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MARINE BIOLOGICAL LABORATORY DEDICATION EXERCISES, JULY 3, 1925

THE new building and endowment of the Marine Biological Laboratory were formally dedicated to the service of science on Friday, July 3, at 2 P. M. in the presence of a representative gathering of biologists and guests. More than one hundred institutions of higher learning in America appointed official delegates, and others were represented unofficially by workers in Woods Hole. Cabled or written greetings were received from marine laboratories in England, Norway, Sweden, Denmark, France and Italy. The occasion is of interest to the scientific public, and more especially to biologists, because the laboratory by its organization and use is the possession of the biologists of America. It is attached to no one institution or section of the country but seeks to serve all.

The Honorable Charles R. Crane, president of the board of trustees of the laboratory, was the presiding officer. In his opening remarks he alluded to the spirit of the laboratory which he characterized as its most unique possession and of priceless worth. Mr. Crane continued:

Even though not personally associated with the vital processes of the laboratory it has been the greatest possible privilege to play the part of a simple spectator in watching the growth of the wonderful spirit of cooperation in the work of biological research.

Some years ago the then business manager of the Rockefeller Institute for Medical Research invited me to spend the evening with him and try to help him understand the nature and conditions of the spirit of the Marine Biological Laboratory. "For," said he, "we all recognize that the spirit is there. It is the rarest thing that we know of, and we have many discussions as to its nature and the conditions under which it has come forth." He then asked me if I had any theory about it. I answered that the essential thing, as it seemed to me, was that it was the purest expression of the highest form of democracy—a form of Soviet directed by the highest rather than the lowest motives.

Many years ago I was associated with a Society for Psychical Research. I followed its processes with a great deal of interest, and although its work was not of so exact and definite a nature as the work of the laboratory here, there seemed to be certain conclusions arrived at regarding the haunts and habits of spirits. One definite conclusion was that spirits feel most at home and make larger demonstrations of their presence in old buildings and among old friends. They are very con-

servative and hard to entice abroad. When I was in business I had several experiences with this process and found great difficulty in getting the spirit of old factories transferred to new and modern ones that were much better provided with material and equipment.

We all know that this spirit which we are so much concerned about has long been domesticated in the old buildings across the street and among the older biologists. Although the street is a very narrow one, the mission of inviting the spirit of the laboratory into the new and more modern buildings and giving it a longer lease of its great power is mainly up to the younger biologists now coming along. Much power to them!

Mr. Crane then introduced in succession the director of the laboratory, Professor Frank R. Lillie, Professor Edmund B. Wilson, of Columbia University, and Professor E. G. Conklin, of Princeton University, for their addresses. The formal exercises were followed by a reception, inspection of the building and in the evening by a lecture delivered by Professor W. J. V. Osterhout of Harvard University, on "Absorption and accumulation."

The afternoon addresses follow.

ADDRESS OF THE DIRECTOR, FRANK R. LILLIE

After extending greetings and welcome to the delegates, guests, workers and members of the laboratory the director interpreted the occasion to the meeting as follows:

We are gathered to-day to dedicate this beautiful building and its endowment to the advancement of science and the good of humanity and to rededicate ourselves to these causes. The scientist devotes his life to increase of learning in the belief "that there is no alleviation for the ills of mankind but in the resolute facing of the world as it is," and with firm faith that by patient seeking the truth concerning man's relations to his world may be found. Through generation after generation of effort, always hard and often ill-rewarded, there has been produced a great body of scientific fact and of hypothesis useful for criticism of creed and custom, for inspiration, for human needs. We are inheritors of this sacred legacy; it is our trust to preserve and develop it.

The science of biology has grown mightily since Darwin's time and has contributed greatly to human culture and human welfare. Its greatest possibilities for the good of mankind, however, still lie in the future, and their realization depends on the progress of discovery, which in its turn rests on the labors of scholars, on the tasks of research.

The farther science advances, the greater the requirements for fruitful investigation. The history of this laboratory illustrates the rate of this progress in the last thirty-seven years. The wooden buildings corresponded well with the needs of investigators in the early days of the laboratory. The Crane building, constructed twelve years ago, was a measure of the needs of that time, and we hope that this new structure and the reconstruction undertaken in the Crane building measure up to present needs, and that they are sufficiently flexible in their provisions to serve the uses of biological science for many years to come.

This is a *research* institution; all its personnel and facilities are provided to aid in the tasks of the investigators. There are officers to conduct the business of the institution, men to man the boats and nets and other apparatus with which the produce of the sea is collected; others to design and keep in order the elaborate apparatus and equipment and to assign their use; yet others to ensure a continuous supply of sea-water to rooms and aquaria, to keep our complicated electrical system in order and attend to other mechanical needs; a department to house and feed the workers; a department to care for buildings and grounds; a library personnel and a library that we aim to make the best possible source of reference in its field. All these persons and facilities are at the service of the investigator.

Believing that it is no less our function to produce investigators than to promote the actual work of investigation, the laboratory also offers instruction to a limited group carefully selected from the best students of biology of American universities. These are the young people whose presence enlivens our proceedings for six weeks in the summer. There are also the candidates for professional status in biology, about seventy in number, graduate students beginning investigation or in early stages of a career of investigation, coming from the principal centers of biological investigation in our universities. These fortunate students receive the benefits of the standards and ideals of research of many institutions during the weeks or months of their work at Woods Hole, an advantage to be procured in no other way.

