



San Diego Ship Modelers' Guild

1492 N. Harbor Drive

San Diego, CA 92101

NOVEMBER 2002

NEWSLETTER

VOLUME 26, NO.11



Richard Little and Dave Dana survey the damage to the mast on Little's *Rattlesnake*

October Meeting

By Bob McPhail

The meeting was called to order at 7:05 pm by the guild master who also gave the purser's report. As of 30 Sept. the account balance is \$/redacted/ of which \$/redacted/ is being held for nametags. The purser projects \$/redacted/ in expenses for the rest of the year.

Nautical Research Guild and Ships in Scale subscriptions have been renewed.

New members and/or visitors were then invited to introduce themselves. Dick Little, a former member, came to visit. He requested assistance in repairing a broken foremast on his ship model of the Rattlesnake.

Robert Hewitt brought in items donated by the family of Fred Fraas. These items were to be put up for auction during the meeting.

Chari Wessel mentioned that the History Channel will be showing "THE SHIP" starting 14 October. It will be a film about the replica ENDEAVOR as it sails the same route of Captain Cook along the coast of Australia during his voyage of exploration. The crew was made up of people who volunteered for the voyage and agreed to recreate the living and working conditions of the 18th century crew as much as possible.

Bill Luther mentioned that the current issue of "Fine Scale Modeler" contained an article on casting resin for models and an article about building a resin model.

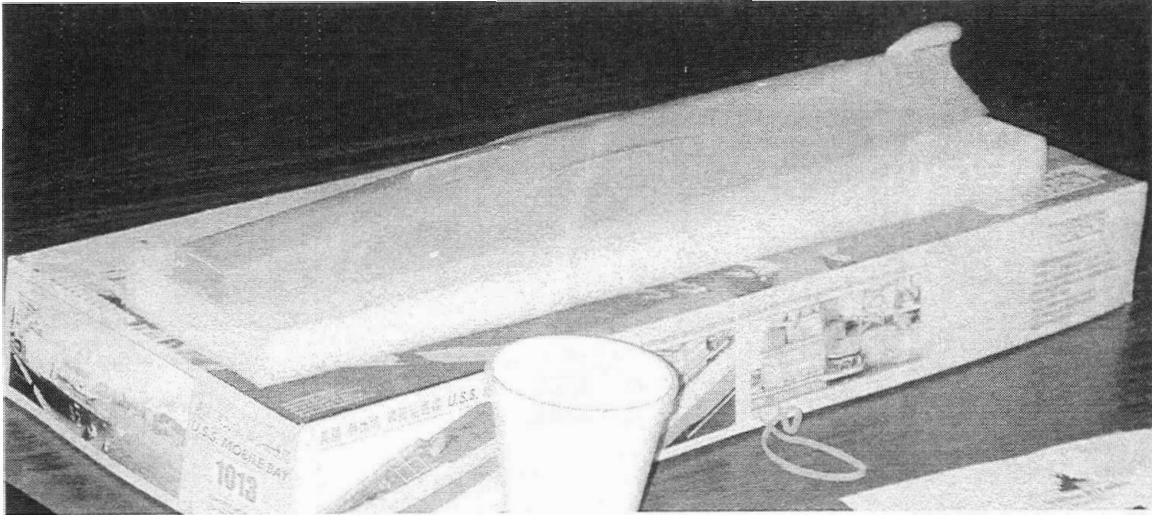
The guild master passed around a list for nametags. Each member needed to check name spelling and whether they preferred a magnetic or pin attaching device for their nametags.

After the break, there was an auction of the items donated to the club. \$33.00 was collected. It was agreed by the members present that the donated part vacuum forming machine would be placed in the model shop so it would be available to all members for use.

Bill Luther then gave a very interesting and informative demonstration on photo etching. He also provided several handouts that supplemented his demonstration.

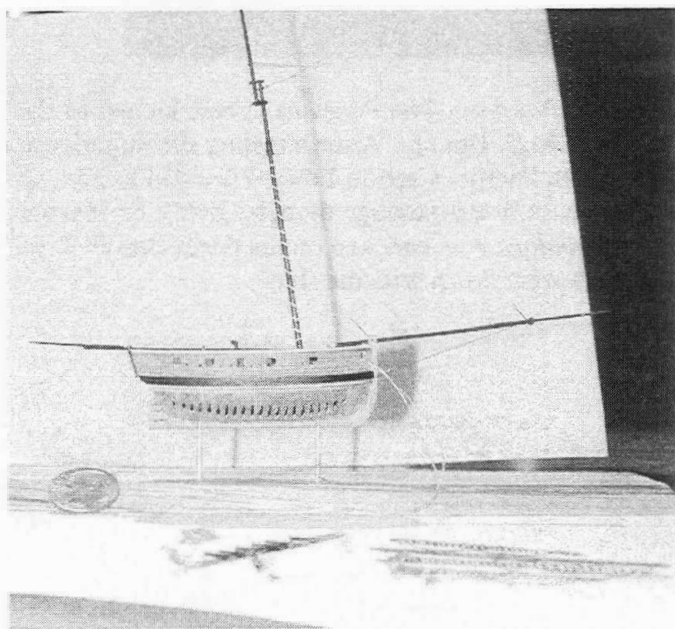
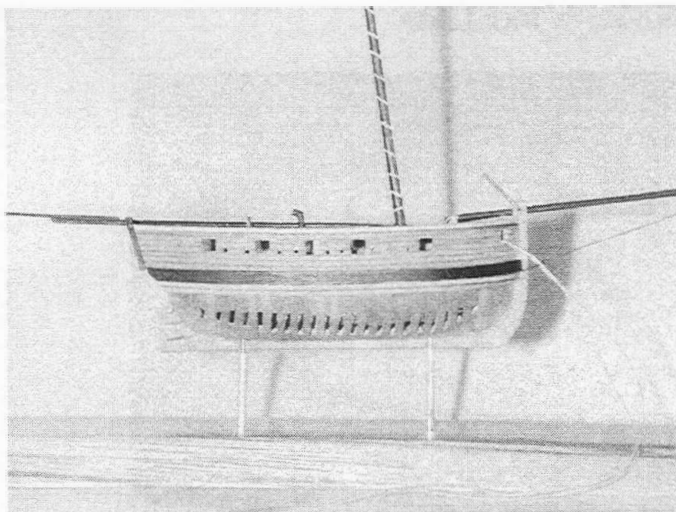


There were also several models brought in for show and tell. K.C. Edwards brought in a model of the GJOA (1872). This Model Shipways Kit is a solid hull kit (scale 5/32" = 1'). In this vessel, Roald Amundsen with a crew of eight set out in 1903 to find the Northwest Passage and spent three winters trying to find it. The original ship was 69 feet long and a breadth of almost 21 feet.



Bruce Jamieson is creating this 1/350 scale model of a modern Ticonderoga Class guided missile Cruiser. This shot shows the hull in progress.

H.M.S.FLY by Robert Hewitt scratch built.
scale 1:240 .05 = 1 ft.



The model is built as an admiralty type. It is solid above the wales with frames shown below. The frames, upper hull and the keel were glued as a block shown in figure 1. The hull was then shaped with a Dremmel drum sander. After splitting the hull on the keel, the interior was hollowed out using a ball end mill. The frames were soaked, separated and trimmed as required. The frames were glued on to the hull using the upper hull and the keel as guides.

