My Days on the *Albatross*

SEATON SCHROEDER

Prologue

Navigation and surveying formed a connecting link, as it were, between what was getting to be called the "Old Navy" and what was soon to take shape as a "New Navy." Seamanship, as an art of special character, was beginning to change its form with the passing of sail power and its supersession by the steam engine; while requiring in its new form no less ability and practiced judgment in the handling of large ships, it offered a diminished field for expertness in craft of only moderate size and speed among officers doing simple watch duty not in company with other ships; and, therefore, it was threatened with a materially lessened regard.

The third essential branch of the naval profession, ordnance, together with its employment under the name of Gunnery, was not even commanding serious attention, although a beginning was being made in the production of rifled guns, largely through the conversion of large caliber smoothbores into rifles of much smaller bore; also, the Fleet Ordnance Officer of the North Atlantic Squadron, Lieutenant J. F. Meigs, had come to be known as the Fleet Gunnery Officer and was attracting attention by his insistence upon the importance of target firing.

Conservative deliberation is commendable in the face of great changes; but many thought it was carried to the verge of paralysis in the process of advancing from cast-iron, through cast-iron and wrought iron, and wrought iron and steel, to finally all steel, with contemporaneous improvements in the mounts. It should be remembered, however, that we had an enormous amount of cast-iron ordnance on hand at the close of the Civil War; also, that the adoption of the rifle principle went naturally hand in hand with the advance in gun material, and everything waited upon the adoption of the rifle principle.

Hydrography

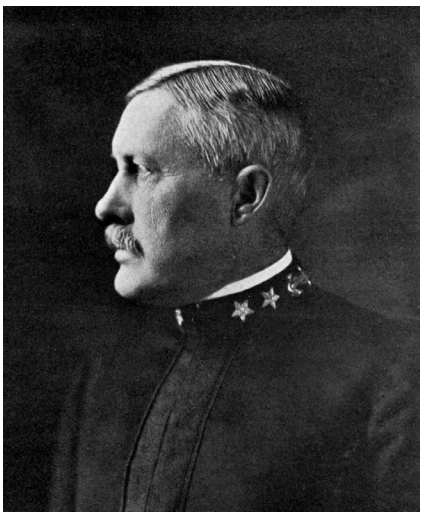
So, in the autumn of 1880, I (Fig. 1) looked forward with relish to duty in the U.S. Navy's Hydrographic Office, which anticipation was fully confirmed, and I passed two pleasant years there, interrupted only during 6 months, the winter of 1881–82, by special duty in surveying Samana Bay in the Dominican Republic. For that work the *Despatch*, Presidential yacht so-called, was detached from her usual sphere and fitted out as a surveying vessel, under the command of Commander William R. Bridgman who gladly accepted the duty, declaring that he would have considered it infra dig to command her in her normal service.

Commander Bridgman was a strict disciplinarian, a quality to which no one can rationally object; very uncompromising in his ideas regarding the performance of duty; reluctant to concede the superiority of steam over sail; a bon vivant and quite imbued with a desire to live and let live; quick to discern the qualities, good or bad, of those under his command, and not overly solicitous to conceal from them the impression made by discernment. One could not help liking him, or, certainly, admiring him.

The little ship of 600 tons was well equipped temporarily for her work, and

EDITOR'S NOTE—The year 2008 is a historic one in marine science. It marks not only the initial cruises of the world's first deep-sea oceanographic research vessel *Albatross* in 1883, but it also marks the centennial of the *Albatross*' cruise to the Philippines in 1908, an event being marked by Philippine authorities. Because many early accounts of the *Albatross*' work are long forgotten or very difficult to locate, we are reprinting a few significant ones, beginning with Rear Admiral Seaton Schroeder's account of his 3 years on the *Albatross* that was published as a chapter in his autobiography, *A Half Century of Naval Service*.

As with other accounts, Admiral Schroeder's chapter reflects the admiration and awe that most on the vessel experienced, owing partly to the vessel's advanced equipment (the latest research gear and, importantly, her use of electric lighting for some undersea work) and to the many thousands of new species brought on board. While late in the *Albatross*' career, some U.S. Navy officers thought poorly of duty on her, Schroeder was much impressed and was very appreciative of all he learned there. He was also much impressed with the capabilities and direction of the *Albatross*' captain, Lieutenant Commander Zera Luther Tanner, who seemingly took as much interest in her biological work as in his Naval work, helping invent or improve some of the research gear used. Thus began the 40-year career of the most productive marine science vessel of her era.



The vessel was put in commission when Captain Tanner reported for duty, and was supplied with the necessary officers and men by successive detail. The vessel left Wilmington on a trial trip for Washington on December 30, arriving on the 1st of January, 1883. The workings of the machinery were carefully studied, and the vessel taken back to Wilmington for final completion.

The *personnel* of the Albatross, on arrival at Washington, was as follows: Lieut. Z. L. Tanner, commanding; Lieut. Seaton Schroeder; Lieut. S. H. May; Lieut. A. C. Baker; Lieut. C. J. Boush; Ensign R. H. Miner; Paymaster George H. Read; Engineer G. W. Baird; Surgeon J. H. Kidder.

Figure 1.—Left: Rear Admiral Seaton Schroeder (1849–1922) was the first executive officer of the *Albatross*. Photo courtesy of the NOAA Central Library, Image ID pers0115. Above: Personnel first assigned to the *Albatross*. Image courtesy of the Rep. of the Comm. of Fish and Fish. for 1882, p. XXVII.

in her were crowded 16 officers, so that four parties could be kept at work independent of the care of the ship. I was the Navigator; and among the other line officers several had had excellent experience in that kind of work in the U.S. Coast and Geodetic Survey, which was a fortunate thing and contributed greatly to the excellence of the results. The essential factor, however, was the high standard of precision required by Captain Bridgman.

