

# History of Ship Modeling

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Do you have a memory, as a child, of sailing a small boat?



Q: How many of you remember sailing a small boat as a child?

## Archaeologists Discovery's



The photo on the screen is a boat from Ur in Chaldea (present day Iraq, north of the Persian Gulf) and dates from around 3400 B.C. the boat is made from bitumen (an asphalt of Asia Minor used in ancient times as a cement and mortar.)

## Archaeologists Discovery's



Second photo is of a Cretan boat from Mochlos around 2600 B.C.

Mochlos is an island, east of Crete (an island in the Mediterranean). Evidence shows that in Minoan times, a Bronze Age civilization centered on Crete (c. 3000–1050 B.C.), Mochlos was attached to the mainland and acted as an eastern harbor. Model is made of clay.

## Archaeologists Discovery's



The third model is from a tomb, [Ancient Egypt](#), c. 2000 BCE

## Archaeologists Discovery's



Two Egyptian Nile boats with crew dating from 1500 B.C.

## Archaeologists Discovery's



On the left is a merchant ship from Cyprus – 800 B.C.

On the right is a Greek warship from Sparta – 600 B.C.

## Ancient World

- In the Ancient world, ships were:
- Most technologically, complex, mechanisms
- Made far-flung travel & trade
  - More comfortable
  - Economical
- A new facet to warfare

In the Ancient world, ships “were among the most technologically complex mechanisms of the ancient world.”

Ships made far-flung travel and trade more comfortable and economical, and they added a whole new facet to warfare.

# Ancient World

In the Ancient world, ships:

- Were significant to the people
  - Expressed through the creation of boat & ship models
    - Made from a variety of materials
  - Variety of purposes
    - Burial votives
    - Household articles
    - Art
    - Toys

Thus, ships carried a great deal of significance to the people of the ancient world, and this is expressed partly through the creation of boat and ship models.

Ancient boat and ship models are made of a variety of materials and are intended for different purposes. The most common purposes for boat and ship models include burial votives, house hold articles, art, and toys.

While archaeologists have found ship and boat

models from societies all around the Mediterranean, the three of the most prolific ship model building cultures were the Greeks, Phoenicians, and Egyptians.

## Egyptian Models



Egyptian ship and boat models are perhaps some of the most enchanting and well-preserved types of ship models available to archaeologists.

Some small models made from ivory, wood, or clay exist, and archaeologists believe these models were actually children's toys.

Ancient Egyptian ship and boat models more often were placed in tombs of prominent people as “magical substitutes for the actual objects which the

deceased has used in life and which he expected to use again in the next world.”

Boats placed in tombs of Egyptian royalty can be separated into two types: boat models that represent actual vessels used on the Nile, and boat models that represent boats that are considered necessary for religious purposes.

The majority of boats found in tombs are carved from wood.

The presence of boat and ship models in the tombs attests to the paramount importance of boats and ships to the Nile-going people of Egypt.

## Ancient Greeks

Archaeologists have determined that Ancient Greeks used:

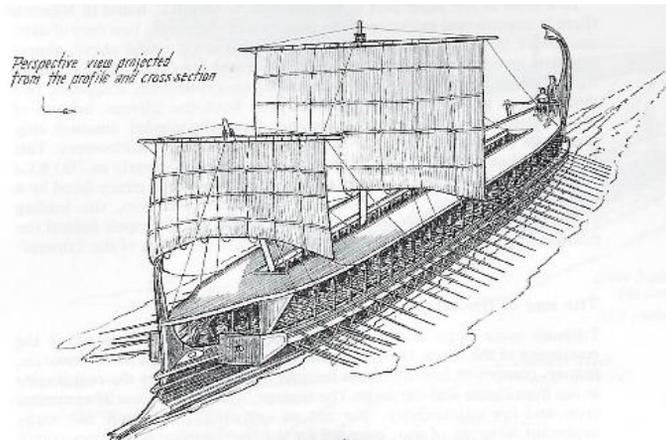
- Ship models
  - Burial or votive offerings
  - Household objects:
    - Lamps
    - Drinking vessels
  - Models are classified as:
    - Small craft
    - Merchant vessels
    - Warships
  - Made/cast from:
    - Wood
    - Bronze
    - Lead
    - clay

Archaeologists have determined that Ancient Greek ship models were used as burial or votive offerings and as household articles such as lamps or drinking vessels.

