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The Editor is always glad to receive for examination illustrated articles on subjects of timely interest. If the photographs are *sharp*, the articles *short*, and the facts *authentic*, the contributions will receive special attention. Accepted articles will be paid for at regular space rates.

RACING YACHTS IN A GALE.

The recent run of seventy vessels of the New York Yacht Club from Martha's Vineyard around Cape Cod to Portland harbor afforded a supreme test of the seagoing qualities of the modern racing yacht. The distance was 152 miles. Not long after the start the wind began to freshen, and throughout the night, as the yachts fought their way along the coast of Cape Cod, it increased to what was probably a moderate gale. The fleet was so roughly handled that the majority of the boats were scattered during the afternoon and night, and the following morning found refuge in the various harbors from Vineyard Haven to Portland. Of those that completed the run, or rather race, for such it was, F. F. Brewster's 90-foot schooner "Elmina" went through without any mishap, covering the 152 miles in 22 hours, 36 minutes, and 38 seconds elapsed time. Equally meritorious was the performance of Cornelius Vanderbilt's sloop "Aurora," a vessel over 30 feet shorter than "Elmina" on the waterline, which covered the course in 26 hours, 11 minutes, and 21 seconds, beating Mr. W. E. Iselin's 90-foot yawl "Vigilant," the old "America" cup defender, by over 9 hours. The "Aurora" was navigated throughout by Mr. W. Butler Duncan, Jr., who says that the one-design Herreshoff yachts (the class consists of the "Aurora," "Istalena," and "Winsome") could hardly be surpassed in their weatherly qualities and were not in the least danger in the seaway. Nevertheless, the fact remains that a moderate summer gale sufficed to scatter this fleet of seventy vessels, completely disabling many of them, and driving the greater part of them to the shelter of the nearest harbor. The casualties comprised almost every kind of a disaster that can befall sails and spars, running and standing gear, from complete wreckage, as in the case of the "Eleanora," formerly the "Effort," whose mast went by the board, carrying bowsprit and everything above deck with it, to the breaking of the jaws of the gaff and the parting of blocks and the minor mishaps so well known to the racing yachtsman. The many casualties merely emphasize the fact, already well known to experienced yachtsmen and designers, that the enormous spars and big sail plan of the modern racing yacht are ill adapted for a thrash to windward in a heavy sea and wind. Although when a racing yacht is staggering along under her full press of canvas, the strains in spars, shrouds and stays run up to a very high figure, they evidently do not equal the more violent strains which occur under the sudden, snappy plunging and lurching of a vessel that is being driven under reduced canvas in a short and lively sea. The result of this experience of a summer's gale will be to bring the moderately sparred and more comfortable cruiser into greater favor with the average yachtsman.

PEARY AND THE NORTH POLE.

Public interest in the present attempt by Peary to reach the North Pole has been reawakened by the recent start of the schooner "Jeanie" from St. John's, Newfoundland, for Etah, west Greenland, for the purpose of getting into communication with the explorer, who has now been absent over twelve months on his present expedition to the North Pole. When Peary left in the "Roosevelt," about twelve months ago, he planned to push as far north as the ice would admit, and then establish winter quarters and make preparation for a dash by sled between March and June of the present year. If he were successful he planned to return to Etah with the ship, if possible, and if not, without it. If he failed to reach the Pole, it was his purpose, should another attempt seem to promise success, to remain in the North till the summer of 1910, and make another attempt in the early months of that year. If any disaster has befallen the "Roosevelt," the schooner will probably find Peary at Etah awaiting her arrival; and he will be there if he has succeeded in reaching and returning from the Pole. Should he have failed in his quest, he will still be far away to the north, and the schooner will bring back such dispatches and reports as he may have sent down. Possibly the vessel will also bring back Dr. F. A. Cooke, of Brooklyn, who went north two years ago and was landed at Etah to undertake a trip to the Pole with a single companion. The last word from him was sent back by a native when he was about to go out over the Arctic ice on his quest. If all goes well the return of the vessel may be looked for about October 1st, when some definite news of Peary's work may be expected.

TWENTY MILES UNDER THE SEA.

The rapid progress of the arts and sciences in these opening years of the twentieth century affords opportunity for the enjoyment of novel situations and sensations, which were possible only in the dreams of the enthusiast of an earlier day. Thanks to official courtesy, the Editor was recently afforded an opportunity, during the trials of the latest submarines built for our navy, to make a run of some twenty miles below the surface of the water in one of these always interesting and to-day extremely formidable craft.

A little removed from the long lines of battleships, destroyers, and auxiliaries, that were moored during the recent summer maneuvers in Provincetown Bay, was the converted hull of an old wooden sailing brig, the property of the Fore River Ship Building Company, which acted as "mother ship" to a group of submarines, recently constructed by that company, which had been brought to Provincetown for their official government tests. Selecting the "Stingray," one of the largest submarines, for the reason that her trials for the day were to be carried on entirely below the surface, we went aboard, and found ourselves on a narrow, flat deck, about five feet in width and sixty feet in length, which covers in the superstructure, a light construction of steel plating built upon the hull of the submarine proper, and perforated so as to allow a free entrance and exit of the water. A steel hand rope, carried in removable stanchions, surrounds this deck. Extending up through the center of the deck to a height of about five feet is a narrow elliptical tower, on top of which is the sighting hood or conning tower, pierced by several little glass-filled ports for observation. Just in front of the conning tower is a removable navigating bridge, used when the ship is at the surface. In front of this are the two tall tubes of the periscopes, which are in duplicate.

