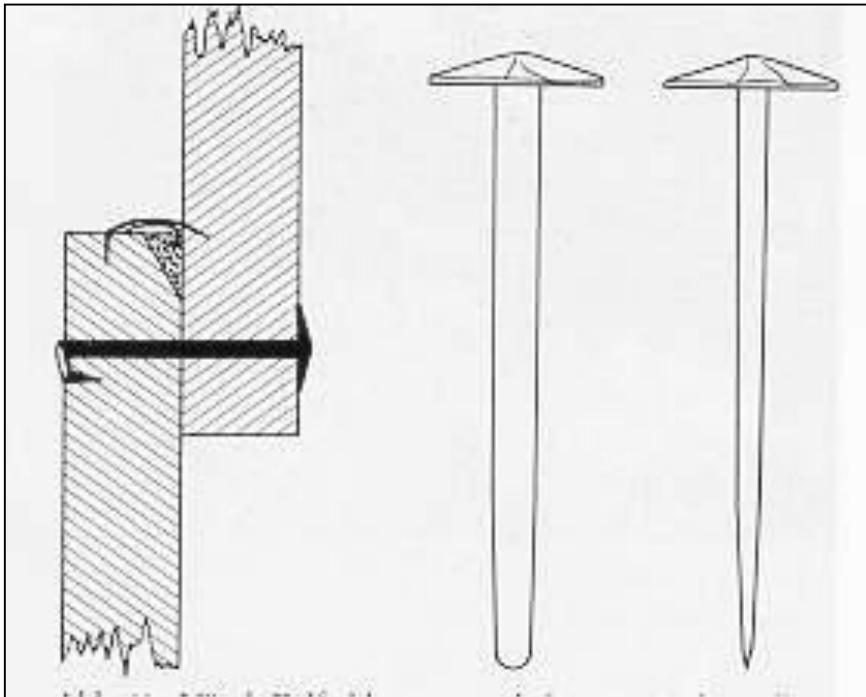
## 1. Shell-based vessels (laced or sewn).



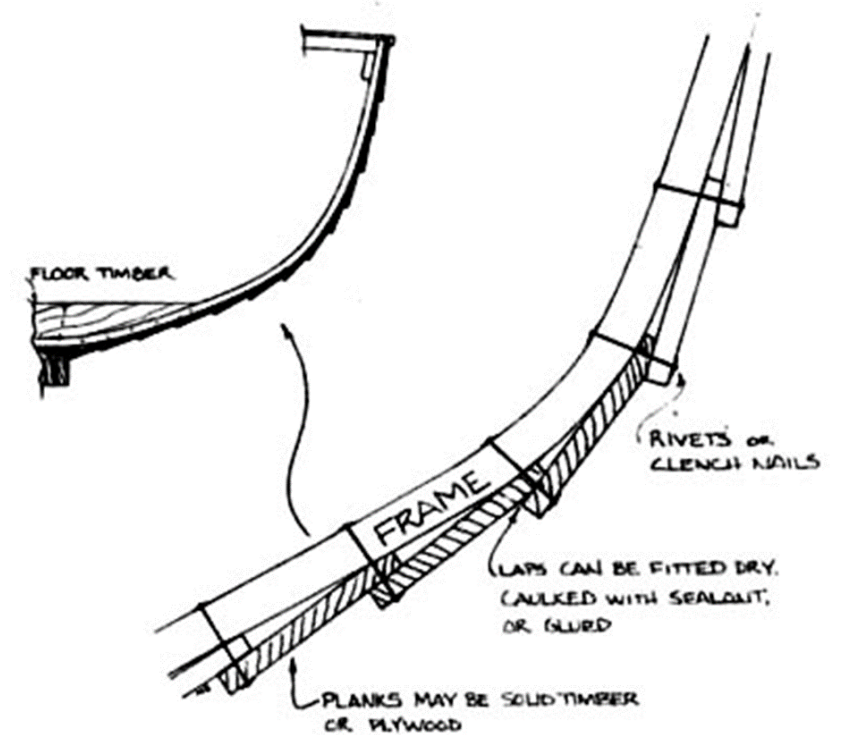
## 1. Shell-based vessels (mortise and tenon joints);