The kinds of ships depicted in Ancient Greek models can be classified broadly as small craft, merchant vessels, and warships.

Models were cast in different materials, including wood, bronze, lead, and clay.

## Greek Warships

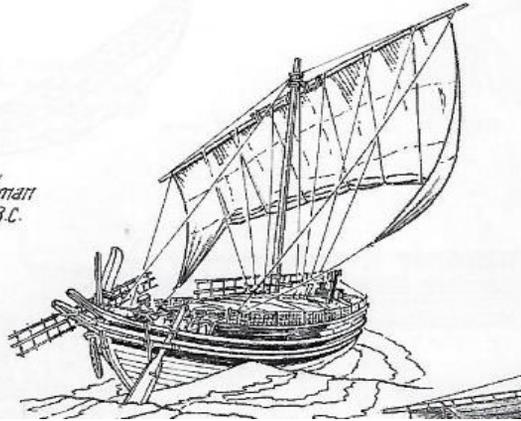


Greek warships were popular subjects to be made in miniature. (the above is an example)

One particular model, acquired by the Land Museum in Kassel, Germany, proves to be helpful to archaeologists and historians in understanding what a hemiolia warship was like. Archaeologists have tentatively dated the Kassel model to be from the 6th or 5th centuries BC through iconographic and literary sources.

## Greek Merchant ships

*Greek merchantman  
fifth century B.C.*

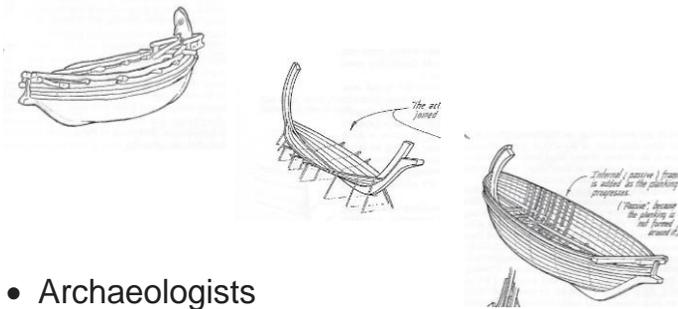


Not all ancient Greek ship models are of warships.

The Greeks established a trading area reaching from the Black sea to the eastern coasts of Spain. Their wooden round ships, about 50 feet long and able to carry 100 to 150 metric tons of cargo.

The Romans imported grain from Egypt, which led to larger round ships that could carry up to 450 tons of cargo.

## Advantages: Ship Models



- Archaeologists
  - Estimate size of vessel
  - How built
  - Assumed, artist scaled models

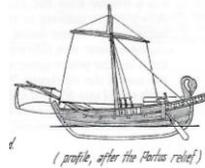
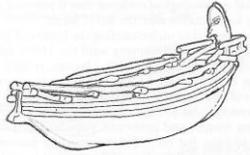
Ship models are helpful to archaeologists in that they allow archaeologists to make estimates regarding the size the vessel would be in real life.

The ships were constructed by building a shell of planks joined together at the edges, usually with wooden dowels, or with mortice and tenon fastening. Into this shell, at an advanced stage of construction, were inserted strengthening frames shaped to fit the hull.

This technique makes the assumption that artists

scaled the models appropriately,

## Period 100 B.C. to 15<sup>th</sup> C. A.D.



- Clay models
- Roman merchantman
- First Century A.D.

