

THE LAST OF A FAMOUS "AMERICA" CUP CHALLENGER.

Of all the English yachts which have come over to compete for the "America's Cup," there is probably none that has made such a good record for herself as the fine old English cutter "Genesta,"; certainly, she came nearer winning the cup than any yacht that preceded her or came after. The American yachting enthusiast who was so fortunate as to be present at that famous race in 1885 of twenty miles to leeward and return, will not soon forget the anxiety with which he saw Sir Richard Sutton's yacht slipping down the wind to the outer mark with an ever-widening distance between her and the centerboard "Puritan," nor the delight with which, when the boats hauled on the wind he saw the center board slowly, but steadily, out-weathering the cutter, and finally romping home the winner by the close but undeniable margin of 1 minute 38 seconds. In the light weather trial the shallow centerboard with her relatively large sail area proved to be a far faster boat than the "Genesta." Although she failed to take home the cup, "Genesta" was successful in winning both the Brenton Reef and Cape May cups.

The "Genesta" was a typical English deep-keel, outside-lead cutter of the so-called plank-on-edge type; though she was not so extreme in her relation of beam to draught as some cutters of her time, she was sent over here at a time when the "keel versus centerboard" controversy was at its height. In none of the races that have followed those of 1885 have the competing yachts of the two nations shown so strongly the distinguishing national characteristics as did "Puritan" and "Genesta," the one being distinguished by narrow beam, deep draught, outside ballast, large displacement and relatively small sail plan; the other by great beam, shallow draught, and both inside and outside ballast, the outside ballast being the first step toward the cutter type, just as the English "Thistle" in adopting a beam of 20 feet showed the first tendency toward the characteristic beam of the American sloop.

The "Genesta" was a composite built boat (elm planking on steel frames), and measured 96 feet on deck, 81 feet on the waterline, 15 feet beam, and 13 feet 6 inches draught. She had a displacement of 141 tons and a sail area of 7,141 square feet. The "Puritan" was 93 feet on deck, 81 feet 1 1/2 inches on the waterline, 22 feet 7 inches beam, 8 feet 10 inches draught, with a displacement of only 105 1/2 tons and a sail area of 7,370 square feet.

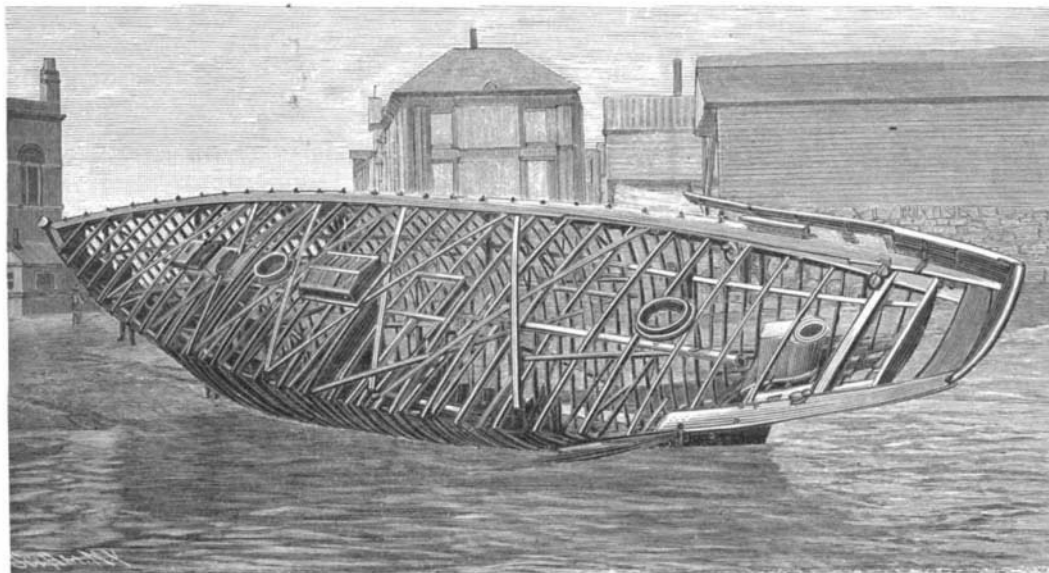
The accompanying illustration, for which we are indebted to The Yachtsman, shows the famous old cutter upon the beach in process of being broken up for old iron and junk, an inglorious end that overtakes all craft except a few favored warships like our own "Hartford," or Nelson's old ship, the "Victory."