## 1. Shell-based vessels (lapstrake)

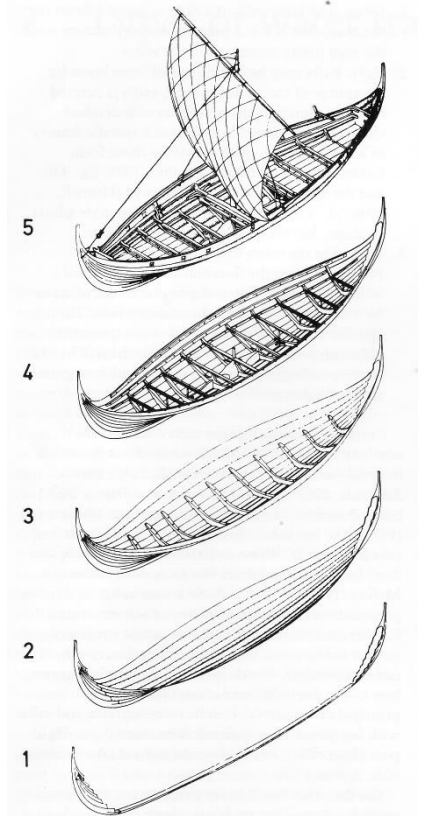
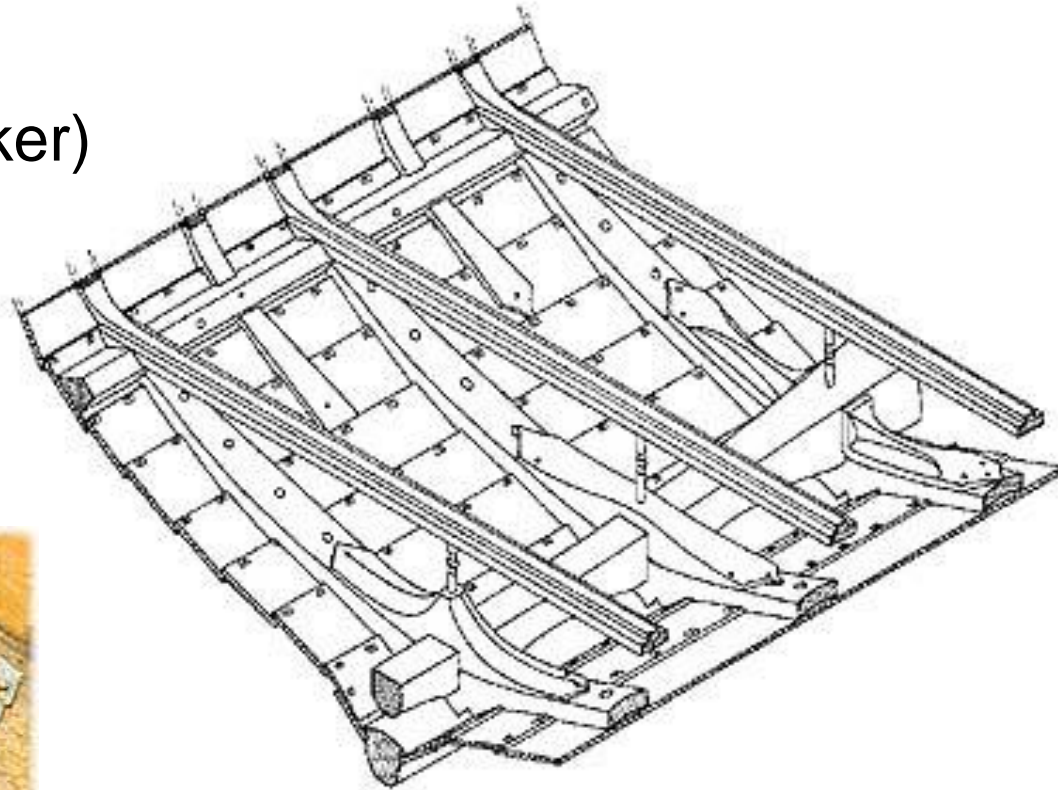


