

THE STORY OF SHIP DESIGN

AND

de COPPET COLLECTION OF
SHIP MODELS

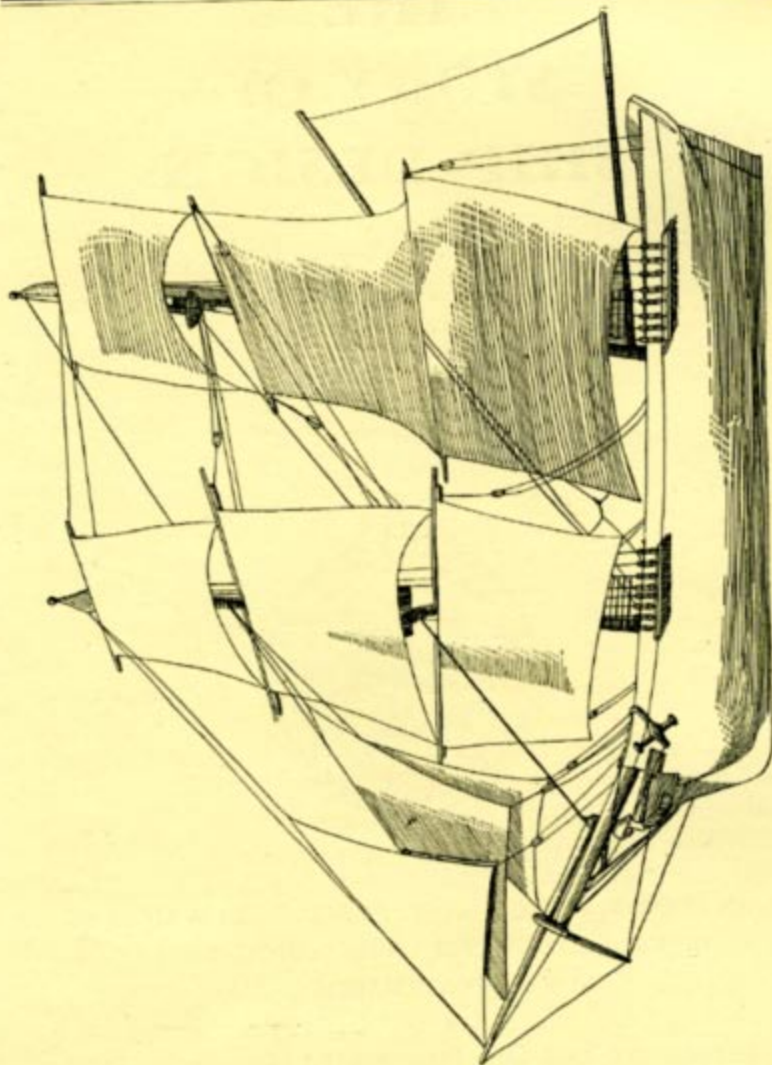
Sketches by Reynolds Printing



AN ADDRESS BY EDWARD T. PIERCE, Jr. AT A MEETING
OF THE OLD DARTMOUTH HISTORICAL SOCIETY,
NEW BEDFORD, MARCH 6, 1932.

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New Bedford, Massachusetts

Sketch No. 61



AMERICAN
FULL
RIGGED
BRIG



Size Length
86 inches. Beam
16 inches.
Depth $10\frac{1}{2}$ inches.

Finished in
natural wood.
Yards very long,
and foresail and
mainsail very
wide.

SHIP MODELS

EDWARD T. PIERCE, JR.



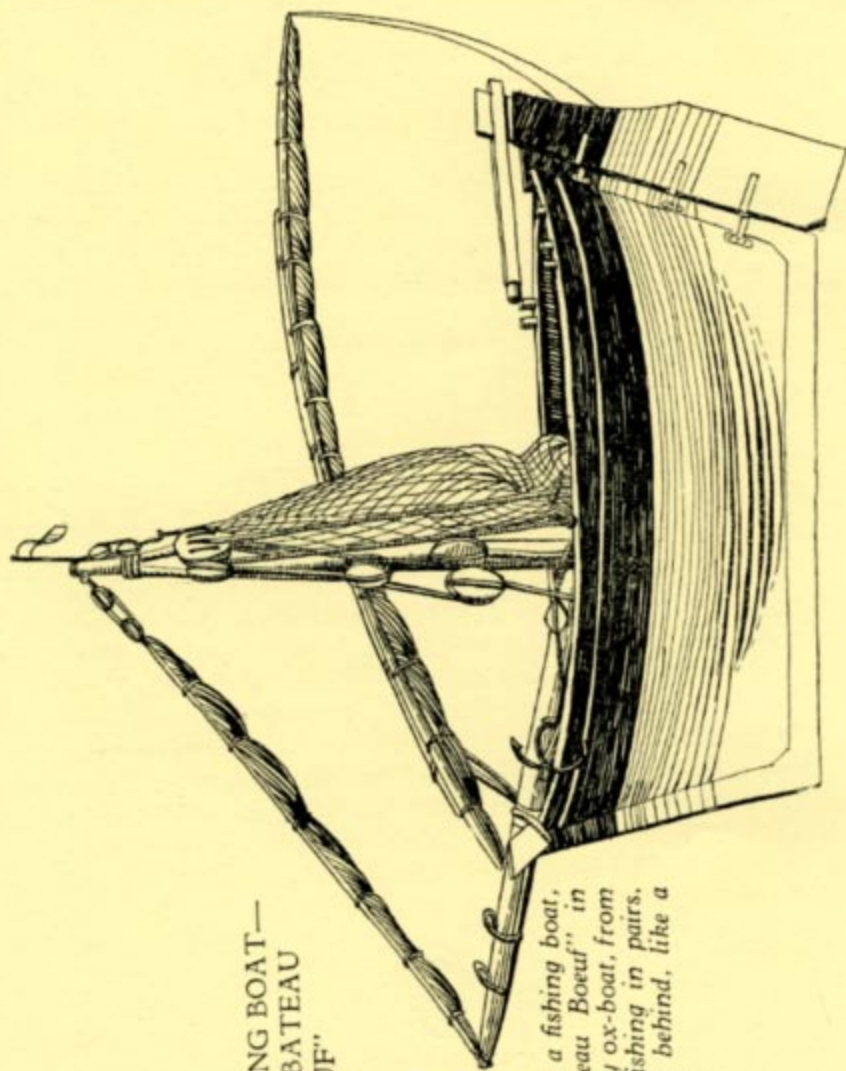
It can hardly escape attention that the Old Dartmouth Historical Society has become the home port of a truly remarkable fleet of ship models. They are as you know, the bequest of Mr. Louis Casimir deCoppet of New York. In a high degree they reflect Mr. deCoppet's taste as a collector, and also, I think, his admiration for our Curator's enthusiasm. For it is enthusiasm which makes the difference between an abiding place of dusty relics and an active, valuable institution like our Marine Museum.



I don't know why it should be my privilege to dip the Society's ensign in honor of the new fleet. There have been many good ship models built in our community, and perhaps many of you could set me right about such nautical intricacies as whether a "Flemish horse" should be "stopped" or "bridled", and whether, under any circumstances, a "cat" can be "rattled." It happens, however, that I have been brought up to believe that anything your President says is about right; so when he said, "You can talk about ship models," I only replied, "I don't see fittin". Of course any one who is familiar with the Whaling Classic knows that is not final like, "I do not choose to".



To tell you all about ship models would far exceed my powers and your patience. But I am sorry I shall not have time to tell you something about the famous collections, or about the books, ancient and modern which seem to belong to the subject. I shall say nothing about that seemingly magical process, whereby a ship becomes crystallized in a model, its precise contours and lines on a scale that lets the



FRENCH FISHING BOAT—
CALLED "BATEAU
BOEUF"

This boat is French and hails from Cette, in the south of France.

This model is a fishing boat, known as "bateau Boeuf" in French. Literally ox-boat, from the custom of fishing in pairs, drawing the net behind, like a pair of oxen.