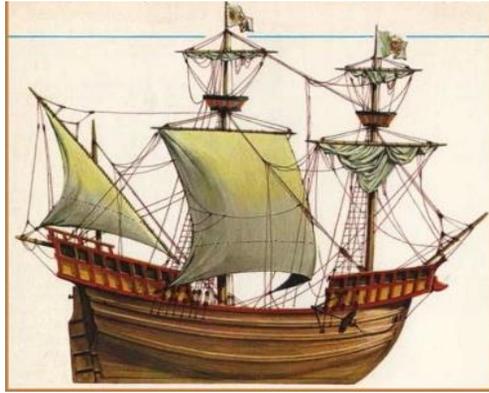
We have covered a period dating from clay models through Roman merchantman in the first Century A.D.

From the first C, through the 15<sup>th</sup> Century A.D., not much is known about ship modeling in Europe.

Much of our knowledge depends upon excavations in northern Europe



## European Ship Models



Some of the oldest surviving European ship models have been those of early craft such as :

- galleys,
- galleons,
- possibly [carracks](#),

dating from the 12th through the 15th centuries

They are found occasionally mounted in churches,

- used in ceremonies to bless ships and those who sailed in them,
- as votive offerings for successful voyages or surviving peril at sea,

Both practices remained common in Catholic countries until the 19th century.

## Matario model



a sailor-made votive ship model

– hung in a church near Barcelona for many centuries.

Now on display in Rotterdam.

Thought to represent a one or two-masted Catalan Nao or Mediterranean carrack from the 15<sup>th</sup> C..

## Santa Marie



15<sup>th</sup> C, was pivotal in the development of the wooden ship.

Prior, the hull was shell built, like the Egyptian, Roman, and Viking ships.

The new development shifted from oar and sail to larger framed, decked sailing ships.

There is no surviving information on what the “Santa Marie” looks like.

The model shown is based on the shipwreck of the  
“Mary Rose”

## Le Griffon



- Built at Cayuga Creek a channel of the upper Niagara River
- French built in 1679
- Believed to be a 45-ton barque
- 30 – 40 feet length with a 10-15-foot beam
- Two-masted

### Model of the French - *Le Griffon*

Until the early 18th century, virtually all European small craft and many larger vessels were built without formal plans being drawn.

Shipwrights would construct models to show prospective customers how the full-size ship would appear and to illustrate advanced building techniques.

## Admiralty Model



### Roger's Collection – U.S. Naval Academy

Ship models constructed for the Royal Navy were referred to as *Admiralty models* and were principally constructed during the 18th and 19th centuries to depict proposed warship design.

Although many of these models did not illustrate the actual timbering or framing, they did show the form of the hull and usually had great detail of the deck furnishings, masts, spars, and general configuration.

Some of these grand models were decorated with carvings of great beauty and were evidently constructed by teams of artisans.

Admiralty models served to educate civilians who were involved in the financing or some other aspect of the ship, to avoid construction errors that might have evolved as the ship itself took form.

## Prisoner Models



During the [Napoleonic wars](#) French and English seamen who were taken prisoner were confined, sometimes for many years, and in their boredom sought relief by building ship models from scraps of wood and bone.

This evolved into something of an art form and the models were sold to the public, which responded by supplying the prisoners with ivory so that the models would be more decorative.

For the most part, the models had carved wooden

hulls with rigging made from human hair, horsehair, silk, or whatever other fine material could be obtained. Bone or ivory would be used for masts and spars, and as a thin veneer over the hull.

## Ship Models



A consequence of Britain's naval supremacy in the eighteenth and nineteenth centuries was wide public interest in ships and ship models.

Numerous fairly crude models were built as children's toys leading to the creation of functional, as opposed to decorative, ship models.

Britain also led the world in model ship sailing clubs – in 1838 the *Serpentine Sailing Society* was started in [Hyde Park](#), followed by the first *London Model*

*Yacht Club* in 1845.