As an instance, I shall never forget taking in to him one day a working sheet, on a scale of 5 inches to a mile, to show him the hydrographic stations that we had established to angle on from the sounding boats. When I said something about those stations evidently being established with considerable accuracy, he assented somewhat reluctantly; but, after examining the sheet with a large magnifying glass, he pointed to one of them located by five "cuts" and commented that one of the cuts was only tangent to the pinpoint. It is no wonder that the chart-construction division of the Hydrographic Office declared it to be the best survey ever turned in.

The 5 months down there were passed in good hard work, the parties leaving the ship at half-past seven in the morning and getting back by perhaps half-past five, though not infrequently not until well after dark. Two of the four parties, of which I had one, did the shore work with theodolite sextant and micrometer telescope. The ship tried to keep conveniently near to where those parties had to go; but as the bay extends in to a depth of about 16 miles, the going and coming often amounted to a good many miles. We had steam launches for the hydrographic parties, while the triangulation parties had only pulling boats; but the crews of those boats became splendidly trained and would pull a racing stroke for miles. The return to the ship was generally under sail; in the afternoon the sea breeze rarely failed, and it was generally so fresh as to require reefing, and care was taken to have the ship always to leeward.

One day was had a rough time with my boat, which was a whaleboat equipped with the sliding-gunter rig. The sea breeze amounted to a young gale and we sped before it at a great rate, but when just about abreast the bow of the ship and preparing to brail up the foresail and bring by the wind, the boat broached-to and filled nearly up to the thwarts, and it took quick to earnest work to bale out that water and at the same time fetch the ship and not drift to leeward astern of her.

At another time we had a quite exciting race with a thunderstorm. My party had the south shore of the bay, and we were close-in on the roots of some tall mangroves and could see nothing except to the northward. Early in the afternoon we noticed that it was getting quite dark. The ship appeared in a peculiar light, being anchored about 2 miles off, and was flying a signal that looked like our boat's recall. It seemed so queer that I had the boat manned and we pulled away from the mangroves and found the whole southern board enveloped in an ink-black cloud which was advancing rapidly, while apparently torn with gusts and rent by flashes of lightning.

It was not necessary to give the order "Give way"; those seamen saw we had a race with that storm and gave way with a will. We had not gone a hundred yards, however, when the boat grounded on a bar. "Overboard everybody," and we "lighted her over," and started again. The same thing happened once again, after which we had a clear course, and the boat fairly flew. I could see that the boat falls were overhauled down on board the ship, and the crew were manning them; so I steered to bring the boat under the falls, and she was quickly hooked on but was barely clear of the water when that storm broke on us with rain and furious wind.

As an outing the work was thoroughly enjoyable—to those who enjoy that sort of thing, as I did. The only fly in the ointment, and a big fly it was, was that in the matter of eating we lived abominably. The member of the mess whom we had elected to the thankless office of caterer, as the mess treasurer was then

called, had not appreciated the isolated character of that bay and had made little provision for the table. There was but one steamer arriving there every 5 weeks, originally from New York, and it was not until the second one had come and gone that he seemed to awaken to the possibility of utilizing her.

The little village of Santa Barbara, near the mouth of the bay, had but scanty resources; once or twice did we get some tough fresh beef and some onions, and with regard to the latter I acquired a taste that I had never enjoyed before. There was no ice, of course, and no way of keeping fresh meat. As in the long passages in sailing ships, ice water was something that we remembered having read about; but we had no desire for it, as the monkeys (water bags) cooled the water quite as much as we liked.

For the picnic lunch taken in the boat, I always took a bottle of coffee, made the evening before and cooled during the night; by keeping it wrapped in a wet cloth and hung in the breeze, it was very palatable and refreshing. My friend Gorringe, of his own accord, sent me a big box of all sorts of things—preserves, cheese, potted things, slab chocolate, honey, sardines, cakes, puddings, etc., which made me very popular for a while in the mess. Chocolate and hard-tack, washed down with cool coffee, made a very satisfying luncheon; and I would, whenever possible, get into some shady nook with the boat and crew and get the greatest enjoyment out of it.

It so happened one day that my mental activities became engaged in a subject quite foreign to our work. I had the use of a steam launch for a special purpose in the mouth of a little freshwater stream that made its way out through a maze of mangroves, and I observed a peculiar wave action imparted to the water by the bow of the launch as it advanced. This led to an interested consideration of the matter which I afterwards embodied in a paper before the U.S. Naval Institute, entitled "A U-Bow Section and a long Buttock Line." The matter was, briefly, this: At a constantly moving point on either bank, if anything a little ahead of abreast of the bow, a wave hollow was formed, followed by a marked corresponding crest, the disturbance apparently ending after the passage of the crest. The hollow must have been preceded by a broad, unnoticeable elevation of the surface, which, under a reasoning given in detail in the paper, I attributed to the pressure of the particles of water being pushed downward, as well as laterally, by the bow of the advancing boat. This suggested a wall-sided bow, in other words, a U-Bow Section, as the shape encountering least resistance to forward motion because of pushing the water straight out laterally.