THE FIRST-CLASS BATTLESHIP "ALABAMA"

The "Alabama," whose record of 17 knots an hour on her recent official trip, places her at the front rank of our battleships for speed, will always be a vessel of particular interest, from the fact that in her we see the introduction of a new type in the United States Navy. Comparing her with the "Oregon," the "Iowa," or the "Kearsarge," the most noticeable difference is the entire absence of the 8-inch gun. Hitherto our battleships have been distinguished from those of other navies largely by the fact that they carried a much heavier armament, due chiefly to the presence on board of a complete battery of guns which were intermediate in power between the main battery of 12-inch and 13-inch guns, and the secondary battery of rapid-fire guns of 5-inch and 6-inch caliber. The battleships of Great Britain, France, and Germany, and with a few exceptions, of Russia, have carried no guns of a caliber between the 12-inch and the 6-inch weapons, and in the "Alabama" we see the first disposition on the part of our naval constructors to follow the European practice. Although the absence of the 8-inch gun is very sincerely regretted by most of our officers of the line, it cannot

be denied that in the "Alabama" the heavy secondary battery of 6-inch guns, on account of its rapidity of fire and the enormous weight of metal which can be thrown in a specified time, goes far to offset the removal of the very popular 8-inch breech-loading rifle.

The "Alabama" was authorized June 10, 1896; the contract for her construction by the William Cramp & Sons Ship and Engine Building Company was signed the following September; the keel was laid the December of the same year, and the vessel was launched on



PRESENT APPEARANCE OF THE FAMOUS CUP CHALLENGER "GENESTA."

May 18, 1898, and has now been completed about eleven months later than the contract date, this delay being due to the failure of the builders, on account of the armor-plate controversy, to receive the necessary armor during the construction of the ship. The vessel is 360 feet long, 72 feet 2 1/2 inches broad, and has a mean draught, when fully equipped for sea, and with 800 tons of coal on board, of 23 feet 6 inches. Her displacement on the draught given is 11,565 tons. She is driven by twin-screw, vertical, triple-expansion engines, and steam is supplied by boilers of the Scotch type. Her normal coal supply is 800 tons and her bunker capacity with nominal loose stowage is 1,200 tons, while with close stowage she can hold 1,440 tons in the bunkers. As compared with the "Kentucky" and "Kearsarge" she has about 8 feet more freeboard, due to a spar deck which extends from the bow about two-thirds of the way out. Her protection consists of a belt of Harveyized armor of a maximum thickness of 16 1/2 inches, which tapers toward the bow and stern. Above the belt, amidships, side armor of 6 inches is

In various articles on naval matters which have appeared from time to time in the SCIENTIFIC AMERICAN we have described and illustrated, with sectional views, the structural features of the barbette of a modern warship; but we think that the most knowing of the naval "sharps" among our readers will be able to learn something from the accompanying illustration showing the interior of a barbette before the turret was installed. The photograph from which our plate was made is one of a series of progress photographs which were filed with the Chief Constructor of the Navy during the construction of the "Alabama." It was taken from the after end of the superstructure, the deck upon which the people around the edge of the barbette are standing being the main deck.

