Figure 10.--Seining in Little Harbor. Baird with net at the stern, G. B. Goode standing in the boat. Courtesy of Norman T. Allen.

were attracted to the new institution which offered an opportunity to conduct scientific research under Baird, who liberally offered his guidance and advice. At this time he actively participated in dredging, seining, or in collecting material in shallow water. Being an enthusiastic collector, he enjoyed going aboard the vessels with his students and assistants. He was frequently seen wading along the beaches of Woods Hole or seining from a small boat in Little Harbor (figs. 10 and 11). The research work conducted in the temporary laboratory buildings was well organized. The first floor was utilized by those who worked with fishes; the second floor was used by the biologists studying invertebrates. The students employed by Baird spent the early morning hours collecting materials in nearby waters. Sometimes the steam launch Cygnet would take them to the "Hole". After several half-hour tows were made the material was brought to the laboratory and examined before the investigators left for the night. Edwin Linton in his recollection of life at Woods Hole in earlier days of the Fish

Figure 11.--Small boat ready for collecting trip in Little Harbor. Baird leaning over the stern (left); G. B. Goode rowing (right). Courtesy of Norman T. Allen.

Commission (Linton, 1927) remarks of the "total absence of anything in the way of play, other than the daily swim." However, it is known that a small part of the laboratory shed was set aside as a social hall used for discussions, conversation, reading, and relaxation. It was unofficially known in the village as "Sharks Parlor." A photograph (fig. 9) taken during this period shows a carriage standing near the shed entrance. The crate on the carriage apparently contained a piano.

For his family, Baird rented the house facing Little Harbor belonging to Miss J. Fish (fig. 12), but his associates were scattered in different dwellings throughout the village. When the number of Commission employees increased, a house was rented to provide office space, living quarters, and mess facilities. It burned in 1883, and the site is now occupied by the Woods Hole Public Library.

Figure 12.--Baird's residence at Woods Hole in the 1880's before the construction of government buildings. Formerly Miss J. Fish's house facing Little Harbor, now property of Paul J. Gulesian. Courtesy of Norman T. Allen.

The purpose of scientific investigations was little understood by the public. Their questions about what the biologists were doing in the laboratory were sometimes difficult to answer. Linton reported that on one occasion A. E. Verrill, who was in charge of the laboratory, found it impossible to enlighten his interlocutors. He had an inspiration and told them that he was paid for his work. This seemed to be accepted as quite a satisfactory explanation. Of course there were many laymen of better education and higher intelligence who were able to grasp the significance of research. Since Baird's time to the present, the problem of visitors and how to satisfy their natural curiosity and at the same time avoid interference with scientific work has been of great concern to all in charge of scientific institutions at Woods Hole. Baird encouraged the people to visit his laboratory because he was convinced that in a democratic society the people are entitled to know about the activities of the institutions which are maintained by expenditures of public funds.

He also thought that research and education should not be divorced. As a practical person he believed that public support would be effective in obtaining the necessary appropriations by Congress for the construction of a good marine station.

The scientific work conducted at the station during the ensuing years was carried out along the lines already established by exploratory studies of New England waters, with greater emphasis on developing practical methods of artificial propagation of fishes and in formulating a system for collecting statistical data. Zoological research was in the hands of specialists, with Verrill as head of the section of marine invertebrates and E. B. Wilson as his outstanding assistant (fig. 13). The fact that this eminent American embryologist and cytologist was associated with the laboratory during the earliest years of its existence has remained a source of pride to many biologists who during the past 80 years were employed by the U. S. Fisheries Laboratory at Woods Hole. Studies of fish and fisheries were continued under the supervision of Goode, while Baird concentrated his efforts in obtaining land and necessary funds for the laboratory.