## Votive Models



19<sup>th</sup> C. Church Votive hanging in a sanctuary;

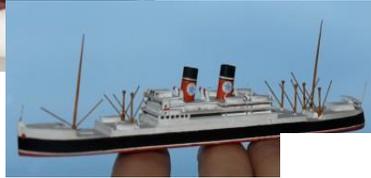
workmanship is somewhat crude, but sufficient to identify it as mid-19th-century vessel

20<sup>th</sup> Century



Model of a frigate at the Naval History Museum located in the Palacio de Correos de Mexico.

## Bassett-Lowke in Great Britain



Early 20<sup>th</sup> Century amateur ship model kits became available from companies such as:

## Boucher's in the United States.



Early 20th century models comprised a combination of wooden hulls and cast lead for anchors, deadeyes, and rigging blocks.

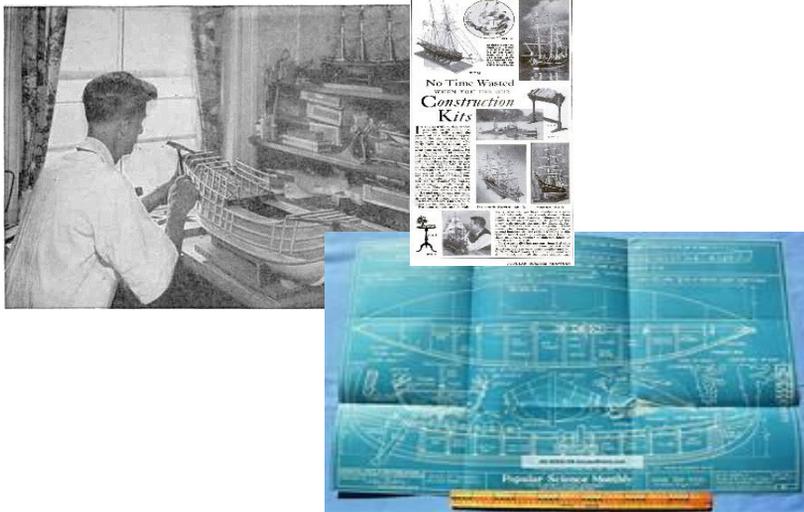
The development of tinsplate and improvements in machine tools enabled significant advances in ship modelling from 1900 onwards. Thin, workable sheets of iron could be coated with tin to prevent rusting, then mass-produced as parts of ship model kits.

The process was pioneered by French ship model

manufacturer Radiquet, which produced a line of zinc boats with pressurized steam engines, wooden decking and brass fittings.

The speed of production for tinplate vessels enabled one 1909 manufacturer to produce ship models of speedboats that had competed that year in Monaco.

## E. Armitage McCann



Ship modelling in the United States experienced a boom in the late 1920s when [\*Popular Science\*](#) magazine published an extended series of articles and plans for famous ships by modeler and former Navy officer [E. Armitage McCann](#).

McCann, who, according to *Popular Science* was the "recognized leader of the ship model building hobby" of his time founded the *Ship Model Makers' Club* in 1929, with him as secretary and treasurer and marine artist and fellow ship model

builder *Gordon Grant* as president.

## Present Day?

- Come a long way from clay models
- So where are we today?

## Wooden Model Ships



A "plank on frame" model of [HMS Sussex](#) on display at the [US Naval Academy Museum](#)

Wooden ship model [hulls](#) can be constructed in several ways. The simplest is a solid wood hull sawn and carved from a single block of wood. This method requires the greatest skill to achieve accurate results.

A variant of this technique, sometimes known as bread-and-butter construction (the wood is the "bread" and glue the "butter") is a hull built up from

thin blocks of wood glued together with either a vertical seam which can be incorporated into deck design, or a horizontal seam. This reduces the amount of carving required, but still requires skill and the use of templates to achieve an accurate hull form.

Modelling precision and lightweight design can be achieved by creating a hollow hull. The *plank on bulkhead* technique inserts a series of shaped [bulkheads](#) along the keel to form a shaped stage which will be covered with planks to form the hull of the model.

