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## THE PILOTS AND PILOT BOATS OF NEW YORK.

The charm and romance which service on the sea possesses for those whose daily life is spent in more prosaic duties on shore, receive their highest expression in the arduous and hazardous calling of the pilots, who do duty off the various harbors that are strung out along our extended coastline on the Atlantic and Pacific Oceans. Of all the various local pilot associations or guilds, there is none that surpasses in interest or importance the body of men who are engaged in the service between Fire Island and Barnegat, upon the stretch of water that covers the approaches to New York Harbor. The history of this service is full of stirring incidents, even for a story of the sea. From the time of the early colonists of Manhattan Island, who kept a whale-boat at Sandy Hook, ready to place a pilot aboard the quaint Dutch merchantman, with its cumbrous stern towering high in air, down to the present day, when the stately liner, but six days out from port, picks up its pilot a few miles outside the harbor entrance, the record of the pilot service of this port has been such as to make the name of the "Sandy Hook pilot" familiar in every corner of the civilized world.


PILOT BOAT OF THE OLD SCHOOL.

The entrance door into the pilot's profession is guarded by a strict system of examination and apprenticeship extending over a period of six years. The boy of 16 or 17, who is ambitious to become a New York pilot, usually picks up his first experience before the mast in a service which lasts for a year and a half or two years. He then passes an examination before the Pilot Commissioners, who are chosen by the Chamber of Commerce and Board of Underwriters, in which he has to show a fair knowledge of the rudiments of education as taught in the public schools. The candidate must of course be in good physical condition, especially as regards his eyesight, the least degree of color-blindness being fatal in a profession which involves so much reading of signals by day and night. The successful candidate then enters upon a six years' apprentice-

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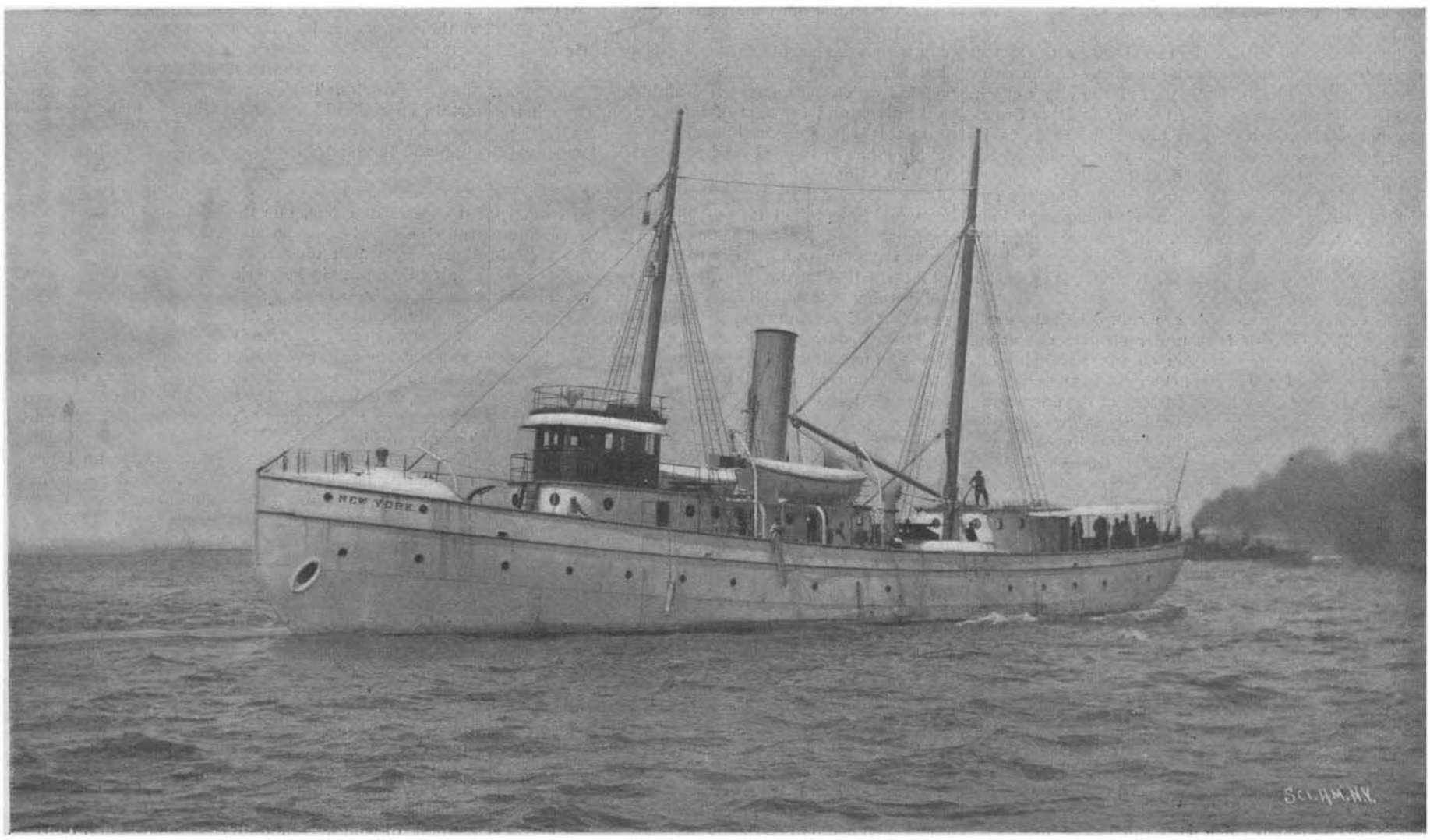


