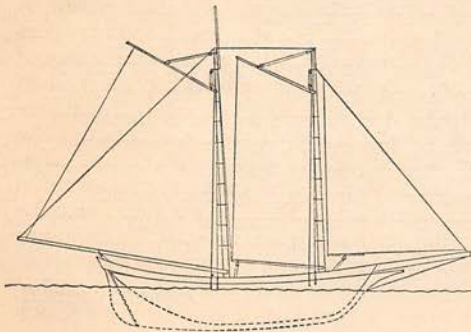




THE EVOLUTION OF THE AMERICAN YACHT.

It is an interesting circumstance that what was probably the first distinctively American craft may still be seen occasionally. The pink or pinkie was so-called from the Dutch, probably at a remote period, for Spenser uses the term in his "Faerie Queene." The model was perhaps suggested by the quaint hookers of the Scheldt, although it is far more graceful; and it is a noteworthy fact that a very large proportion of the marine terms employed in the English language are from the Dutch. The American pink was invented for the cod-fisheries; it was at first pointed at both ends, and was from five to ten tons burden, and rigged with two fore-and-aft sails. Afterward, the pointed prow was sheered off and a bowsprit and cut-water were added. These pinkies are highly picturesque and seaworthy, but have been gradually superseded by the broad-stern fishing-schooners of Gloucester



A PINK.

and Essex, Massachusetts. But antique examples of this curious craft are still to be seen creeping in and out about the little sleepy ports downeast or laying their rusty sides on the oozy flats left by the tide. They are most common in the waters about Eastport, especially in the herring fisheries.

The year 1713 was a great era in American naval annals. In that year, Captain Andrew Robinson built the first schooner ever seen. This was at Gloucester. As she glided into the

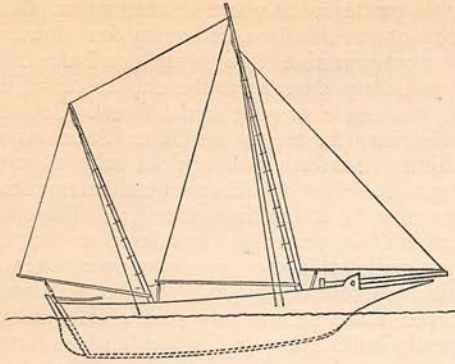
water, a by-stander cried: "Look, how she schooners!" Catching at the word, Captain Robinson replied, "A schooner let her be!" The new rig came at once into wide acceptance. Only eight years later an old chronicler, Dr. Moses Prince, wrote of Captain Robinson: "This gentleman was first contriver of schooners, and built the first of that sort about eight years since; and the use now made of them, being so much known, has convinced the world of their convenience beyond other vessels, and shows how mankind is obliged to this gentleman for this knowledge." This is by no means the only instance of the adoption of American marine inventions by other nations. Captain Howe's patent for double top-sails, for example, is now universally employed in square-rigged vessels. The fore and aft sails of the schooner are really a division of the sails of the sloop; and the sloop-rig, if analyzed to its square root, is evolved from the lateen-sail of the Mediterranean cut into a mainsail and jib. When properly shaped these two sails present one three-cornered sail divided near the middle by the mast, exactly where the yard of a lateen-sail would hang to the traveler on the mast. Subsequent modifications naturally suggested the cutter by dividing the jib in two, and Captain Robinson, as we have seen, divided the mainsail, and added a mast, and the result was a two-masted fore-and-aft schooner. During the last twenty years the schooner's mainsail has in turn been divided, a third mast has been added, and the result has been the three-masted schooner. Each of these modifications has been suggested with the idea of facilitating the handling of the sails, while the principles involved continue the same in each. A fore-and-aft vessel sails several points nearer to the wind than a square-rigged ship, hence a decided advantage in one of the most valuable features of a ship when sails are the motive power. This, of course, is of vital importance in coasters obliged to beat up

narrow estuaries, or in yachts intended for racing.

Exactly when the schooner had square top-sails added to her rig it is difficult to ascertain, but one and two top-sail schooners were at one time much in vogue. The square sails, however, have been discarded in this rig for many years in America, while the top-sail schooner—and a very jaunty rig it is—continues to be a favorite in Europe. The *Wanderer* is the only topsail schooner-yacht now flying the American flag. After the invention of the schooner there seems to have been no essential difference between English and American ships for nearly a century. The *Constitution*, built by Humphreys in 1788, had the falling-in topsides of foreign frigates, great breadth on the load-line, a straight keel, full bow, and sometimes a raking stern-post, which were the characteristics of sea-going vessels at that time. But a new era in the modeling of vessels on this side of the Atlantic began soon after the opening of this century; to this we were indebted very largely for the successes of the war of 1812, and for the great activity of our commercial marine until the breaking out of the late civil war, and for the frequent trophies carried off by our leading yachts. Almost simultaneously, a group of master-builders appeared, whose united talents and efforts brought about this revolution in the principles of ship-construction. We think, however, it is no overstatement to say that to no one are we more indebted for this result than to Henry Eckford, who was born in 1775, the year of the Declaration of Independence. At sixteen, in the ship-yards of his uncle, Mr. John Black, at Quebec, he commenced a study of the pursuit in which he was to gain such distinction. At the early age of twenty-one, Mr. Eckford settled in New York, and by his original and scientific methods at once obtained recognition and abundant employment. His careful system of study is well described by his biographer. "Upon the return of one of his vessels from a voyage, he obtained by a series of questions from her commander an accurate estimate of her properties under all the casualties of navigation. This, connected with her form, enabled him to execute his judgment upon the next vessel to be built. In this way he proceeded, successively improving the shape of each, until those constructed by him, or after his models, firmly established the character of New York built ships over those of any other port in the Union, * * * Fashioned after his models our vessels gradually dispensed with their large and low stern frames, the details of their rigging underwent extensive changes, and in the important particulars of stability, speed, and capacity, they

soon far surpassed their rivals." One of Eckford's greatest feats was the construction of the sloop-of-war *Madison*, of twenty-four guns, in the most primitive of navy-yards on Lake Erie, in just forty days after the timber of which she was made was cut in the forest. Cooper, in his *Naval History of the United States*, says: "Henry Eckford was undoubtedly a man of genius. * * * His professional qualities proved to be of the highest order." The two-decker *Ohio*, generally considered to be the finest sailing ship-of-war we have ever had, was built by Eckford, and may still be seen lying at the Charlestown navy-yard. He subsequently built a frigate for the Turkish navy, and accepted an offer to superintend the navy-yards of that government. But after building one line-of-battle ship at Constantinople he died there suddenly. The influence of his genius was such, however, that all the Turkish men-of-war built for years after that were after his models and rig, presenting, in that respect, a striking contrast to the fleets of other nations, with their full bows and inflected topsides.

Another important feature of this period of American naval construction was the invention and development of the famous Baltimore clipper. Already the maritime enterprise of this noted port had been distinguished by the famous voyages of such armed merchant-ships as the *Leila* and *Argyle* in the latter part of the eighteenth century. The Baltimore clipper appeared by gradual evolution in the early part of this century, and was intended originally as a model for a ship that would be advantageous in eluding the British cruisers in the West Indies, who were in the habit of boarding our vessels, and taking away such of the crew as were English citizens. Another cause for the origin of these clippers was the pirates swarming in those waters, and also, alas, the design of stimulating the importation of African slaves. Their origin seems to have been suggested in part, at least, by Commodore Daniels, who was at one time connected with the navies of the South American States, and made a name as a ship-builder. Caleb Goodwin was also one of the ship-builders who distinguished himself at that time in winning fame for the fast ships of Baltimore. These clippers were doubtless due to a study of Spanish, and especially Genoese models. The Latin races, while inferior to the English as sailors and navigators, have, until this age, shown greater skill in the scientific application of the principles involved in the designing of ships. Suggestions might also have been obtained from the small craft of the Channel and Bermuda Isles. When full fledged the Baltimore clipper was a ship with a low free-



BALTIMORE BUCKEYE.

board, broad of beam before the center, having a flaring bow above, but sharp at the water line, and with a deep draught aft, or what is called a long leg, a slightly raking stern-post, and a clean run. They were rigged as schooners and more rarely as brigs, and were heavily sparred, while the masts raked to such a degree that a line dropped plumb from the main truck would nearly or quite touch the taffrail. These lines gave at once a dry deck, stability, and sail-carrying power. When the War of 1812 broke out, the superior qualities of the Baltimore clipper at once became apparent. The Atlantic was swept by these hardy little cruisers, who contributed more to uphold the honor of the stars and stripes than any other element in the war. This fact was fully appreciated by the enemy. Said Captain Wise, of H. M. frigate *Granicus*, to Captain Coggeshall, one of our successful privateersmen, but at that time a prisoner to the English: "Coggeshall, you Americans are a singular people, as respects seamanship and enterprise. In England we cannot build such vessels as your Baltimore clippers. We have no such models, and even if we had them, they would be of no service to us, for we never could sail them as you do. We have now and then taken some of your schooners with our fast-sailing frigates. They have sometimes caught one of them under their lee in a heavy gale of wind, by out-carrying them. Then, again, we have taken a few with our boats in calm weather. We are afraid of their long masts and heavy spars, and soon cut down and reduce them to our standing. We strengthen them, put up bulkheads, etc., after which they lose their sailing qualities, and are of no further service as cruisers."