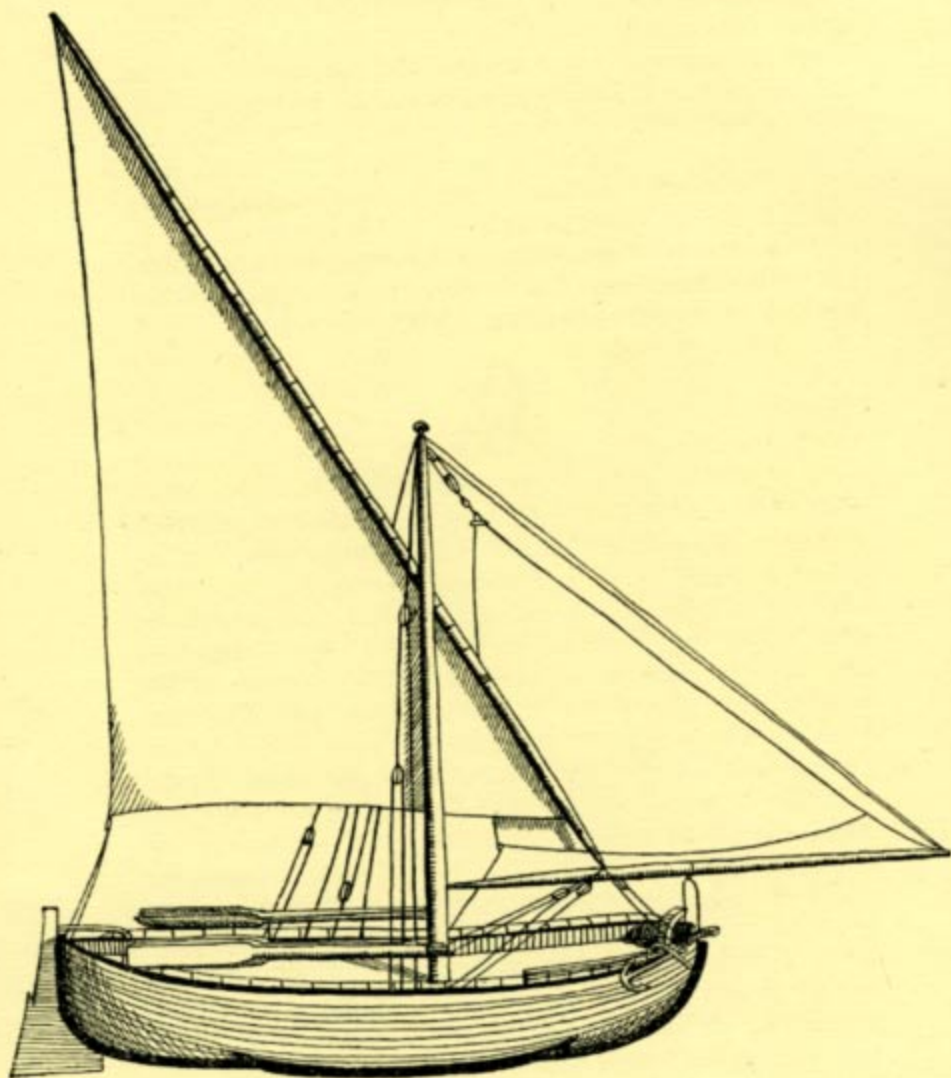
eye apprehend them in a single glance, nor of the equally magical sublimation from a model to a precisely similar ship. These are matters for the designer and the amateur, whose interest is generally in the sailing or making of models. Not many people are aware of the sport of model yachting, because it is far too esoteric to become popular or attract publicity, but it has international cup races and a heading — which is denied to ship models — in the *Britannica*. The boats are about six feet long, the last word in yacht design, and are so cleverly built that they weigh only 3 pounds without their thirty pounds of lead ballast.



For us it might be more informing to look at models with the eye of a simple, more technical observer. I think that the village blacksmith who comes with a polite but indefinite nautical interest to a marine museum, would go away with more sense of "something accomplished, something done," if he were permitted to infer from their arrangement that ship models and ships have had an interesting and orderly evolution, and if he were informed that, like mankind, their early purpose was a serious one. They did not get frivolous till they were discovered by the United States, or rather its accredited representatives, the fashion magazines, which gave them a page between abnormal psychology and the stock market. Perhaps today, our neighbor, having fore-sworn these expensive follies, may visit a museum, and try to visualize a better fashion from the relics there displayed. If he should follow—in imagination—that succession of vanities which we call (in a climax of vanity) progress, through all the meanderings that these little symbols of history suggest, he would certainly earn a night's repose.



I shall try to do something of the kind myself. I mean follow those vessels of wrath and piety which we call ships,—whose clean little souls we have here about us—as they



NEAPOLITAN PARANCELLA

Generally used for fishing, this one mounted a single gun forward. She used oars, and has hooks at the side, for drawing her out upon the beach.

disseminated their precious cargo along the wind-ways of the world. We shall have to go as far from Old Dartmouth as her ships ever went. For our Marine Museum has seen the saga of whaling develop into the maritime epic of mankind.

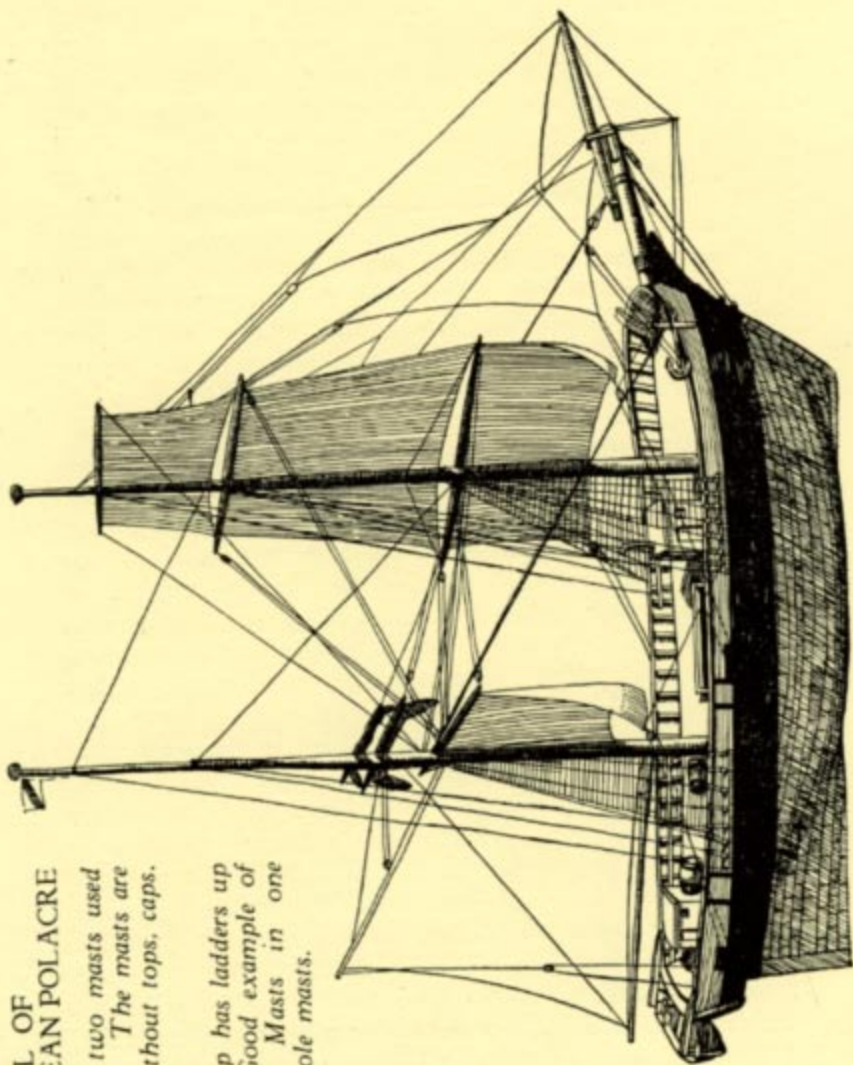


Ship models originated in man's fear of the hereafter. The earliest now known owe their existence to a religious belief of the Ancient Egyptians. They believed that a man might be called upon by the august judges of the unseen world for certain tasks, possibly unpleasant and certainly laborious. Accordingly, if he was a powerful man accustomed to having these things done for him, they filled his tomb with little figures of workmen and all the apparatus of their trades. Ushabti—answerers they were—who should answer for the great man when his name was called. Ships were necessarily included, as they were much used by the Egyptians, mostly on the Nile, probably on the Mediterranean and Red Seas as well. On these early models you find the square sail, which you may see on many of the models in this museum, and which today is found on many sea-going yachts. 8000 years. Surely that is venerable antiquity for a sail. Now for evolution. Tip up your square-sail yard as far as it will go, put it a-cock-bill is the correct expression (though it was probably unknown to the wily Egyptian who first turned the trick). You will have a sail not so well suited to running up the Nile before the wind, but infinitely better for catching a favoring slant if you are sneaking back along the windward bank. There you have the idea of sailing against the wind, and the great-grandfather of the sail which did it first and is doing it pretty successfully on the Mediterranean today. The lateen, whose high, narrow triangle appears, completely evolved, with the dhow type of vessel about the time of Alexander the Great, was present in the defeat of the Turks at Lepanto, and of the Armada in the British Channel. It was the rig of the dreaded corsair, and it shared the tall poop of the Santa Maria with Columbus. We have two examples of the true lateen, which

MODEL OF
MEDITERRANEAN POLACRE

A vessel with two masts used in Mediterranean. The masts are in one length, without tops, caps, or crosstrees.

This small ship has ladders up her topmasts. Good example of the "Polacre". Masts in one length, we call pole masts.



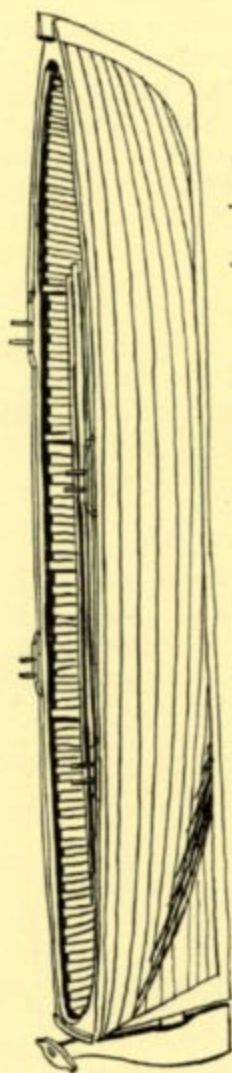
trace their descent through the Tartane, a romantic little ship that readers of Conrad will remember. The green model is a fishing boat, known as "bateau boeuf" in French and bovo in Italian. Literally ox-boat, they get their name from the custom of fishing in pairs, drawing the net behind like a pair of oxen. This boat is French and hails from Cette, a big seaport in the south of France. The other model is a Neopolitan Parancella. They were generally used for fishing but this one mounted a single gun forward. She used oars and had hooks at the side for drawing her out upon the beach.