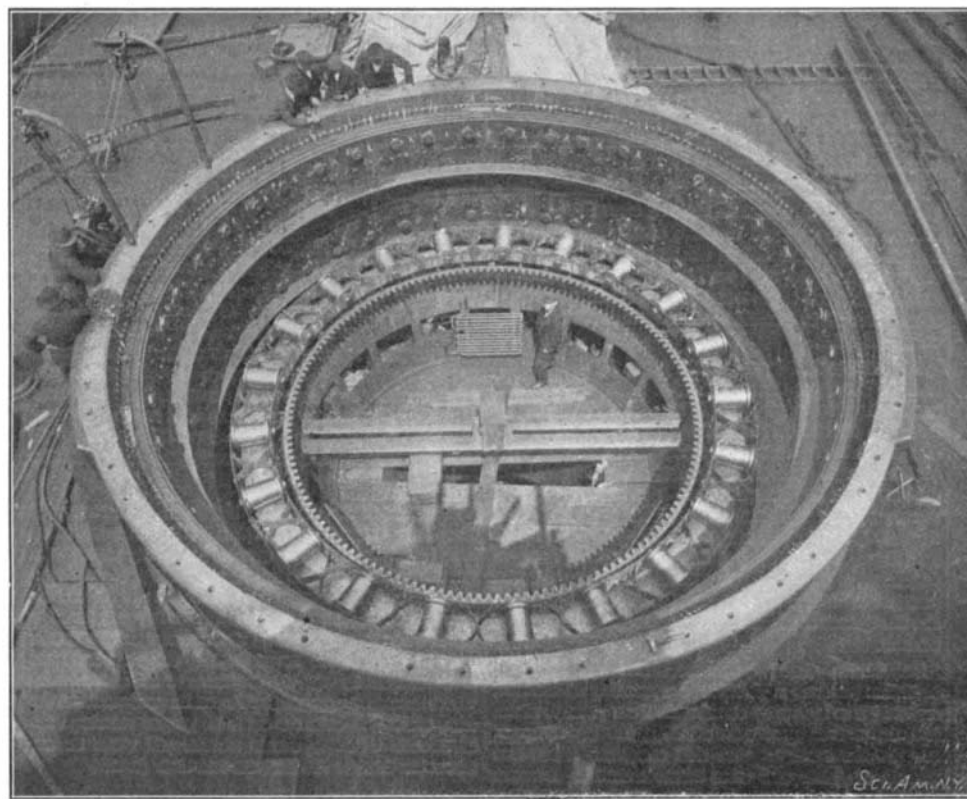
The barbette is a vertical, cylindrical, heavily armored redoubt, which extends from the protective deck to a height of 3 feet 8 inches above the main deck. The duty of this redoubt is to protect the unarmored base of the turret, the mechanism by which it is rotated, and the hoist by which the ammunition is brought up to the guns. Within this cylinder, which is about 12 1/2 feet in depth, is located a circular track upon which is a circle of twenty-one conical rollers, which are held in their proper spacing and radial position by means of two concentric rings, firmly braced together.

Upon these rollers is carried the whole weight of the turret, the guns and their mounts, a total of 277 tons. The lower half of the turret is in the form of a circular-inverted cone and is unarmored; the upper and armored portion of the turret is elliptical in plan, and the rear portion of it projects over the top edge of the barbette, enough space being left between the turret and barbette for easy clearance in turning.

The barbette is protected for two-thirds of its circumference with 14 inches of Harveyized armor, the remaining one-third, or the portion which is nearest to the point of view from which the photograph was taken, is protected with 10 inches of armor, less protection being needed on this portion of the barbette because it is screened by the 6-inch side armor on the hull of the vessel. The armor is bolted to a backing of teak, within which is 1 inch of steel plating attached to a heavy framing of steel beams, angles, and channel beams. The internal diameter of the barbette is 27 feet.

Immediately within and below the circle of rollers is seen the massive circular rack which forms part of the turning mechanism of the turret, rotation being effected by means of two electric motors carried in the base of the turret. The shafts of these motors are connected by suitable gearing with pinions which engage the circular rack; and the training of the great weight of the turret and guns is accomplished with a speed and accuracy which are impossible when hydraulic, compressed air, or steam motors are used.

The after barbette of the "Alabama" contains altogether 26 tons of armor. The total weight of the installment, including turrets and guns, is 783 tons. The forward barbette and turret, however, are much heavier, the total weight in this case being 978 tons. This increase is due to the fact that the "Alabama" carries her forward guns above the spar deck, and, therefore, some 7 1/2 feet to 8 feet higher above the waterline than the after pair of guns, the increase in weight being due entirely to the increased height of the barbette.



INTERIOR OF THE BARBETTE OF THE FIRST-CLASS BATTLESHIP "ALABAMA."

carried up to inclose and protect the guns of the secondary battery. The main battery of four 13-inch guns is carried in elliptical balanced turrets which have 14 inches of armor protection. The secondary battery is extremely powerful and consists of fourteen 6-inch rapid-fire guns, twelve of which are carried on the main deck and two on the boat deck amidships. She is also armored with sixteen 6-pounders, six 1-pounders, four Colts, and two 3-inch field guns. She is fitted with four tubes for the discharge of Whitehead torpedoes.

PROF. HENRY F. OSBORN has been appointed to succeed the late Prof. O. C. Marsh as palaeontologist of the United States Geological Survey. Prof. Osborn will have charge of the vertebrate palaeontology of the survey especially with reference to the completion of the monograph for which illustrations were prepared under the direction of Prof. Marsh.

SILVER BRONZE.—Melt equal parts of bismuth and tin and add an equal part (by weight) of mercury. It is sprinkled, finely powdered, upon the freshly sized or varnished surface.—Pharmaceutical Post.