The Baltimore clipper was the parent of several types of vessels. The famous oyster pungies of the Chesapeake are allied to it, but the latest phase of this form is the Balti-

more buckeye, of which we give a diagram. It is long and low, and, unlike other vessels now built in America, has a raking stern-post and the greatest beam in the fore-section, while the masts have the rake of the old-time clippers. The sails are triangular in shape. But their most remarkable feature, which seems to suggest the Genoese influences already alluded to, is the long, beak-like cut-water, flanked by broad breast-plates at the knight-heads in the bow, in which the hawse-holes look like eyes. These are, by all odds, the most foreign-looking craft in American waters, and are very good sailers, especially on a wind.

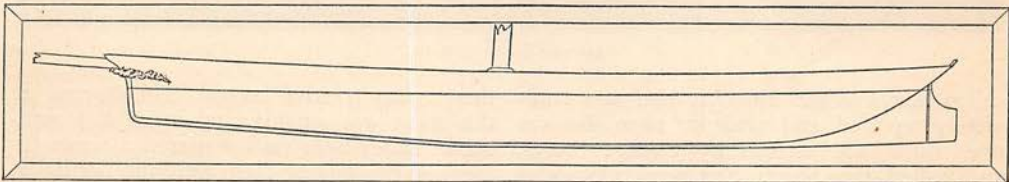
Another modification of the Baltimore clipper was developed in our pilot-boats, which, little by little, assumed the type represented by the *George Steers* and *Mary Taylor*, famous little schooners designed by George Steers in 1845,—a type which continues to be followed, with little variation, in this service even now, after a lapse of forty years. They have a keel sloping up to the fore-foot, deep draft, great dead rise on a vertically sharp floor, and a sheer both at stem and stern which makes them buoyant and dry in a sea-way.

About the year 1844 began the most important era in the history of American ship-building. Our Liverpool packets had already demonstrated the capabilities of our builders and mariners. The *Canada*, for example, under the command of Captain Seth G. Macy, made her trips almost with the regularity of a steamer. Fourteen to sixteen days was the average length of her voyages between the two ports. This may have been an extreme case, but the fact remains that these "liners" made a remarkable record. They carried double crews, that being before the great labor-saving invention of double top-sails. The quarter-masters or steerers had their quarters aft, and the reefs in the top-sails were shaken out whenever the wind lulled, and thus the "liner," in a gale, would often walk past ships which could not make sail or take it in fast enough. Those were the days when the Webbs, the Livingstons, the Browns and Bells, the Claghorns, the Eldridges, the Fullers, the Lawrences, and other excellent artisans of New York, Salem, Boston, or Philadelphia, were in their prime. The increasing importance of the East India trade—especially the tea trade—a few years before the general adoption of the propellor in steamships, and the rush to California after its cession to the United States and the discovery of gold, induced the construction of the famous clippers which carried the development of sailing-ships to the highest point of excellence yet reached in the history of naval architecture. Without moot- ing the question about the respective merits of

the noted Aberdeen clippers and the American ships which, during a period of perhaps fifteen years, circled the globe with their vast expanse of canvas, it is not too strong a statement to say that some of the runs made by our ships at that time have never been surpassed by either sail or steam. The great builder of packets, Isaac Webb, died in 1843. Donald McKay, a native of Nova Scotia, who removed in youth to Newburyport and made a name there and in Boston, began, at the same time, to win a world-wide reputation for clipper ships of a size and speed hitherto unexampled. Many competitors appeared at the same time. The ship *James Baines*, built by McKay, ran 420 miles in 24 hours. The ship *Red Jacket*, built at Rockland, Maine, ran 2280 miles in 7 days, or 325 miles per diem, for a week. The *Flying Cloud*, McKay's most celebrated ship, once made 374 knots, or 433 miles, in 24 hours and 25 minutes, equal to 17.17 miles an hour. To appreciate these distances, compare them with the greatest distance ever made in 24 hours by a Liverpool steamer, the new and now celebrated *Alaska*,

up toward the stem. A similar feature can be observed in the sheer plan of the yacht *Maria*, which is printed below.

At the same time that the American merchant clipper was entering upon its brief but glorious career, evidences of activity in another department of marine architecture became apparent, which, with various alterations, have continued to the present time, and are now attracting more general interest than ever before. I refer to the development of the American yacht. The Romans had numerous pleasure vessels, but there is no reason to suppose they were intended for anything more than floating barges. The Greeks, the Venetians, and other southern people also had their pleasure ships, but the Dutch and the English were the first who are recorded as enjoying yachting for the exercise it gives to the manly virtues, making of it at once a vigorous pastime and a school for seamen. A yacht was built in 1604 for Henry, eldest son of James I. Pepys in his Diary has much to say of a Dutch sailing yacht called the *Bezan*, pre-

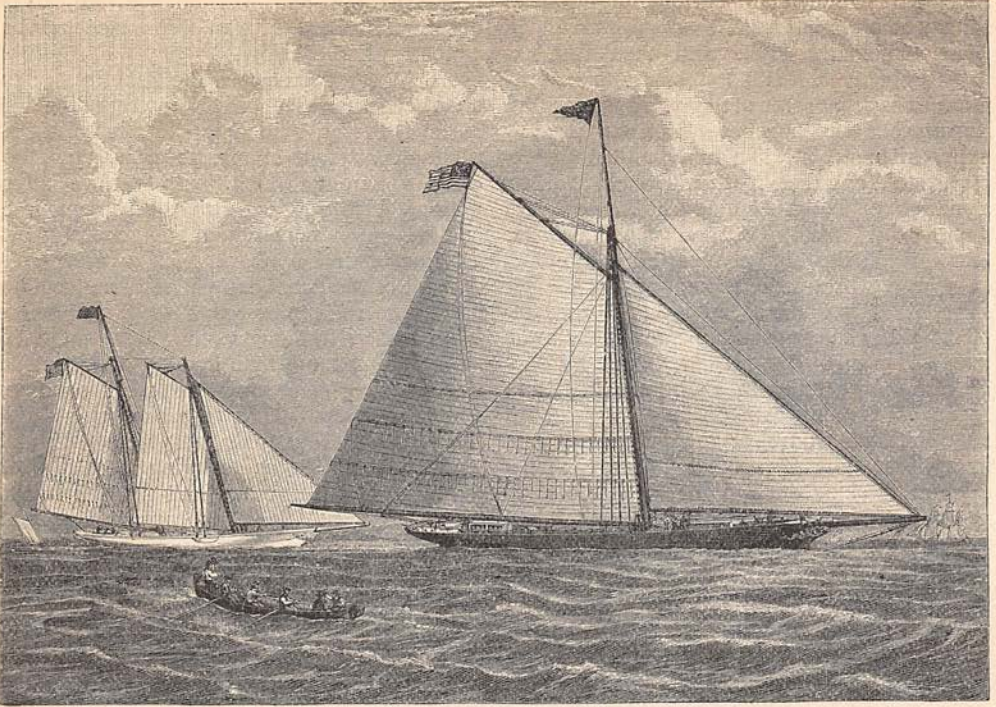


SHEER PLAN OF THE "MARIA."

in the fastest westward passage yet accomplished from Liverpool to New York. Her greatest run was 419 miles in twenty-four hours. This proves what all sailors know, but of which few landmen are aware—that, with a strong and steady favoring wind, it is possible for a sailing-ship to equal the speed of an Atlantic steam-ship. The difficulty lies not in the ability of the ships, but in the fact that the wind is unsteady. These American clippers were a modification of the Baltimore clipper, with less beam, a slightly flaring bow, a long, sharp, hollow entrance, suggesting the wave line, the greatest beam about amidships on the load line, and a rising floor with an easy bilge. Although heavily sparred, their masts were generally proportionately lower than in the ships which they succeeded, and the yards were longer, giving a large but low spread of canvas. This type of ship may be said to have culminated in the *Great Republic*, built by Donald McKay in 1855. She registered 4300 tons, and carried four masts. A peculiarity of this noble ship was her rising keel, which, for a length of sixty feet, sloped

sented by the Dutch to King Charles I. in 1661. He had the instincts of a genuine yachtsman, for he not only enjoyed the excitement of a sail in a stiff breeze, but also the snug comfort of a cozy cabin with attractive companions and books. Further on he says: "A yacht was built to beat the *Bezan* by our virtuosos, with the help of Commissioner Pett," and succeeded in doing so in an exciting race to which Pepys briefly alludes. This is the first match race on record in the annals of yachting.