### LAPSTRAKE PLANKING





## 1. Shell-based vessels (clinker)



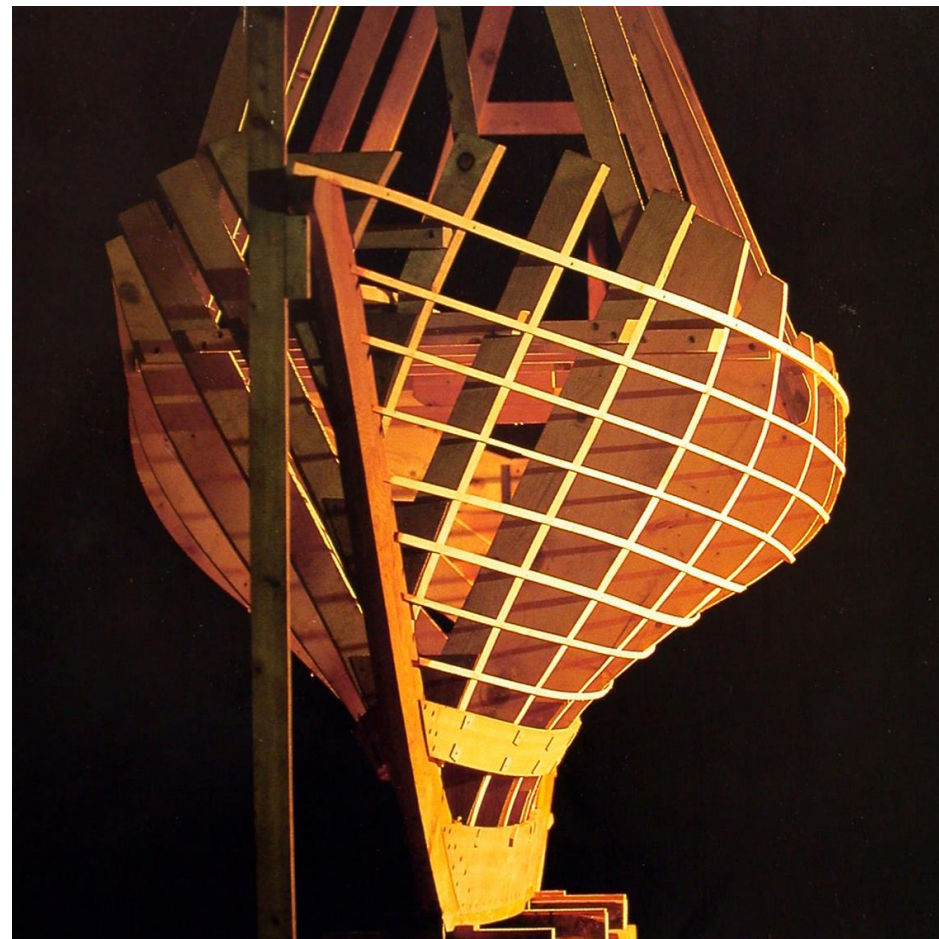
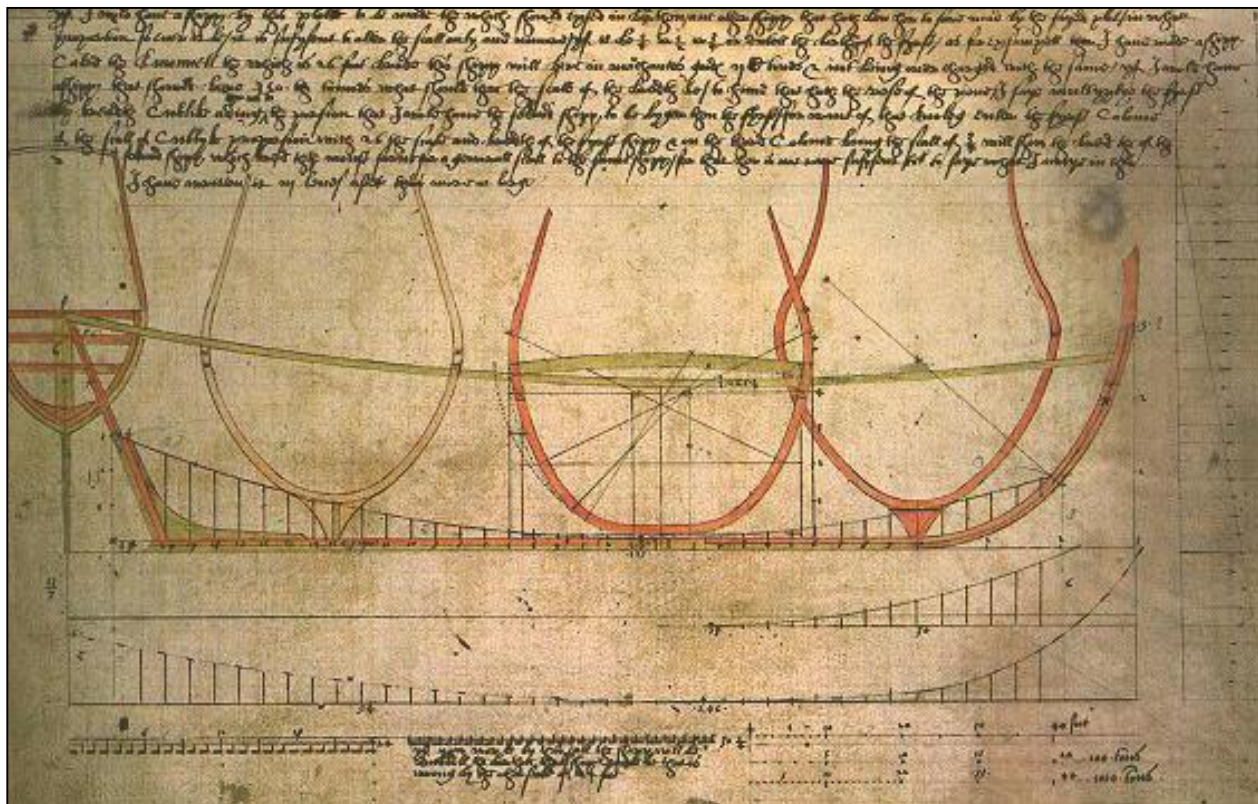
A  
Figure 2.1 A Five stages in the shell sequence of building a medieval boat. After Crumlin-Pedersen, 1983b: fig 5.  
B The skeleton sequence: planking-up on an already erected framework. (Drawing: NMM Greenwich.)