While we are in the Mediterranean, and not too far from Provencal influence, I should like to mention what looks like a little brig with ladders up her topmasts. This is an example of a polacre. You will find that Cooper uses the word in his history of the Navy. The significant thing is that the masts appear to be all in one length, unlike typical square rigged masts which show plainly their separate spars and doublings. We should call them polemasts, and they make a light and simple rig, but not a very strong one. The boat in question is a chebeque, or as we say xebec, a type that seems to have varied widely in form and rig, and links the Lateen rig of the early galley to the fuller lines and square rig of later merchant vessels.



Let me return in a broad leap of 2000 years to the Mediterranean of classical times. The Egyptians were not seamen; the Phoenicians were. Their record for circumnavigating Africa stood for 1500 years. If they *did* proceed beyond the tin mines of Cornwall to Scandinavia they *may* have inspired our rude ancestors with the idea of the Norse double-



Model of ship's boat. Lapped streaked. About one foot long.



Model Hull of Ship, Partly Completed.

Size Length 54 inches. Beam $11\frac{1}{2}$ inches. Depth 10 inches.

ender, which *may*, in turn, have inspired some other ancestor with the idea of a whale boat. From this maze of speculation, I pass (unbelieving) to the fact that there actually are in existence Greek models of the ancient "roundship"—the merchant man of early days which plowed its leisurely way from port to port along the paths of trade, while the military gentlemen and Vikings went dashing about in galleys and double-enders, generally known as "longships". The navy of oars we are mercifully spared from considering, though it is well represented in European museums. It had one advantage in that it furnished steady, non-competitive employment for undesirable citizens and conquered populations.

The old merchant ship — which was the ship of St. Paul — cannot be dismissed. Early Greek examples show the fortified castles so conspicuous in all mediaeval ships, but which have left us only the term fo'c's'l and the beautiful stern and quarter galleries — the officer's quarters as you might imagine — in ships of the eighteenth century.



I may seem to have forgotten that we owe our early ship models and other good things to human fear, but I haven't. Objects of art in classical and mediaeval times have a way of being connected with temples or churches, where it was the custom to place a votive offering or tablet when one had the good fortune to be saved from shipwreck or to return from a voyage. The Romans weren't much more willing seamen than the Egyptians, yet they must have depended on the sea for transportation, as no part of their empire was far inland. Wind and water that were the breath of life to a Northman were just anguish to a Roman. Even in fancy they were something unpleasant. But let him speak for himself. With a lot of anti-nautical imagery Horace expresses the sentiment of votive offerings, though Horace had only been delivered from the squalls of a coquette. This is probably the most recent translation.

MODEL OF THE
FRENCH MAN-OF-WAR
"MARS" CIRCA 1790

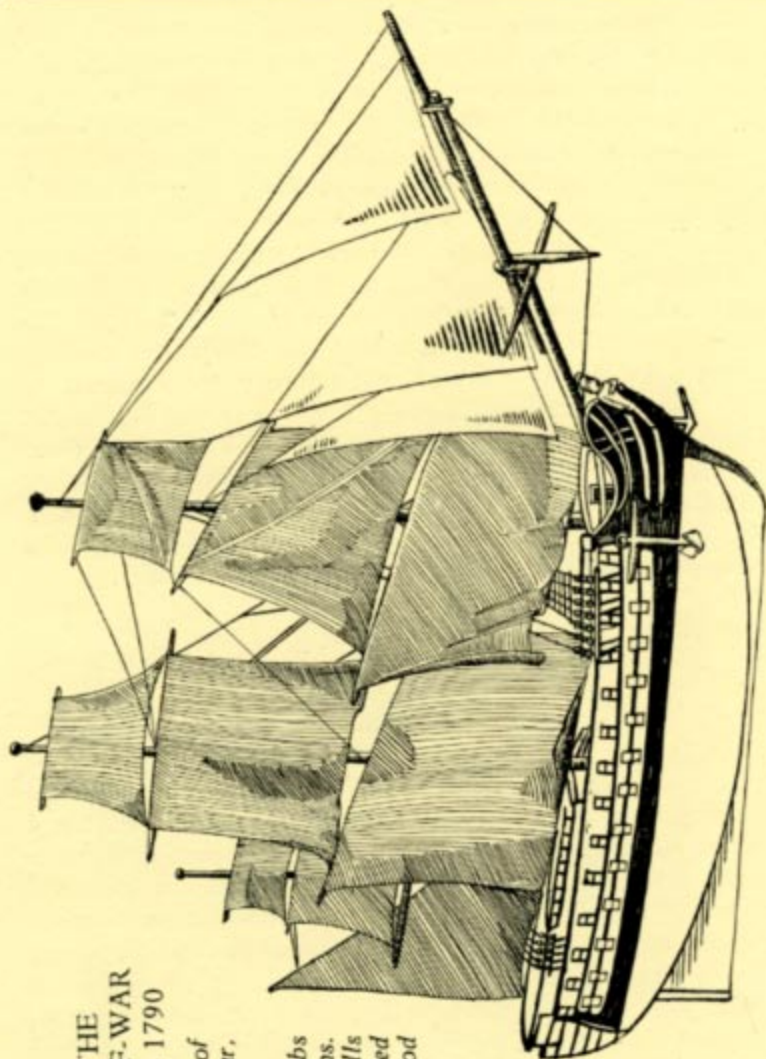
Contemporary hull of famous man-of-war, fully planked.

Constructed on ribs and mounting 64 guns. The bow with scrolls leading to a finely carved figurehead of Mars, God of War.

The stern finely pierced and galleried.

Completely rigged with all sails set and equipped with minute running gear. Set on miniature ways.

Height, 62 inches; length, 88 inches.





Which pretty lad, perfume arrayed,
Now pets you at the cave where roses grow,
My Pyrrha sweet?
For whom's your bright sunglinting hair
So simply neat?

Alas, how many a windy day
(When he complains of broken dates)
He'll feel the pale
Assault of spindrift's lashing—wreck—
And the blust'ring gale.

Poor innocent, unheedingly
Would treasure you as summer calm:
And hope to see
You aimiable, forever mild,
And fancy free.

Unhappy they for whom — untried —
You glow. A votive tablet hung
In Neptune's shrine
Is witness I am saved from wreck
By power divine.

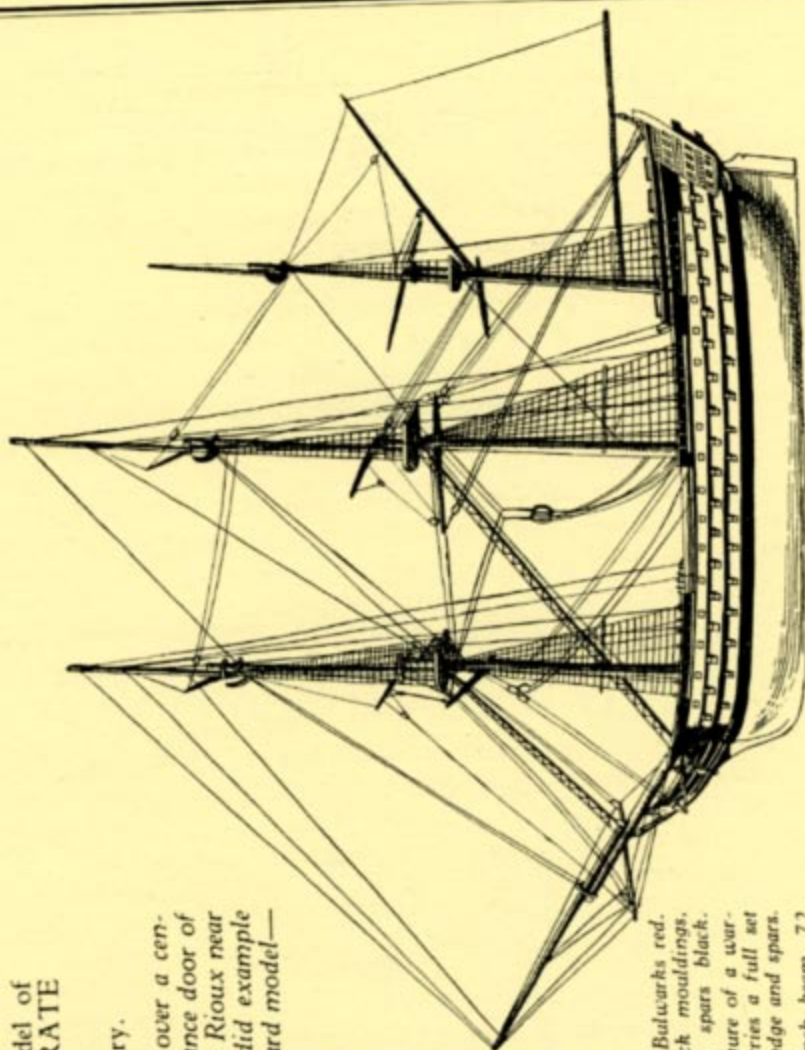
Dockyard Scale Model of
FRENCH FIRST RATE
126 GUNS.

Late 18th Century.

This model stood for over a century above the great entrance door of the hall of the Chateau de Rioux near Bordeaux. It is a splendid example of the Continental dockyard model—large—so that every detail of hull and rigging could be carried out faithfully.

The hull is white below the waterline, black strakes buff above with buff port-shutters, red within. Carriages of her 126 guns are red. These guns are made to scale, 36 pounders on the lower gun deck, 24 on the upper, 12 on spar deck, and 8 and 4 pounders on the forecastle and poop.

Decks are natural wood. Bulwarks red. Lower masts buff with black mouldings, upper masts natural wood, spars black. At her bow is a helmeted figure of a warrior painted white. She carries a full set of anchors, bower, stream, kedge and spars. (Size 96 inches long, 14 inch beam, 72 inches high.)