*Plank on frame* designs build the model just as the full-size wooden ship is constructed. The keel is laid down in a manner which keeps it straight and true. The [sternpost](#) and [stem](#) are erected, deadwood and strengthening pieces inserted, and a series of shaped frames are built and erected along the keel to form the internal framework of the model. The planks are then applied over the frame to form the external covering.

A wooden hull can be used for operating models if properly sealed

## Plastic Model Ships



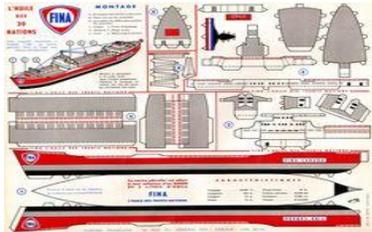
In the decades since World War Two [injection-molded polystyrene](#) plastic model ships have become increasingly popular. Consisting of preformed plastic parts which can be bonded together with plastic cement, these models are much simpler to construct than the more labor-intensive traditional wooden models. The inexpensive plastic kits were initially targeted to the post war generation<sup>[31]</sup> who could glue them together and produce passable replicas in a single afternoon. Plastic models are available in both full

hull and waterline versions for a wide variety of vessels.

A more recent addition has been a variety of kits in cold cure resin marketed by various small companies as part of a [cottage industry](#). These often cover more obscure subjects than mainstream manufacturers.

Scales vary as well, with many kits from the early days being "box scale"; that is, scaled to fit into a uniform sized box designed to fit conveniently on hobby shop shelves. Scales have since become more standardized to enable modelers to construct consistent scale collections, but there are still many to choose from. In Europe 1/400 scale remains popular, while in the United States and Japan the most popular scales are [1/700](#) (making a World War Two aircraft carrier about a foot long) and [1/350](#) (twice as long as [1/700](#)). Nevertheless, mainstream plastic kit manufacturers continue to produce kits as small as 1/1200 and as large as 1/72, with a few even larger.

## Paper Ship Models



Building scale models entirely from paper or card stock has a large following, primarily in Europe, Russia and Japan. Paper model kits don't typically come in a box, but rather in a booklet or a file to be downloaded directly from the internet, and printed on your own printer.

## Radio Control Ship Models



Some hobbyists build and operate scale model ships utilizing radio control equipment.

These can range from small models that can be operated in aquariums to vessels capable of navigating large bodies of water.

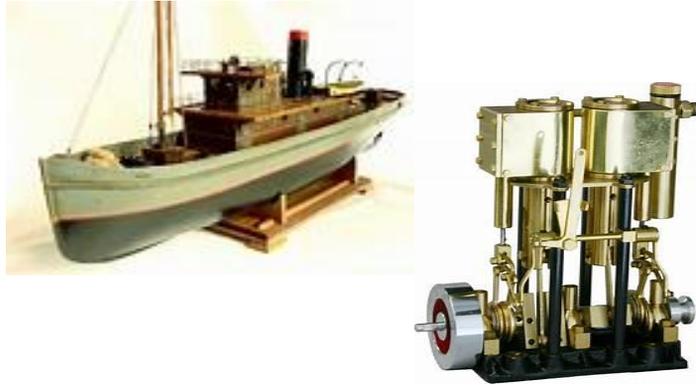
## Model Sailing Yachts



Model yachts are operating craft, which may be sail, steam, engine or electric motor powered, typically resembling pleasure power craft.

The construction and operation of models of working ships such as sailing yachts.

## Live Steam Ship Models



Enthusiasts build [live steam](#) model ships of many types and in many scales.

These range from simple boats with steam engines to models of racing hydroplanes.

## Wargaming Ship Models



[1:1250 scale die-cast models](#) of ships

Model ships have been used for [war gaming](#) since antiquity, but the introduction of elaborate rules made the practice more popular in the early 20th century.