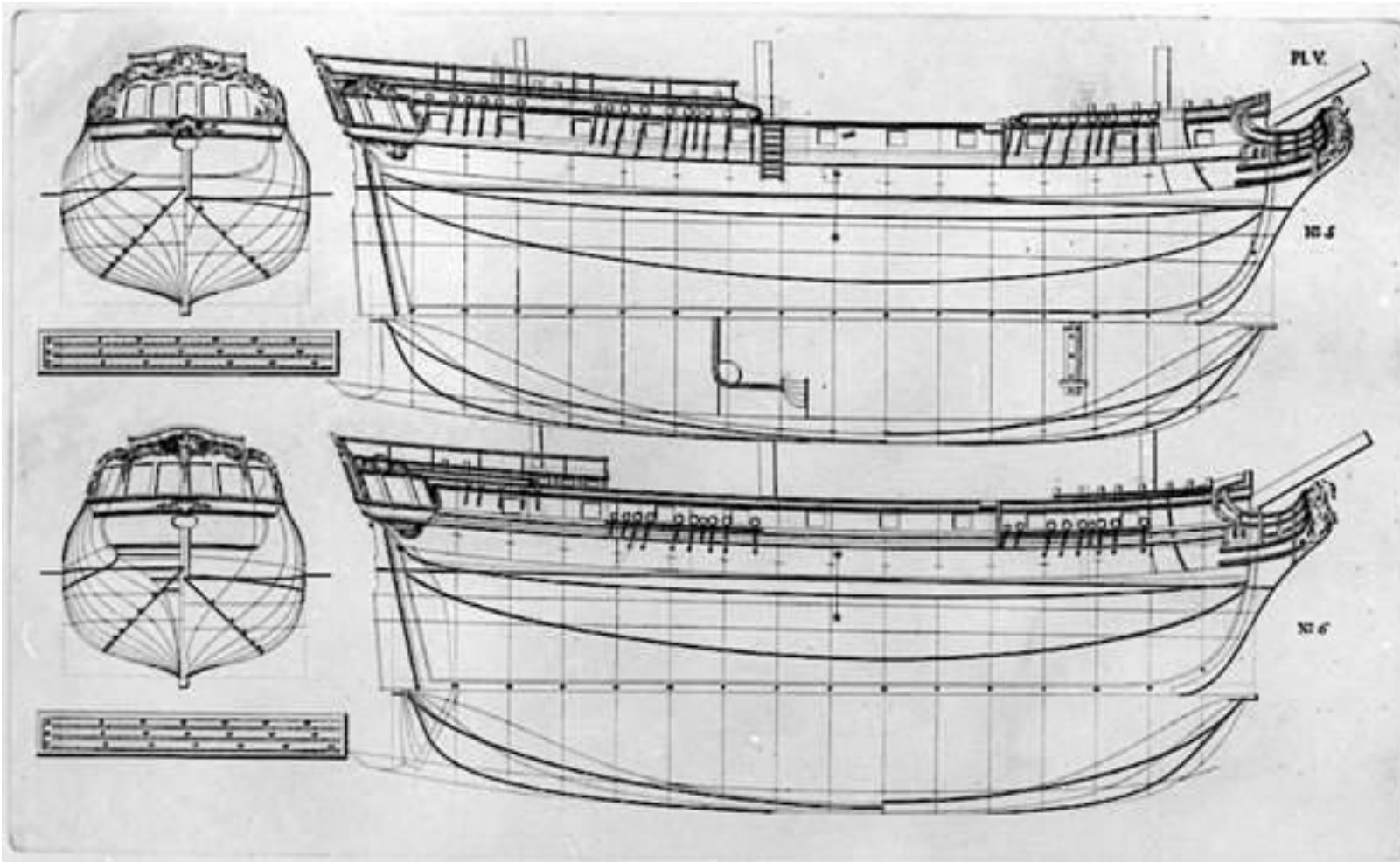
1. Shell-based vessels (flush laid: the bottoms of bottom-based vessels are are shell-based);



## 2. Frame-based vessels







Frames'  
shapes must  
be determined  
in advance.