The first organization that gave distinct encouragement to yachting was, however, not established until 1815. It was founded at Cowes and was called "The Royal Yacht Squadron." It was followed in 1820 by the Royal Cork, which, however, as the Water Club had existed since 1720. Yachting began in America in an informal way early in this century. It is an interesting fact that there is an American yacht still in commission, whose frame was made in 1819. Originally intended for a Baltimore pungaie, she was turned into a schooner-yacht and

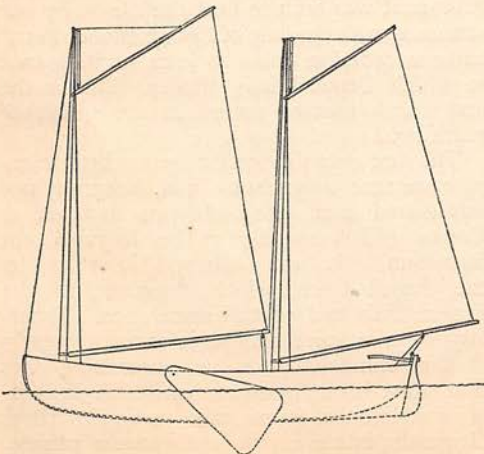


"AMERICA" AND "MARIA."

called the *Hornet*. In 1847 she was completely repaired, and again in 1850 she was overhauled and altered by George Steers, and called the *Sport*. She now belongs to the Hull Yacht Club, and possesses some excellent sailing qualities. In 1836, the *Wave* was modeled by Stevens and built by Brown & Bell. The *Sylph* schooner was the crack yacht in Boston in 1835. But she was beaten by the *Wave* in a thrash to windward off Nantucket Shoals. This seems to have been the first race of American yachts of which

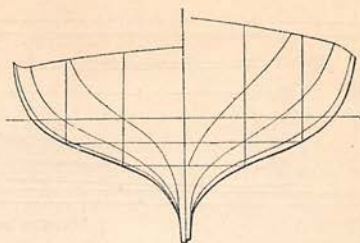
there is any positive record. The interest in this sport was gaining, and in 1838 a number of saucy little craft acquired a name for themselves; among them were the *Mohamet*, *Dream*, *Raven*, and *Breeze*. The latter was fast, beating to windward, and was originally an oyster-boat. But no regular yachting organization was formed until 1844, when the New York Yacht Club was founded, with a membership of nine members and nine yachts. The first regatta in America was sailed July 17, 1845; the *Cygnets* was the winner. All the yachts of that period had a strong rake to the masts. Their canvas was confined to lower sails, excepting sometimes a small jib-headed main-gaft top-sail in the schooners. The head of these sails had very little slant, being about parallel with the booms.

Robert Livingston Stevens was the most distinguished of a family of inventors, who are identified with the progress of ship and steam navigation in America. He was possessed of extraordinary mental activity. But for none of his inventions will he be longer remembered than as the designer of the famous sloop-yacht *Maria*, whose exploits mark an era in American ship-building and yachting. She was built at Hoboken in 1844 by Mr. Capes, after Stevens's plans. Her sheer and sail plans are well indicated in the accompanying diagram and drawing. She was one

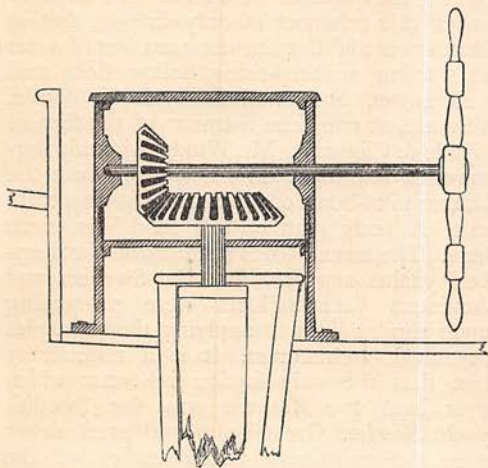


A PIROGUE WITH LEE-BOARD.

hundred and ten feet over all, with a beam of twenty-six feet eight inches. Her draft aft was five feet three inches, decreasing forward to a minimum of six inches under the fore-foot. The main-boom was ninety-five feet long and three feet in diameter, and hollow, being constructed of doweled white-pine staves, strengthened by iron hoops and trusses of iron rods. The foot of her mainsail measured ninety-two feet, and of her jib



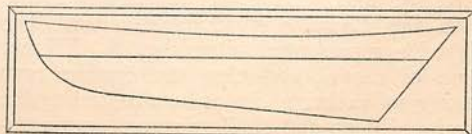
BODY PLAN OF A NORWEGIAN PILOT-BOAT.

BEVEL-WHEEL FOR SMALL YACHTS. SCALE $\frac{3}{4}$ OF 1 IN. = 1 FT.

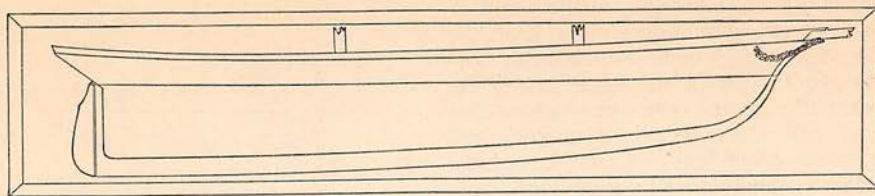
in American waters makes it practically a cis-Atlantic invention. It is an evolution from the lee-board, such as the Dutch used two centuries ago on the broad, bluff sloops which floated on the canals of Holland. The lee-board can be seen in the pictures of Vander Velde. After the Dutch settled on Manhattan Island they borrowed the rig of the down-east pinks for the boats which plied in New York Bay, and gave them a lee-board. The name of this peculiarly American craft was taken from the Caribs of the West Indies, brought thence by some hurricane-beaten freebooter, and thus we had the pirogue. It was as a barefoot lad, sailing a pirogue for a ferry-boat between Staten Island and New York, that the late Commodore Vanderbilt began his wonderful career. Pirogues without the lee-board are still used on the Lakes.

seventy feet, the latter being laced to a boom. The model of the *Maria* was suggested by the low, broad, almost flat-bottomed sloops employed to steal over the shallows of the Hudson and the Sound—vessels depending on beam rather than on ballast for stability, and imitated by many of our coasters, which are so stiff that they sometimes run down the coast without either cargo or ballast. Though having a floor with only moderate dead rise, the lines of the *Maria* were much finer; she had a long, hollow bow, and was so sharp that the extreme point of the bow had to be widened where the bowsprit entered the hull. The deck plan was not unlike an elongated flat-iron, as she was very broad aft, tapering off only moderately from the greatest beam to the broad and somewhat heavy stern. The model of the *Maria* has since then been generally followed by small center-board sloops in New York waters and along the Sound, and on the Merrimac, although never to the same extreme degree. Two features gave especial significance to this extraordinary yacht. One of these was her double center-board. The principle of the center-board was not strictly new, Captain Schank of the Royal Navy having used one in Boston when the British fleet was stationed there; but its general adoption

Mr. Stevens fitted the *Maria* with two center-boards. The forward one drew twenty feet of water when down, and was weighted with lead. Nicely adjusted springs enabled it to rise easily and rapidly in case it touched the ground. When housed it rose several feet above the deck, and had slots cut to fit the deck beams. The after-board was intended to aid in steering her when running free, as she griped and yawed. She was steered by a long tiller, but since that time the steering-wheel has come into general use in American yachts; even little sloops of not more than twenty-two feet length are now to be seen with a wheel. Several neat inventions are in use for this purpose; a diagram is given here of one of them, called the bevel-wheel. Another peculiarity of the *Maria* was the massive India-rubber compressor on the traveler, to break the strain of the main-boom on the sheet in jibing. This is probably the first time rubber was ever employed for this



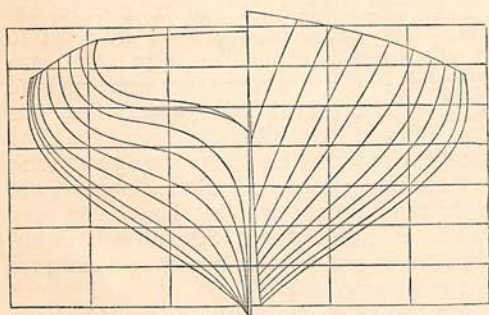
THE "SHARK."



SHEER PLAN OF THE "AMERICA."

purpose. Since then it has been used to ease the bitter end of a fishing-schooner's cable when riding in a gale, at the head of fore-topmast stays, and even for the lanyards of wire shrouds. Another feature of the *Maria* which was not sufficiently considered at the time, but is deserving of emphatic attention now in view of recent developments in English yacht construction, was the outside lead ballast she carried. Iron ballast on the keel has been not uncommon in the smaller New England yachts, but the use of outside lead ballast by the *Maria* over thirty years ago, even if differently placed than in English cutters, is a remarkable fact. Molds five inches deep were fixed outside on her bottom, carefully shaped to the lines of the floor, for a distance of twenty feet on each side of the keel. Holes were then bored through the skin, and several tons of hot lead were poured into the molds.