The practice of giving representations of ships as votive offerings passed into the Christian religion, especially in the churches of St. Nicholas, who seems to have had sea travellers under his protection. The transition from religious to secular and subsequently decorative use, still under the influence of fear, is so very odd that I shall quote from the *Encyclopedia Britannica* before I am accused of too much romancing. That Irreproachable Authority says:

"Of all the ornaments of the table in medieval times, the most conspicuous was the *nef*. In the form of a ship (from which it took its name) it was generally designed to hold the table utensils of the host, knives, napkins and at times the wine. Some later examples were carried out with great elaboration, sails and rigging being carefully finished and with a number of figures on deck. The reason was fear of poison originally. As this became less, it changed character, becoming purely an ornament or sometimes a drinking vessel."

Whether we may assume from this that our familiar sauceboat has evolved from the ship-model, I do not know. But we certainly have the background to the discovery of Mr. Tripp that our new model of a French first rate spent a hundred years of its life over the doorway of the French Chateau de Rioux. Ornaments have a way of starting on the table and ending on the shelf.

It would not be fair to leave the "*nef*" without another word for the ships of a stirring age. Consider the wreckless — I spell the word with a "w" but you may do as you please — voyage of Richard the First's dromons from England to Palestine in the 12th Century in the Crusade. The dromon had no castles but still she was a roundship, quite different from the great galleys, in which Venice as Mistress of the Sea, was supreme. The Venetian roundship — the merchant or sailing vessel — was called a *nef* or buss-ship and felt to be just an old bus. As a matter of pedigree, dromons, busses, *nefs* and carracks could all have dammed the caravel and the galleon, and probably did. For a sire, the galley yielded to the need for heavier armament, in the struggles against Turk and corsair, and became the galleasse, a shippier ship with castles fore and aft, but depending on

Model of the Thames River Barge

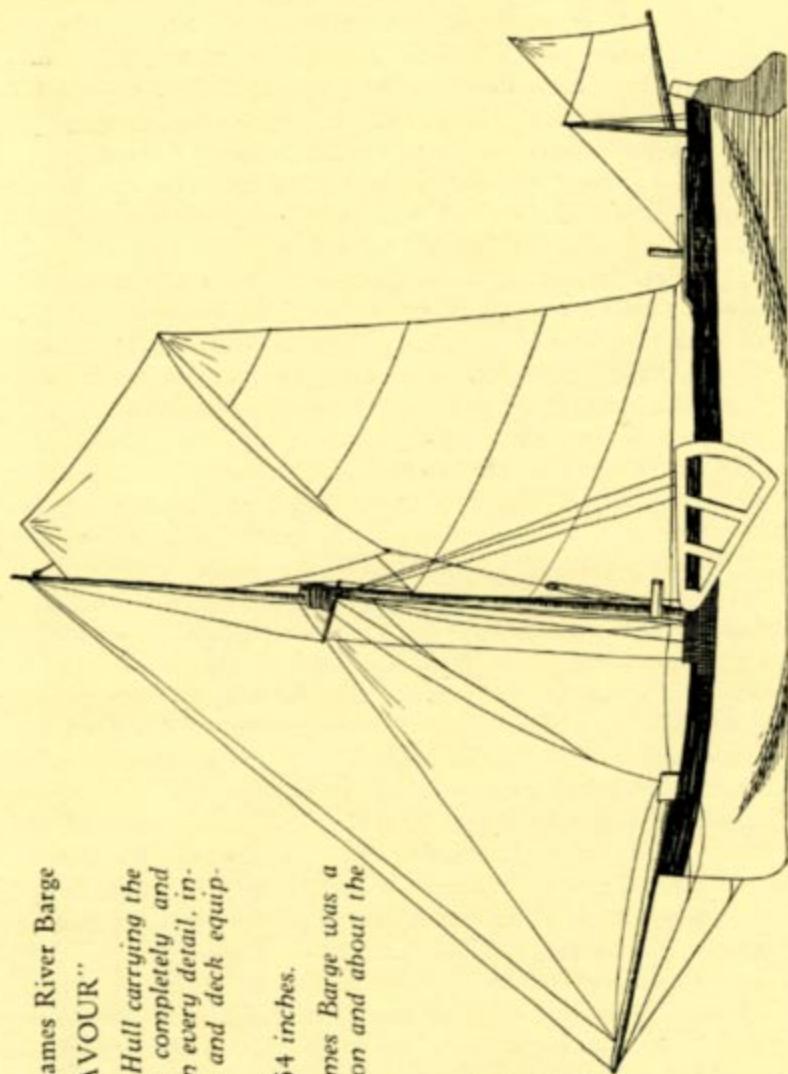
"ENDEAVOUR"

Painted grey. Hull carrying the old lee boards; completely and carefully rigged in every detail, including all sails, and deck equipment.

Length 54 inches.

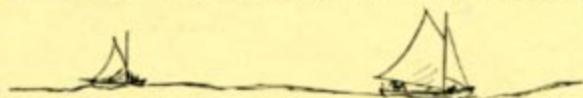
The old Thames Barge was a picturesque ship on and about the Thames. The crews were incredibly small.

The old skipper was often seen at the helm while "the old woman," was peeling her potatoes.



sails as much as oars. Such is the lineage of the caravel and the galleon.

You remember that the growing power of the Turk closed the old route to India, and brought into being the Age of Discovery. We may think of it as a beginning in 1415 when Henry the Navigator of Portugal founded his "Geographic Society", the spiritual parent of Diaz, da Gama, Magellan and Columbus. The scientific spirit with which Henry undertook his quest for knowledge, aided by the Moors who had been the conservators of learning for medieval Europe, seems to be reborn in Colbert two centuries later. Colbert laid the foundations of naval architecture, and we shall see that France had the best ships in the world in the period which our large French models illustrate.



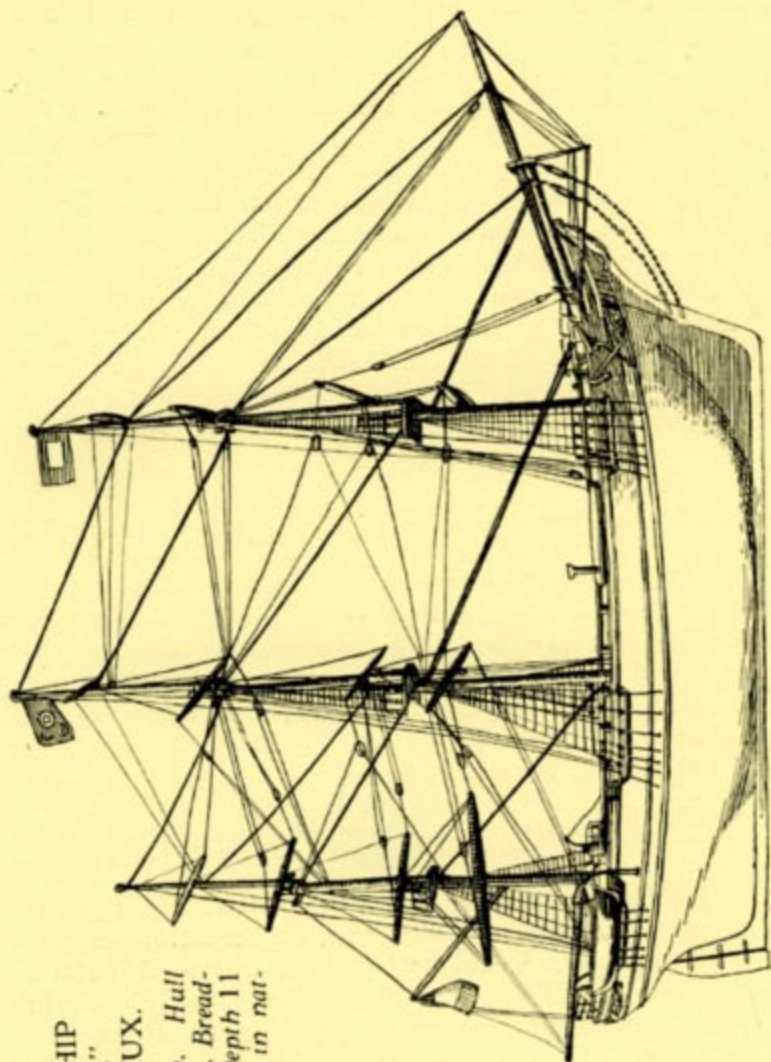
In following science from the Moors and Portugal to France, I am skipping Spain and England, whom the age of Discovery left as bitter rivals for supremacy at sea. The age of the caravel, the pinesse and the galleon, the age that Kingsley writes about in *Westward Ho*, came to a climax in the defeat of the Spanish Armada.



The Dutch were also very busy with their ships, preparing, perhaps unconsciously, to enter the naval struggles of the next century. In 1599 a Hollander named Barentz, attempting to find a northern route to India, lost his ship in the ice. This regrettable mischance gave us one of the most important bits of evidence in all nautical history. The journal of the return voyage in small boats shows a ship's boat with a triangular sail set on a headstay, and a fore 'n' aft mains'l extended by a sprit. This is the Eohippus or three toed horse of all triangular headsails and fore 'n' aft mains'ls. In one form, it has come down to the present almost unchanged. You may see it on the Thames barge

FRENCH SHIP
"JEANNE,"
OF BORDEAUX.