In the scientific circles of his time Baird was recognized as an organizer and administrator of the highest rank. He had a rare faculty of adapting himself with unusual tact to subordinate positions, as can be seen from his work for nearly 30 years when he devoted his principal efforts to the organization of the National Museum. Moreover, through his position as Assistant Secretary of the Smithsonian Institution he obtained cooperation of nearly every branch of the Government. In spite of the well-known fact that his chief, I. Henry, Secretary of the Smithsonian Institution, a physicist, had little or no fondness for zoology, the relationship between the two men remained harmonious. Upon the death of Henry in 1878, Baird succeeded him as Secretary and assumed an even greater burden of administrative work. In his discussions he displayed a remarkable ability to convince his listeners and secure their assistance. This was so well known in Congressional circles, where Baird was a frequent witness at hearings of various committees, that one influential Senator was quoted as saying: "I am willing to vote the money asked for by Prof. Baird, for he will get two dollars worth for every dollar we give him, one-half by direct purchase and one-half by gift." This reputation helped Baird in obtaining Congressional appropriation for the construction of the Fisheries Station, since the increased scope of activities of the Fish Commission required larger and more permanent accommodations than those provided by the Light-House Board.

The power of persuasion of this remarkable man was so great that he was equally successful in dealing with college professors, students, local politicians, State Fish Commissioners, Senators, Congressmen, and business officials. In his attitude to others he was never condescending, vain, or "highbrow", but always tried to explain the merits of his point in terms understandable to others.