The element to which I afterward learned to attach the greater importance was the incontrovertible fact that the lower and greater part of the void under the afterbody, constantly being made by the forward motion of the ship, is filled from underneath. In order to counteract to the utmost the retarding effect of the diminished pressure under the run, it is necessary to give as free ingress as possible to the water flowing in as the vessel advances, and that manifestly can be the most naturally accomplished by so shaping the bottom that the water can begin to rise well forward, that is, by giving her a long buttock line, and that cannot be well done except in association with a bow section of a more or less U-shape. The way a vessel "squats" when running in shoal water is proof enough of the lack of pressure and buoying power under the stern, caused by the water not flowing in freely.

The long buttock line, expressed in other terms, is an old story perhaps; but it is strange what failures there were to recognize the various bearings of the phenomenon of the water coming from underneath to fill in under the stern. Anything that checks that inflow must retard the vessel, and among such checks obviously is shallow water under the bottom; and yet, 5 or 6 years after the time of my Naval Institute paper, one of the greatest shipbuilding firms in the country wasted some time and a great deal of money in trying to make a vessel that they were building come up to her contract speed in shoal water. When, finally, a course was laid off in deep water, that vessel made her speed easily and with less horsepower than was developed on the unsuccessful trials. It is interesting to recall that within a few years after that, when courses were laid in the deep water off Cape Ann, Mass., for the speed trials of large vessels, objection was made to one course in that in one place there was a small area where the depth was only 25 fathoms.

In all that special work of the *Despatch*, uniforms had to be discarded. We quickly learned to dress entirely in blue flannel, however hot it might threaten to be. Besides, we often had to be in the water for a while with no thought of a change until the ship was reached, and flannel was the only stuff with which to meet that condition. One hot day, while we were working in water about knee deep, erecting a station at the outer end of a mud flat, a hailstorm came up, and it was so cold that we had to lie down in the water to keep warm. It was noticeable that among those who had the bracing, out-of-door work and exposure there was no sickness, while those who had the ship duty, such as the Executive, engineers, the doctor, and the paymaster, several suffered from fever.

Our work included establishing the latitude and longitude as accurately as was possible with the instruments we had. Upon arrival, we first ran meridian distances several times, with our special outfit of chronometers, between Santa Barbara and San Juan, Puerto Rico. At that time I first made acquaintance with what we now call Porto Rico cigars; the acquaintance soon grew into intimacy.

As the spring passed and summer approached, other duty was being contemplated for the *Despatch*, and in May we were called north. It was becoming quite hot, and the rainy season was approaching, too, so that regrets at quitting that picnicking work were tempered. Upon reaching Washington, we were all detached.

To the *Albatross*

I returned to duty in the Hydrographic Office for the summer, being engaged in devising the plan and scope of Azimuth Tables and doing some of the computing. Before the computing was entirely completed, however, at the instance of

Lieutenant Zera Luther Tanner (Fig. 2) who was to be in command, I was invited by the Commissioner of Fish and Fisheries, Spencer Fullerton Baird (Fig. 3), to join the steamer *Albatross* (Fig. 4), then being completed, as Executive Officer and Navigator, an offer which I gladly accepted, and I was so ordered in October 1882. In any vessel in the regular Navy I would probably have had to worry through a period of watch duty in a commonplace, low-power steamer with a broadside battery of smoothbore guns on wooden Marsilly carriages, and with nothing to relieve the tedium of those wretched years, so I considered myself very fortunate to get this assignment.

The *Albatross* was a small vessel [234 feet long], not much over 1,000 tons, built of steel, with twin screws. She was the first government vessel to be equipped with an electric illuminating system. The environment, therefore, was of a distinctly progressive nature. The duties of the Executive were, of course, very light in so small a vessel; but as Navigator I had opportunity to gain more experience and skill in offshore navigation and inshore piloting than I would have had in many more years in a man of war, for we were always on the go, and on work requiring precision. I can never be too thankful for the practice of that cruise.

Before completing the 3 years and a little over, in that little ship, I realized that my greatest good fortune lay not so much in the mere experience gained in navigation as in the association with the Captain, Lieutenant Tanner. He had entered the Navy from the Volunteer service at the close of the Civil War. Being, unfortunately, more advanced in years than many about him, he reached the retirement age before attaining a rank higher than that of Commander.

Caught by the drastic reduction of the Navy in 1870, he long remained a Lieutenant, but was promoted to Lieutenant Commander shortly after our ship went in commission, and having been for some years on special duty with the U.S. Fish Commission vessels, naturally he was chosen for the command when the *Albatross* was built.

Figure 2.—Zera L. Tanner (1835–1906), the first commanding officer of the *Albatross*. Photo courtesy of the NOAA Central Library, Image ID theb3604.

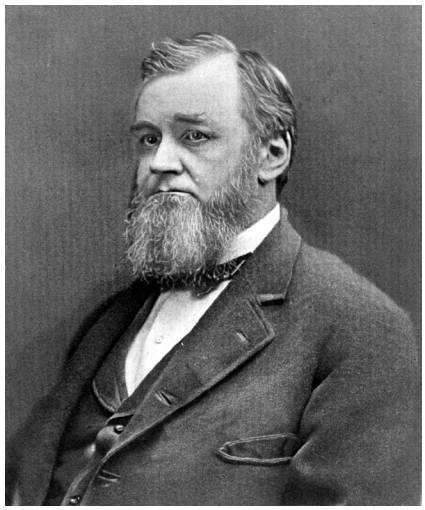


Figure 3.—Spencer Fullerton Baird (1823–1887), first Commissioner of the U.S. Commission of Fish and Fisheries. Photo courtesy of the NOAA Central Library, Image ID pers0097.