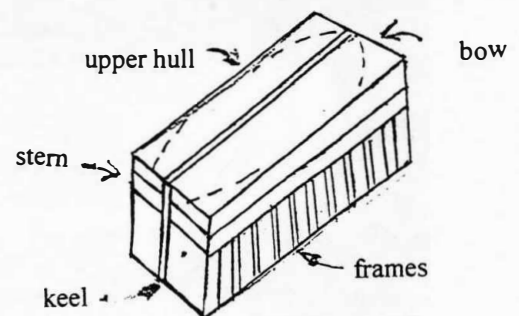
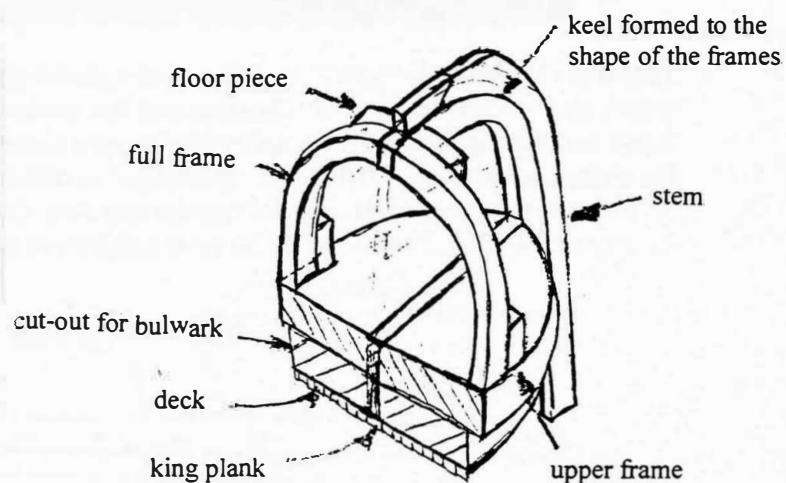
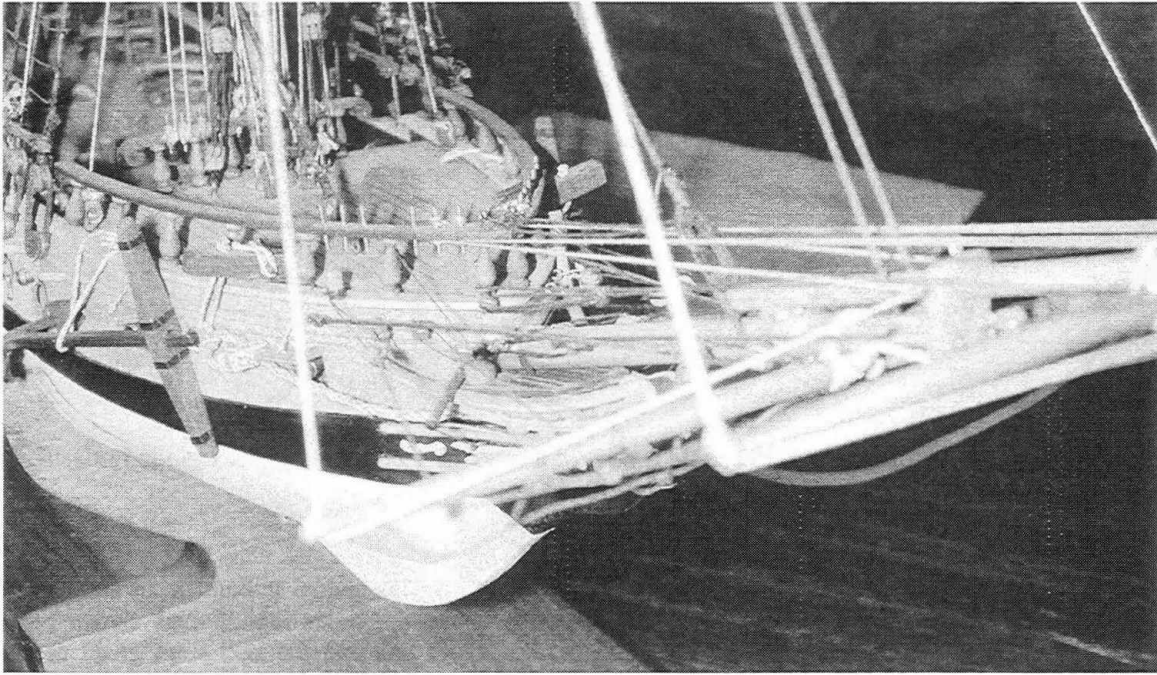


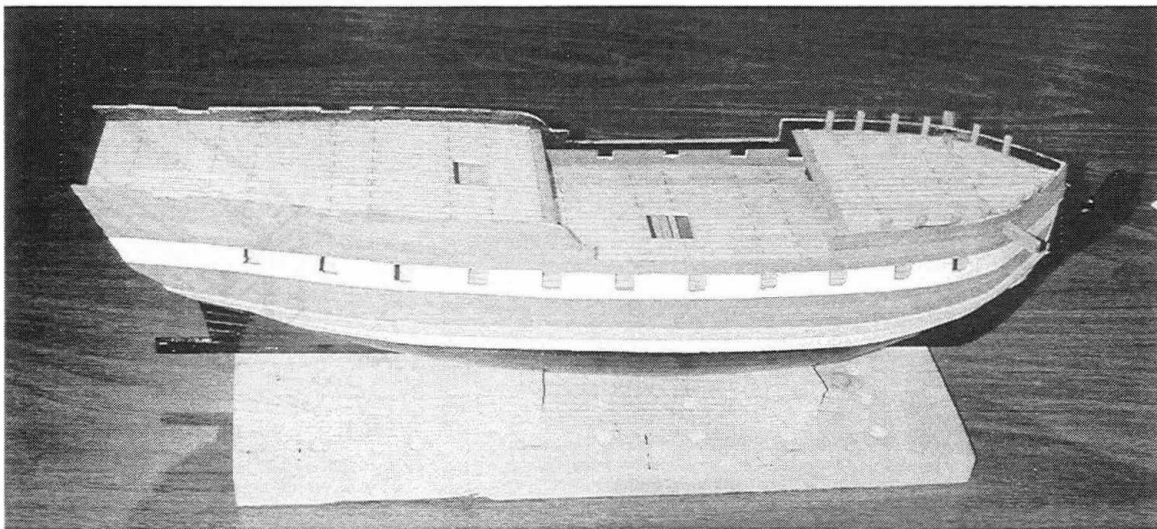
figure 1. blocks of pear glued



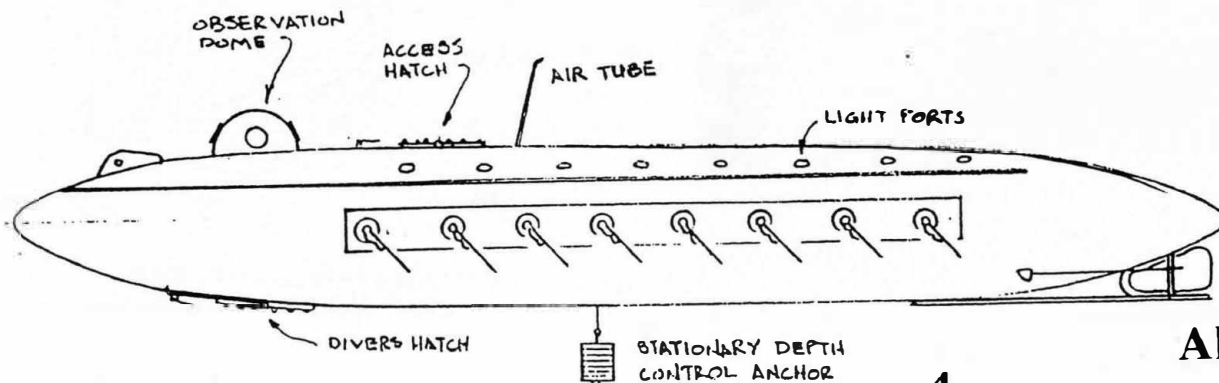
section looking towards the bow
shown upside down as assembled