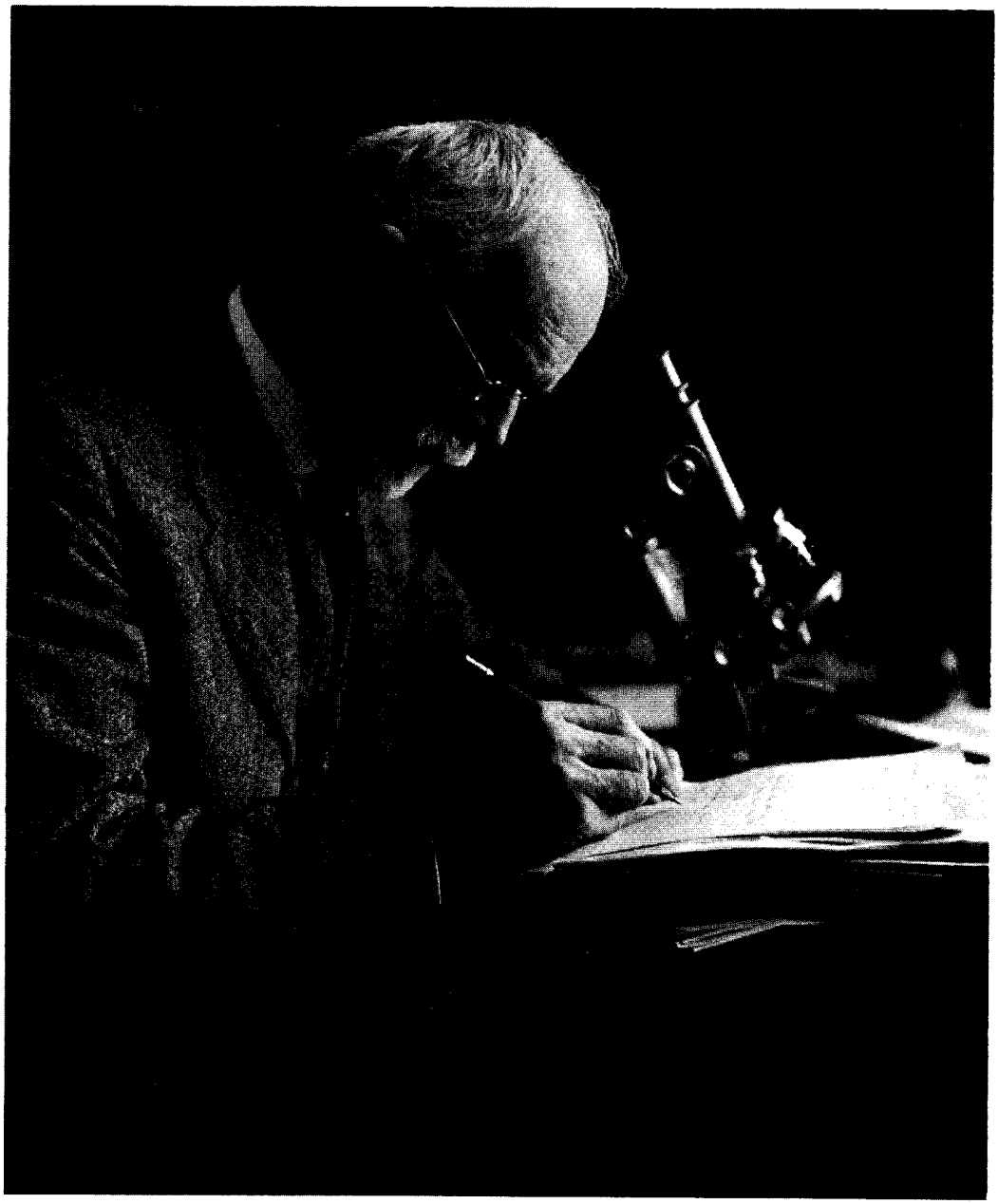

Figure 13.--E. B. Wilson of Columbia University, Professor and assistant to Verrill at Woods Hole. Photograph taken in 1924.

Since the Fish Commission became more and more involved in fish culture, it was necessary to find an inexpensive and safe method of transporting live fry to the place where they were to be released. It was not difficult for Baird to obtain full cooperation of the American railroads, who granted to the Fish Commission special low rates for travel of personnel and for delivery of large containers of water and young fishes. Later on, special railroad cars were built for this purpose. One such car was frequently seen at the railroad terminal at Woods Hole.

On July 18, 1872, the Old Colony Railroad opened its services to Woods Hole. This improvement was a great benefit to the village and of considerable convenience to the members of the Fish Commission. The first train conductor, Augustus S. Messer, remained in the service of the company for many years and became highly respected and known and loved by the residents and commuters for his friendliness and services which he was eager to extend. The administration of the railroad encouraged friendly relations with the travelling public; this policy was continued until the late 1950's when due to the financial adversity of the owners, the New York, New Haven, and Hartford Railroad, to which the Old Colony Railroad was leased in 1893, stopped passenger service between Boston and Woods' Hole. Good transportation facilities were an important factor in the growth of Woods Hole as a scientific center. At first the fastest train travelled from Boston to Woods Hole, a distance of about 80 miles, in 3 hours 10 minutes. Soon, however, the famous "Flying Dude" train was inaugurated. It made its first trip early in the spring of 1884 and cut the travel time to only 1 hour 47 minutes. The Old Colony Railroad "was the equal to any road and inferior to none." (Fisher, 1919).

At the request of Baird the Old Colony issued special tickets which facilitated transportation of the officers and employees of the Fish Commission to and from Woods Hole. An agreement with various other railroad companies authorized the Fish Commission to transport live fish in the baggage cars of passenger trains without extra charge and allowed the Commission messengers to have free access to them while en route.

During the formative years the final decision crystallized in Baird's mind regarding the location and character of the permanent laboratory of the Fish Commission. In 1882 he arrived at the conclusion that the proposed station was to be used both for research "and for propagation of the marine fishes and that the best conditions for the latter purpose were found on the south coast of New England because greater variety of fish can be found here and so far as the winter hatching was concerned, the cold being much less severe, and the other circumstances more favorable." The choice was between two locations: Newport, R. I., and Woods Hole. The citizens of Newport showed great desire to have the station and exerted their influence on Government authorities to induce the Fish Commission

to choose their town. Necessary buildings and the use of a suitable wharf were offered, and the Navy Department invited the Commission to establish its laboratory and hatchery on the northern end of Coasters Harbor Island, which was thought not to be required for the Naval Training School.