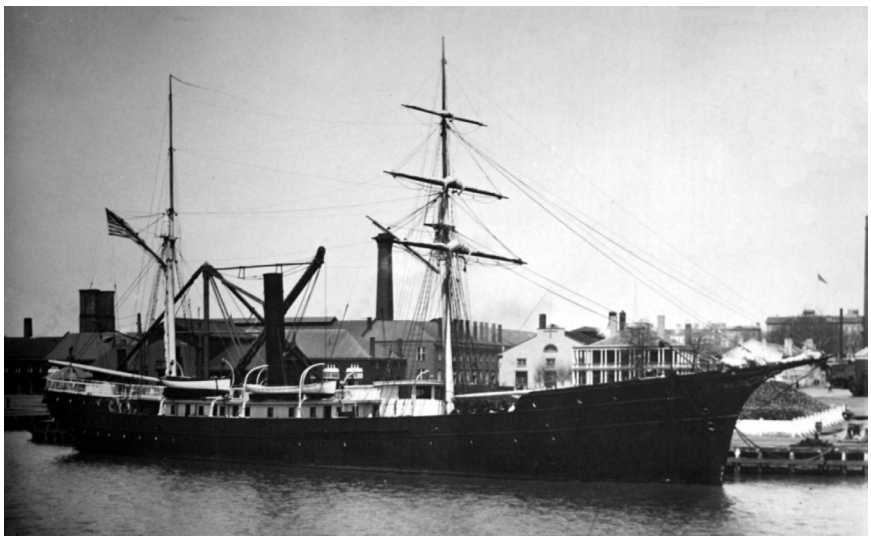
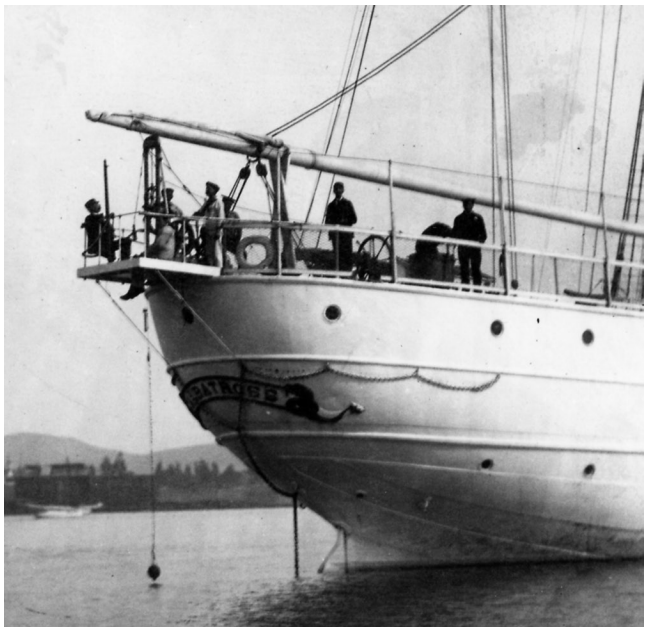
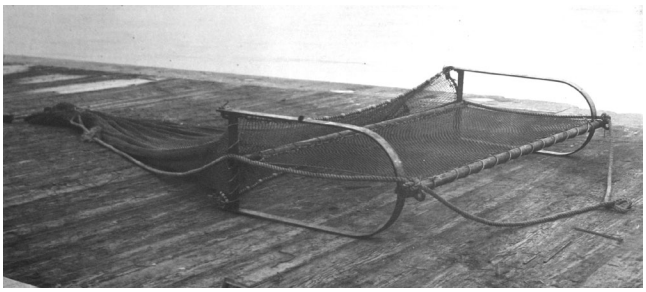


Figure 4.—The *Albatross* at the Washington Navy yard. Photo courtesy of the Natl. Archives, Image 7412.

He had commanded big ships in former times and was a consummate seaman; but apart from ability in the techniques of the profession, he had a remarkable insight and balanced judgment regarding both men and things, coupled with an iron nerve and decisiveness.

I have always felt that I owe more to his personality and unconscious example during those 3 years than to those of any other one man, and that is saying a great deal, for I have served with many, both senior and junior to me, from whom I have drawn inspiration as well as useful and practical suggestion. I also learned in that school how much more impressive and effective is unconscious example than studied example merely exemplifying precept.





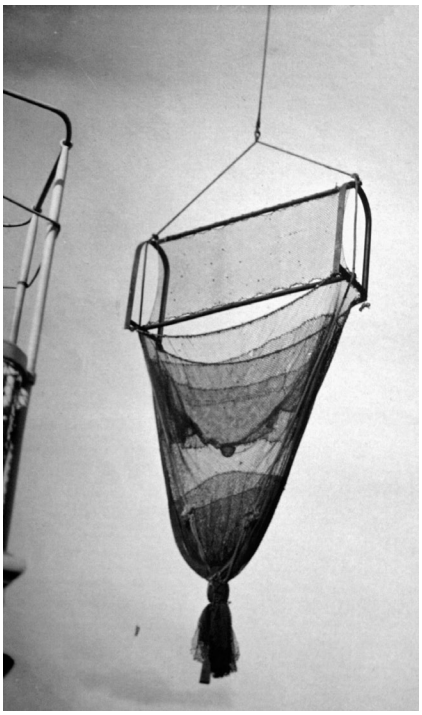


Figure 5.—Examples of gear onboard the *Albatross*. Top left: The stern, showing the Sigsbee deep sea sounding apparatus. Photo courtesy of the U.S. Army Military History Institute. Bottom left: Crew sampling with surface nets. Photo courtesy of the National Archives, Image 7184. Top and bottom right: Blake deep sea trawl. Photos courtesy of the National Archives, Image 7431 (top) and Image 7420 (bottom).