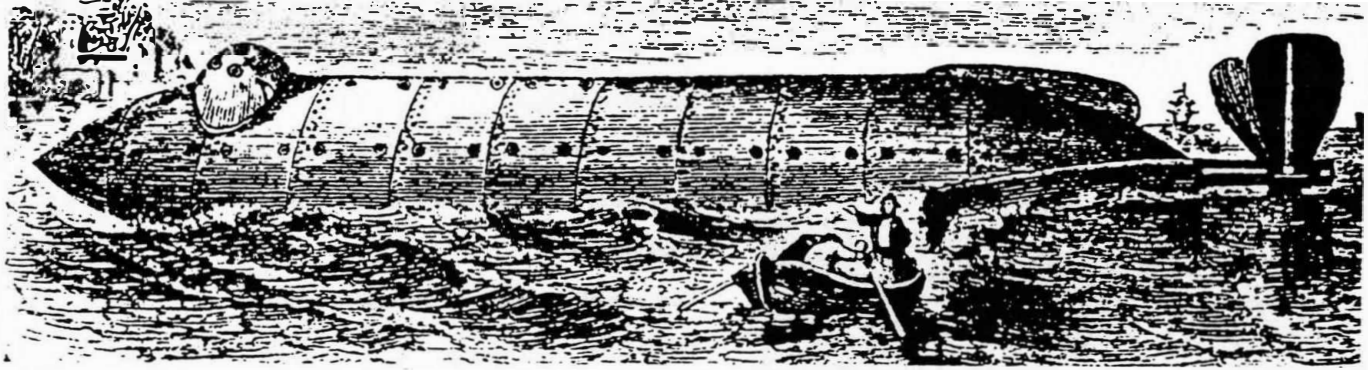
Detail of the bow of the *Rattlesnake* by Dick Little



Ship Modeler **Mike Forget** is working on this model of the *H.M.S. Pandora*. The *Pandora* is best known as the vessel sent to capture Fletcher Christian and the mutineers of the *H.M.S. Bounty*. After arresting the majority at Tahiti and then spending four unsuccessful months combing the South Pacific, Captain Edward decided to give up the chase and steer for England. In attempting to discover a new more direct passage through Cook's Endeavour Strait between the northeast tip of Australia and New Guinea the *Pandora* was wrecked on the Great Barrier Reef on August 29, 1791. Thirty-one of the crew and four of the mutineers went down with the ship.



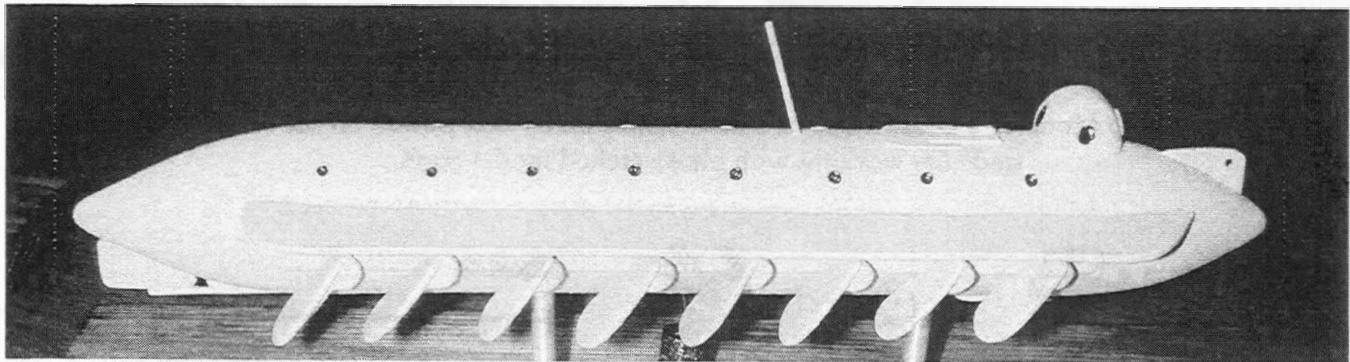
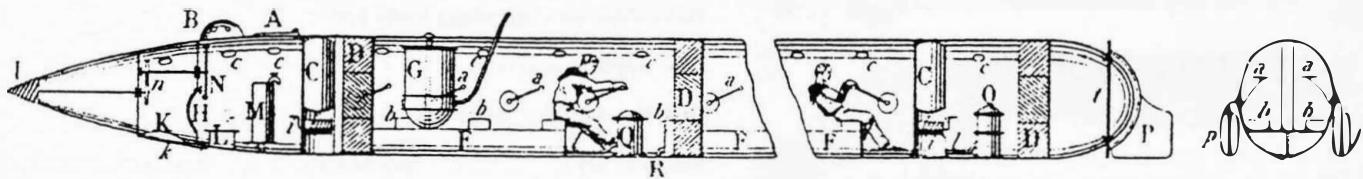
Alligator



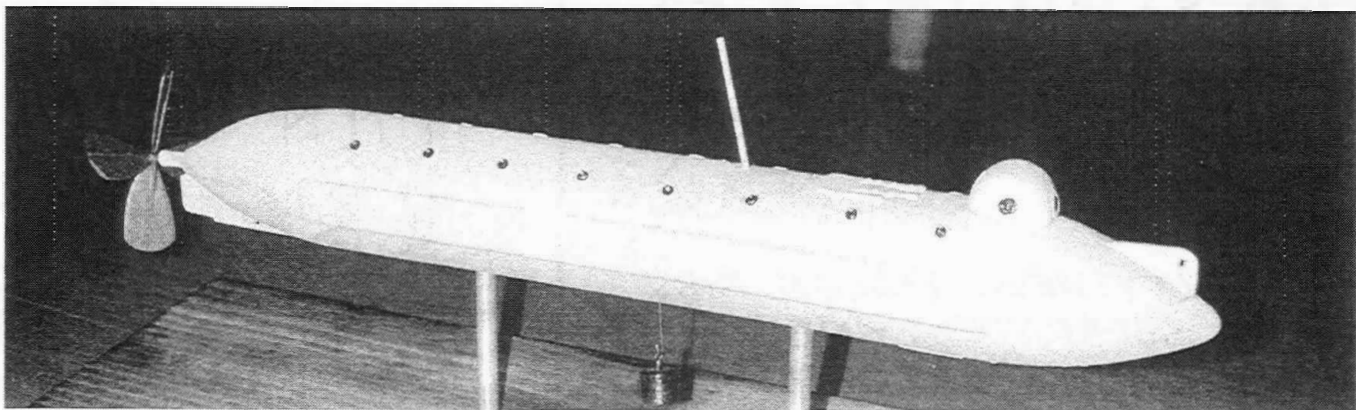
811. FEDERAL SUBMARINE
ALLIGATOR—U.S. Navy's first. By 1861 both Germany and Russia possessed submarines; French inventors were building a third. Suddenly remembering Bushnell and Fulton, U.S. Government hired French engineer De Villeroi to design and build sub for Navy at Philadelphia—one that could blow up ironclad *Merrimack*

then at Norfolk. Born was *Alligator*, 47 feet long, 6 in diameter, "built of steel plates." Critics described her motive power as "absurd arrangement of hand-worked, duckfoot paddles in age of screw propeller." The paddles which "opened and shut like the leaves of a book" were worked by 16 men sitting two by two. Air was produced by "two machines—a bel-

lows passing over a chamber of lime, the other producing oxygen." She was armed with a "spar torpedo." But she never made an attack. Failing construction deadline, De Villeroi absconded. Government seized vessel for completion. Under a Mr. Eakins, "Gator" left Philadelphia in June '62. during storm, she was abandoned off Virginia Capes. (Diagram below)



Scratch built Civil war 1862 Union submarine the *Alligator* by **Bob Hawkins**. Built at a 1:48 scale it was made with PVC pipe, plastic wood, pine and paper cones. The first configuration shown here had folding oars that rotated 180 degrees back and forth. It achieved 3 knots.