MODERN STEAM PILOT BOAT "NEW YORK"—OWNED BY THE NEW YORK AND SANDY HOOK PILOTS ASSOCIATION.

## THE PILOTS AND PILOT BOATS OF NEW YORK.

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ship, at the end of which he passes a final examination, in which he must give proof of his knowledge of the management of a square-rigged vessel and of the tides, channels, shoals, points of land and night lights of the locality in which he is to serve. If he is also found to be of good moral character, etc., he receives his "license for piloting vessels to and from the Port of New York by the way of Sandy Hook."

Before the present association was formed each pilot boat worked independently of the others. The laws which regulate pilotage require that the incoming vessel shall take "the first who shall offer himself," and it may well be imagined that there was keen competition between the various boats in the endeavor to sight the incoming vessel and be the first to put a pilot aboard. In the natural order of things the surest way to have intercepted the ships would have been for the pilot boats to cruise a few miles outside of Sandy Hook, where all incoming vessels must pass; but the rivalry between the boats frequently caused them to push out as far as 500 and 600 miles to the east. When a steamer was sighted, there would be a hard race to meet her, and every stitch of canvas was spread that the spars would carry. Speed was of the highest importance in those days, and the boats were modeled and rigged with all the care that is bestowed upon a modern racing craft. They were invariably schooner rigged, and while they could carry a heavy press of sail, they were capable of being quickly made snug under reduced canvas when it came on to blow.

Now it can be understood that while there was unlimited excitement in the old order of things, it must have been both costly and dangerous. The history of those early days of pilotage is full of disaster, and the long cruises to the eastward were as costly as they were unnecessary. This was well understood by the pilots, and it was only a question of time before some arrangement would be made by which the work could be carried on systematically and with less risk and expense. Delegates were appointed from each of the pilot boats (twenty-nine in all), and the Consolidated New York and Sandy Hook Pilots Association was formed. All of the pilot boats were bought by the association, and after the best nine had been selected, the other twenty were sold. This move alone saved nearly $100,000 a year to the association.

The cruising radius of the boats was also reduced to reasonable proportions. Formerly it extended from the capes of the Delaware River on the south to New York and to the east from New York to Halifax; but now the extreme length of the cruising line has been reduced to sixty miles, thirty miles to the southward and thirty to the eastward. The distance is divided into six "stations" of ten miles each, one pilot boat being allotted to each station. At the center of the line, and off the entrance to Gedney Channel, is stationed the "New York," a new steam pilot boat built specially for the association. She is known distinctively as the "station" boat, and while she does her share of the work of placing pilots on incoming vessels, she also takes off pilots from the outgoing ships, her position, about three miles outside of Sandy Hook, placing her directly in the way of ships outward bound. A reserve pilot boat is stationed off Staten Island. The boats, it must be understood, do not remain continuously on one station, but move in rotation from station to station. The boats which are farthest to the east or south are naturally the first to sight the incoming ships, and hence they are the first to be depleted of their pilots. As soon as this occurs the boat leaves its station, notifies the other boats, and sails into New York Harbor, anchoring off Staten Island. Meanwhile, the other boats move out one station, leaving the station next the "New York" vacant. The latter station is taken by a boat from Staten Island with a full complement of pilots, which leaves the island on the return of the empty pilot boat. The pilots are divided into companies of seven men each, and to each boat are assigned three companies, whose round of duties is as follows: One company is engaged in service on the pilot boats at sea, another in piloting ships out of the harbor, and a third in waiting at the headquarters of the association until the boat returns empty to Staten Island. It will thus be seen that there is a constant rotation of the boats and the pilots, each sailing boat making the round of four stations (the fourth being the relieving station off Staten Island), and the pilots, by companies, being engaged in piloting ships in, taking other ships out, or waiting in the office at 24 State Street, New York. The station ship "New York" does not take part in the rotation of the pilot boats, but keeps the same station continuously, running into New York for coal and water once in every fortnight.