Our little ship was designed and thoroughly equipped for the exploration of the deep sea, having the latest sounding and trawling and dredging machines with all their perfected accessories (Fig. 5). The exploration consisted of more than ascertaining depths, temperatures, specific gravities, and obtaining cup specimens of the bottom; there was much that was of major interest to biologists and students of natural history, for with our trawl nets we would bring up specimens of life on the bottom at depths of 2,000 fathoms and at intermediate depths, and, with the dredges, large samples of the bottom with the fish found there. Soundings and temperatures were also obtained from a depth of 4,000 fathoms.

The operations were not solely in the interest of science. There was one subject of perhaps more immediate popular concern than the "specimens," and which was said to have had its due

weight in determining the building of the ship. In 1879 a New England deep-sea fisherman, driven somewhat off the usual Atlantic cod, *Gadus morhua*, and hake, *Urophycis* spp., fishing ground south of Nantucket, caught a lot of fish of entirely novel aspect which proved to be an exceptionally fine food fish. They would average perhaps 10–20 pounds in weight, with flesh not unlike that of the cod, and with a pleasant flavor; it was also a more economical fish than the cod, a greater proportion of the weight being edible.

One of the fish was sent to the Smithsonian Institution's National Museum where it was duly described as a new species and named *Lopholatilus chamaeleonticeps*; the common name given was tilefish (Fig. 6). Its feeding ground becoming defined, it was caught in increasing numbers each year until the spring of 1882, when incoming ships reported having passed through immense fields of dead fish while crossing the northern edge of the Gulf Stream. Investigation proved them to be tilefish exclusively, and it was estimated that about one billion, five hundred million had been killed by some environmental change, the nature of which seemed to defy conjecture.[1]

Professor Baird, the eminent Commissioner of Fish and Fisheries, had recognized the importance of developing tilefish fisheries when those fish gave promise of abundance. He was equally keen to discover if the family had been completely exterminated or if a few individuals had survived and would reproduce, and the *Albatross* was looked upon as a useful agent in determining that question and also in obtaining light upon the history of the fish. We, therefore, made careful surveys and studies of the waters that they had frequented, making temperature and specific gravity observations, and in different years we made many casts of the trawl net and of the dredge not only to bring up tilefish if possible, but to procure samples of the bottom where they would feed and to examine the contents of the stomachs of such other fish as were brought up, to determine if the food they contained was of a kind that tilefish would eat.

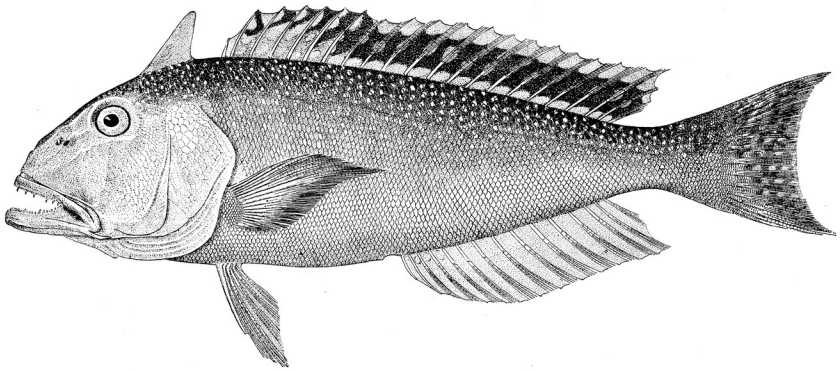


Figure 6.—The tilefish. Image courtesy of the NOAA Central Library, Image ID fig0378.

At every haul in those waters there was eager examination of the net in the hope of seeing the distinctive, large, round, yellow spots; but none were obtained. The other and smaller vessels of the Commission prosecuted the search at the same time with immense trawl lines carrying sometimes 1,000 hooks. But that search also was unavailing.

The search was unavailing only in the failure immediately to obtain an individual fish. The research, under the enlightened methods of the Commission, later [1903] known as the Bureau of Fisheries, solved the mystery of the sudden, apparent creation of the new fish, and determined the cause of its all but total extinction, and forestalled surprise at its reappearance in 1892. Its sudden appearance, in 1879, was simply its discovery; it had presumably existed there from time immemorial.

In brief, the explanation is this: the structure of the tilefish permits and requires it to live under the pressure found in deep water as a bottom fish; at the same time, examination of its habitat shows it to be a denizen of rather warm water; these two conditions coexist only on and near the edge of the continental shelf paralleling, in general, the southern coast of New England and the Jersey Coast. At depths of from 60 to 150 fathoms is found the inner edge of the warm water of the Gulf Stream, inshore of which runs the cold Arctic countercurrent; and that belt is where the tilefish was found.

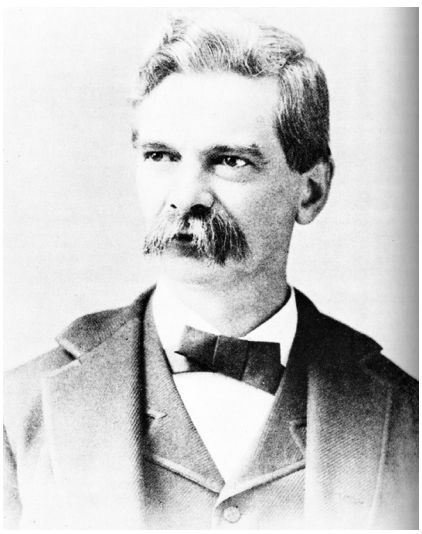


Figure 7.—Prof. A. E. Verrill (1839–1926). Photo courtesy of the NOAA Central Library, Image ID pers0099.