In 1862 the *Alligator* was modified with screw propeller and reached 4 knots. This version also had four men working the crank for the propeller. Both versions had a bottom hatch for divers. It was armed with two limpet mines.



Small sheet of Glass

Sheets of Cardboard of various thickness and hardness

Flat piece of thin Styrofoam from the top of a foam egg carton

Masking tape

Various sticks and pieces of corrugated cardboard

White Glue

Super Glue

Super Glue Accelerator

Small Blades

Chisel blade (Manicure Scissors, the smaller the blades the better)

Single edge Razor #17) Exacto Knife

Micro Shear, Xuron #410 or equal, also called sprue cutters

Flat Nose Pliers

Plastic Pudding Cups, empty works best

Glue Applicators to suit

BOOKS, in order of preference

Photoetching for The Plastic Ship Modeler, Loren Perry, Gold Medal Models

Building & Detailing Scale Model Ships, Mike Ashey, Kalmbach Books

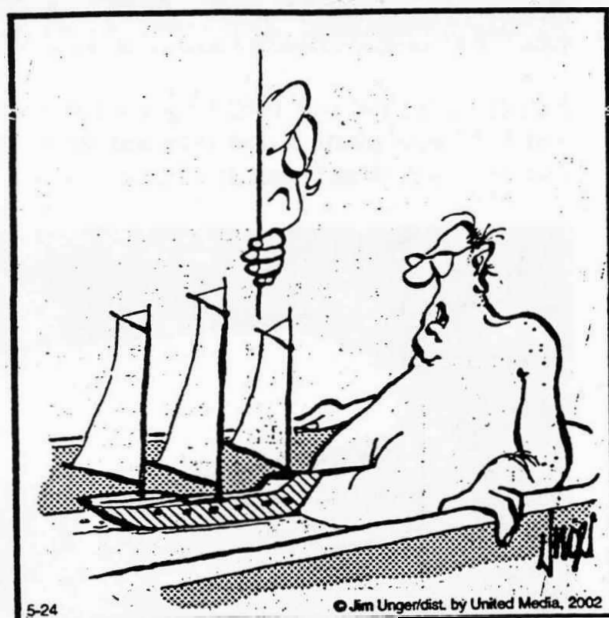
Basics of Ship Modeling The Illustrated Guide, Mike Ashey, Kalmbach Books

The San Diego Ship Modeler's Guild enjoyed a demonstration by Bill Luther on the secret tools of the trade for working with photo etched model parts.



SHE'S GOT THREE BROKEN RIBS
AND A SEPARATED KNEE -
WE'RE GONNA HAVE TO OPEN
HER UP.

HERMAN



"Call the doctor!"

CASTING MODEL PARTS

Frank Dengler

Ship models typically have a variety of duplicate parts. Examples include bitts, chocks, vents, search-lights, lockers, doors, hatches, davits, boats, and various types of ordnance. Duplicate fittings can be individually carved or fabricated, but the process is usually tedious, time consuming, and prone to production of parts that aren't uniform in appearance. Model ship fittings may be purchased, but manufacturers may not offer parts of the type, scale, or authenticity desired. Some commercially available model parts are still cast in white metal which disintegrates after prolonged exposure to air.

To circumvent these problems, ship model builders "cold cast" their own duplicate parts relatively easily. This article is intended as an introduction to the process. Although some products are cited as examples, the author does not endorse any individual product or vendor. Ship model builders should explain their requirements to a knowledgeable vendor and let him/her recommend suitable products. The procedures described herein are not intended to override or circumvent instructions provided by molding and casting material manufacturer's and associated Material Safety Data Sheets (MSDS) which should be consulted for specific guidance.

The first step in the molding and casting process is to carve, fabricate, or purchase a "master" of the part to be duplicated. Sometimes it may be expeditious to modify a part provided in a kit as the basis for a more accurate component. Duplicates of kit parts may also be used to enhance a model's appearance, for example providing more cannon and gun port lids for a plastic model of HMS VICTORY so closed gun ports on hull halves can be opened. Models of modern warships can often be improved by copying life rafts, gun mounts, or aircraft from one kit to replace or supplement comparable items on another.

Model builders should remember that "master" parts will be submerged in a fluid media that hardens to form a mold. If this fluid is permitted to flow through holes in a "master", for example, the hole formed by an anchor stock and shackle, the molding material will have to be torn to extract the "master". This damage to the mold may be avoided by inserting a thin plastic sheet blank across the hole. The molding material will then flow part way into the hole to form a depression in the casting. The membrane left in the casting by the blank can be carved out when the casting is dry to restore a hole like the one in the "master".

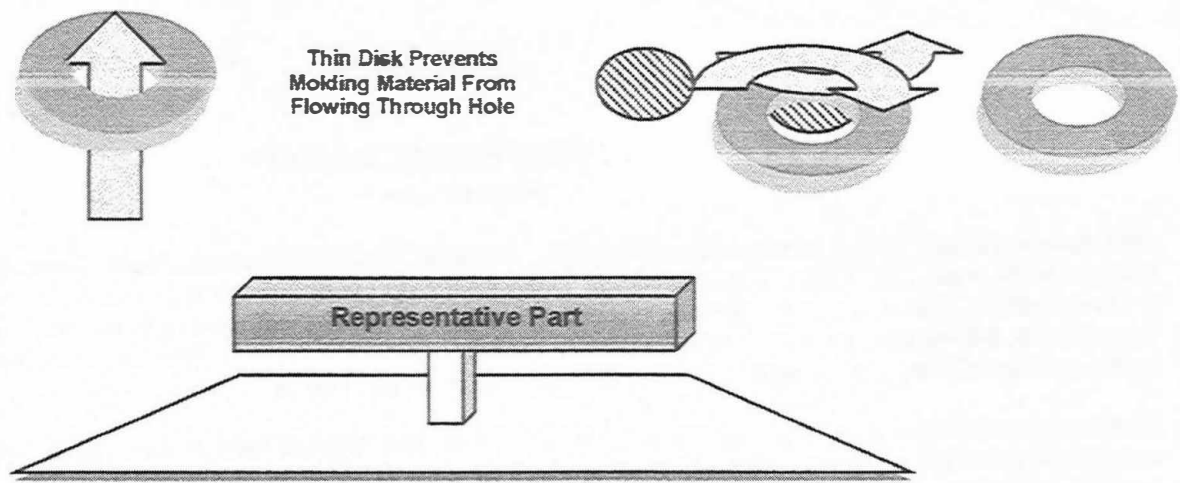
When completed, the "master" is temporarily glued to a waterproof base plate, like a piece of plastic sheet. A minimum amount of glue should be used since the "master" will ultimately be detached from the base. The "master" should be attached at a point that will not be visible on the model, like the underside of a gun mount base ring, or at a point where excess casting material can be easily filed, ground, or sanded off, like the relatively flat transom of a model ship's barge. The attachment point should have an adequate cross section on the base plate so that when the "master" is removed and the mold is inverted casting material can be poured through the "master's" former "foot print" into the mold cavity. In some cases this may require setting the "master" on an intermediate block that will leave a hole big enough hold in the mold for the introduction of casting material. If "masters" are essentially two dimensional, like watertight doors, they may be glued, face up, directly to the base plate.