The pilot boats, as we have said, are very handsome vessels, built of the best selected materials and heavily sparred. Of this type was the famous schooner "America," which in the fifties crossed over to England and captured the cup which has caused in later years such keen international rivalry in yacht building. The cost of a first class boat ran as high as $15,000, this being the contract price of the "Joseph Pulitzer," which was built in 1894 and was subsequently offered for sale at $7,000, when it was decided to sell off the greater part of the fleet. The dimensions of this boat were: Length, 78 feet; beam, 22 feet; depth, 9·4 feet; tonnage, 76·85. The "R. K. Fox," built in 1876, was 65 feet long, 20 feet in beam, and 7 feet in depth, with a tonnage of 47·68. The boats were designed to be easy in a seaway and when lying to in rough weather. In fair weather, with everything set, the best of them are capable of a speed of 12 knots, while the average speed is about 10 knots. When cruising over their allotted station of ten miles of water, they generally have the four lower sails up and jog along at about 4 or 5 knots an hour. When the weather is too rough to maintain station, the steam pilot boat takes the place of two sailing boats off the lightship and all the other boats run inside for shelter.

The "New York" is under a penalty to the commissioners of $100 if she is not on station, and she is supposed to, and actually does, remain at sea in every possible kind of weather. To this end she has been designed on the general lines of a lifeboat. She can work with either bow or stern to sea, her freeboard is unusually lofty, and she draws an unusual amount of water. Forward she is provided with a turtle-back to throw off the heavy seas that may come aboard. She is also provided with bilge keels to prevent her from rolling excessively. When it comes on to blow unusually hard, the "New York" steams between the Scotland Lightship and Sandy Hook Lightship. The vessel was designed by A. Cary Smith, who is responsible also for the design of many of our finest yachts, and those who are familiar with the latest fashions in yacht designing will see that the "New York" embodies some of the best features of this class of vessel. The dimensions of the vessel are as follows: Length on the water line, 140 feet; length over all, 155 feet; beam, 28 feet; draught, loaded, 14 feet. On these dimensions she must carry coal, water, and stores for one month, and provide accommodation for fifty men. The forefoot is considerably cut away, and the screw is placed much further forward than usual and is deeply immersed, an arrangement which prevents "racing" and contributes to quick steering and general handiness. The bow projects well over the water and the counter is carried down to the water line, which renders her ends very buoyant and enables her to back and go ahead against any sea that may be running. The keel is built on the trough principle and is fully two feet in width. The 100 tons of coal are carried at about the middle of her length, between the engines and boilers, immediately forward and aft of which are placed the large water tanks. The distribution of weights is such that her trim will be the same whether she is loaded or light. She carries two deck houses of steel, the forward one containing the captain's and mates' rooms, the officers' mess and the galley, the after one being a large smoking room. Abaft the boiler casing is a large hoisting engine, which is capable, by means of swinging booms, of hoisting two boats at once from or into the water.

Below deck there are two large saloons and twelve staterooms. A passage along the sides allows communication between the forward and after accommodation without going on deck, so that at all times during the heaviest gales that blow the pilots may remain snugly housed below. This handsome craft is furnished with "all modern improvements," including hot and cold running water, electric light, bathrooms, etc. Motive power consists of a compound engine, with cylinders 26 and 48 inches in diameter by 30 inches stroke, developing 800 horse power. Steam is furnished by two single-ended Scotch boilers, each 10½ feet in diameter by 11 feet in length and containing two furnaces. Working pressure is 110 pounds per square inch. The total cost of the "New York" was $85,000.

It can readily be understood that, taking it all in all, the pilot's life has taken on more comfort and lost much of its peril since the changes above outlined have been introduced.

One of our illustrations shows the method of exchanging signals by night. The incoming steamer shows its position by burning a blue light. The pilot lays his white sails broadside to the offshore horizon and shows his position, or distinguishes himself from surrounding craft by burning a "torch" or "flare-up," which is simply a wad of oakum or cotton waste on an iron handle, dipped in oakum or cotton waste. A view of pilot boats on the distant horizon by night when they are signaling, presents a weird and striking effect, the white sails flashing out and disappearing as if great fireflies were sporting on the waters.