Experiments with hatching marine fish eggs during 1880 showed that the water around Newport contained an excessive amount of sediment which settled on the eggs and materially impaired their development. Furthermore, the water of this part of Narragansett Bay was polluted by the drainage of a number of large cities (Newport, Fall River, Bristol, Providence, and others). The water around Gloucester was also found unsuitable because of high turbidity caused by sediment. The conditions at Woods Hole were totally different. Baird (1884) describes them in the following words: "the water is exceptionally pure and free from sediment, and where a strong tide, rushing through the Woods Hole passage, keeps the water in a state of healthy oxygenation especially favorable for biological research of every kind and description. The entire absence of sewage, owing to the remoteness of large towns, as well as the absence of large rivers tending to reduce the salinity of the water, constituted a strong argument in its favor, and the station was finally fixed upon for the purpose in question." From a biological standpoint the decision was sound and, as further developments have shown, the laboratories at Woods Hole have been supplied with sea water of high purity. At the present time, however, due to the greater population density, increase in the size of the scientific institutions, and large numbers of pleasure boats visiting the harbor during the summer months, the water has become polluted to such an extent that the taking of shellfish from Woods Hole Harbor is no longer permitted by sanitary regulations and swimming in Great Harbor is discouraged.

Another biologically important characteristic of Woods Hole water mentioned by Baird remains unchanged. Due to the absence of large fresh-water streams, the salt concentration of Woods Hole sea water is nearly constant throughout the year and does not vary with the alternate changes of the tides. There are very few locations along the eastern coast of the United States and in the Gulf of Mexico where such a stability in the salinity of water can be found. As Baird visualized it many years ago, this constitutes a great advantage for "biological research of every kind and description."

The decision regarding the character of the marine laboratory to be established at Woods Hole was influenced by the success of the first laboratory of this type organized in 1870-74 by Anton Dohrn in Naples, Italy. The latter laboratory, which up to the present day remains a mecca for biologists working with marine material, was established as a private enterprise, financed primarily through subscriptions by different European colleges and universities for the use of laboratory facilities. Baird thought that the first permanent

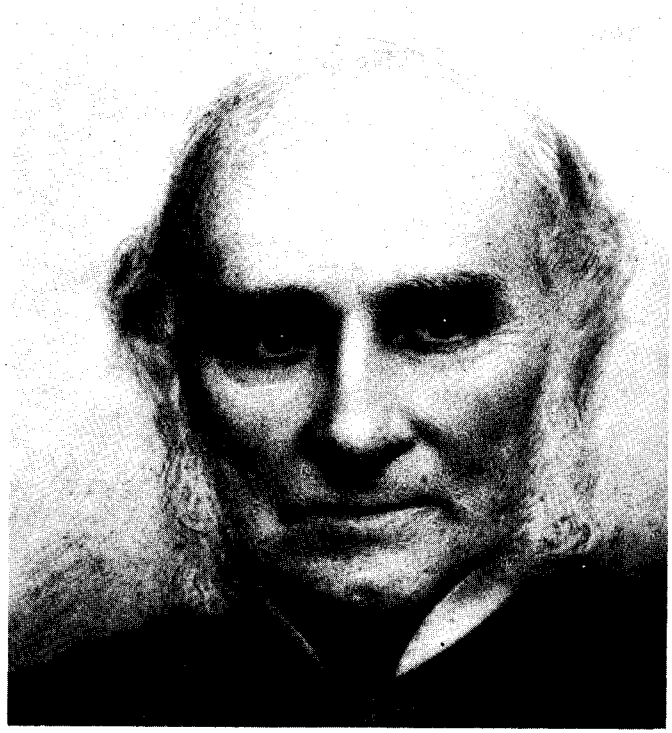

Figure 14.--Joseph S. Fay, citizen of Woods Hole who donated land for the U.S. Fisheries Station. Courtesy of the Church of the Messiah, Woods Hole.