Great inventive ability had contributed to the building of the *Maria*, and her performances justified the expectations of her builder. She was known to log seventeen knots, or over twenty miles, an hour in smooth water. But that was essentially

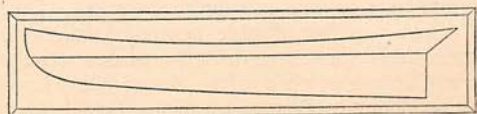


BODY PLAN OF THE "AMERICA."

her element. Her extreme shallowness, notwithstanding the fineness of her lines, did not give her sufficient momentum in a seaway, and for once she was beaten in a match with the *Coquette* in October, 1846. The *Coquette* represented altogether a different type of model, and thus the conflict now raging in yachting circles here regarding the merits of deep and shallow vessels was practically settled before many of those now dis-

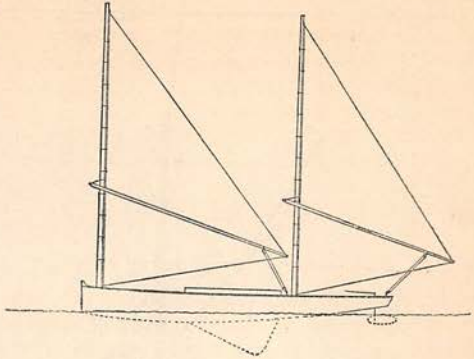
cussing the question were born. The *Coquette* was a little schooner of only sixty-six feet in length over all. But she drew ten feet of water aft, having a sharp-rising hollow floor and a sharp run. She was built by Louis Winde, a Swede, at one time member of the firm of Winde & Clinkard. Mr. Winde evidently borrowed a few ideas on the subject from the famous pilot-boats of the Scandinavian peninsula. A body plan of this model is given here. The resemblance to many of our deep-keel yachts suggests that the Swedish and American yacht-builders were proceeding upon similar lines in applying the principles of naval architecture. It is a noteworthy fact that the only foreign schooner which ever beat the *America* was the Swedish yacht *Sverige*. Great beam and great depth were the prominent characteristics of the *Coquette*, aided by iron ballast carried low. Each yacht in her own domain had outsailed everything, and it was therefore as champions hitherto without a rival that the two yachts were matched against each other for a purse of one thousand dollars. Owing to her larger dimensions, aside from her great powers, it seemed to be a foregone conclusion that the *Maria* would carry off the prize. But the wind was blowing fresh from north-east, obliging the taking in of a reef or two. The boats started from a buoy in Gedney's Channel. On the outward run, going free, the *Maria* walked away from her rival; but when they came up on the wind, with a heavy chop running, the *Coquette* not only made up the distance lost, but won by four minutes and forty seconds without time allowance. The *Maria* was afterward rigged into a schooner, and foundered in the Gulf Stream, being altogether unfitted for cruising in blue water.

While these events were firing the enthusiasm of all true sailors, another great ship-builder was aiding to give prominence to American seamanship, to stimulate inter-

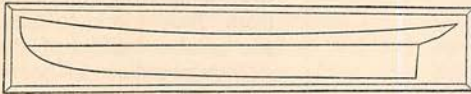


THE PILOT-BOAT "GEORGE STEERS."

est in the noble sport of yachting, and to immortalize the American yacht. This was George Steers—a name identified on both continents with the highest achievements of ship-building. He was the son of David Steers, a native of the Isle of Jersey, and, at one time, captain in the British service, and also a designer of ship-models. After he came to the United States he found employment in our navy, and was the first who had charge of the Navy Yard at Washington. We give a drawing of one of Captain Steers's vessels, the cutter *Shark*. It will be seen that she combines qualities developed in the Baltimore clippers, the early English,



A SHARPIE.

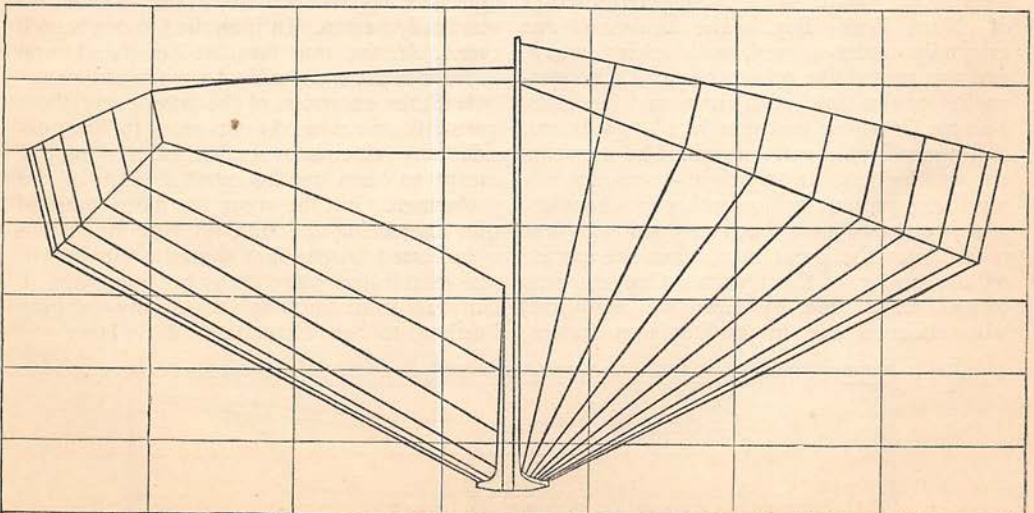


THE "IDLER."

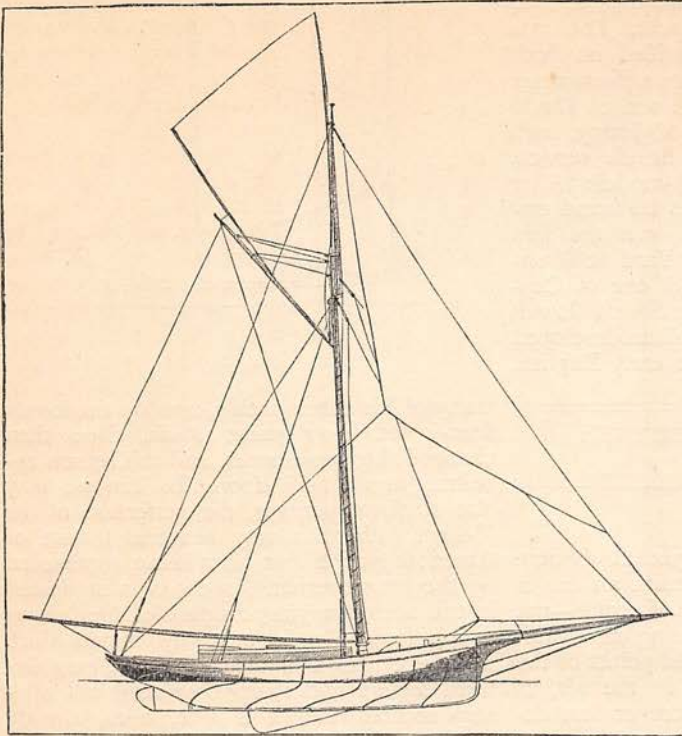
and the present Bermuda yachts. George Steers, whose achievements mark an era in American yachting, was a man of genius—not so much, perhaps, in originating new principles, as in seizing the essential points of the various ideas then floating in the air, as it were, and suggested, in more or less degree, in the models of contemporary builders. He harmonized them in a definite and nearly perfect type, which has been followed, with slight modifications or idiosyncrasies, in most American yachts since 1852. George Steers was not so much an inventor as an organizer of principles of naval construction. The famous *America* exhibited about every principle followed by the American ship-builder, except the center-board, and that he employed in

many of his other yachts, notably the lovely fleet-footed sloop-yacht *Julia*, since then changed into a schooner, and this season appearing again as a sloop. To him we may also attribute, perhaps, the perfection of the V-stern, hitherto a very beautiful feature of American yachts, but now being superseded by the long overhang, such as is indicated in the accompanying diagram of the famous racing-sloop *Gracie*, built by David Carl. The long heel, keel rising forward, long forward section and sharp floor, and full midship section had, it is true, been already employed in the prahus and other vessels of the East Indies, but this did not detract from the merit due the American builders, as they made a new and, doubtless with them original, application of these principles.

George Steers made his first hit with the cat-boat *Manhattan*. He then produced a number of very able pilot-boats, such as the *Mary Taylor* and *George Steers*. The latter was lost on the Jersey shore in a gale of



BODY PLAN OF A SKIP-JACK.



THE "REGINA," SHOWING A CENTER-BOARD CABIN SLOOP WITH DOUBLE HEAD-SAIL.

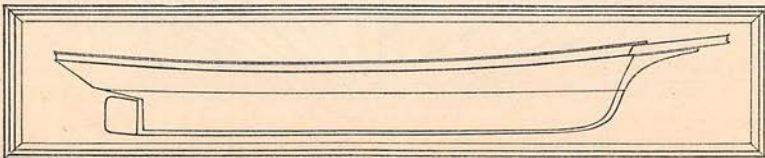
wind, with all on board. The famous *America* was built for Commodore John C. Stevens, one of the founders of the New York Yacht Club, who was always identified with the encouragement of yachting in America, and to whom it owes more than to almost any other of our yacht-sailors. Wearing a huge broad-brimmed hat, he might often be seen steering a yacht in the summer breezes of New York Bay. The *America* was originally under-sparred, with raking masts, and was rigged like other American schooner-yachts of the time, with main and fore sails, a single jib whose foot was laced to a boom, and a small main-gaff top-sail. She now carries two topmasts and flying jib-boom, according to the present fashion with our schooners, and her masts have been stepped with less rake. After the great race, when she carried off the trophy of the Queen's Cup, she was owned, for a time, by Lord de Blaquiere, who stiffened her by adding iron frames,

which impaired her sailing qualities. Recently an overhanging stern has also been added. George Steers also built the steamer *Adriatic* and the screw frigate *Niagara*. It may be added here that the family ability for naval construction has been further illustrated by Henry Steers, his nephew, who designed the *Idaho*, at first a steamer, and afterward a sailing-ship. Under canvas she made the fastest voyage recorded from New York to Rio. He is also builder of the *Idler*, a noted center-board schooner-yacht presenting the rare combination of equal ability on a wind and running free, and able both in rough and smooth water, being what is called an "all-around" boat.