Merchant Ship. Hull
Length 76 inches. Bread-
th 11½ inches. Depth 11
inches. Finished in nat-
ural wood.



model, which also betrays her relationship to Holland by lee boards — the centerboard of a catboat translated into Dutch.

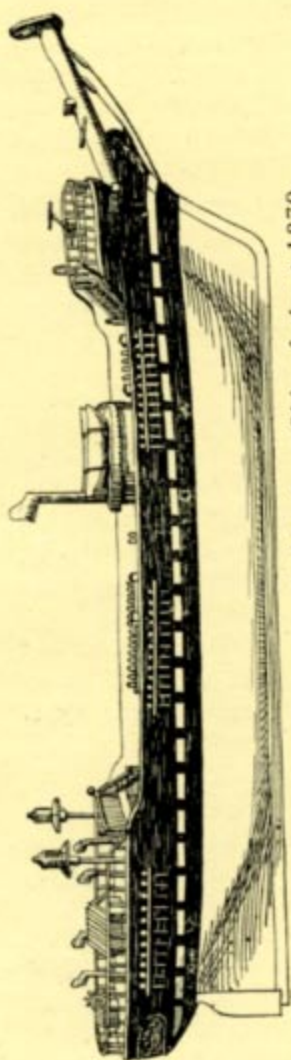
After the Age of Discovery, the ship model emerged completely from its origins, and embarked upon a secular career. There are some contemporary models of this period, and there are others, perhaps more reliable for study, which represent an enormous task of patient research. The South Kensington Museum at London probably has as fine a collection as any, but almost everyone has seen reproductions of the Santa Maria and the Mayflower. A galleon, or Tudor ship such as the *Henri Grace a Dieu* with its painted sails, would be a very attractive and instructive addition to our collection.



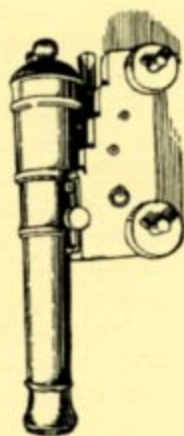
Models became more common as they began in the literal rather than the supernatural sense to substantiate themselves. In other words, the ship came to be built from them. Mr. Charles G. Davis who has written two splendid books on model making says "In England it was the custom for ship-builders to prepare and present with their plans a small built up replica of any newly proposed class of ships in order that the Lords of the Admiralty, who were perhaps none too well versed in the reading of ship's plans, might the better realize just what the new ships were to look like." These so called Admiralty models are much sought after by collectors.

The Dockyard model of which we have several examples is probably no less authentic, but as it was intended for builder rather than buyer, it was not so beautifully finished, nor made of boxwood and other rare materials.

The Admiralty model was generally left unfinished to show or suggest the construction. The fitting of ribs and keel is a piece of very beautiful craftsmanship, which no enthusiast would willingly conceal beneath the decks. That is the reason why builders today leave a couple of planks missing in the side of a built-up model. The frame of a ship or a model of this type determined the form, and is quite firm without any planks at all.



Norwegian Ship, "Irma." Merchant Ship of about 1870.
Length 60 inches. Beam 11 inches. Depth 9 inches.
Hull painted black, with ports bottom pink.



Brass Cannon.
Part of armament of large model of
Topsail Schooner.

We have what are called Dockyard models in the French first rate and that of the smaller Mars. Both are ships of the line of the period just previous to our Revolution, and you may remember that French naval guns were pointed at King George's back while he was arguing with us. In nautical history, these and the large Spanish model represent a great period. Coming in the latter part of the eighteenth century, they show the result of the first methodical work in naval architecture which was initiated under Louis Quatorze. France was far ahead of England in this respect. This age of beautiful ships, perhaps the most beautiful the world has ever known, was also the period when the mushrooms and sausages of early furniture gave way to the exquisite forms of Queene Anne, Chippendale, Sheraton and Hepplewhite.



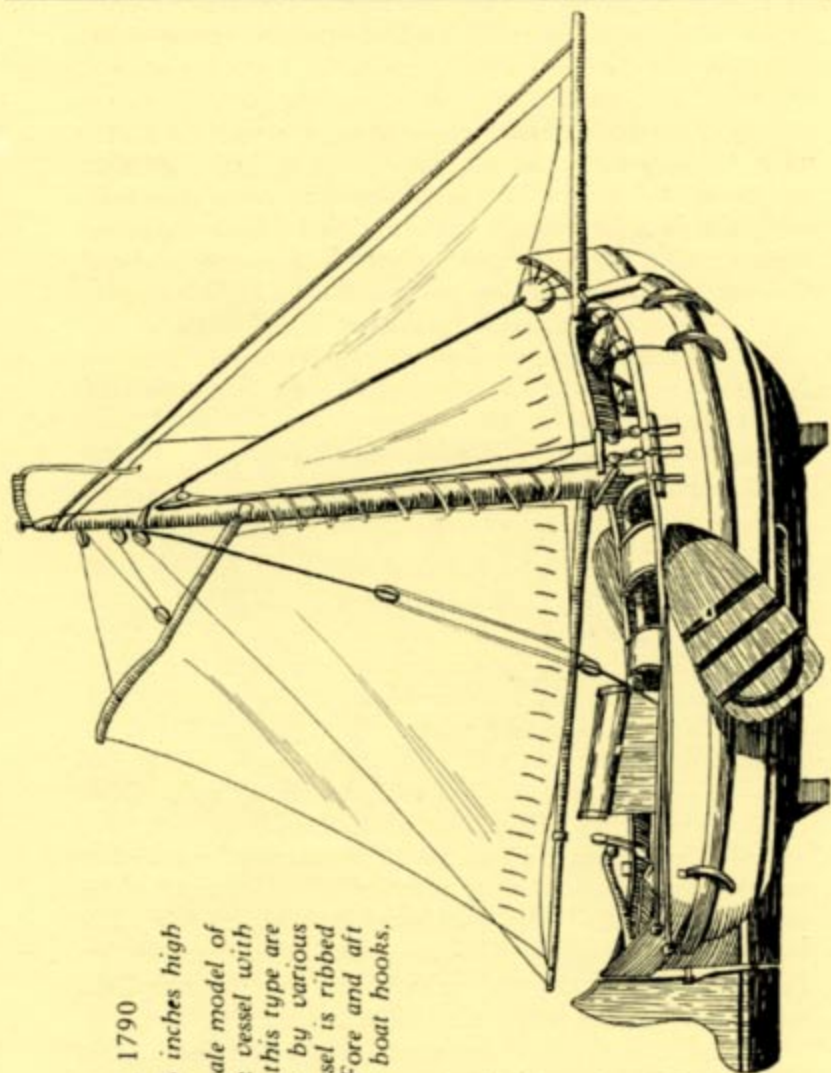
The very beautiful bone scale model of the Caledonia, first rate ship of the line, emphasizes all these points. In 1792 the English captured a French ship called the Commerce de Marseilles. That seems to have been the custom of the time, to let the French and Dutch bring out an improved ship and then take it away from them. The Commerce de Marseilles was very long for her time — over 200 feet — and her batteries were higher than usual. Two English vessels had heeled over while their ports were open and sunk in harbor, (like that western steam yacht at Padanaram). So with new ideas, and the further example of the captured San Pareil, the British set to work, and in 1808 launched the Caledonia. She was a long time in coming, but she was as good as she was beautiful, and according to Chatterton, she lingered round till 1907.

I shall take leave of big ships for a while and look at little ones. Previously they had all been so little that there wasn't much difference in design. Now the smaller ones were free to work out their own individuality. The yacht, for instance, seems to have come to England from Holland about 1660, and Charles II is responsible for the introduction of yachting. It was mostly a case of sailing evolutions — drilling and flag-waving like a small scale navy. That it ap-

Model of
DUTCH POON, 1790
Size, 30 inches long, 23 inches high

An unusually good scale model of a Dutch Poon, or work vessel with a raised cabin. Vessels of this type are often seen in paintings by various Dutch artists. The vessel is ribbed and planked in oak. Fore and aft rig. Full equipment of boat hooks, etc.

Large covered hatch amidships. Huge windlass forward. Typical Dutch lee boards. Dutch vessels of the period were seldom painted, being rubbed down with oil instead. In this vessel the old oak has taken on a delightful color which harmonizes with the tan of the sails.



peared at all may explain why the British family overcame the French lead in nautical matters. It was the old case of the Northman and the Roman.

The yacht in its earlier stages was not unlike the Dutch bezaan rigged model, only it had lots of carving and gilding like a birthday cake. This particular model has been called a poon. Perhaps it is, but to me it looks as much like an otter, a pleit, a hektjalk, or a boier. It is almost certainly not an aak, a cagge, a vischhoeker, a rinkelaer nor a hoogarts. There are too many Dutch varieties. We have one model of a Dutch type with bow and stern rudders, and complete equipment of oars and sails, which does not even appear in the catalog of the Amsterdam museum.