Its destruction was quickly explained by Professor Addison E. Verrill (Fig. 7) as due probably to a forcing outward of the cold water, as a result of a severe storm which occurred at that time, thus causing throughout that narrow zone a sudden lowering of the temperature which could not fail to be fatal to the warmwater fish. A remarkable coin-

[1]For additional information see Collins, Capt. J. W. 1882. History of the Tile-fish. *In* U.S. Comm. Fish Fish., Rep. Comm. for 1882, App. B., Sect. XI, p. 237–292.

cidence, seemingly providential in its character, is that the crustacean upon which the tilefish feed are limited to much the same physical conditions as the fish that feed upon them; there was noted a marked absence of them too in the same localities and depths where, previous to the cataclysm, they had been found in vast numbers. By 1898 the tilefish was entirely reestablished in its old habitat.

Another study considered by the Fish Commission, in which it was thought the *Albatross* could help, was that of the migrations of the shad, *Alosa sapidissima*, on the Atlantic coast (Fig. 8). Each spring that dainty fish appears, first in Florida waters and successively in freshwater rivers farther north, but, after accomplishing its task of depositing its spawn and incidentally giving joy to epicures during the summer, it disappears, and its farther movements are unknown.

We could not discover anything of value. It does not come to the southern coast in one huge school and wend its way northward; its appearance off Charleston, S.C., in the Chesapeake Bay, the Delaware River, and the Hudson River, off Boston, and in the Bay of Fundy are so close as to indicate a progress faster than it can swim; evidently different schools approach each freshwater outlet independently from the direction of the Gulf Stream. The suggestion that it returns to deep water, diving under the Gulf Stream, is met by the sole and somewhat negative argument that it has never been seen outside of that stream.

While working in that interesting zone southward of Martha's Vineyard and Nantucket, we occasionally made hauls, in the trawl nets, of one kind of fish that interested us peculiarly. That was the witch flounder (*Glyptocephalus cynoglossus*) (Fig. 9), the peculiarities of which were that it had a delicious flavor, much like the sole (Soleidae), and was possessed of a mouth too small to take a hook large enough to land it. The latter feature was prohibitive of taking them for commercial purposes; but I understand that there has been an enterprise on food to take them for the

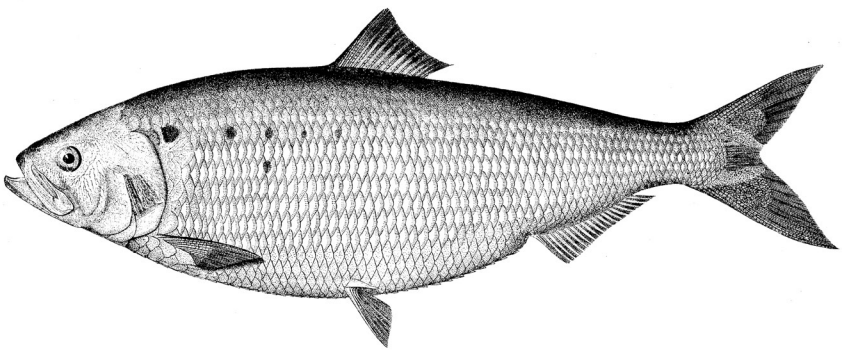


Figure 8.—The shad. Image courtesy of the NOAA Central Library, Image ID fig0480.

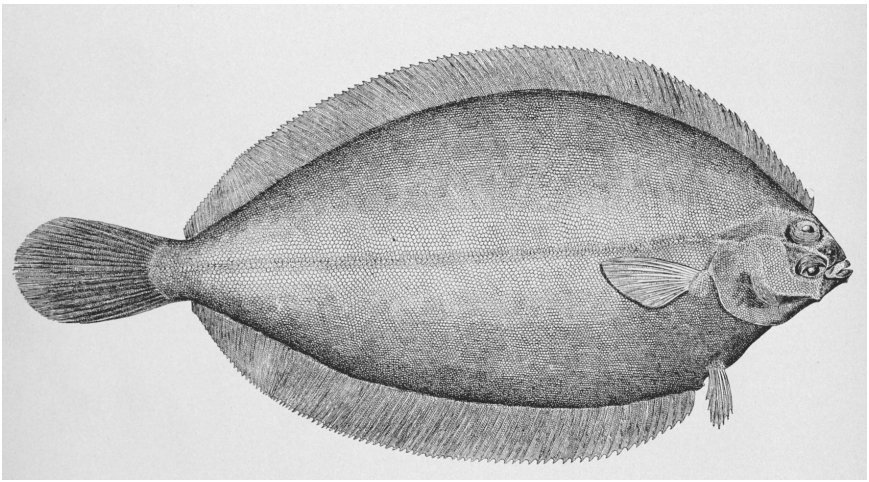


Figure 9. —The witch flounder (formerly pole flounder). Image courtesy of the NOAA Central Library, Image ID fig0313.

New York market. In that region also we often had a nice luncheon of sea scallops, *Plactopecten magellanicus*, brought up in the dredge.

The Fish Commission's headquarters for the summer was at Wood's Hole, Mass., (Fig. 10) we would be out on the ground as long as the coal lasted, and then go in there for coal and to clean up and have a day or two of relaxation. So the summertime passed most pleasantly.