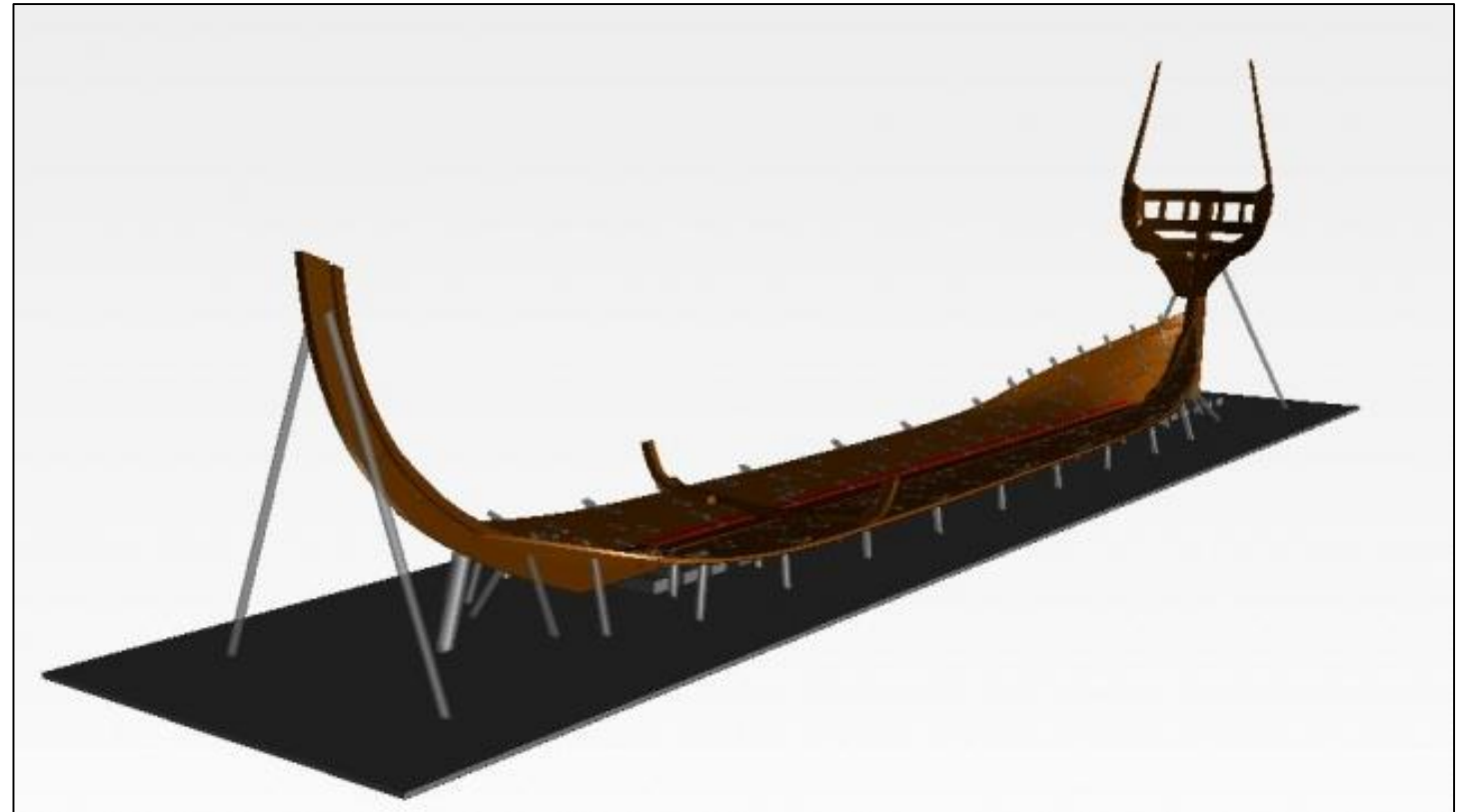
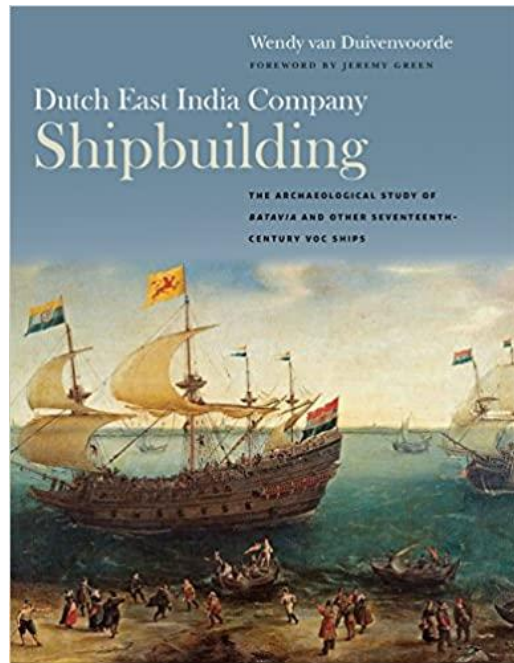


## 3. Bottom based vessels

Cogs



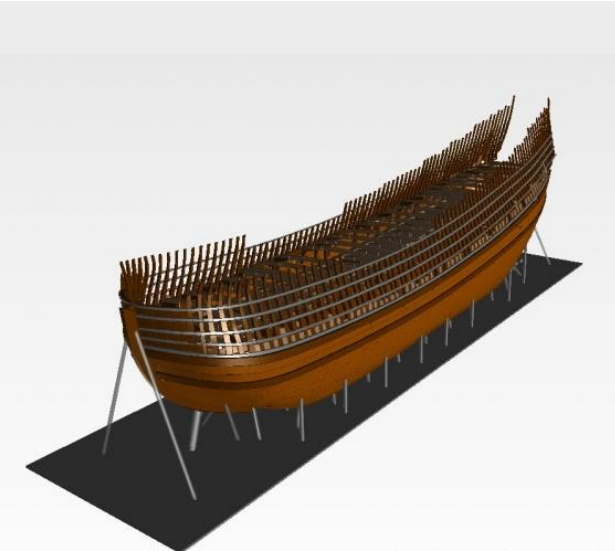
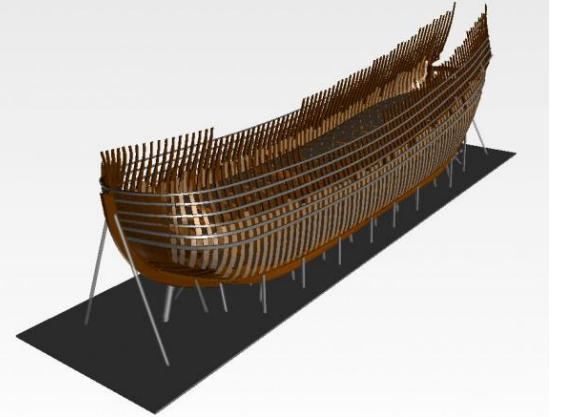
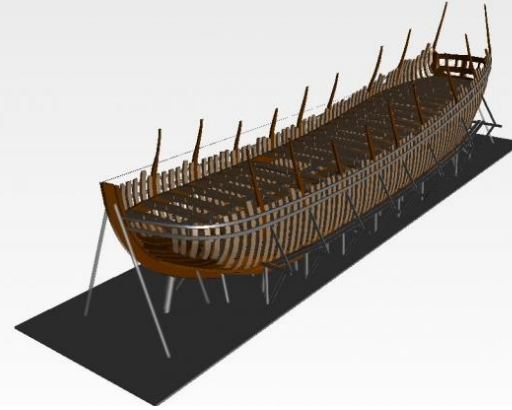
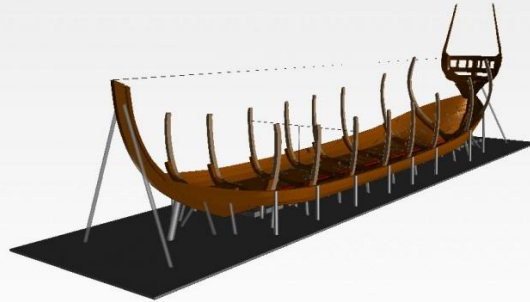
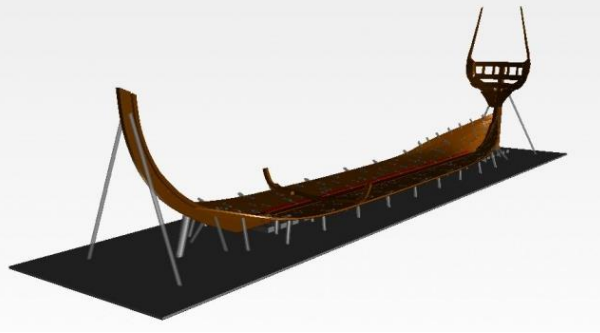
## 3. Bottom based vessels