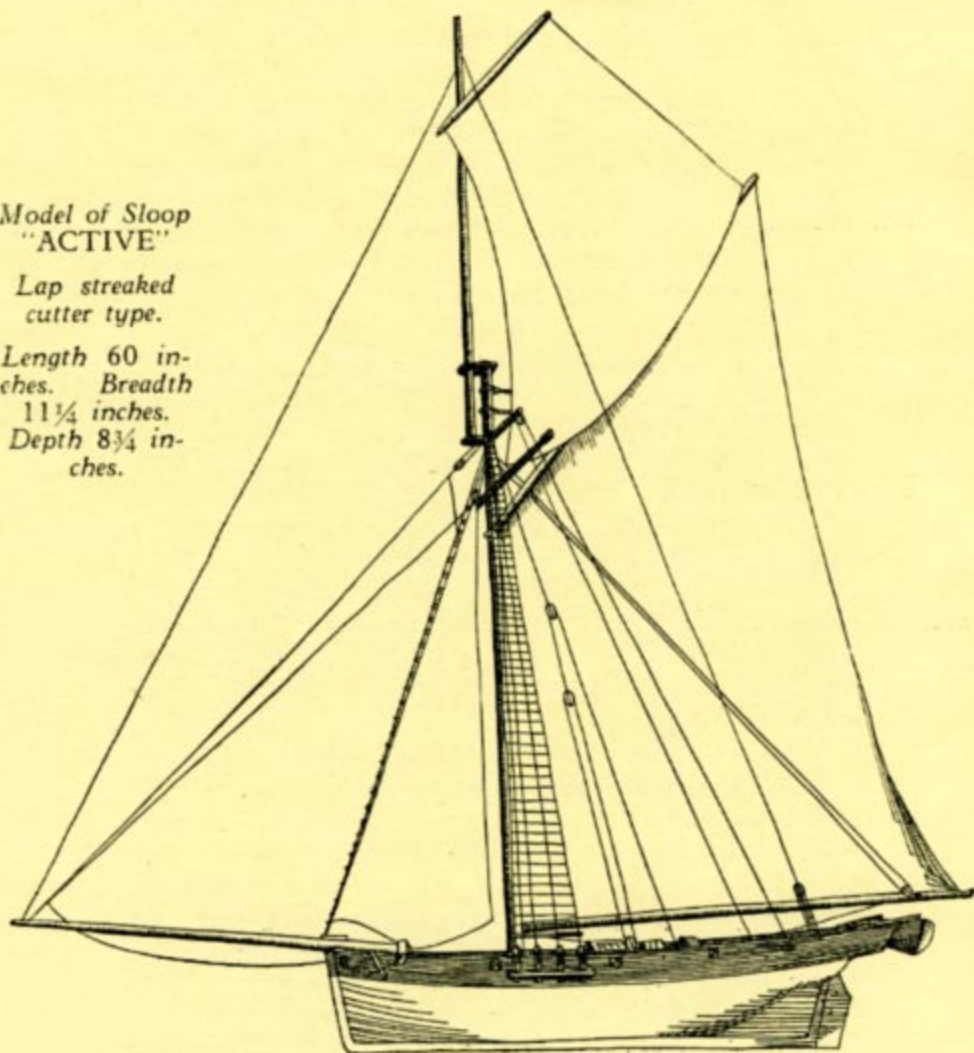
We have a model of a much more satisfactory type of small boat, the favorite of romance in the Channel that the tartane was in the Mediterranean. It is a little lugger, still unriggered. The lugger is a development, on longer and finer lines, of the French *chasse marée*, and, at the end of the eighteenth century, was used for quick runs across the channel and into some place like Polperro or Mevagissey with a cargo of smuggled tea, silks or brandy. All this has a familiar sound. The lugger could easily have come to this country as a type. Individuals did come, and it is extraordinary that she did not remain as she was by far the fastest boat of her time in Europe where the rig is still used for fishing boats and yachts.

Naturally, they had to have boats to catch the luggers (you know the way governments go about a business like that, spend a lot of money, have a lot of men and uniforms—and slower boats). Marryatt tells us about life on a Preventive Ship, or, as they came to be called from their rig, Revenue Cutters. It is the familiar story. These were good boats, but it came to a point where even the yachts sailed circles around them; the luggers had always been faster. The British government became aroused and built a new class. The model we have, my favorite in the whole collection, might easily be one of these cutters. It is called the *Active*, and though I don't offer it as evidence, I might call your attention to a list of cutters given by Chatterton which gives an *Active*

*Model of Sloop
"ACTIVE"*

*Lap streaked
cutter type.*

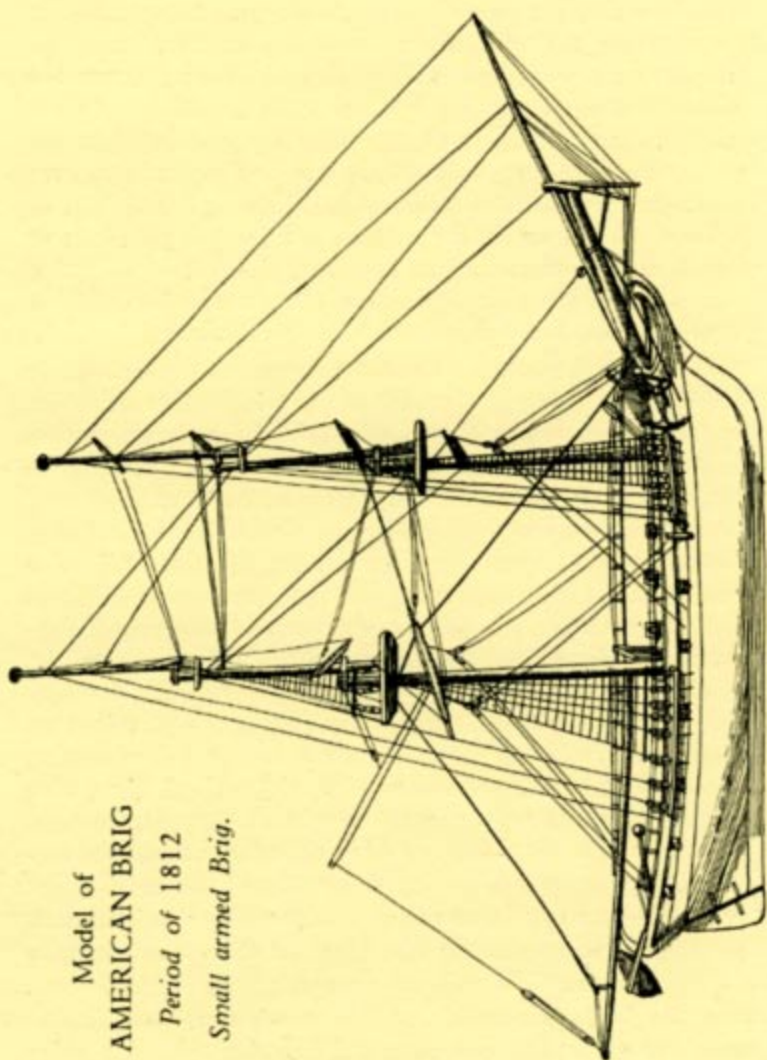
*Length 60 in-
ches. Breadth
11¼ inches.
Depth 8¾ in-
ches.*



of about the right proportions as built in 1836. It also gives the speed, which had at last begun to interest the authorities as 10 knots and 6 fathoms. This is very fast going, but I think it makes the identification rather probable. Look at the provision for sail. A tall mast for that day and age. The cutter rig, with reefing bowsprit and housing topmast—an excellent rig if you have the crew to handle it. In addition to the large lug-tops'l, this little flyer could set a square tops'l or raffee over a broad squares'l, and perhaps even extend the mains'l with a ringtail. The beautiful lines of her form are not unlike the luggers, and her sail plan is more efficient. It is interesting to note that the fast ocean racing yacht *Mistrees* last summer in these same waters logged 11½ knots in a race, and this is considered extraordinary.

The time has come to cross the Atlantic. Prof. E. P. Morris in his "Fore 'n Aft Rig in America" offers us a nice piece of evidence. Our old friend Cap'n John Smith writing about the governor of Bermuda in 1620 says, "Having an excellent Dutch Carpenter he entertained of them that were cast away in the Dutch Frigot, he employed him in building of boats, whereof they were in exceeding great want." The Dutch Carpenter must have come from a part of Holland where they used two slender masts with overlapping triangular sails and without heavy rigging. This is an excellent rig, especially for beating to windward. In hull the Bermuda sloop, when she appears in Chapman's *Architectura Navalis* of 1760, had developed a more or less overhanging bow, a raking sternpost—a figure (or mid-section) like a wine glass and a raking mast. Every one of these elements is found in the racer of today. I have spoken particularly about the lugger and the Bermuda boat became from one of them—I think the latter—was developed one of the best of our early American designs and one that has been neglected in the popularity of clipper ships. The evidence connecting the Bermuda boat with the "Virginia-built" or "pilot schooner" or "Baltimore" vessel is not complete. These famous little ships improved steadily from the time of the Revolution up to the war of 1812. In the lofty little privateer brig and in two top'l schooners still unrigged, we have models which splen-

Model of
AMERICAN BRIG
Period of 1812
Small armed Brig.



didly illustrate the type at the height of its development. Without being tediously analytical, it may be said they had the easiest lines that had so far been devised for a sailing ship. They were very fast in calm weather, and very lightly rigged. Their lack of capacity for arms or cargo naturally limited their service to that of small trading vessels, often used for privateering and piracy. When the evolution of this type had been accomplished, nothing more could be done to ease the form of a sailing ship until Nathaniel Herreshoff remoulded its bows. And curiously enough, the missing element that he supplied had always been in existence. We have been far enough round the world by now to recognize that the pram bow of the famous Wasp, was foreshadowed in the Polynesian canoe which is directly related to the Egyptian burial model. Similarly the bow of the Baltimore vessel was deceptive. If you study one, you find hints of the modern spoon bow. In the old drawings it is so obscured by fittings that its nature is not noticed.