Air trapped in the extremities of the mold cavity may prevent casting material from flowing throughout the volume necessary to produce a complete and accurate part.

If a part is relatively large and its long axis is parallel to the base plate, it may be necessary to glue temporary plastic rod stock "struts" between the ends of the part and the base plate to serve as vents that permit air to escape when casting material is poured into the main attachment point at the center.

If a "master" has narrow extensions, for example gun barrels protruding from a turret, it may be prudent to temporarily glue small rod sections or blocks on the ends of the "master's" extremities to serve as reservoirs that allow casting material to flow through and fill tips.

After the "master" is temporarily glued to the base plate, it should be surrounded by a waterproof "dike" such as a plastic pipe section or a box assembled from four plastic sheet sides. The "dike" is glued to the base plate to form a container for the liquid molding compound. The "dike" should generally be about 1/2" higher than the "master's" highest point above the base plate. Before pouring molding compound into the "dike" area, the "master" should be inspected to ensure it is free of chips, cracks, debris, or excess glue that could disfigure castings.



Molding compound and casting material can be obtained from a variety of vendors including AE Yale Enterprises, 4055 Pacific Highway (east of the Marine Corps. Recruit Depot), San Diego, CA 92110-2087, phone: 619-299-7710, E-mail: sales@aeyale.com. Yale carries a quart kit of Quantum Silicones Inc. molding compound for about \$35.00 and a 2 quart kit of Por-A-Kast urethane casting material for about \$37.00. An alternate source for casting supplies is Micro-Mark, 340 Snyder Avenue, Berkeley Heights, NJ 07922-1595, Phone: 908-464-2984, Fax: 908-665-9383, or on the Internet at: <http://www.dxmarket.com/micromark/dir/20.html>. If enough members are interested in casting parts, the San Diego Ship Modelers' Guild may want to purchase some molding and casting material for staging in the shop aboard BERKELEY.

Users should mix molding compound components per manufacturer's instructions, for example 1 part actuator to 11 parts base. Mixing should be thorough enough to ensure the result is completely homogenous, but not vigorous enough to induce air bubbles. When properly mixed, the molding compound should be poured into the "diked" area to a depth of about 1/4" to 1/2" above the top of the master. Ideally, the wet mold should be placed in a rigid container attached to a vacuum pump and the pump should be activated to draw trapped air bubbles away from the master. However, if this isn't feasible, the compound can be rubbed into crevices and/or the entire "dike" assembly tapped to encourage settling while the compound is in its most fluid state immediately after pouring. The upper surface of the wet molding compound will normally be flat, however, if it dries rapidly and becomes significantly rippled, forms a "stalagmite", or adheres to the "dike" to form a raised lip, it should be smoothed out as much as feasible since the mold will be inverted and its original upper surface will become its base. If the base is not flat, castings may be deformed.

When the molding compound dries, generally in about 24 hours, the "dike" should be loosened or broken away and the "master" twisted, snapped, or sliced off the base plate. An incision should be made with a sharp blade, like a Number 11 Excel, in the surface of the mold that was against the base plate. The incision will normally extend horizontally from the opposite sides of the attachment point and vertically down to the surface of the master, forming a slit through which the "master" can be extracted. It may be necessary to extend the incision to incorporate the "struts" used to make vents, but extensive cutting should be avoided since severed sections may become misaligned or be incapable of containing liquid casting media.

When the "master" has been extracted, the mold should be placed on its former upper surface so the opening where the "master" was attached to the base plate is on top. Two part casting material should be mixed per manufacturer's directions, for example, equal amounts of Part "A" and Part "B". Again, care should be taken to avoid creating bubbles. The mixed casting material is then poured into the mold. Ideally the mold should be placed in a vacuum as cited above to draw air out of the casting. However, if this isn't feasible, a wire may be used as a probe to ensure the casting material flows into recesses, extremities, and under the mold lip during and immediately after pouring. The mold may also be tamped to cause bubbles to surface at the attachment point. See manufacturer's instructions for casting material drying time, normally around 10 to 20 minutes. When the casting material is dry, the casting can be extracted like the "master" was removed from the mold.

A "critical mass" of casting material can generate heat, gas, and/or result in deformed castings. "Critical mass", in the author's experience, about the size of an H. O. scale train box car, may be avoided by using several "masters" which, when assembled, form the desired part. Alternately, blocks of chemically compatible foam or another non-reactive, somewhat compressible, substance can be suspended within the mold to fill volume that would otherwise be filled with casting material. This technique has been used in open molds used to create small hulls. The resultant hollow hulls are then fitted with decks.

WHITE DEATH

Australian waters lure big game fishermen on world's greatest fishing trip.

By Al. A. Adams

"One thing a fisherman sees far more than do his fellow men, and that is the coming of the dawn and the breaking of the light, and the bursting of the sun into its supremacy."

* * *

This matter of Australian sharks is astounding!

A statement by an eminent New York scientist to the effect that there was no such thing as a man-eating shark and further that there are no waters in the world which he (the scientist) would not swim rang a challenge to the heart of the late Zane Grey. For a good many years Grey had gradually yielded to an impression that Australian waters, especially on the Indian Ocean side, would develop some of the greatest big game fishing in the world.

Throughout 12 years of his extensive travel to the far reaches of the Pacific Ocean Zane Grey had with him as head of his camera department a man close to his heart - Gus Bagnard (pronounced Ban-yard).

Bagnard, aside from being a cameraman of exceptional ability, came to love the whirl of a reel and the dip of a rod through his long association with Grey. With the words of the New York scientist to the effect that men like Grey were a bit off the beam to think there were such creatures as man-eating sharks, Grey, Bagnard and their party were off for the bottom of the world--Australia, and the Great Barrier reefs, 1300 miles of rugged coast to disprove a few contentions. With Grey, no trip was too far, or too expensive as long as the thought remained in his mind that more and still larger fish were to be caught. They also wanted to prove to that great following, the disciples of Izaak Walton, that the big ones don't always get away!

The party arrived in Australia in time to welcome the New Year, 1936. From Sydney they motored down the coast some 275 miles to the little village of Bermagui, where camp was established.

Grey and Bagnard walked up a gradual ascent from their camp -- a wooded slope leading to a jutting promontory opening out above the insatiate, crawling sea. Standing on the bold and precipitous bluff, they watched the waves breaking with thundering crashes and echoing roars and saw the swells dash to a flustered frenzied ruin upon the rocks. Intently they listened to the lapping, purling sounds of the water receding through the pebbles.

Away to the north they beheld standing bleak and bare, Montague island with its gray, unmoving sentry -- Montague lighthouse. As far as fish were concerned, they had only to look out over that dark blue ocean, the Tasman sea, notorious for its currents and storms, and its schools of whales and fish, to know that they would find new and boundless sport. They were suddenly sure that here would be found the grandest fish of all.

Dr. David Stead, of Sydney, a scientist of international reputation, had stated he was certain there were white death sharks up to 80 feet in length. If there aren't, thought he and Grey, where do the white shark teeth five inches across the base, which have been dredged from the ocean bed, come from. With fish abounding, why not some unknown species huge and terrible?

With two small power boats and a sailboat at their disposal the Grey party began one of the grandest fishing parties ever staged. Within four months' time, half of which was lost to fishing due to rough, high seas and high winds, they caught 67 big fish weighing more than 21,000 pounds, an average of over 313 pounds per fish and all taken on regulation tackle.

Grey caught the first yellow fin tuna ever reported and since that catch a \$2,000,000 tuna industry has been developed. He also took the Australian record black marlin at 480 pounds and the Australian record striped marlin at 324 pounds.

As for Gus Bagnard, he believes that anybody could tell him anything about the sea or what lives in it and he would have no reason to doubt it. He has seen too many strange things of the sea to be dubious.