Small miniature ships, often in 1:1200 scale and [1:1250 scale](#) were maneuvered on large playing surfaces to either recreate a historical battle, or in the case of governments, plan for future encounters.

These models were basic representations of ship types, with enough detail to make them recognizable.

[Bassett-Lowke](#) marketed these to the public in England, along with more detailed versions that appealed to collectors.

## Large Scale War Ship Models



Larger ship models have been used in museums to document historical ships, in companies for decoration and public relations. These are typically built by commercial firms, or, in the past, model departments of large shipyards.

One famous builder of ship models for the United States Navy was the firm of [Gibbs & Cox](#); a 1/48 scale model of the [USS Missouri](#), which is on display at the [Washington Navy Yard](#) museum, required an estimated 77,000 man hours to

construct.

Commercial ship models are usually built to rigorous standards; for example the US Navy has an exacting set of specifications regarding the use of materials and methods with the aim of ensuring a model "lifespan" of one hundred years.

## Engineering Ship Models



Test model in a towing tank

Model ships are important in the field of engineering, where analytical modeling of a new design needs to be verified.

Principals of [similitude](#) are used to apply measured data from a scaled model to the full-scale design.

Models are often tested in special facilities known as [model basins](#).

## Manned Ship Models



Manned model of a 250 000-dwt tanker

Manned models are model ships that can carry and be handled by at least one person on an open expanse of water.

They must behave just like real ships, giving the ship handler the same sensations. Physical conditions such as wind, currents, waves, water depths, channels and berths must be reproduced realistically.

Manned models are used for research (e.g., ship

behavior), engineering (e.g., port layout) and for training in ship handling (e.g., maritime pilots, masters and officers). They are usually at 1:25 scale.

The aim of training on manned models is to enable seamen to acquire or to develop maneuvering skills through a better understanding of a ship's behavior as it sails in restricted water conditions at maneuvering speed. Manned models are considered by maritime pilots as the next best thing to a full-scale prototype for understanding a ship's behavior.

The [Port Revel Ship handling Training Centre](#) is a [French](#) maritime pilotage school specializing in training for pilots, masters, and officers on large ships like [supertankers](#), [container ships](#), [LNG carriers](#) and [cruise ships](#). The facility uses manned models at a 1:25 scale on a man-made lake designed to simulate natural conditions in harbour, canals, and open seas.

## Model Shipwright Clubs/Guilds/Society's

### **THE NAUTICAL RESEARCH GUILD** "ADVANCING SHIP MODELING THROUGH RESEARCH"

Annual membership includes our world-renowned quarterly magazine, Nautical Research Journal, which features photographs and articles on ship model building, naval architecture, merchant and naval ship construction, maritime trade, nautical and maritime history, nautical archaeology and maritime art.

Other benefits include discounts on annual conferences, ship modeling seminars, NRG products and juried model competitions which are offered exclusively to Guild members. We hope you will consider joining our ongoing celebration of model ships and maritime history.



For more information contact us at: [www.thenrg.org](http://www.thenrg.org) or call 585 968 8111

Model shipwright guilds tend to concentrate their efforts on highly accurate static models of all types of watercraft and are social groupings intended to allow more experienced ship modelers the opportunity to pass on their knowledge to new members; to allow members of all levels of expertise to exchange new ideas, as well as serving as social function.

Some model shipwright guilds are incorporated into government and Naval facilities, achieving a semi-

official status as a clearinghouse for information on naval history, ship design and, at times, teaching the craft of ship modeling, through model building, restoration, repair of the facility's models, as well as, [museum docent](#) services. The [USS Constitution Museum](#) operates a model shipwright guild from the [Charlestown Navy Yard](#) adjacent to the berth for the vessel itself, as does the [San Francisco Maritime National Historical Park](#) by sponsoring the [Hyde Street Pier Model Shipwrights](#) and providing work and meeting to them aboard space aboard the ferryboat [Eureka](#) tied at the [Hyde Street Pier](#) where they are considered working museum volunteers.