Chart Improvements

Our work, however, was not limited to the region of No Man's Land. It extended from Trinidad to St. John's Newfoundland, and all about the West Indies and the Gulf of Mexico, being north in summer and south in winter. Incidentally we expunged from the charts a great number of "Reported Dangers," contributing to the ease of mind of many mariners. The depths that we found in those reported positions in the Atlantic were about 3,000 fathoms (18,000 feet) so often as to cause joking comment; in the Caribbean Sea they were less. We had an opportunity to see how seriously impressed ship captains could be with those pseudo shoals.

At Curaçao we met an American tramp steamer whose captain came on board to ask if we had located a

shoal reported in a certain latitude and longitude and which he had recently verified. He described how he had seen the gulls flying excitedly about and had gone close enough to see the surf clearly breaking over the reef but had finally sheered off and given the place a wide berth. I remembered our search well, as we had just finished it. Seeing the birds circling about, and then what seemed to be surf, we had approached cautiously with the hand lead going until right in the middle of the disturbance when we tried with the deep-sea sounder and reached bottom at something over 2,000 fathoms. It was a tide rip which probably formed in that general vicinity regularly at certain stages of the tide, and the birds were attracted by the flotsam.

We did not encounter very much bad weather; but we had enough to show us that that little vessel was a remarkable sea boat. Her weights had been so skillfully distributed that lying-to in a heavy sea she would rise and fall with scarcely any roll. In one gale we tried a method of lying-to that had been practiced by one of the White Star liners, which consisted of hoisting the forestorm staysail and stopping the engines; she lay there with the wind and sea a couple of points abaft the beam, as comfortable as an old shoe.

One winter we were were loaned to the Navy Department and, for the Hydrographic Office, sounded out the Caribbean Sea, running lines of soundings across it. While sounding, which would sometimes take an hour, valuable data were also obtained about the currents; using the engines to keep the wire vertical, so as to have "an up-and-down cast," both the strength and the direction of the current could be noted.

It was interesting; at the same time it was quite strenuous work for the Navigator. I would be in the chart house; the officer of the deck would call me when about to stop and take a sounding; while he was handling the ship for the sounding, I would take observations of the two stars (if at night) at approximately right angles to each other, work out and plot the position, give the course and distance to the next sounding, about 12 miles off, lie down and be asleep in no time and up and ready for the next one; and that would keep up as long as the coal lasted. We visited many small, out-of-the-way places, which have always held a certain fascination. Among other ports we passed a week or so at Kingston, Jamaica, and I found several old friends there who had not forgotten our tour to the West Indies aboard the U.S.S. *Canandaigua*.

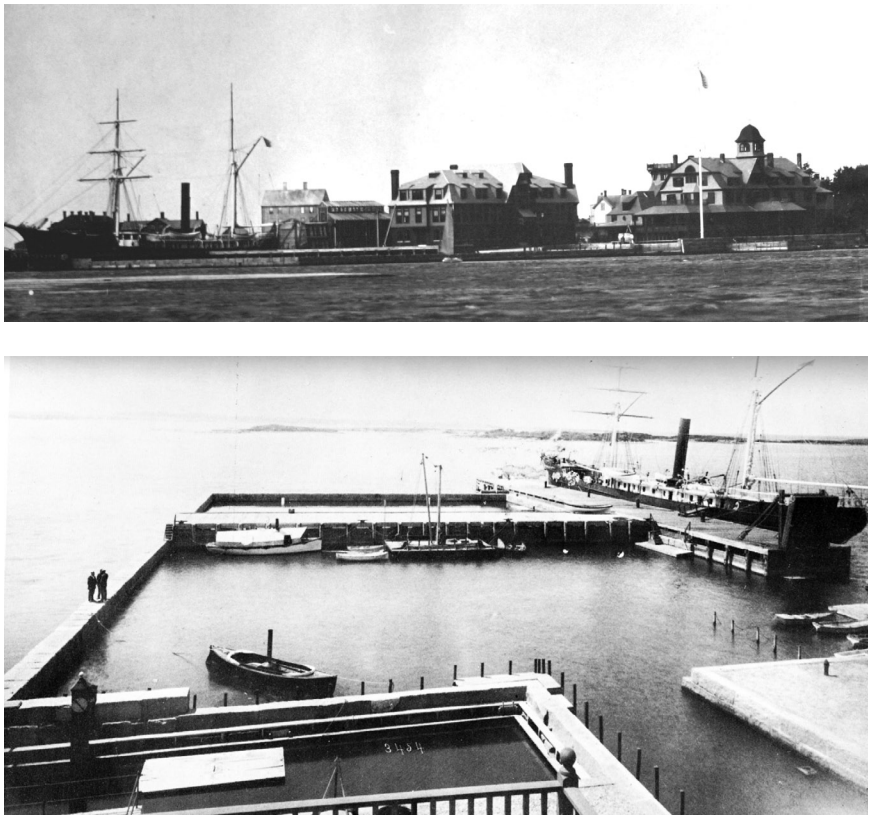


Figure 10.—Woods Hole, Mass. Top: Looking northeast with the *Albatross* at the wharf. Photo courtesy of the NOAA Central Library, Image ID fish7226. Bottom: Woods Hole wharves with the *Albatross* at right. Photo courtesy of the NMFS Northeast Fish. Sci. Center, Image hisa-015.

Gulf Research

The Gulf of Mexico was a fruitful field for research in the way of fish. We got in touch with the fishermen of those waters, and we soon learned the food value as well as the pleasant flavor of the pompanos, *Trachinotus* spp., red snappers, *Lutjanus campechanus*, and certain other species. We found also that those fishermen were becoming depressed over the outlook with regard to the snappers, as the banks where they were found were becoming "fished out"; some of the men were even talking of finding other employment for their boats.

