Introduction to Nautical Archaeology I Wednesday 13-May-2015 17:10-18:00

Ships And Boats





Ships and Boats



...and since we are comparing ship sizes:



Skin Boats



Skin Boats



Skin Boats



Sewn Boats



Sewn Boats



Basket Boats



Rafts



Rafts



A. A seven-log catamaran, Negapatam, S. India, used exclusively in the flying-fish fishery

Junks
























































































Summary:

• Thinking of Ships: taxonomies.

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



2. Taxonomies

<u>A. J. Richard Steffy</u>: Cargo carriers, warships, fishing craft, utility craft.

B. Eric Rieth:

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

<u>C. Sean McGrail:</u> Floats, Rafts, Boats;

<u>D. Hasslöf / Lucien Bash</u>: Shell-first, skeleton-first, things in between;

2. Taxonomies

<u>E. Lucien Bash / Fred Hocker</u>: Shell-first, skeleton-first, Bottom-first;

<u>F. Basil Greenhill</u> Rafts, Skin boats, Bark boats, Dugouts

<u>G. Patrice Pomey:</u> Conception, Structural Principle, Construction Sequence;

<u>H. Piero Dell'Amico:</u> Oral tradition, Partially geometric methods, Geometric methods.

A. Dick Steffy's taxonomy (function):

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

<u>1. Cargo carriers:</u> 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).



<u>2. Warships:</u> gun platforms, stability, sturdiness, speed, maneuverability.



<u>3. Fishing craft:</u> adaptation to the fishing techniques; as many examples as fishing communities.



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





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

Irish curach:.



Irish *curach*:



Log catamaran from the Solomon Islands boat:



Ambatch canoe from Kenya:





B. Eric Rieth's taxonomy (technology):

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

1. Floats,



1. Floats,

Ox-Hide Ravi River Cashmir



1. Floats,

India: Tandem floats

Inverted pots



Tin cans



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

2. Rafts,

3. Boats:

3.1. Dugouts,


3. Boats:

3.2. Extended dugouts,





















3. Boats:

3.3. Assembled craft.



3. Boats:

3.3. Assembled craft.



C. Sean McGraill' taxonomy (bouyancy):

- 1. Floats
- 2. Rafts
- 3. Boats

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.)

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



<u>D. Hasslöf / Bash:</u>

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

E. 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.

Shell-based vessels



Shell-based vessels

1.





1. Shell-based vessels







Shell-based vessels

ABBON.

1.





1. Shell-based vessels





- 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.)



Shell-based vessels

1.

Flush laid planking

2.

Frame-based vessels

2. Frame-based vessels



Frames' shape must be known in advance...

2. Frame-based vessels



Bottom based vessels

3.





3. Bottom based vessels:

Bottoms with raised sides.



Mixed construction:

Ship of the Bourse de Marseille

J. M. Gassend proposed the following construction sequence:



1. On dispose les varangues B, en s'apprugant sur les trois premières virures déjà en place. place . 2. En se sevrant des varangues B comme gabarit, on dress les trois vinures suivantes en chevillant de l'intérieur les virures de borde. 3- quand on arrive à l'emplacement des varangues B, on cheville de l'extérieur les bordages avec des tourillons.

1. On dispose les varangues C en s'appugant sur les vinures précédentes . Vinures et memberures sour gournables. 2. On dispose les trois ou quatre virures de bordage mirantes. Les varanques C servent de gabarit. 3- Toutes les chevilles de bordage sont enfoncées de l'intérieur, à l'exception de celles tombant à l'aplomb des varangues C, qui sont alors enfoncées de l'adtérieur.



F. Basil Greenhill's taxonomy (roots):

1. Rafts

2. Skin boats

3. Bark boats

4. Dugouts

1. Rafts



Figure 5.1 Sixteenth-century log rafts of Ecuador as drawn by G. Benzoni. After Edwards, 1965: pl. 16b (courtesy The University of California Press).

1. Rafts







2. Skin boats



2. Skin boats



3. Bark boats



4. Dugouts


4. Dugouts











- 1. Conception
- 2. Construction
 - 2.1. Structural Principle
 - 2.2. Construction Sequence

1. Conception

How does the shipwright conceive the ship in his mind?

How does he define the structure?

Skeleton first? Shell first? Bottom first?

2. Structural Principle

Is most of the hull strength conferred by the planking, or by the frames?

Do the frames shape the runs of the planks (are the planks bent against/over the frames)?

Frame based? Shell based?

3. Construction Sequence

a) Keel, floor timbers, first strakes, first futtocks, second batch of strakes, etc.

b) Keel, first group of strakes, floor timbers, second group of strakes, etc.

c) Bottom, floor timbers, first futtocks, etc.

d) Sides, bottom...

Kyrenia (4th c. BC)

Structural conception: shell based. Building technique: shell first.



Marsala (3rd c. BC)

Structural conception: shell based.

Building technique: first 11 strakes, floor timbers, second group of strakes, futtocks; in other words: shell first.



Madrague de Giens (1st c. BC)

Structural conception: shell based.

Building technique: although some of the floor timbers were fastened to the keel, it is considered purely shell first.



Anse des Laurons II (2nd c. AD)

Structural conception: shell based.

Building technique: although some opinions have been published suggesting a mixed construction it does not seem possible to consider other than a shell first construction.

Bourse de Marseille (2-3rd c. AD)

Structural conception: shell based.

Building technique: although the construction sequence proposed is based in a number of reversed pegs it does not seem likely that the (trapezoidal) garboard was affixed to the keel after the first floor timbers were in place, however, it seems possible that the upper strakes were built over the futtocks suggesting a mixed construction.



Port Vendres I (4th c. AD)

Structural conception: shell based.

Building technique: possibly mixed.

Yassi Ada II (4th c. AD)

Structural conception: shell based. Building technique: mixed.



Yassi Ada I (7th c. AD)

Structural conception: bottom shell-based, upper works frame-based.

Building technique: mixed.



Saint-Gervais II (7th c. AD)

Structural conception: impossible to state given the fact that the ship was not fully excavated; perhaps mixed.

Building technique: mixed.



Serçe Limanı (11th c. AD)

Structural conception: Frame based.

Building technique: mixed.



H. Piero Dell'Amico's taxonomy (conception):

- 1. Oral tradition
- 2. Partially geometric methods
- 3. Geometric methods

Oral tradition:

1.

Cannot be built unless you know how to.

1. Oral tradition:

Cannot be built unless you know how to.

2. Partially geometric methods

There are some geometric of mathematic aids, but you must know how to build ships to understand them.

Examples:

whole molding, half models.

Fig. 2 - Cantiere Crivello, Porticello (Palermo). Seste di imbarcazioni costruite in precedenza (P. Dell'Amico).

2. Partially geometric methods Examples:

Whole molding.

2. Partially geometric methods Examples:

Half models.

3. Geometric methods

Full projects. Theoretically "anyone" could build a ship from them.

Thank you!