<https://www.maritiem-erfgoed.nl/blog/studenten-maken-digitaal-3d-model-17e-eeuws-schip-online-toegankelijk>

# Ab Hoving

<https://www.maritiem-erfgoed.nl/blog/studenten-maken-digitaal-3d-model-17e-eeuws-schip-online-toegankelijk>



Construction  
sequence of a  
bottom-based ship.

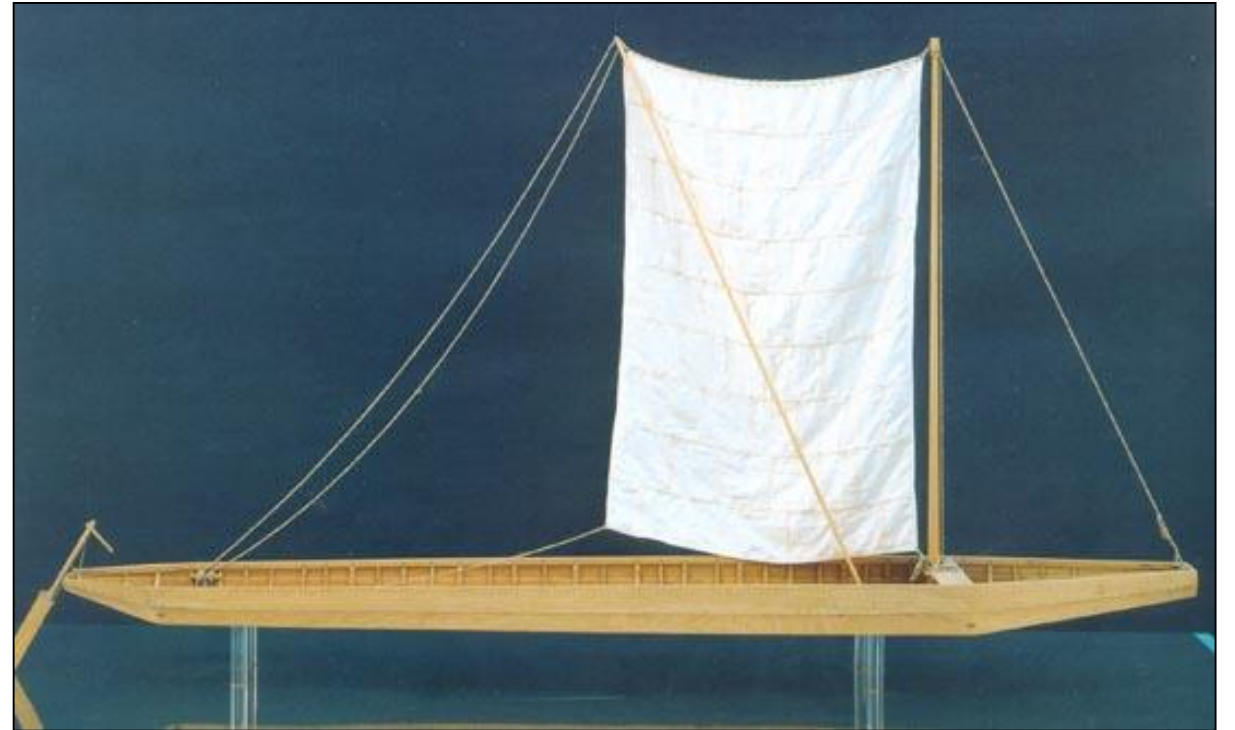
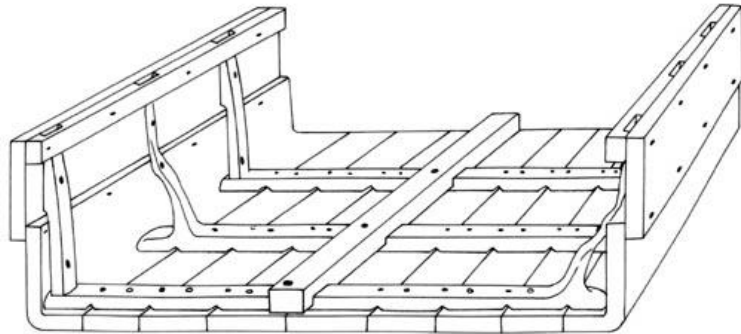


## 3. Bottom based vessels



## 3. Bottom based vessels:

Bottoms with raised sides.