It was during the meet of the International Congress of Big Game Anglers held under the auspices of the Anglers of Australia in 1939 that Grey's party took nine out of eleven awards. Grey established his award on his striped marlin catch at 409 pounds. Bagnard's brother, Lyle, took five awards, the first being his 1382-pound tiger shark, a world's record; a 1150 pound whaler shark, a 111 pound marlin on 6 strand line, 6 inch tip and 6 ounce rod; a 358 Mako shark and a 986 pound tiger shark on 24-strand line. Gus established two world's records and one Sydney record. He caught the largest hammerhead shark ever taken at 552 pounds and the Sydney record black marlin at 324 pounds. Gus holds the world's record for his white death shark at 1036 pounds -- one of the most ferocious big fish ever caught. Gus took this huge man-eater on regulation 39-strand line. This was one of the largest fish ever taken on rod and reel. Lyle's world's record tiger shark is the largest fish ever taken on rod and reel.

These official weights were made by the Metropolitan museum, which issued official certificates. When Lyle's huge man-eater was hauled up for the weigh-in a full-grown Airedale dog was expelled from the stomach.

Bagnard states that he has seen these white death sharks swim close to rocks upon which seals were basking, lash out with their tails and flip seals into the water. The sharks would then devour the seals before they could get away.

As proof to their contentions that there is such a thing as a man-eater the party gathered data on 300 cases of shark fatalities from the civilized whites. A lady friend of Bagnard's wife was destroyed by a gray nurse shark while the party was in Australia. Bagnard also witnessed the horrible destruction of a boy who was in waist-deep water. A huge shark swallowed the lower half of the boy's torso and carried the screaming, bleeding boy out through the surf. He was seen no more.

The white death shark is very white in appearance and has a vicious, diabolic mouth, containing triple rows of wickedly sharp teeth. The jaw is of gristle and as the teeth break off or wear away the undeveloped or smaller teeth rotate outward to take the place of the original set. They have no bones or backbones, being practically invertebrates. The skin itself from study by dissection appears to be nothing more than undeveloped teeth.

The white death shark is one of the only big fish that inhabits all the seven seas, being both north and south of the equator.

It was a deep and powerful emotion that these men of Grey's party felt when they killed a shark – a justification that each shark taken would never kill a human being.

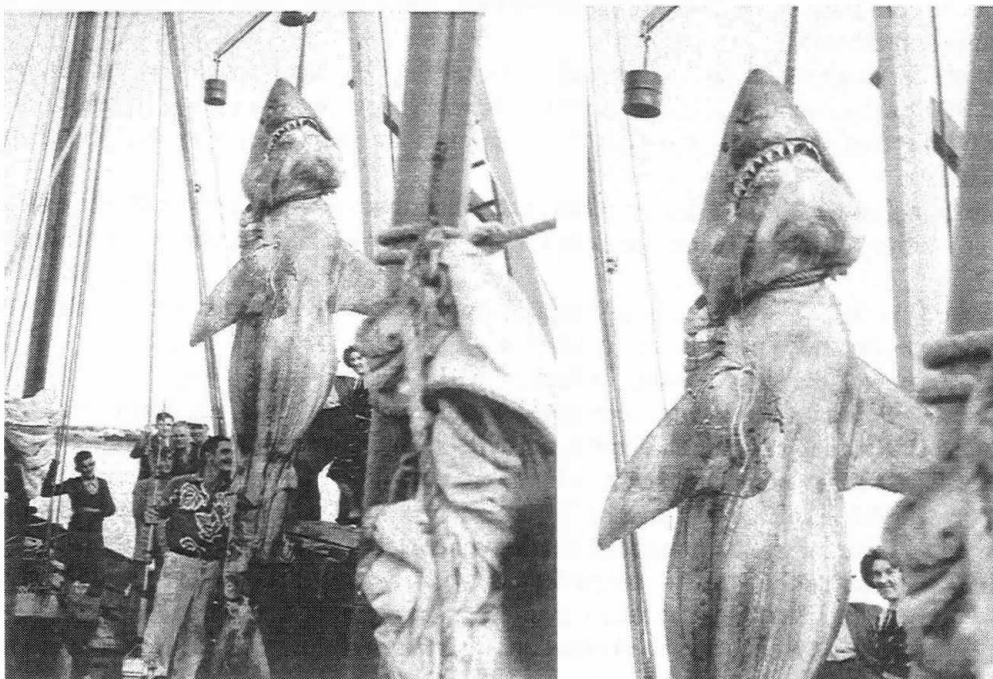
These gray nurse sharks hunt in packs and have been known to leave the salt water of the sea to traverse as far as 90 miles up fresh water rivers where they would attack people.

A gray nurse shark, which Gus caught, was about to give birth to its young and when taken aboard the boat Bagnard found himself acting as midwife to 38 young sharks. The shark from the time it is born until death seems never to stop moving and never sleeps. Their only instinct is to eat.

I was fortunate to know Gus Bagnard at the start of World War II and instrumental in his being employed by the Douglas Aircraft Santa Monica plant in the Tooling Division – a real pleasure having his friendship. In the accompanying photo Mr. Bagnard is shown with the 1,036 pound White Death shark, the largest fish ever taken on rod and reel. He presented that 1,000 yard reel and rod to me – a great gift. Zane Grey had presented the rod and reel to Gus years before.

Bagnard returned to Southern California, a son has been born. President John Davis of the National Angler's Club has presented a gold marlin lapel pin to the baby, significant of honorary lifetime membership. Bagnard's son is now the youngest member in this noted anglers' organization. Gus Bagnard and his brother Lyle passed away.

And so it was that Grey, Lyle and Gus sought the joy of anticipation – of trolling sunny, strange waters, of purple coral reefs and ribbon beaches of white sand, and the shore haunts of the aborigines. They strove always for the unattainable, whether it was a great fish or the ultimate in beauty.



The Birth of the American Navy: Part 2

The *Constitution* was to be built in Boston; the *Constellation*, in Baltimore. New York got the *President*; Norfolk, Virginia, the *Chesapeake*; and Portsmouth, New Hampshire, the *Congress*. Joshua Humphreys himself was chosen to build the *United States* in Philadelphia. (The ships were named as they neared completion. At the start they were designated with the letters A through F.)

Obtaining materials—specifically live oak—was the first priority. All told, it took the wood of more than 1,500 trees of various species to build one of these ships. A party of more than eighty New England shipwrights and woodcutters headed for the islands off the Georgia coast in the fall of 1794, but by the following spring, after a hard winter of foul weather and disease, only four remained. John Morgan, their leader, wrote Humphreys, "If I am to stay her[e] till all the timber is cut I shall be dead. . . . If you was here you would curse live Oak."

MORGAN WASN'T ABLE TO get the timber-cutting operation going satisfactorily until he turned to local planters who rented him slaves. Accustomed to the climate and working conditions, they were able to make good headway, and shortly after their arrival, oak shipments started to arrive at shipyards in the North. So in yet another irony surrounding the *Constitution* and her sister ships, the most important materials needed to build these vessels destined to defend American freedom could be successfully obtained only through slave labor.

By early 1796 work on the six frigates was again stymied, this time by political events. Word had been received of a peace agreement with the Barbary States in North Africa. According to law, this meant that all work on the vessels should cease. And it did, for a time. But the momentum of the new Navy had already built up too far for it to end so abruptly. President George Washington appealed to Congress to let the vessels' construction continue, and eventually a compromise was reached: Work would continue, but only on the three frigates nearest completion.