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THE Canadian Mining Annual shows that mining enterprises in Canada are on the increase. The geological survey places the total value of the mineral output for 1897 above $28,000,000, or an increase of $6,000,000 over the previous year. The output is divided as follows among the principal mining provinces: British Columbia, $10,455,268; Nova Scotia, $6,000,000; Ontario, $5,000,000; Quebec, $2,063,266; Northwest Territories and Yukon, $3,000,000.

### Science Notes.

Repeating prescriptions cause much trouble in many sections of the country. In India few doctors hand the prescription to the patient. The document is sent directly to the druggist, who never thinks of refilling it for a customer unless so ordered by the prescriber.—Phil. Med. Jour.

An anthropologist named Ammon, says the Medicinisch-chirurgisches Central-Blatt, makes the statement that Bismarck's brain was probably the heaviest on record. He judges from measurements of Schäfer's bust of the great chancellor that his brain must have weighed 1,867 grammes (over 58 ounces). Cuvier's brain weighed 1,830 grammes; Byron's, 1,807; Kant's, 1,650; Schiller's, 1,630; and Dante's, 1,420. The average for a well built European adult man is given as 1,380 grammes.

A scientist looking for microbes says there are absolutely none on the Swiss mountains at an altitude of 2,000 feet. Here is the place for the purity party and scaremongers who are forever horrifying the public with the dismal fear of microbes. They would have to take their supply with them, most of which are useful to man. It is pleasing to observe that the microbe does not give himself lofty airs, but, as a fellow creature, comes down to our level and dwells cheerily in our midst.—Meehan's Monthly, from Revue Scientifique.

Hydrogen cooled to —205° and under a pressure of 180 atmospheres is allowed to escape rapidly through a coil of tube into a vacuum vessel, doubly silvered and surrounded by a vacuous space maintained below —200° C. About 1 per cent of the gas is obtained in the form of a clear, colorless liquid showing no absorption spectrum, and with a well-defined meniscus and apparently high refraction and dispersion. A glass tube closed at one end plunged into it becomes filled with solid air. Helium is similarly condensed to a liquid.—J. Dewar (Comptes Rendus, 126, pp. 1408–1412, 1898.)

Miss M. A. Ellis contributed a paper to the British Association on the human ear as a means of identification. She pointed out that the helix, or outer rim of the ear, and the general shape of the pinna, or whole outer ear, were the most useful for purposes of identification. Ears do not change shape after childhood, although they enlarge slightly after middle life. From the varieties of 64 pairs of ears, many belonging to individuals noted in art, science, and literature, printed from life by Miss Ellis, it has been found that the right and left of each pair of ears usually vary in shape.

The balloon used by Messrs. Spencer and Berson, of the Berlin Observatory, in their sensational balloon ascension in London recently, was inflated with pure hydrogen, instead of coal gas, and reached the remarkable altitude of 27,500 feet—more than five miles from the surface of the earth. This record has only once been exceeded, in 1862, by Glaisher and Coxwell, who claim to have gone 1,500 feet higher. Allowing, however, for the superiority of modern recording instruments, and the extreme debility which overcame the two aeronauts even at the lower level, there may be some reason to question whether Coxwell and Glaisher's altitude was actually reached.

An editorial writer in The Sun gives the Surgeon-General's estimate of the number of deaths from disease up to the present time as about 1.500, or only about three-fifths of one per cent, in a total force of about 250,000 men. He cities a Konversations-Lexicon published in Leipsic—Brockhaus', we presume—as stating the loss of life from disease in the German army during the Franco-Prussian war to have been nearly two per cent. A French medical authority, Dr. Cheun, according to The Army and Navy Journal (also cited by The Sun's writer), gives the number of "sick and frostbitten" in the French army as 339,421. The Hispano-American war has lasted thus far about five months. The Franco-Prussian lasted about seven months. The advantages of the Germans in being thoroughly prepared, the writer thinks, go far to neutralize this disparity of duration.

A very interesting application of telegraphy, as carried out by means of Hertzian waves, has lately been tried in Dublin. During the races of the Royal Alfred Yacht Club the proprietors of The Dublin Daily Express were able to receive their dispatches by means of this system. Mr. Marconi, who conducted this operation, followed the racing yachts in a tugboat, in the cabin of which was the necessary apparatus used in transmitting the messages. An observer stationed on the bridge signaled the progress of the race, and Mr. Marconi transmitted the report to land. The messages were received by a subordinate at Kingston, a distance of some five or ten miles from the point of transmission, and from there were telephoned to the journal. All the messages were received in the space of a few minutes after they were sent, and were published in subsequent issues of the paper. The transmission was accomplished without a single hitch, and none of the messages required repeating, the apparatus working satisfactorily throughout.