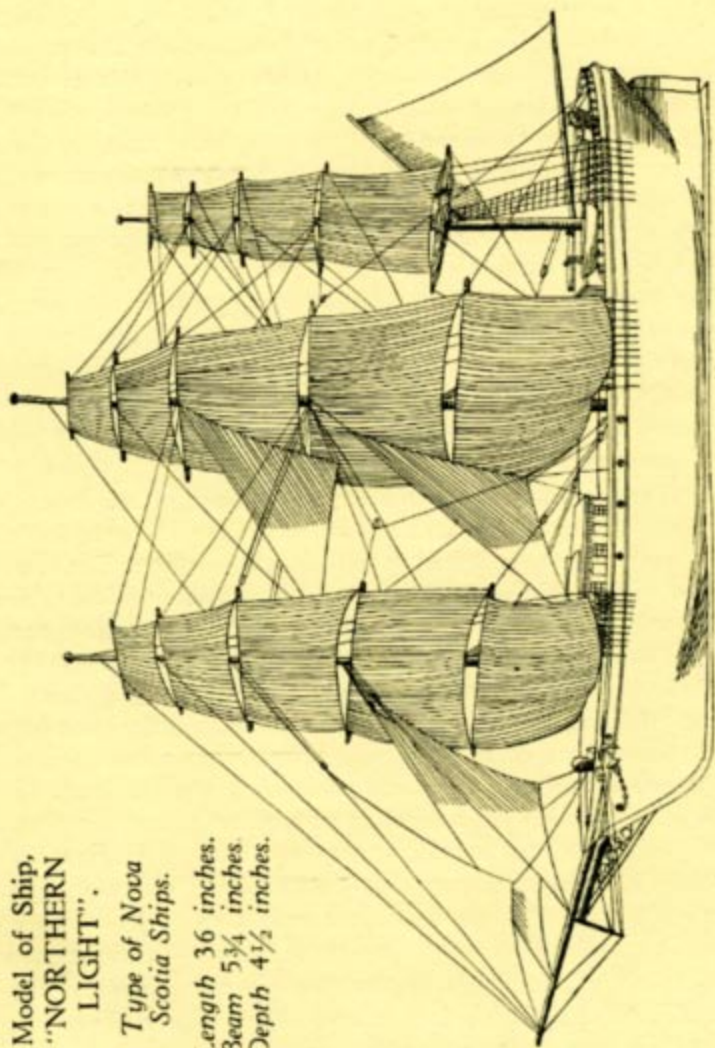
If we are to be fair in the nautical history of our country, we should remember that the ship which did most for us (when we most needed it) was the little privateer. The excellence of her sailing qualities, and the gallantry with which she was handled, earned a respect which our young navy could never have won by mere force. It is obvious enough, when you consider the tremendous ships of the line, that the best tactics against them was to sail away into the eye of the wind and leave them; only to sweep down again when the opportunity offered, upon some ship of your own size. The colonist, whether on a trading voyage or privateering, had only his speed to save him from the cruisers of European Navies and the pirates of the West Indies. We might pass over the fact that the Baltimore model spent its declining years as a slaver, showing its elusive heels — unrighteously — to all pursuers. Naturally, the European navies, England, Holland, France (we learned about frigates from her) liked our little brigs and schooners.

When the English captured any, they paid them the usual compliment of taking them home to have their lines copied at the Dockyards. If this had not been done, we should

Model of Ship,
"NORTHERN
LIGHT".

Type of Nova
Scotia Ships.

Length 36 inches.
Beam $5\frac{3}{4}$ inches.
Depth $4\frac{1}{2}$ inches.



know even less than we do now about this very important type. Indeed the size and finish of our models, which we are very fortunate to have, make me think of the expert model makers of the Dockyards.

We have come to the most tragically dramatic episode in maritime — perhaps in human — history. Hand power, prowess and craftsmanship, and the joy that is in them, begin to falter after the day of the clipper. The captain and the bucko mate have abdicated. From gun, machine and man we have evolved unstable compounds like gun-man and machine-gun. The packet rat and pirate would cast the shifty eye of envy at the tribute collected by their motorized descendents of Chicago and New York. Our two fisted ancestors, the Goths and Vandals, who were centuries wrecking the Roman order would admire the work of the machine against Christian or feudal culture, and doubtless their shades look expectantly to Moscow for that new mechanism which shall annihilate the remaining vestiges of humanity.

I have been careful not to speak of Baltimore clippers, though the name was used. The distinction is important. The form of the true clipper-ship did not develop from the Baltimore model, even though the first clipper was the Anne McKim of Baltimore. No, the clippers became more unlike her as time went on. The lines were just as sharp at the ends, but the clipper was far more of a carrier. The Baltimore section would have made too deep a ship if it had been used in so long a vessel as the later clippers. They themselves reached the limits of their structural material. The powerful clipper ships of America made their reputation for speed in gales of wind, for they were built to excell under such conditions. The Baltimore ships, like the English tea clippers were built to make the most of light airs in calmer latitudes. Of most influence in clipper ship design were the powerful and sturdy packet ships which were making fast voyages in the north Atlantic passenger trade. These in turn were something of a refinement of the merchant brig and small ship of a somewhat earlier date. While we have no model of an American clipper ship or packet, we have the merchant brig, and two modern merchantmen in gaudy col-

Model of British Ship
"CUTTY SARK"

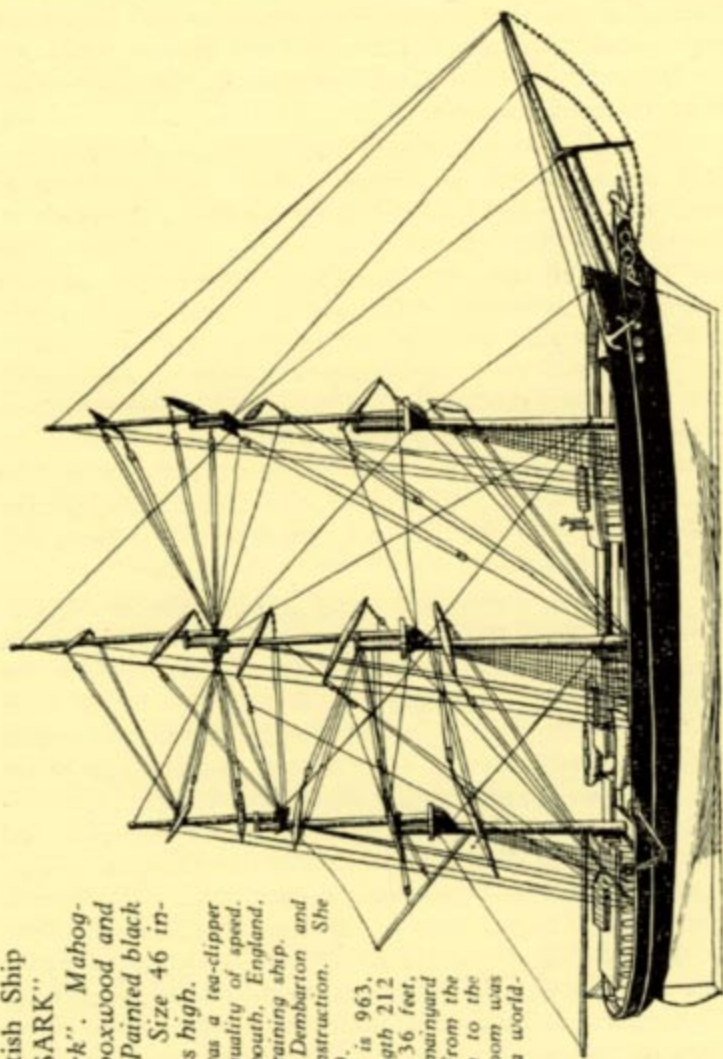
The "Cutty Sark", Mahogany deck houses boxwood and metal equipment. Painted black and bronze hull. Size 46 inches long, 33 inches high.

The Cutty Sark was a tea-clipper world-renowned for quality of speed. She is still at Falmouth, England, used as a stationary training ship.

She was built at Dumbarton and was of composite construction. She was launched in 1869.

Her gross tonnage is 963, net tonnage 921. Length 212 ft. 5 inches, breadth 36 feet, depth 21 feet. Her mainmast was 78 feet long. From the end of her jib-boom to the end of her spanker-boom was 280 feet. There is a world-wide interest in this remarkable ship.

Models of the Cutty Sark have been made in the British Isles, Germany, America, Canada, Australia, New Zealand, and South Africa.