The U.S. Navy was finally launched in 1797. The first of the three frigates to slide down the ways was the *United States* in Philadelphia on May 10. The *Constellation*, somewhat smaller than

the others, came next in Baltimore on September 7. Then finally came the *Constitution* on October 21 in Boston.

Initially the men of the new Navy were not up to its ships. Starting from scratch in 1794, the service was fast becoming just another Federalist bureaucracy by the time tangible evidence of its purpose finally arrived: the superfrigates. Without any professional traditions, it lacked focus. Its highest offices had been filled by either political appointees or experienced captains from the old Continental Navy, each of whom had his own ideas about how it should be run.

Embarrassments were more often the norm than achievements. The first captain appointed to command a U.S. Navy vessel abruptly went on furlough so he could sail a merchant ship to China. The first captain of the *Constitution*, a political appointee, had to be relieved of command after several errors of judgment during the vessel's inaugural voyages. And the *Constellation* drifted aground while anchored in the Delaware River, then rolled over on her side when the tide went out.

But in time the new Navy finally shook down into a professional fighting armed service worthy of its ships. It ordered more frigates and completed the three left unfinished in 1797. It responded to the crises that initially had led to its creation. It took the fight and the flag to the doorstep of the tormentors of American merchant ships, first in the Caribbean during the Quasi-War with France, then to the Mediterranean against the Barbary pirates.

Command of one of the squadrons sent to accomplish this first major projection of American power overseas went to a captain far down on the seniority list, Edward Preble of Maine. In the same way that the *Constitution* is now symbolically viewed as the flagship of the entire U.S. Navy, Edward Preble is revered as the founding father of the naval officer corps. It was around him that all of the modern Navy's traditions of service, duty, and professionalism coalesced shortly after the turn of the nineteenth century, as he commanded the *Constitution* off the Barbary Coast.

From Invention and Technology, Fall 1997
Written by Roger Archibald
Contributed by Bill Luther

Preble had a reputation as a disciplinarian with a short temper. He demanded perfection from his crews, which at first led to a fair degree of dislike for him. But opinion started to change after an incident aboard the *Constitution* while en route to Gibraltar one night in September 1803. Threatening to open fire, Preble faced down a menacing British warship that in the dark claimed to be a more powerful ship of the line, but which was actually much lighter. Recognizing his courage and spirit during that confrontation, the young officers he had been assigned—whom he initially called "nothing but a pack of boys"—started to show him more respect.

DURING THE YEAR THAT FOLLOWED, the Mediterranean squadron labored under harsh conditions at sea, political pressure from home, and the decline of Preble's health in the effort to force the Barbary States to cease attacking American merchant ships. The squadron suffered some ignominious defeats but also enjoyed some spectacular successes, like the boarding and burning of a captured American frigate right under the enemy's guns, which Britain's Lord Nelson later called "the most bold and daring act of the age."

Through it all Preble set an example of leadership for his cadre of young officers, who solidified into the nucleus of the Navy's future professional career officer corps. Known as Preble's Boys, these officers—almost to a man—went on to great achievements in the next decade during the War of 1812. Stephen Decatur, the best-known hero of the Barbary campaign, commanded three of the Navy's first six superfrigates, the *Congress*, *United States*, and *President*. The *Constitution* was commanded in her three major battle encounters of the War of 1812, all victorious, by three alumni of the Preble's Boys fraternity: Isaac Hull, William Bainbridge, and Charles Stewart.

En route back home in late 1804 after his squadron had been relieved, Preble called at Gibraltar before heading out across the Atlantic. Witnessing the *Constitution's* arrival from the quarterdeck of HMS *Victory*, flagship of the Royal Navy, Lord Nelson is said to have remarked, "In the handling of those trans-Atlantic ships there is a nucleus of trouble for the Navy of Great Britain."

That trouble was less than ten years in coming. The *Constitution* first proved her worth during the War of 1812 not by defeating a British warship but by masterfully evading five of them that had trapped her off the New Jersey coast during a calm. A month later, however, when she encountered one of her pursuers alone en route to Nova Scotia for repairs, Capt. Isaac Hull's only desire was to demonstrate his vessel's superior armament.

APPROACHING FROM THE ADVANTAGEOUS windward side, he held fire until within "half a pistol's shot," then let loose a double-shotted broadside from which the HMS *Guerrière* never recovered. Within fifteen minutes her mizzen mast had toppled, and the other two masts soon followed.

Aboard the *United States*, Capt. Steven Decatur achieved a similarly brilliant victory when he engaged HMS *Macedonian* off the Azores in October 1812. Taking advantage of the superior range of his twenty-four-pound guns over the enemy's eighteen-pounders, he managed to cripple his opponent's rigging before his vessel was in effective range of their guns.

Even when stalemated, the superfrigates still managed to play a role in the war. Despite being bottled up in Norfolk for the entire duration by an effective British blockade, the *Constellation* nevertheless managed to take up station in Hampton Roads and prevented the British from destroying harbor fortifications defending the port.

But credit for the greatest tactical victory of the War of 1812 must go to the *Constitution*, which in the closing days of the conflict managed to defeat two attacking vessels, HMS *Cyane* and HMS *Levant*, simultaneously. When the *Cyane* attempted to maneuver behind *Constitution* and expose her to deadly raking fire (a broadside fired the length of an opponent's deck), Capt. Charles Stewart put his sails aback and threw the *Constitution* into reverse—no small feat for a 3,000-ton sailing vessel—and cut the *Cyane* off. She had no option but to break away, exposing herself to the *Constitution*'s own raking fire.

Time rather than any enemy was what eventually destroyed most of the Navy's first six frigates. The *Chesapeake* and the *President* were captured by the British, taken to England, and broken up (scrapped) between 1817 and 1820. On the basis of the lines taken off the latter—a common practice—the British constructed HMS *President*. In 1820 the *Congress* became the first American warship to visit China, the highlight of a career that was otherwise singularly uneventful. She was broken up at Norfolk in 1836.

THE *CONSTELLATION* WAS once thought to have been preserved. A sloop of war of that name that has been on display since 1955 on Baltimore's Inner Harbor was formerly believed to have been converted from the 1797 superfrigate. However, research revealed that this present *Constellation*, currently undergoing restoration, is actually the last full-fledged sailing warship built for the Navy. She was launched in 1855 at Norfolk, two years after the original *Constellation* was broken up there.

The *United States* lasted until the Civil War. Falling into Confederate hands with the loss of Norfolk in 1861, the by-then relic was dubbed the *Confederate States* and outfitted as a floating gun platform for harbor defense. A year later, when Union forces were again threatening, the Confederates ordered her sunk in a river channel to obstruct enemy vessels. The story goes that her live oak timbers were still so sound that workers ruined a boxful of axes in their attempt to scuttle her. They finally had to bore a hole from the inside to get her to sink. Refloated by Union forces, she was broken up in 1866.

The *Constitution* alone survives intact. In anticipation of the vessel's bicentennial (being celebrated throughout 1997), the Navy has been carrying on a three-year, \$12 million restoration and refit that has left the *Constitution* in the best condition she has been in since she was built.

The success of the restoration comes in no small part from an exhaustive research effort that was mounted in advance of any actual work on the ship. It reached as far afield as the National Maritime Museum in Greenwich, England, and as far back in time as the era of the vessel's construction. Researchers had to rediscover the diagonal riders, which had been removed from the *Constitution* sometime between 1820 and 1850 and never replaced. Since no original records remained of this revolutionary innovation, researchers had to turn first to the plans the English had taken from the captured *President*, which included short diagonal riders of iron (a British variation on the original design due to the shortage in England of timber of suitable size). Close examination of the *Constitution*'s hull once out of water revealed the pattern of where the original timbers had once been installed. Tests on a laboratory model proved their utility, and the Navy decided to reinstall them aboard the ship, where they have now successfully reversed the fourteen inches of hog that had developed in the vessel's keel since her last major restoration sixty-five years ago.