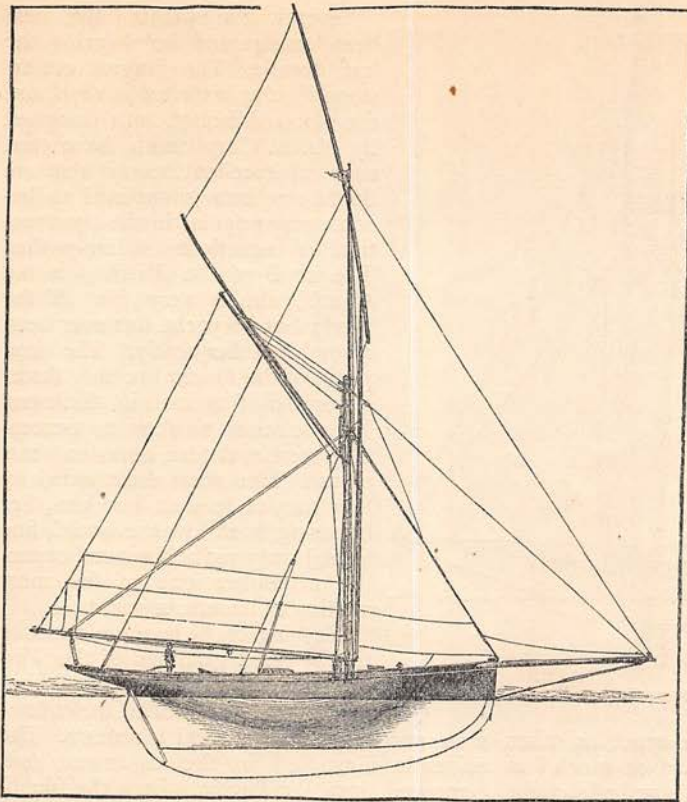
Since the historic race of the *America* at Cowes, occurred the ocean race of the *Fleetwing*, *Vesta*, and *Henrietta*, in 1866, for a

sweepstakes of \$65,000, which was won by the latter, owned by James Gordon Bennett. In 1870 the *Fleetwing*, purchased by Mr. Bennett, and altered and rechristened the *Dauntless*, was beaten by the English schooner *Cambria*, owned by Mr. Ashbury, in a race to New York. In 1871, the same gentleman brought over the *Livonia* schooner to race for the Queen's Cup with the New York yachts, and was badly beaten. In 1881 the famous Scotch cutter, *Madge*, was brought here, and won five out of six races with American sloops.

With the exception of the latter event, these trans-Atlantic races do not seem to have decided any principle or resulted in anything else except to keep up the *esprit de corps* of our yachtsmen. But the sport has been pursued with alternating although growing interest, as is indicated by the fact that the number of well-established yacht clubs has increased in ten years from thirty-five to seventy-six, from Portland to San Francisco. Many large and



MODEL OF THE CENTER-BOARD SLOOP "GRACIE."



THE CUTTER "MURIEL," SHOWING THE DEEP DRAFT ENGLISH TYPE OF BUILD AND RIG.

bined length of the foot of the mainsail and jib averages seventy feet. A strong outrigger extends five feet from the stern for the main-sheet block and traveler. They of course have center-boards and carry sand-bags and live ballast. In a race, from twenty to thirty men may be seen hanging on the weather side of a Penny Bridge boat. A similar racing-boat is also popular on the Delaware at Philadelphia.

Accompanying this condition of affairs has been an impulse to experiment, and to produce models or mechanical conveniences adapted to meet special wants. Those who object to this or that model should remember that the whole process of naval construction is a beautiful example of adaptation of means to ends. As in the truest architecture, or in the human form itself, so every line, whether of hull or sails, in a ship, however pleasing and

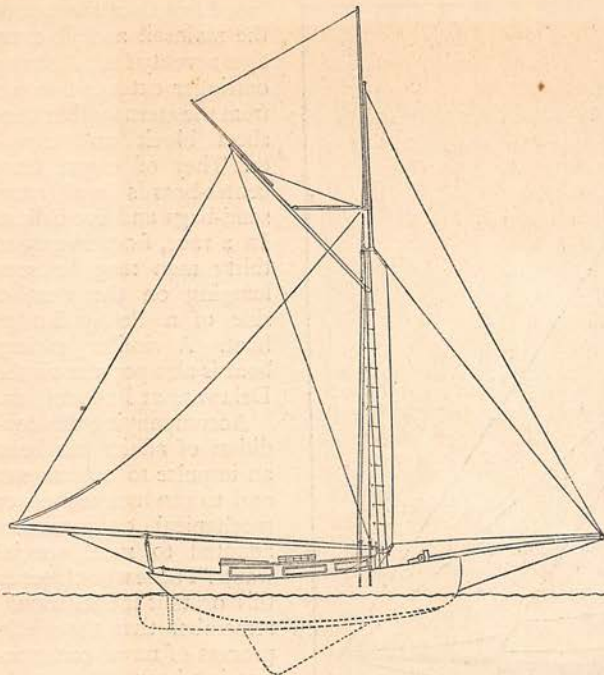
expensive yachts have also been constructed during this period, although the tendency has been rather toward the production of small and inexpensive yachts, to be sailed by amateurs or Corinthian sailors, thus placing an otherwise costly sport within reach of many who have aquatic tastes—a result which cannot be too highly commended, as it tends to incline our young men to cultivate their health and develop their energies. This may also be called emphatically the age of the cat-boat, a rig peculiarly American, and requiring for its fullest action a broad and rather full model. The cat-boats have also become very popular in England, where they are called *una* boats, after the famous *Una*, built by Robert Fish, of Brooklyn, and taken to England in 1852.

The Penny Bridge boat, like the cat-boat, is also a peculiarly American craft, and was at one time entirely local. Originally built at Penny Bridge, Brooklyn, by Lenox, Mumm, and other well-known builders, they are literally the flattest sailing-boats afloat. The genuine Penny Bridger is twenty-eight feet long, and about twelve feet beam and thirty inches deep. They have hardly any bilge, rising with scarcely a bend to the rail. The mast is about forty-one feet long, and the com-

harmonious to the eye, was first employed with a distinct purpose of utility.

One of the features of this period in the history of American yachting has been the invention of the sharpie. Originally intended to float among the oyster-beds in the shallows of Long Island Sound, a disposition has been shown to bring it into favor for yachting. It is really the old-fashioned punt greatly enlarged, with finer ends, fitted with center-board and cabin, an overhanging stern and a rudder attached to a spindle. The original sharpie carries one or two three-cornered sprit-sails. But they have also been rigged as sloops, schooners, and yawls. They are very fast and stiff, and are excellently adapted to the purpose for which they were designed. I have seen a schooner-rigged cabin sharpie some fifty feet in length, and drawing only one foot aft and three inches forward, which has been to the West Indies.

The skip-jack is another curious and by no means ungainly craft, evolved out of the sharpie by adding to the latter a rising floor, as indicated in the accompanying illustration. The advantage of the skip-jack lies in the fact that, while exhibiting excellent sea-going qualities, both as to safety and speed, and almost

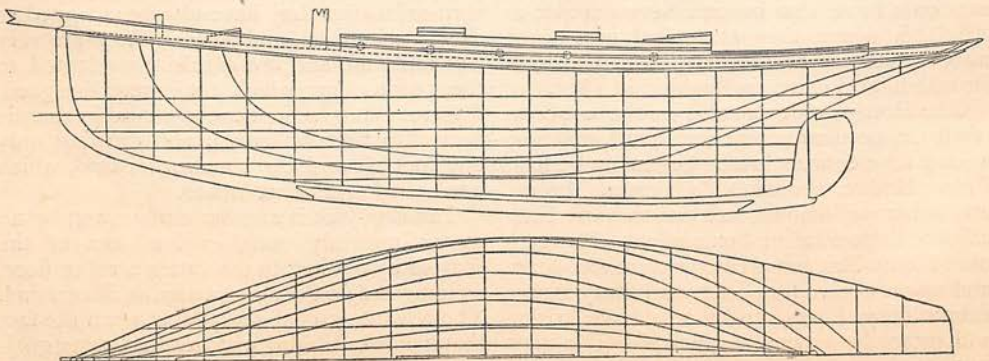


HERRESHOFF YACHT "KELPIE."