marine laboratory in the United States should also include a school of marine biology. His plans had to be modified to conform with the policies of Congress. He realized great difficulties in obtaining Congressional appropriation for the purchase of land for the laboratory and entered into negotiations with the owners of most desirable tracts of land on the shore of Great Harbor in Woods Hole. At the same time he persuaded a number of influential and wealthy persons to give financial support to his project. Joseph S. Fay, a leading citizen of Woods Hole (fig. 14) donated three acres of land along North Street. The tract comprised a narrow strip between the shores of Great Harbor and North Street (present Bar Neck Road); it extended beyond the end of North Street in a northwesterly direction for about 425 feet along the breakwater on the northern shore of Buzzards Bay and ended at the boundary line of the Pacific Guano Company. Two other parcels of land not contingent with Fay's property, one along Water Street (known also as County Road) of 0.9 acres in area, and the larger piece of 1.5 acres along the east

shore of Great Harbor were acquired by purchase with the money contributed by various parties. The annual report of the Commissioner of Fish and Fisheries for 1883, lists the following parties who contributed the money:

Old Colony Railroad Company	$2,500
John M. Forbes	1,000
Alexander Agassiz	500
Johns Hopkins University	1,000
Princeton University	1,000
Williams College	500
Isaiah Spindel and Company	500
Mrs. Robert L. Stuart	250

The subscribed funds and the land donated by Fay were available to the Fish Commission only in the event of an appropriation by the U. S. Government for necessary improvements. The titles of the tracts of land to be conveyed to the U. S. Government were investigated by the U. S. District Attorney for Massachusetts and pronounced valid. Full jurisdiction over the land in question was ceded by the State of Massachusetts on March 30, 1882. The value of the property which the U. S. Fish Commission received as a gift from private citizens and organizations was estimated not less than $15,000.

To facilitate the transaction, the deed to Fay's land in consideration of one dollar and the funds contributed by others were turned over to Charles F. Choate and J. Malcolm Forbes as Trustees. They purchased the two smaller parcels from individual owners and, on April 20, 1883, conveyed all the acquired property, including the deed to Fay's land, to the United States Government.

To obtain the contributions, Baird offered the universities continuous use of research tables in the proposed laboratory. In a letter of September 3, 1881, to Forbes, Baird wrote as follows: ". . . . I have written to Alexander Agassiz (fig. 15) asking him if he would like to join in the enterprise and promising him a perpetual right to a table in the laboratory and the facilities of the station to be utilized by anyone he may designate. This is the system adopted at the Naples Aquarium, where establishment by this means has been successfully maintained."

Baird (1885, p. LIV) states: "The colleges in question and Mr. Agassiz made their contributions with the understanding that, as far as possible, they were each to be allowed to send one specialist to the station for the purpose of carrying on scientific research." This promise was continued to be honored by his successors. On one occasion, in May, 1895, Commissioner McDonald denied the privilege and stated "this agreement, as a matter of contract, is not authorized by law; as a matter of courtesy, it has been and will be carried out unless something intervenes to make it impossible." (Letter on file at the Bureau of Commercial

Figure 15.--Alexander Agassiz, Professor at Harvard University, conducted several oceanographic expeditions on the U. S. S. Albatross and one of the contributors to the fund to purchase land for the U.S. Fisheries Laboratory.

Fisheries Biological Laboratory at Woods Hole.) Conklin (1944) writes that "when, on one occasion, this privilege was cancelled by a Commissioner of Fisheries, Mr. Agassiz fought the order with characteristic vigor, and it was rescinded."

The grant of land belonging to Fay was made by him upon the following conditions: " . . . . and they are conveyed subject to the proviso in the deed to us that if hereafter they are not used for the purpose of the United States Commission of Fish and Fisheries nor by the United States of America, they shall revert to the said Joseph S. Fay, his heirs and assigns, and with the reservation of a perpetual right of landing for the said Fay, his heirs and assigns at any suitable landing place on the premises to be provided by the United States." The restriction remained in force until October 28, 1914, when as a result of lengthy litigations brought by the heirs of Joseph S. Fay, an agreement was reached