

Research and Reconstruction of Ships

Anthropology 616 – Fall 2010

The Term Project

Fifty percent of your final grade will depend on an individual ship report. This will consist of a short (3,000 words or so) analysis of the vessel's purpose, form, and construction, a scantling list, and a set of drawings. The text should not be merely a description of the vessel (that is the purpose of the drawings), but your analysis of why it was built the way it was and how it was suited to its purpose. Topics you might address include choice of materials and fastening methods, vessel size and cost, function, performance, and durability. Include a bibliography of your principal sources.

The text must include a table of principal dimensions in metric units (with contemporary equivalents), and your calculation of the size of the vessel in both a neutral modern unit (metric tons displacement) and appropriate contemporary units. For example, the size of the Kyrenia ship was reckoned by the number of amphorae it could carry, while the Bremen cog was measured in grain lasts. For some vessels, you may need to furnish other information, such as the weight of the armament for warships. In addition to the displacement, please include a table of the main hull coefficients. Attach a sheet or sheets showing the calculations you made to reach your tonnage figure and coefficients. The drawings must include at least the following:

1. Lines;
2. Construction plans:
 - a. Longitudinal section;
 - b. Two transverse sections (one at the widest point on the hull);
 - c. Plan of main deck.

All drawings must be labeled (project name, drawing description, your name, scale, and date completed) and signed by you. Neatness counts, but pencil final copies are fine. Inked final drawings look nice, but if you do not already have extensive inking experience, ruining a final copy is a poor way to get it; concentrate on good pencil work instead. The type of vessel you choose is up to you, except:

1. It must be built of wood.
2. No dugouts, rafts, birch bark canoes, etc.
3. No pleasure craft.
4. It must be at least 10 meters long, but no more than 40 meters.
5. It should not have elaborate castles or deck structures.
6. It may not be a specific vessel for which plans already exist, or a direct copy of such.

You will find that some vessels are simply not practical for a semester project: 100-gun ships of the line, for example. Within the limits above, the possibilities are endless. This project is supposed to be fun, so use your imagination.

Helpful hint: do not wait until the night before the due date to start the written portion! And don't write before you have read Dr. Crisman's "**Guidelines for Writing your Term Paper.**" This project is not just a test of your drafting skills. The grading is as follows: 25% on lines, 50% on construction drawings, 25% on the written portion. This raw grade is then multiplied by a coefficient between 0.9 and 1.1, which represents, for lack of a better term, degree of difficulty. Those who attempt more will receive credit for it. At the same time, this coefficient is a measure of how broad your research was and how effectively you have distilled the available evidence into a believable reconstruction. For example, a copy of a simple ship, such as one of the Zwammerdam barges, which does not take into account evidence from other vessels of the period, would receive a low coefficient, perhaps 0.93. On the other hand, an attempted reconstruction of real field data from an excavated wreck that has not yet been studied would require a great deal of extra effort and broad research to fill in the holes, and would thus receive a high coefficient, perhaps 1.03. This project is a chance to do original research and to communicate the results of research and analysis in a clear, understandable product.

Get started on the research and decision-making for this project early. Avoid the trap of over-researching, trying to get every detail right before you start drawing. Very often, the best way to find out what you do and do not know about your ship is to start drawing, and the process of drawing will help you to plan further research. The lines must be completed by the beginning of class in **Week 9**; you will need the time after that to complete the construction drawings and the written report. A scantling list and midships construction section must be completed by the beginning of class in Week 10. The construction drawings should be completed by **Week 12**. Finally, **the project is due at the beginning of class on Tuesday, November 16, 2010.** Don't even think of being late - turn in what you have done. Late projects will be graded for "B".

Checklist for submission:

- | | |
|---|--|
| <input type="checkbox"/> Drawings (lines, construction, deck) | <input type="checkbox"/> Principle dimensions |
| <input type="checkbox"/> Title blocks on all drawings | <input type="checkbox"/> Scantling list |
| <input type="checkbox"/> Written analysis and bibliography | <input type="checkbox"/> Calculated displacement and hull coefficients (with appended worksheets showing calculations) |

ANTH 616

Lab Projects Nos. 1-6

Project Number 1: Elementary Lines

Draw the lines of a generic hull, 45 cm long, 15 cm in beam. There should be two waterlines, one buttock line, at least five sections, and a single diagonal. Do not worry about keels, rabbets, or any other refinements. The primary goal here is to produce a set of fair, properly justified lines. This drawing should be properly titled, dated and signed. The project is due at the beginning of class in **Week 5**.

Project Number 2: Slightly More Complicated Lines

Draw the lines of a vessel 20 meters long, six meters in beam, with a draft amidships of 2.2 meters. The vessel should have a transom and a rabbeted keel, stem, and sternpost. There should be a deck, and the location of its outboard edge should be indicated by a dashed line on all three views. Draw this vessel at scale 1:50, and provide a graphic scale of the proper form. The drawing will be graded on the basis of accuracy (agreement of points between views; each point out of agreement by more than 0.5 mm is 1.6 points off), completeness, fairness, and neatness. This drawing should be properly titled, dated, and signed. The project is due at the beginning of class in **Week 5**.

Project Number 3: Hull Calculation

Calculate the displacement and basic hull coefficients (block, prismatic, midships, waterplane) for the hull drawn for Project Number 2. You may submit the results either as a separate sheet, or as a neat table on the drawing itself. The project is due with Project Number 2 at the beginning of class in **Week 5**.

Project Number 4: Mapping

In groups of two, map a scatter of timbers on the floor of the Ship Lab using two different methods: 1) triangulation and 2) direct survey measurement (DSM). First, define the parameters of the "site" by mapping the room and preparing a plan view of the room that shows the locations of the datums. Then, record a sufficient number of points on each timber so that its orientation can be accurately determined within the plan view of the site. Your two plans (one for triangulation, one for DSM) are to be drawn at 1:10, must include a sketch of each timber (with its field number and its

measured points clearly identified), and must also include the datum points, a north arrow, a metric scale, and a title block. Include, as well, a table for each plan that lists the measurements from each datum to each measured point, the measurements taken to map the outline of the room, and the measurements between datum points. The project is due at the beginning of class in **Week 9**.

Project Number 5: Fragment Recording

Record a fragment of a timber from the Ship Lab shelves. This should include one letter format data recording sheet and a 1:10 scale drawing with at least 3 views and one section showing the wood grain. The project is due at the beginning of class in **Week 9**.

Project Number 6: Recording Curves

In this assignment, you will record a frame using three different methodologies: 1) offsets, using a horizontal datum and plumb bob; 2) a bevel-gauge goniometer; and 3) a digital goniometer. From your "field" data you will prepare a drawing showing the three frame sections, sequentially and not superimposed, at a scale of 1:10, with each point plotted and indicated by a circle with a point in the center. The horizontal plane must be indicated, as well as the angle of list as determined from the top of the keel. Selecting the section you feel is most accurate, you will then prepare a complete section drawing of the frame at 1:10 showing its molded dimensions, the overlap and fastening of the floor and futtock, as well as the dimensions, locations, details of the keel and planking. In addition to the pencil drawing of the detailed section, prepare a carefully inked publishable copy on Mylar. All three of your completed section drawings must include metric and Imperial scales and a title block. Finally, prepare tables of offsets, segment measurements (bevel gauge goniometer), or attitude readings (digital goniometer). The project is due at the beginning of class in **Week 11**.

Project No. 6 Checklist:

- Pencil drawing showing three frame curvatures.
- Pencil drawing of detailed frame section
- Inked drawing of detailed frame section.
- Tables of offsets and goniometer measurements and readings.