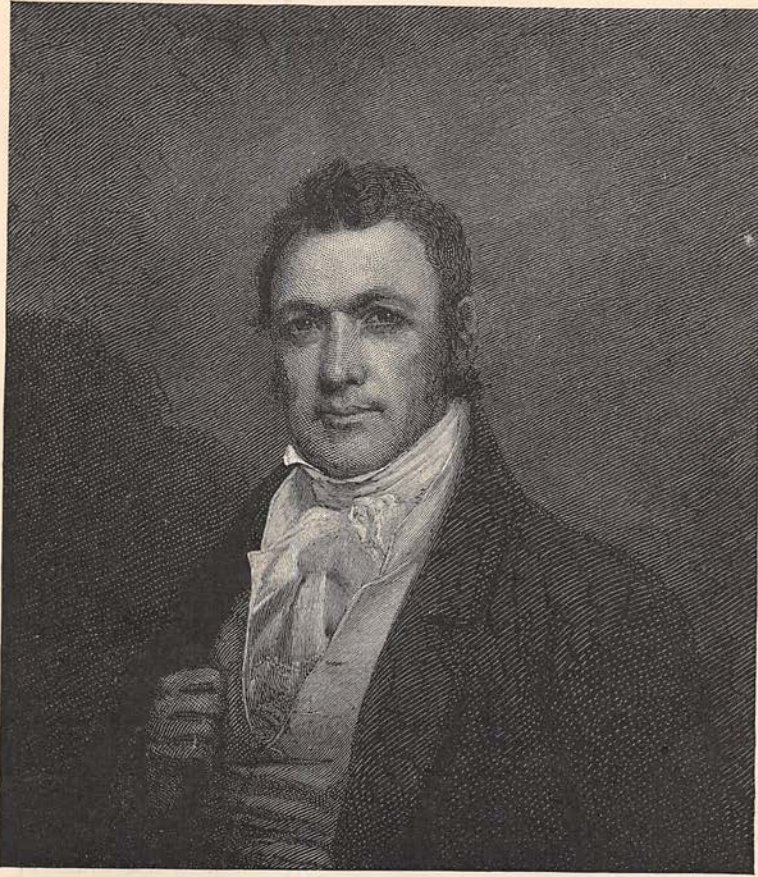
the same amount of interior space as other yachts, she can be constructed at much less expense, her frame being composed of straight timbers. Of course, the center-board is an indispensable feature of the skip-jack model. Another peculiar craft not unfrequently seen in our harbors is the boat made without frame timbers, other than the keel, stem, and stern-posts and fashion-pieces. The planking is made of unusual thickness, and the streaks are but two to three inches in width. They are bent to the shape, and bolted together through and through so tightly that calking is unnecessary. A large ship, the *New Era*, was actually built on this plan at East Boston a few years ago, but did not seem to have strength to resist the strain of heavy freight.

Several iron yachts have also been constructed here during the last decade. The famous cutter-sloop *Vindex*, launched in 1870, and the sloop *Mischief*, both designed by Mr. A. Cary Smith, have won such an excellent record that we doubt not iron is destined to become very popular in the construction of American sailing-yachts. The rival of the *Mischief* is the *Gracie*; she is very fast off the wind; but no yacht has ever been altered so frequently. The iron plates of the *Vindex* are only three-sixteenths of an inch in thickness. But she seems to show no perceptible wear and tear, after ten years of use. Her great draft, aided by four tons of lead on her keel, her imposing mast, low free-board, fine lines, jaunty rig, and general capacity, make her one of the most striking of American yachts.

Nothing could be more opposite to the solid qualities of the *Vindex* than the midge-like "skimmer of the sea" called the catamaran, another recent nautical invention. The principle illustrated in the catamaran was borrowed from the Pacific, where the islanders for ages have sailed in large double canoes, propelled by a triangular sail of matting supported on two light spars of bamboo. But Mr. John B. Herreshoff, of Bristol, Rhode Island, conceived the idea of adopting the double-hull principle in our waters, and first attracted general attention to the subject by the catamaran *Amaryllis*, which was exhibited at the Centennial. The turbulent waters of the Atlantic are not favorable to a craft which demands great lightness of construction, the hulls requiring to move separately. But Mr. Herreshoff has succeeded in solving the problem so far as regards inside



SHEER PLAN AND HALF-BREADTH PLAN OF THE "VALKYR."



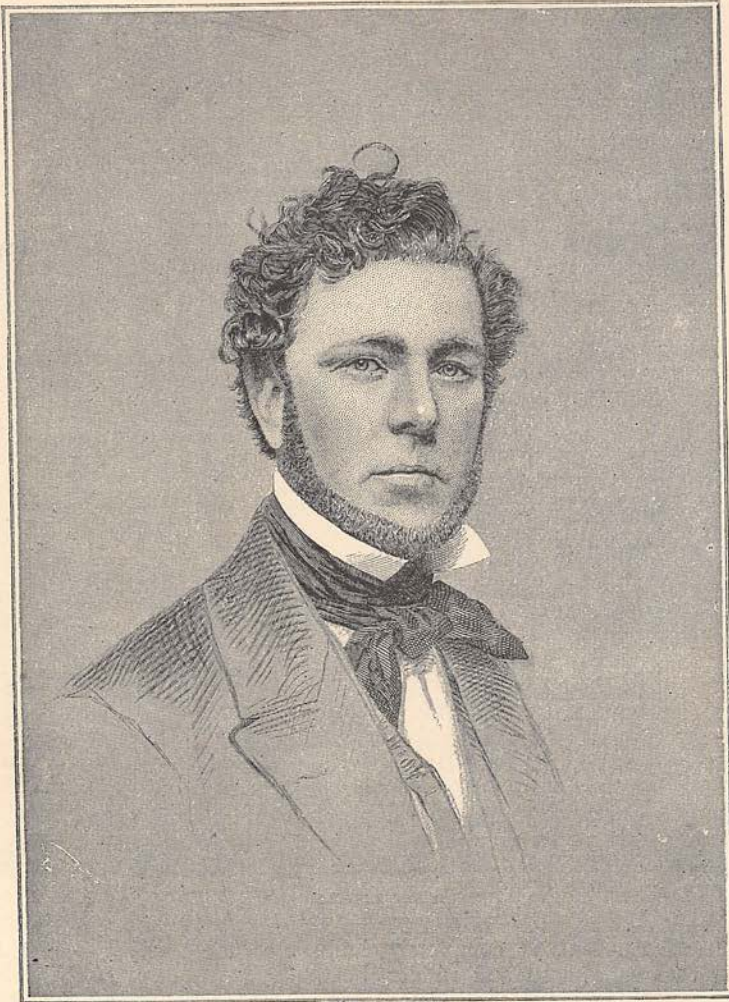
HENRY ECKFORD.

cruising. Each of the hulls is completely decked and has a center-board and rudder of its own. By a very ingenious contrivance the two rudders can be moved by one tiller. The hulls are joined by transverse beams and galvanized iron rods, trussed, and so nicely supported with elastic arms and links that each boat is separately swayed by the action of the water. A car, with seats, is firmly attached to the cross-bars. The sloop rig is the one adopted in these catamarans. They are generally from thirty to forty feet in length and have become very popular for smooth-water sailing. The catamaran cannot lie as close to the wind as a swift center-board sloop, and is slow in staying, but off the wind her speed exceeds that of any other vessel of her size afloat. The great stability offered by the double hull makes it impossible to capsize it. The catamaran is liable, however, to go down head foremost, or to sink through the straining of one or both hulls. If employed in smooth water, in harbors or on lakes and rivers where winds are very puffy, it is a far safer boat for

lubbers to use than any single-hulled sail-boat.

To Mr. Herreshoff we are also indebted for a type of yacht which for certain qualities has not had its superior in America. He is and has been totally blind since he was thirteen years old, but few men living have equaled him for ingenuity and success in certain branches of marine architecture.

From the outset the Herreshoff sailing-yachts were marked by lines so peculiarly his own that it would be impossible to confound them with the models of other builders, although their great success and popularity has at last led the yachtsmen of New England to imitate them frequently, at least in part. They are characterized by a long and full midship section, moderate dead rise (the now famous *Shadow* has a sharper floor than most of the Herreshoff yachts), a clean run, the run and futtock timbers being invariably attached to the deadwood and keel almost at right angles, without any of the gentle, curved modeling or the hollow floor usual



Eng^d by W. G. Jackson.