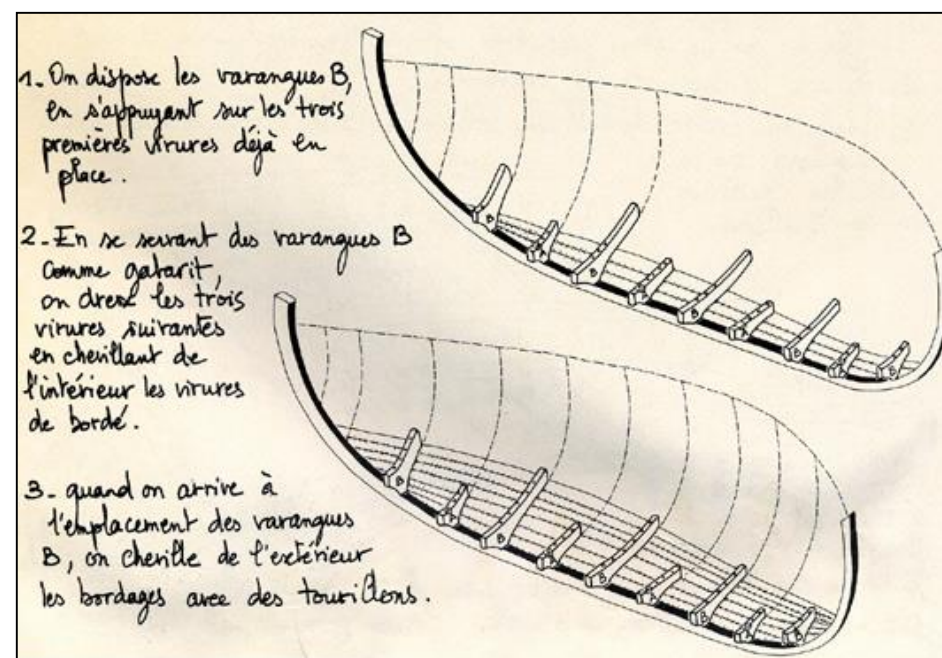
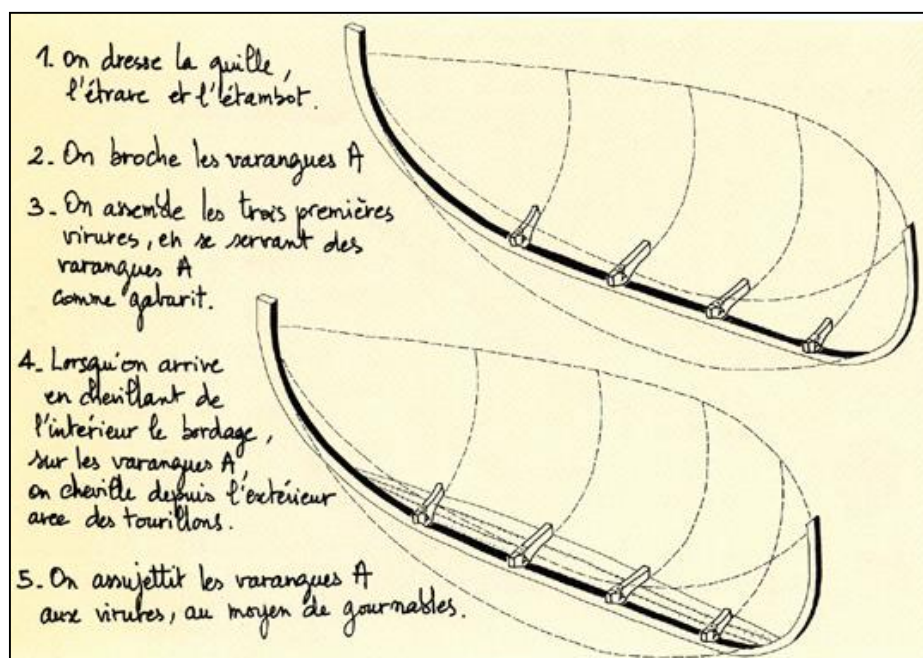