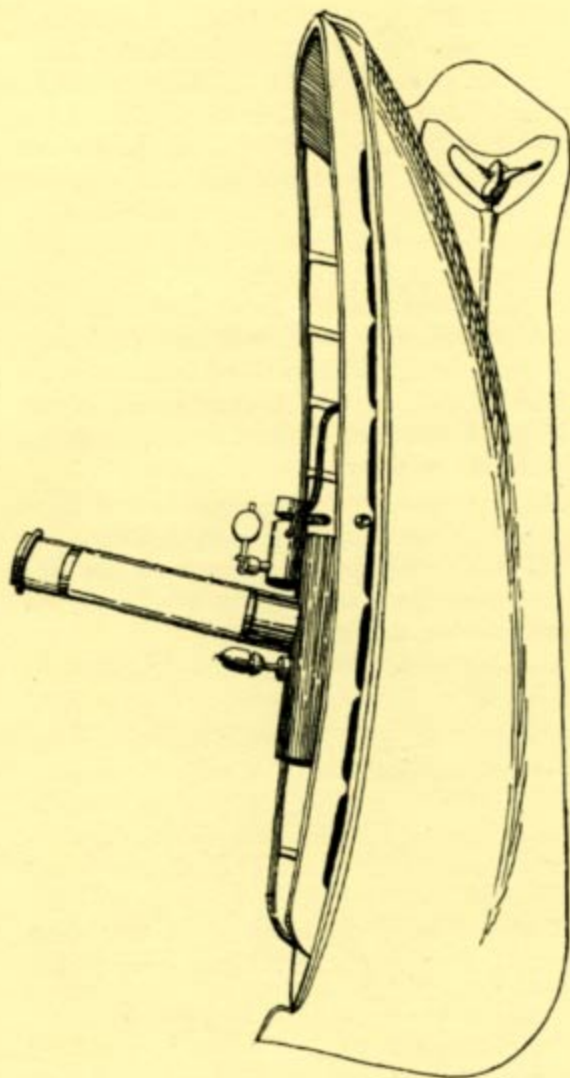
ors, and a little English tea-clipper, the popular Cutty Sark, the original of which you can see in the harbor of Falmouth, England, today. She is of composite build (iron frames and wooden planks) and shows the flat floor, fine ends, and yachtlike grace of the true clipper. Capt. Lubbock's book calls her the fastest ship in the world. This point is so confusing that I think I had better explain it. It depends on what you mean by speed. Capt. Arthur Clark points out that none of the English tea-clippers exceeded 1000 tons but that they consistently made very fast voyages and probably combined the good qualities of the merchant ship in a higher degree than any other vessels that have ever been built. They were not as powerful, however as the larger California clippers like the FLYING CLOUD, nor could they ever make such records under extreme conditions as the 436 miles in 24 hours of the LIGHTNING, or the 21 knot record of the JAMES BAINES, the highest rate of speed by a sailing ship that can be supported by evidence.

I wish I could point out to you the rig and lines of these American built flyers. There is an interesting model of the FLYING CLOUD in the Boston Museum where the ship is apparently floating on a sea of green glass, and you can look below and see her sailing lines.

But perhaps a review of 8000 years in 30 minutes leaves you indifferent to speed.

You may remember the game where we hang on the wall a picture of a large tailless donkey, blindfold ourselves, and then pin tails all over him trying to get one where it belongs. Now this donkey is the maritime history of mankind, and if I seem to have stuck too many tales in the wrong place and generally confused the outline of the beast, I am not so sorry as I should be. For the game has been most amusing, and it may have served to make you more critical of the beast's anatomy.





Model of the "VOLTA"

A complete working model of the small ice-breakers used in the Baltic Sea. Model of metal.

The steam boiler is fitted with water and steam gauges, steam whistle and safety valve, and the engine is of the two cylinder type. Storage tank supplies alcohol for heating boiler. Develops good speed. Length 32 inches, beam 10 inches, height 15 inches to top of smoke stack.



ADDENDA

Not long after this review of ship-design was prepared there appeared in the April issue of *YACHTING* an article by Mr. Weston Martyn, on "Looking at a Sixteenth Century Ship — A Model of an Elizabethan Galleon, as Constructed from Plans Preserved in the Library of Samuel Pepys." He says of the ships of this period, "They were the ships which put the world on the map. Before Columbus took his long chance aboard the *Santa Maria*, there were no deep-sea ships, properly speaking; there were merely timid coasters and potterers about the Mediterranean, if we except the undecked craft of a few bold Vikings, and perhaps, an odd handful of mythical Chinese junks and Polynesian dugouts."



The article goes on to describe the work of Mr. G. S. Laird Clowes, Chief of the Ship Model Section of the Science Museum, South Kensington, who, incidentally, is authority for the interesting statement that the earliest known *contemporary* scale model in England (and probably anywhere else) is that of the *FAIRFAX*, built in 1654. As a result of Mr. Laird Clowes' research a model has been built in the workshops of the Science Museum, the lines of which were worked out from drawings in the note book of one Matthew Baker, appointed a Master Shipwright in 1572. These are the only lines known of a ship of the period or before it. The note book fell into the hands of Samuel Pepys, and has been

preserved in the Pepysian Library, Magdalene College, Cambridge. Other MSS of the period have been used for details and for checking. The ship was 100 feet long on the keel and 38 feet wide.



The label on the model case says, in part: "The period illustrated is that of the last few years of Queen Elizabeth, when the galleon, with its comparatively fine lines, a fore-castle set well back from the stem, and a long beak was firmly established. The typically Tudor decoration, which relied on simple mouldings and brightly contrasted colors, had not given way to the carving and gilding of the Stuart period. The four masted rig (two square rigged and two lateen) was then normal for the larger men of war; and, while mizzen and bonaventure-mizzen top-sails of the lateen type had been discarded as useless, the square topsails for these masts, as well as the sprit topsail, had not yet been introduced. Topgallantmasts and sails on both main and fore masts were a recent innovation, and it will be noted that both topsails and topgallant sails were still cut very narrow in the head." This ship carried 600 men. A photograph of the model, and reproductions of the lines, are shown in YACHTING April 1932.



It would be much to be regretted if the recently aroused interest in ship models, (though it has so far been primarily in their decorative character) should not fire the technical and antiquarian interests of our marine museums as it has excited the energies of builders and collectors. Something of the sort is essential if the fast disappearing knowledge of

local and characteristic boats of the United States is to be saved.

The importance of this work, the need of instant cooperation of all who know anything about early American boats, the results of scholarly and valuable research are set forth in *The Fore 'N' Aft Rig in America*" by Morris.



Recent numbers of *YACHTING* (which often has well-illustrated articles on matters of technical (and historical interest) have described and given lines of some most interesting types. Model makers of the better class could well devote their attention to building a few carefully made examples of pinkies, Nomansland boats, Block Island boats and other small craft, which have a definite historical value if they conform to such authoritative designs as these. And, on their part, marine museums would do well to acquire them, instead of a monotonous profusion of nameless clippers and whalers.



Models of ships are built in four different ways.

BLOCK models are hollowed and shaped out of a single block of wood. Scarcity of suitable wood, of which the soft, straight grained white pine of New England was by far the best, now makes this method impossible except for small models.

BREAD AND BUTTER models are built of pieces of board set horizontally, one upon another, and glued with waterproof casein glue, in the manner of a chocolate layer cake. The boards may be, and generally are, cut to approx-

imate size before being glued together. One may, (in a small model) include the topsides down to the waterline, the next from the waterline to the turn of the bilge, and the next from the turn of the bilge to the garboard. If the boards are of equal thickness, and the planes of glue kept parallel to the load waterline, the lines of glue will show the waterlines at different levels of floatation, and the result is a waterline model. The method lends itself to accurate reproduction of a design.

BUILT-UP models are the most intricate and expensive kind. Properly they are constructed by setting up keel, stem and stern, and fastening to the keel correctly shaped ribs, as in real shipbuilding. The ribs are fixed in place by fore 'n' aft stringers, shelves and ribbands, and with deck beams athwartships. For decorative models the work is often skimped by combining a block topsides with a simulation of ribs and keel. In either case the frame of the model is then planked with narrow strips of thin wood, shaped as are the planks of a real ship, not laid on straight like siding of clapboards. Planking-over a block model, especially with bone, is often practiced to give an indifferent model more value, but it is dishonest workmanship and should be despised.

CANOE-BUILT models are very light, and are built especially for racing. The method consists in setting up a back bone as in the built up model, and framing it over a dummy or form with a large number of very thin, flat ribs. The planking may be of some such hard wood as mahogany, or the frame may even be covered with a skin of canvas and varnish like a canoe. The form is removed when the light frame has been fastened enough to make it rigid.





A FEW BOOKS OF INTEREST
IN THE STUDY OF SHIP MODELS
AND MODEL YACHTS



Ship Models — How to Build Them, by Charles G. Davis, N. A.
Publication Number Eleven of the Marine Research So-
ciety, Salem, Mass., 1925.



The Ship Model Builder's Assistant — by Charles G. Davis, N.
A. Publication Number Twelve of the Marine Research
Society, Salem, Mass. 1926.



The Marine Room of the Peabody Museum of Salem. Peabody
Museum, Salem. 1921.



Catalog of the Watercraft Collection in the United States Na-
tional Museum. Compiled and edited by Carl W. Mitman,
Curator, Divisions of Mineral and Mechanical Technol-
ogy. Washington, Gov't Printing Office, 1923.



Catalogus der Scheepsmodellen en Scheepsbouwkundige Teeken-
ingen 1600-1900 in het Nederlandsch Historisch Scheep-
vaart Museum. Amsterdam, 1923.



Build a Winning Model Yacht by Thomas Moore. Frederick A.
Stokes Co., New York, 1923.

Ship Models — by Chatterton. Edited by Geoffrey Holme. Published by the Studio Limited, London, 1923.



The Baltimore Clipper, Its Origin and Development. By Howard Irving Chapelle. Publication Number Twenty-Two of the Marine Research Society, Salem, Mass., 1930.



Souvenirs de Marine. Collection de Plans ou Dessins de Navires et de Bateaux Anciens ou Modernes Existant or Disparus avec des elements numeriques necess aires a leur construction. Par le Vice Admiral Paris. Paris 1832. 6 Vols.



The Fore 'N' Aft Rig in America — by E. P. Morris. New Haven, Yale University Press, 1927.



Ancient and Modern Ships Part I. Wooden Sailing Ships. By Sir George C. V. Holmes, K. C. V. O., C. B. Handbook of the Science Museum, So. Kensington, London, 1910.



Model Yacht Designing — A Practical Method of Designing for the Beginner. The Value of Metacentric Balance in Models. By Capt. Alfred Turner, R. N. March, April, May and June, 1931 issues of Yachting.



Model Yacht Steering Gears—Articles in Yachting December 1927, January 1928, and January 1929.