GEORGE STEERS. (BY PERMISSION OF D. APPLETON & CO.)

in foreign and most American vessels, and carried to the farthest limit in the English lead-keeled cutter. These yachts are further characterized by a high free-board and great sheer, both fore and aft, the forward curve, following a parabolic line, beginning about a third of the length from the stern. The blunt stem is also slightly curved, the quarters are rather heavy, the trunk and wash-board are high almost to clumsiness, and the standing-room extends so far aft that the rudder-head is inside instead of on deck, as is usual with small American yachts, and the rudder is of uncommon dimensions. These yachts have been, with but two or three exceptions, invariably furnished with center-boards, and yet have good draft and a deep, rocker keel. Their long bowsprit curves downward and they are heavily sparred, giving the impres-

sion of being top-heavy, and when one first sails in one of these yachts this impression seems to be confirmed, for they are tender-sided, and a light breeze at once carries them well over; but, like the English cutter, when they find their bearings they go no farther, and accidents to them have been exceedingly rare. Notwithstanding their full body, the Herreshoff yachts have been very successful as racers. The lightness with which they are built aids this result while unfitting them for heavy weather. In a race in Boston harbor in 1870, the prizes in each of the three classes were won by these yachts, one of them being the *Kelpie*, of which a diagram is given on page 360. Herreshoff has been most successful with small yachts, especially sloops and cat-boats. The *Shadow*, the only competing yacht which won a race from the *Madge*

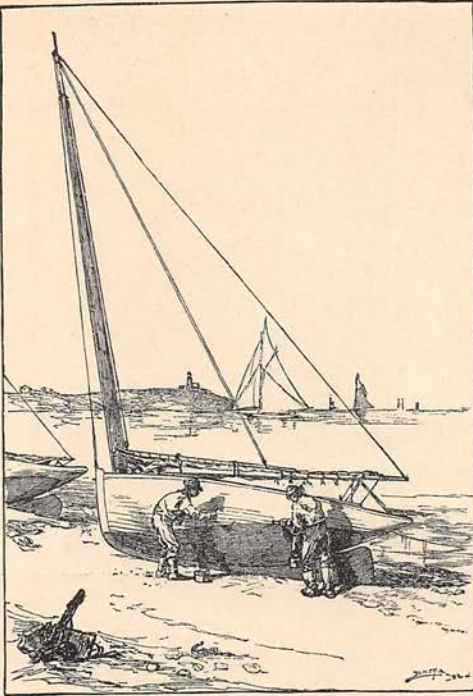


COMMODORE JOHN C. STEVENS.

in 1881, is one of Herreshoff's crack models and one of the last he designed before taking to the building of steam-yachts. She has won no end of prizes, and, whatever may be the merits of the case, it is certain that in eating into the wind she fairly surpassed the *Madge* in the first race, when both yachts were on the port tack after rounding the buoy. On that tack the *Madge* did not feel the loss of her starboard topmast-stay, which it has been alleged was the cause of her defeat.

At present we are in the midst of a great transition movement, which has been hastened, but not originated, by the *Madge's* great success in 1881. Twelve years ago the writer predicted, in talking with Mr. Herreshoff, that a movement in favor of narrower and

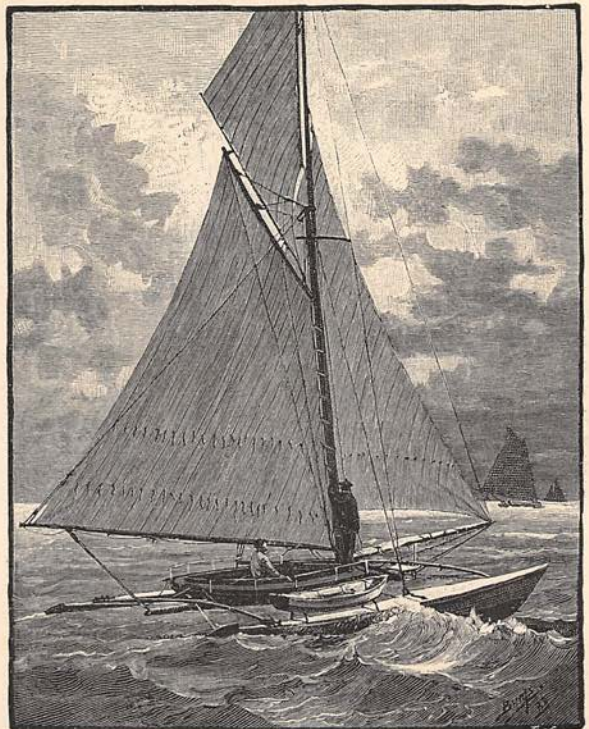
deeper yachts, with double head-sail, was not far off, because after going to one extreme there would follow the reaction natural to an active people like ours, unsatisfied long to remain fixed to one idea, and also because of certain advantages inherent to the deeper boat which we had not sufficiently considered while inshore yachting was most in vogue, but must regard, if long cruises were to become more general among our yachtsmen. Commodore Centre about the same time gave public expression to similar views. Not long after that the building of the *Vindex* gave emphasis to these predictions. The change has come at last, like everything in this rapid age and country, with an energetic rapidity that threatens to proceed to an extreme as ab-



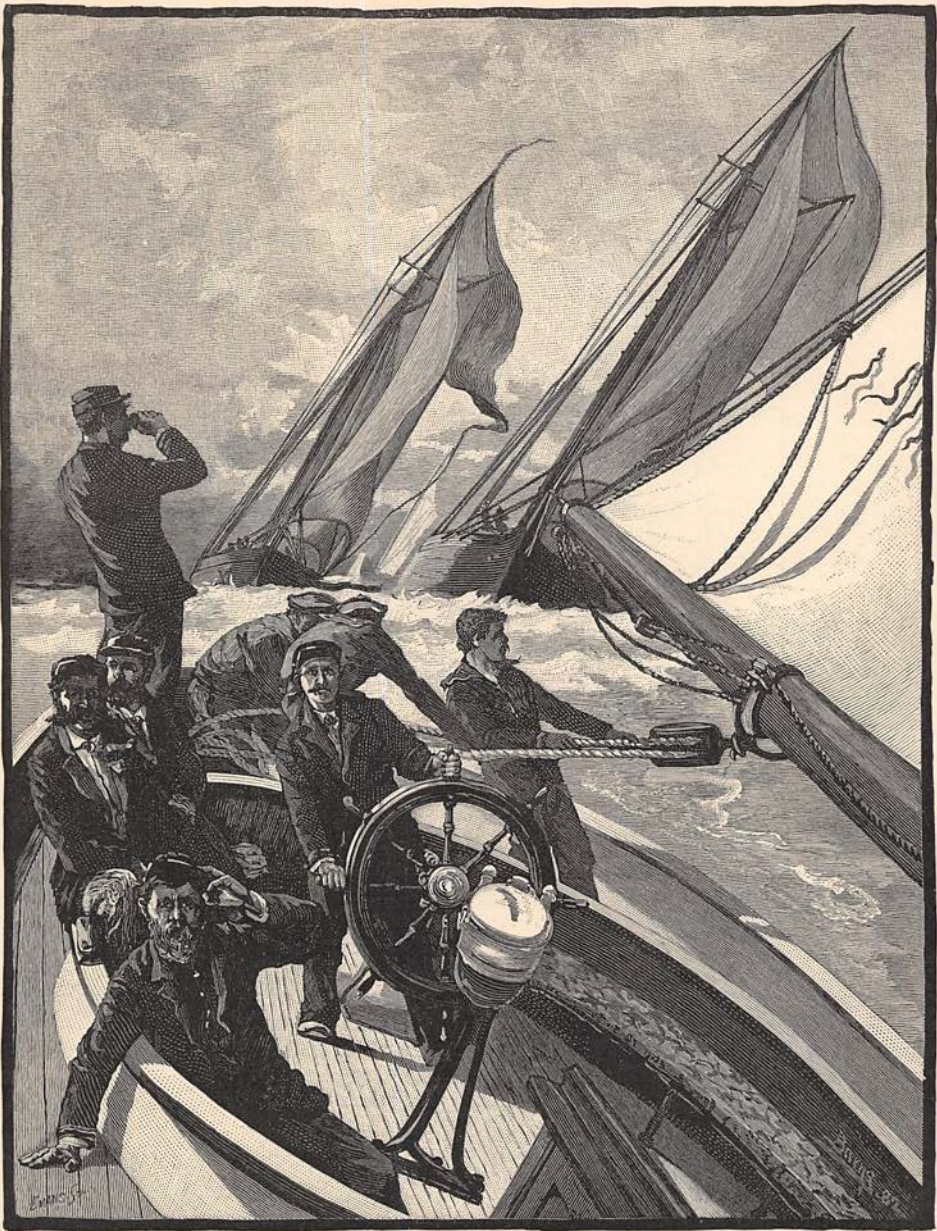
GETTING A CAT-BOAT READY FOR THE SEASON.

surd as that alleged against the advocates of the extreme "skimming-dish" type of yacht. Most of those who favor a change incline to a compromise in one or more details. While, for example, the fixed bowsprit is still retained, the large single jib is fast giving place to fore-sail and jib, called double head-sail, or split jib, as in the *Regina*. The form of the head-sail of the three types is well indicated by comparing the accompanying diagrams of the *Kelpie*, the *Regina*, and the *Muriel*. Flush decks are also coming into fashion, as in Mr. Platt's new center-board schooner *Montauk*, built by the Poillon Brothers, and designed by Mr. Ellsworth, who drafted the fine racing-sloop, *Fanita*. Double-topping lifts and other minor imitations of English rig have been adopted, while in the modeling of the hull greater draft and metal added to the keel are innovations coming rapidly into acceptance, especially in Massachusetts waters. It is curious to look at some of our genuine American sloops and schooners, whose owners have become infected by the epidemic of foreign ideas, with heavy additions of iron patched upon keels that were never intended to

carry them. The introduction of the flush deck, while it adds greatly to the looks of a trim yacht, as a trunk cabin can hardly be considered ornamental, of necessity implies greater depth of model, but of course must be confined to yachts of some size, unless, indeed, many of the principles hitherto followed in American yacht-building are entirely abandoned. One of the most notable compromise yachts yet built is the *Valkyr*, designed by Mr. A. Cary Smith, of which we give the sheer and body plans. Although a center-board sloop, she draws six feet on a length of forty-six and seven-tenths feet on the water line. While broad amidships, her lines taper aft to a fine, narrow elliptical counter. Her bow is sharp, but wedge-shaped, and her head-rig is, like that of the *Regina*, a long, straight "horn" of a bowsprit and two jibs. Her sheer plan suggests the cutter, while her interior plan is American, and her rig is modified by English patterns. She carries seven tons of her ballast in lead on her keel. The method by which it is fixed to the keel was invented by Dr. Dawson, her owner, and is worthy of notice. The keel was first shaped and then turned over, and a groove hollowed out on the under side of it, twenty-seven feet long by sixteen inches wide amidships. The groove was filled with pigs



CATAMARAN.