The ship was driven to the outside mile course by the electric motors, the gasoline engines which are used for propulsion on the surface in extended runs, being uncoupled. The first surprise of the day was the extraordinary smoothness of the motion, there being not the slightest vibration to indicate that the vessel was under way. As we approached the course, orders were given to dismantle the upper works and send everything below. The wire handrope around the deck was removed, the stanchions lifted from their sockets, the navigating bridge on the conning tower was knocked down, and all of this material, with the steering gear, compass, etc., was handed, piece by piece, through the manhole, until the ship was stripped clean for the dive. As soon as everybody had gone below, the manhole was closed, and the submarine was ready for her first run over the measured mile course. Below decks throughout the five hours below the surface we were struck with the purity and sweetness of the air, and the absence of any odor other than that of the last coat of paint which the interior had received. Forward, side by side, we noticed the two torpedo tubes. Aft, beyond a bulkhead, were the twin gasoline engines, and abaft of them the two motors, the former used for charging the batteries and for propulsion when the ship is at the surface, the latter being used exclusively for propulsion when the ship is submerged.

While making the trial runs, the steering is done by a man in the conning tower. Immediately below him, standing on the deck, is the lookout, with his eye at the periscope. Facing the side of the vessel, another man controls, by means of a handwheel, the diving rudder, and holds the vessel at its proper depth. At various stations were men with their hands upon the wheels and levers that regulate the ballast tanks for giving the proper submergence and trim to the vessel; aft were the engineers.

It will be remembered that when we went below, the submarine was floating at the depth for surface cruising. The first operation was to admit sufficient water into her tanks to sink the boat to the awash condition, and in sharp succession the commands came, "Fill the main ballast tank," "Fill the forward trimming tank," " Fill the after trimming tank." Immediately one could hear the rather ominous swish of the water, as it rushed into the vessel. Instinctively our eye followed the pointer on the large depth gage, which was fastened on the side of the submarine in front of the man who controls the diving rudder. The tanks were left open till a depth of five feet was registered. Then came the order to start the engines, which was shortly followed by the sharp word of command, "Dive." A few swift turns to the handwheel were followed by a curious dipping or lurching sensation, as the submarine, impelled by the downwardly-deflected rudder astern, changed from the horizontal to an inclination of about five degrees, and began to go down. The descent was shown at once on the depth gage, which moved quickly to indicate eight, ten, twelve, and ultimately fifteen feet, the depth at which the runs were to be made.

It should be explained here that the handling of the diving rudder is the most delicate operation, and the one requiring most skill and judgment, connected with the submarine. The rudder must not be put down too suddenly, or there may be too precipitate a plunge. At 9.5 knots, the speed at which the run was made, it took about five degrees of rudder to make the dive. The submarine going down had an inclination of three and a half degrees. To keep her on an even keel when submerged, it was necessary to give her about one and a half degrees of the diving helm. This is due to the fact that when the submerging tanks are filled, she does not take in sufficient water ballast to entirely sink her, but is adjusted with a reserve buoyancy of about 1,000 pounds. To correct this buoyancy, it is necessary to keep the helm slightly down when she is running. To reach the fifteen-foot depth takes from fifty seconds to a minute and a half, according to the speed at which the boat is being run.

The mile course was laid out about half a mile offshore, the start, finish, and quarters being marked by pairs of ranges set up on shore. The instant of passing the ranges was noted by the man at the eyepiece of the periscope, which was swung around at right angles to the axis of the boat. As each range passed the field of the periscope, the observer called out "Mark," the time being taken by observers both on shore and within the submarine. When the mile course had been covered, which was done under full power at the rate of nine and a half knots, the diving rudder was put up, and the same curious change of level was felt as when the dive was made.

Perhaps the most surprising thing about this five hours' trip below water was the fact that, even when the boat was being driven at the highest speed, there was practically no vibration, and absolutely no indication that the water was sweeping by the vessel at a speed of nearly twelve miles an hour. The only sound was the slight hum of the electric motors, punctuated by an occasional word of command from navigator or engineer. As far as any indication of sight or sound was concerned, the cabin might have been that of any ship that sails the surface of the sea in the orthodox manner. The first suggestion that the boat was alive with movement came when, at the end of the run, the submarine thrust her nose above the surface, when the swish of the broken water at the bow could be distinctly heard. After making a wide turn, and heading for the course, the rudder was put down; a dive to the fifteen feet depth was made, and, under a reduced speed of about eight knots, the course was again covered. This was repeated, until the twelve runs scheduled for the day's trial had been completed, the speed of the successive runs varying from nine and a half down to a minimum of about four knots. The engines were standardized by counting the revolutions corresponding to the various speeds.

A look through the eyepiece of the periscope, while we were submerged, removed the last doubt as to the ability of the submarine to "see." By means of a handwheel the periscope may be swept rapidly around the whole horizon; and so perfect is the reflection of the little mirrors, that we were able to pick out any particular battleship, yacht, or object on shore, with as much ease and as perfect visibility as if we had stood six or eight feet above the water, at the level of the object glass at the top of the periscope. The operator stated that in rough weather the wash of the waves keeps the glass clean and does not interfere with vision.

There can be no question that the submarine has at last "come into its own." Among the captains of the battleships and the line officers in general at Provincetown, there was noticeable a growing respect for these craft, due to the varied and accurate work which the flotilla had accomplished during the summer maneuvers. There has been a steady but slow growth in the speed of the submarine. Its control is now perfect, and its radius of action is being rapidly increased. Our largest boats have a radius of about one thousand miles; and two are under construction on the Pacific coast which will have a cruising radius of about three thousand miles. This means that the submarine is taking on full seagoing qualities. It must no longer be regarded as restricted to seacoast operation. The time is not far distant when an admiral searching for the enemy upon the high seas may include a submarine flotilla in his fleet. The profound significance of this fact upon strategy and tactics will be appreciated by every naval expert.