As a result, plans were set in motion to put the ship under sail once again. This happened in July 1997 in Massachusetts Bay off Boston. Before then, the *Constitution* had last sailed in 1881.

CMDR. MICHAEL BECK, THE *Constitution*'s sixty-fourth commanding officer, leads the way below from the vessel's topside, down to the gun deck, then the berth deck, and finally the bilge. Here at a point about twelve feet below the water line he steps over a massive timber that rests atop the planks—one of the diagonal riders.

"This is the technological key that unlocked America's access to the world," he says.

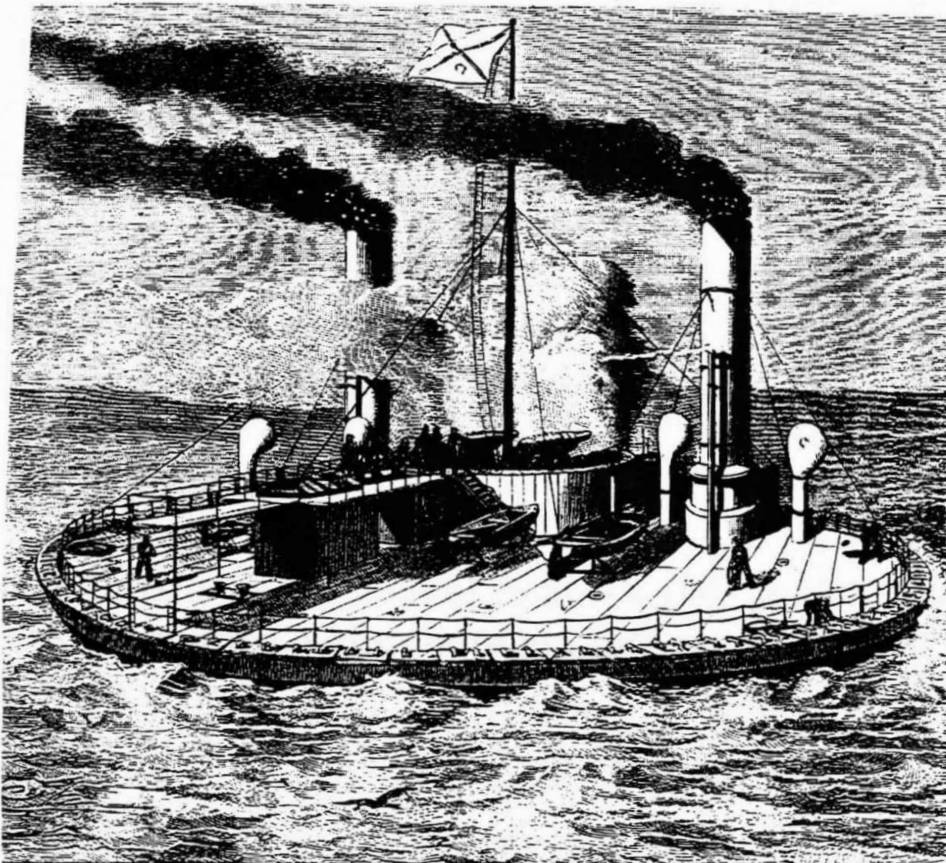
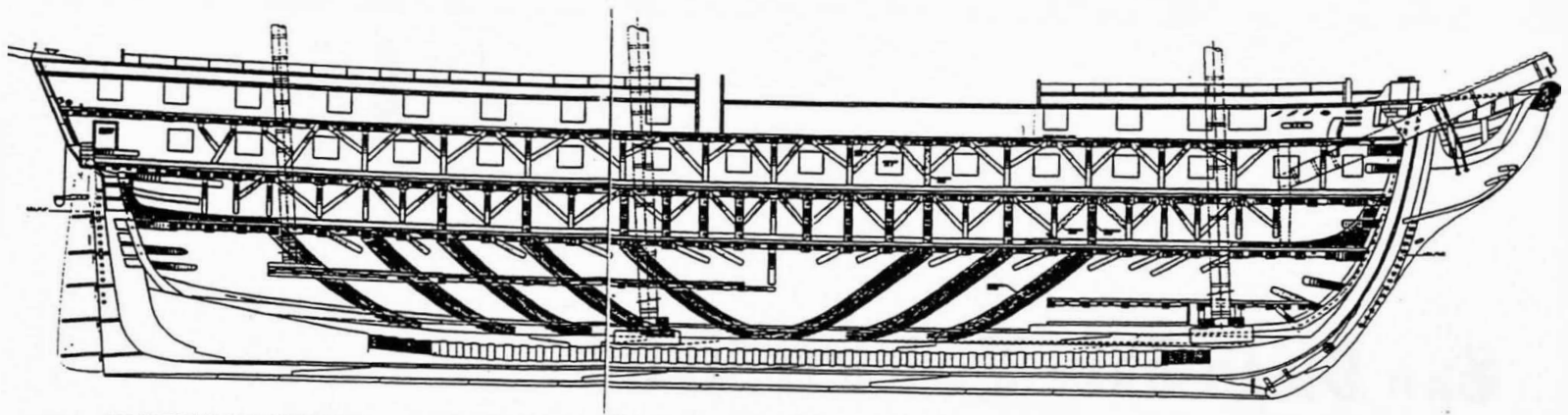
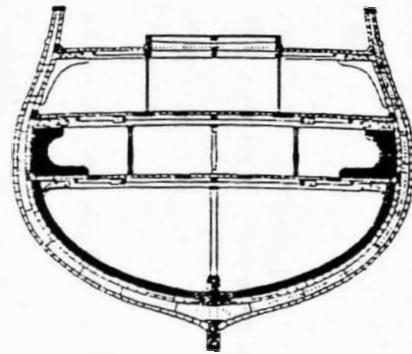
At the vertex where two of the beams meet above the keel, he continues. "We went from an isolationist country composed of disparate states to an assertive union of people determined to take a leadership role in the world. Diagonal riders provided the technological breakthrough to achieve that. These ships enabled the United States to gain a reputation in the world as a power to be reckoned with. And that allowed American interests to eventually become global in scope."

It is perhaps no coincidence that at the same time as Lewis and Clark were taking the American flag westward across the continent to reach the sea beyond, the *Constitution* and Capt. Edward Preble were carrying the American flag across the Atlantic to be seen on those continents beyond. In the same way that Lewis and Clark opened the frontier to the onslaught of American civilization, the *Constitution* and the other superfrigates of the early U.S. Navy opened the ports of the Old World to American commerce.

"It was manifest destiny to the east," says Michael Beck. "A manifest destiny for world trade." ★

Roger Archibald, who served with the Navy in Vietnam, writes often on maritime subjects.

The ships' revolutionary structure used "knees" (between decks below) to transfer the main gun battery's weight to diagonal riders (right), which kept stresses from building up at the keel's center.



ADMIRAL POPOV, a Russian warship built at Nicolaev in 1875 to a design by, and named after, Vice Admiral Popov. She was a vessel of 3,553 tons, entirely circular, a design meant to provide a steady platform for her guns irrespective of the state of the sea. She was armed with two 12-inch guns mounted in a rotating circular *barbette in the centre of the ship and was powered by eight engines driving six propellers. A second ship, named the *Novgorod*, was later built to the same design. They were reasonably robust for so revolutionary a design, but suffered from two considerable drawbacks: they proceeded *awash in the slightest seaway and their flat bottoms pounded badly, and although when used in rivers they steered well when going upstream, they were unmanageable coming downstream and revolved continuously. See also **LIVADIA**.



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