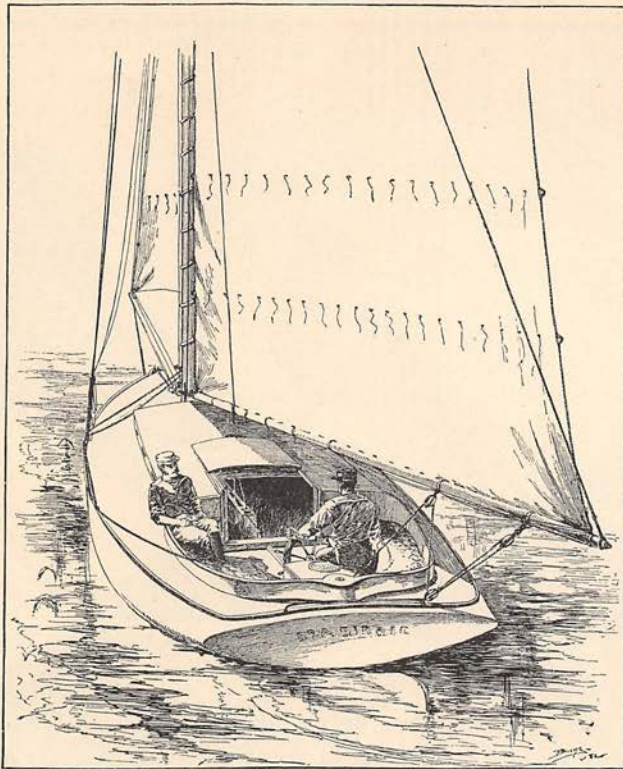


A FRESH BREEZE.

of lead, and then, a barrier of earth and plank having been raised on each side, a quantity of boiling lead was poured into the crevices, which fused the whole into a single mass. This is altogether different from the method generally employed in fixing lead on the keel of the modern cutter. It will be seen from the diagram on page 366 that a keelson is dispensed with, the sharp floor timbers being braced by iron knees, called knee-floors.

Long riveted bolts pass through these and the keel, and entirely through the lead.

Already we have such American-built cutters here as the *Muriel*, the *Yolande* or the *Oriva*, constructed by Mr. Piepgrass. Whatever be the sailing qualities of the latter, she presents one of the finest examples of ship-building skill ever constructed in this country. She is in every respect an out-and-out cutter, except that the bowsprit runs in through a gammon



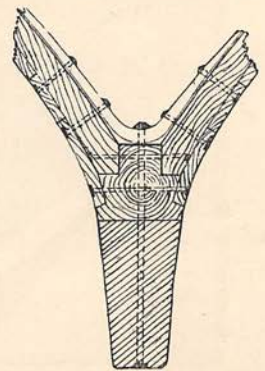
TYPE OF SMALL AMERICAN YACHT.

iron over the stem instead of by the side of it. The decorations of her cabin, in which great economy of room and admirable mechanical devices have been displayed, was designed by Mr. Eidlitz, the architect. Another architect, Mr. Prague, was employed to design the sumptuous cabins of the *Montauk*, an indication that the decoration of our yachts is keeping pace with the interest displayed in decorating our houses. Mahogany and cherry are the woods most affected for this purpose at present. An excellent adaptation of the latter may be seen in Mr. Lawley's small but beautiful sloop *Countess*.

With the arrival of the cutter has also come the yawl rig, first brought into prominence on the Atlantic coast by the yawl *Edith*, of the Eastern Yacht Club, but a favorite rig for some years with the bold mariners of the San Francisco Yacht Club. There the mizzen is called a driver, and is leg-of-mutton shape instead of square-headed. It is a picturesque rig, and very convenient in small yachts intended for cruising and to be sailed with an eye to economy. As such we think it is destined to supersede our class of small schooners.

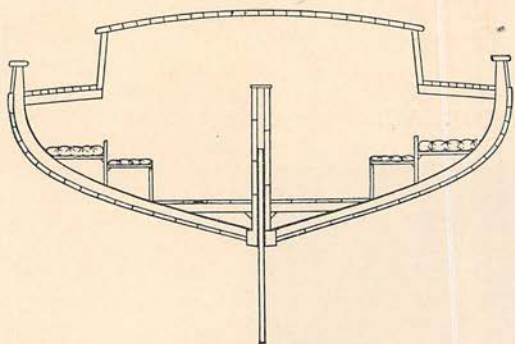
What then—are we to see foreign models and rigs driving out native inventions? No, very far from this; but in answering the question we

are brought face to face with problems which, with mathematics and without them, by "rule of thumb" or absolute empiricism, have been discussed almost interminably by salts, scientists, and tyros alike without reaching results acceptable to all, nor can they be ever quite settled, at least not until the question is dispassionately considered from every point of view, and with the fundamental principle of adaptation fully acknowledged. The American beamy yacht has at the outset greater initial stability than the narrow, deep-draft, heavily ballasted type, and less displacement, therefore, because carrying less weight. The beamy, shallow boat can thus spread more canvas to her length and weight, and gain in speed, other things being equal, by the greater sail-power to her weight up to an inclination of thirty degrees. It is



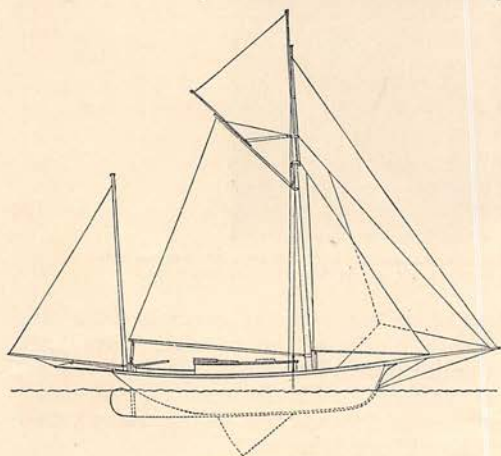
KEEL PLAN OF CUTTER, SHOWING IRON FLOORS AND LEAD ON THE KEEL.

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MIDSHIP SECTION OF TYPICAL CENTER-BOARD SLOOP-YACHT, 40 FEET LONG OVER ALL, 14 FEET BEAM, 3 FEET 9 INCHES DEEP, EXCLUSIVE OF TRUNK.

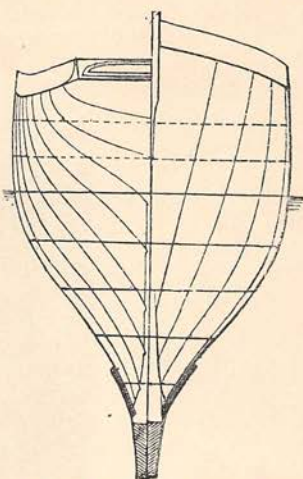
more difficult to carry her to that point than a narrower vessel, but when that is reached she is far more liable to capsize than the other type at an inclination of forty-five degrees, although the latter reaches that point with less lateral force of wind or waves. Each principle, therefore, has its advantages, while the merit claimed for the narrow cutter in carrying weights and canvas low can be also applied to sloops, if so desired. If the cutter is safer and easier in a sea-way, she is more uncomfortable, as she lies over so far, while by reducing beam a little and increasing



AMERICAN YAWL.

the draft a vessel can be designed that for cruising may combine the chief points of

each type. We find something of this sort in our deep-sea fishing schooners of fifteen years ago. Where they cannot live no other craft of the same size can. The extremes to which each type has been carried are due mainly to the arbitrary rules of measurement adopted by racing organizations. The English clubs tax beam and



BODY PLAN OF TYPICAL ENGLISH CUTTER, 38 FEET LENGTH OVER ALL, 6 FEET BEAM, AND 6 FEET DRAFT.

tonnage, measuring length from the heel of the keel. Therefore, the English yachtsman tries to get stability out of depth, and cheats the rules by raking the stern-post. Until recently American clubs taxed length, and thus, for a given sail-power, size was obtained by beam rather than by length and depth. All rules of measurement can only be general and arbitrary, but it is by this time evident that no rule can approximate justice without also taxing the spread of canvas carried. This is actually the latest phase adopted in this knotty question, and only three cabin-yacht clubs in America still adhere to the absurd length-over-all system of yacht measurement. Were it not for these opposite rules, hitherto laid down in the interest of racing, there would now be far less divergence between English and American yachts. For the rest, the discussion of the relative merits of each would be more valuable if we would first inquire for what purpose a yacht is intended. Adaptation lies at the basis of the whole question, and it is idle to expect to invent a model that will be equally good in rough and in smooth water, for cruising and for racing, for deep water and for shallow sounds.

S. G. W. Benjamin.