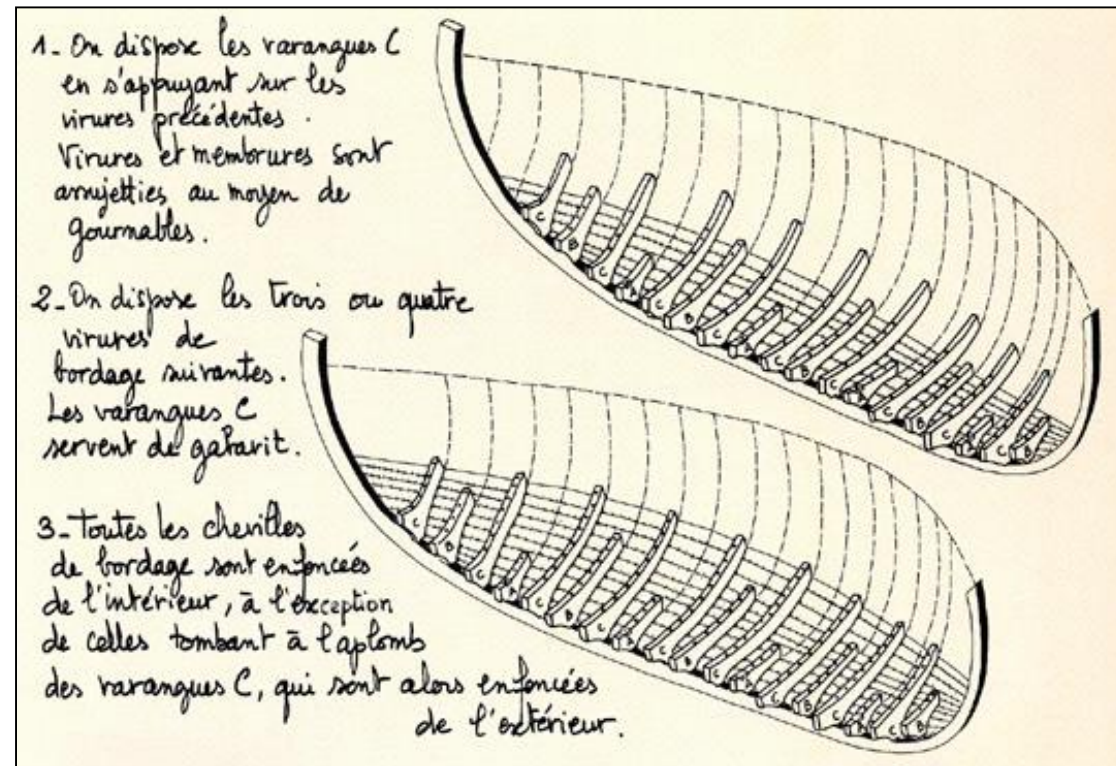
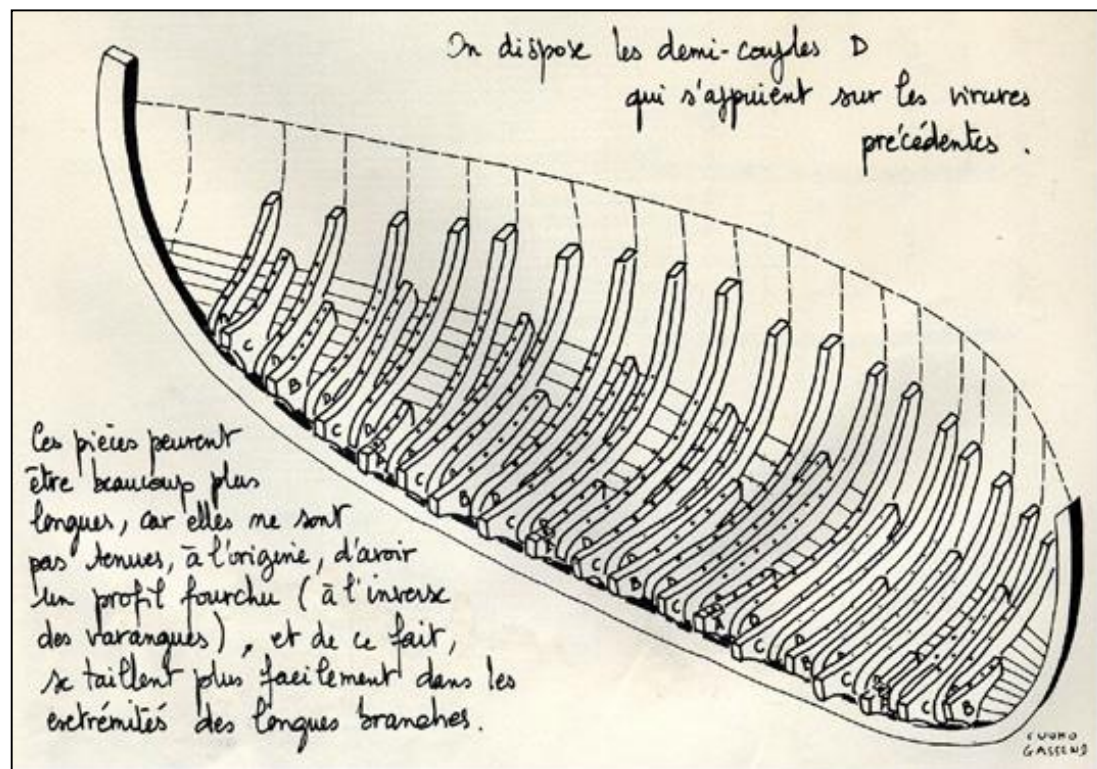
Mixed construction:

Ship of the Bourse de Marseille

J. M. Gassend proposed the following construction sequence:







(end Part 1)

The last three taxonomies are presented in the next powerpoint.



[http://www.asergeev.com/pictures/k/Qatar\\_traditional\\_boats.htm](http://www.asergeev.com/pictures/k/Qatar_traditional_boats.htm)