By great good luck we were able to lend them an unexpected helping hand. While trawling and dredging in comparatively shallow water, 25–35 fathoms, not far off the west coast of Florida, we brought up some bottom fauna that the naturalists of the Commission quickly recognized as food on the snappers; so we threw over some lines, with two hooks on each, and instantly pulled them up with a fish on each hook. It did not take long to spread the news; and we found densely populated ground of a considerable extent that was a godsend to those fishermen.

While in the Gulf in the winter of 1884–85, we went up the Mississippi to New Orleans at the time of the World's

Figure 11.—Hon. William E. Chandler (1835–1917). Photo courtesy of the Library of Congress, Prints and Photographs Div., Digital ID cwpbh 03803.

Industrial Fair and, being moored at the end of the pier, were open to visitors all day, during a week, as part of the Exposition. A large number of people flocked on board, and many seemed quite interested in our apparatus.

One thing in the Exposition that attracted much attention was the incandescent electric lighting of an auditorium where concerts were given. That mode of lighting was still in its infancy, and the point of switching on suddenly a large circuit had not been reached; with the circuit closed, the dynamo had to be sped up gradually, the lights beginning with a faint glow which quickly attained to the proper brilliancy amid the applause of the audience. Electric lighting for general use had not yet been introduced in the city, and that useful display was probably made partly as an exhibit.

The officers of the *Albatross* were interested especially in the tangible results that flowed from a large part of the operations. The dredgings often produced material that was important principally as a subject for detached scientific study and which would appeal more strongly to the naturalists than to the officers, but the latter would still have the responsibility of handling the ship and apparatus to secure the results.

For me, personally, the interest in the navigation and piloting was generally paramount; at times there would be situations that quite relieved any monotony that might exist in that branch of the work. One such occasion arose in August 1884. We were at Newport, R.I., and the Secretary of the Navy, William E. Chandler (Fig. 11), came on board by invitation of the Fish Commissioner to take passage in the ship to Wood's Hole.

We proceeded to sea, taking our departure from Brenton's Reef lightship, and almost immediately ran into the dense fog. We kept on, headed for the Sow and Pigs lightship off the western entrance to Martha's Vineyard Sound, about seventeen miles from Brenton's Reef. In due course we heard her fog signal right ahead, which verified our compass course; but before long we suddenly ceased hearing it and were greatly perplexed. When we had run the distance I so informed the captain and advised against standing on without some check for the position, for the course changed there for entering the Sound.

The captain had hardly rung to stop before a tremendous blast sounded right alongside and we made out the outline of the lightship not 50 yards away. We investigated the matter afterwards, and learned that there had been no interruption of the whistle at that time. It was simply a noteworthy instance of the aberration of sound, which under certain conditions of varied temperature causes its horizontal carriage to be broken by zones of silence when the vibrations are refracted upward over large areas but may return to the surface farther away.

That, of itself, was an interesting incident; but what was uppermost in our minds at that time was the problem of entering Martha's Vineyard Sound and finding Wood's Hole in a dense fog which would soon be reinforced by the shades of dusk. Captain Tanner said that it would never do to let the Secretary of Navy think that a naval vessel could not go through a fog. Shortly afterwards he added, "I'll hold her here by the lightship. You go and work out the tides and currents, and courses and distances, and we'll stand on." So I went into the chart house and studied the probable strengths of the currents which run from 1 1/2 to 2 and a half knots an hour, eastward at one time of the tide and westward at another, and are deflected partially into or out of Buzzard's Bay.

From this study I made out a little table of courses to be run, with the number of miles and tenths to be made on each, to carry us into and up the Sound clear of Lucas Shoal and the Middle Ground on the starboard hand and of the Elizabeth Islands on the port hand; fortunately the shores of the latter are quite bold and steep-to. It was about 18 miles from there to Wood's Hole. As soon as I returned to the bridge we started ahead, having cautioned the engine room that it was important to maintain a uniform rate of speed, and having the comfortable assurance that that could be relied upon. It was very blind running; but we made the courses and distances carefully and were prepared for any eventuality. As we approached the completion of the run, I said to the captain that I thought we probably had not reached abreast of Wood's Hole, but pointed out that there would be danger in overrunning because of the foul ground off Falmouth beyond, and suggested that we stop the engines and put the helm a-starboard and we might then see or hear something.

This was done. Fortunately, it was deathly still. The officer of the deck had taken station on the forecastle, and I hailed him and asked if he could see anything. He replied: "No, sir, but I hear a cock crowing right ahead." That showed we were on the safe side of the channel, and we remained there for a while with the hand lead over; but after some minutes a light struggled through a rift in the fog close by, and remained in sight long enough for us to get a bearing and to recognize it as Tarpaulin Cove light, 4 miles from Wood's Hole. Knowing Tarpaulin Cove to have a clean bottom, we made for it and anchored, and at four the next morning, the fog having lifted, we ran into Wood's Hole; and the Secretary of the Navy was not delayed at all events.

Like all pleasant cruises, that of the *Albatross* had to come to an end some time. In January 1885, when the ship was preparing for the winter's work in southern waters, all of us who had been on board from the date of commissioning, except Captain Tanner, were detached. It had been an exceptionally pleasant cruise. A safe rule to accept is that a busy ship is a happy one; and the *Albatross* was not exception. Moreover, besides being busy, we were a congenial mess and did not get tired of each other, as might well have been the case with so much of the time passed in the isolation of the sea. We separated with cordial feelings all around.