The laboratory is a *cooperative* organization. Its ownership rests in a corporation of some 350 members, the great majority of whom are professional biologists. Its affairs are administered by a board of trustees of thirty-five members elected by the corporation, composed, with but *two most valuable exceptions*, of university professors in various fields of biology of some twenty-five institutions; detailed administration is in the hands of an executive committee of five chosen by the board from its own membership. As substantially all the members of the Marine Biological Laboratory are representatives in one capacity or another of American universities, col-

leges and research organizations, so in practice the laboratory belongs to these institutions; here they have extra-territorial privileges and abiding place; and the contributions that they make to the support of the laboratory in return for the various uses of their biological departments constitute their recognition of this relationship. In 1924 seventy-two American institutions of learning thus contributed. This relationship is usually maintained through the university departments concerned and is continued at the pleasure of such departments; but in the case of the larger institutions it is a constant and continuing one. The smaller institutions enjoy here the same advantages as larger ones, and thus the handicaps of their necessarily less adequate provisions for research at home are to some extent equalized.

The laboratory is *national* in its scope. There is no sectionalism in its organization or in its life. It was established in New England by New Englanders and is strongly supported by the institutions of this part of the country; but it is no less strongly supported by the institutions of other eastern states; and indeed in proportion to cultural and geographical conditions by more remote states of the Union. Twenty-seven of the seventy-two cooperating institutions of 1924 lie west of the Alleghenies. Twenty-eight states of the Union were represented by the workers last year, and the following countries—Brazil, Canada, China, England, Holland, Hungary, Japan, Poland, Sweden. The laboratory has indeed numerous other international connections and extends its welcome to all qualified investigators of whatever nation.

The laboratory also represents all fields of biology; it is not controlled by any one biological sect, neither by Darwinians or Lamarckians, by vitalists or mechanists, by zoologists or botanists, by morphologists or physiologists. It aims to provide suitable facilities for all kinds of biological work. It thus has no program of its own for the development of one or even several directions of biological investigation, save in the broadest sense. As it is catholic in its membership, so also is it catholic in its interests. This policy keeps it abreast of scientific interests; it ensures the use of means and equipment for the most promising problems of the time; it provides for a constant renewal of strength.

As part of this policy the laboratory avoids salaried appointments on its scientific staff, excepting those concerned in the courses of instruction, who receive small emoluments. The laboratory thus does not enter into competition with universities for personnel. Voluntary leadership in the various departments of biology within the institution has proved most devoted, sufficiently continuous for all matters of scientific policy and also flexible enough to avoid unprofitable specialization of the uses and of the means of the laboratory.

The Marine Biological Laboratory was given its name and location on the seashore, because at the time of its foundation the value of the life of the ocean as material for the study of biological problems was beginning to be fully recognized after some fifteen years of fruitful activity on the part of the Naples Zoological Station. The expectations of the advantages to be derived from the study of marine material have, I venture to say, been exceeded in the results. The life of the ocean has proved our greatest asset in the contributions to the advancement of biological science made here. But this asset places no limitations on the use of the other biological materials, and in addition we draw on whatever sources of supply that inland institutions use.

The Marine Biological Laboratory traces its origin from the establishment of the "Anderson School of Natural History" on the island of Penikese by Louis Agassiz in 1873; Agassiz died in the winter of that year, and the school was continued the following summer under the direction of his son, Alexander Agassiz, but was then abandoned. From 1880 to 1886 a seaside laboratory was maintained at Annisquam, Massachusetts, under the direction of Alpheus Hyatt, a student of Agassiz, by the Woman's Education Association of Boston in cooperation with the Boston Society of Natural History. The present organization was established and incorporated in 1888 as the result of an effort made by the group interested in the Annisquam Laboratory to secure an independent and broader foundation. A site was selected at Woods Hole and a plain wooden building, now the south wing of our large wooden laboratory, was erected here and opened for work on July 17, 1888.

The first director was Professor Charles Otis Whitman; under his inspiring leadership the laboratory grew rapidly, the entire series of wooden buildings was erected and the principles of organization and administration outlined above was developed. With grateful acknowledgment to the far-sighted citizens of Boston who founded the laboratory I think it may be said that it was to Professor Whitman more than to any other single person that the laboratory owes its form of organization, its scientific ideals and its national character. Professor Whitman was successful in securing and maintaining the cooperation of scientific men of the first rank in building up this enterprise. The development of the laboratory rests upon the high reputation and earnest devotion of many of the leading biologists of America working together for a common purpose.

In 1913 Mr. C. R. Crane, president of the board

of trustees, presented the laboratory with the beautiful building annexed to this, which was imperatively needed for the growth of the institution, and for the accommodation of the more refined methods of investigation then developing. This was in a way our first footing on a permanent basis; the wooden buildings had always been recognized as temporary accommodations.

The war intervened to slow down development, but before the close of the war it was apparent that the existing buildings and equipment were inadequate to measure up to the needs and to the responsibility for the development of biological research with which we were confronted. Efforts began immediately after to secure recognition of America's responsibility for furnishing the best possible marine observatory and to secure the funds necessary for building, equipment and endowment. In this endeavor we received invaluable aid from the National Research Council, which lent our organization its unqualified endorsement and moral support, so sadly needed by a society of impractical professors. It required five years to secure the necessary pledges and now at the end of the sixth year of effort we enter upon the enjoyment of the fulfilled expectation.

These years were, I believe, well spent in the prolonged and painstaking studies led by the assistant director, Dr. Gilman A. Drew, and the architect, Mr. Charles Coolidge, to ensure the best kind of building for the most advanced types of biological research. I doubt if so large a body of experts as those called in consultation here ever combined their advice in the construction and equipment of a laboratory building. The defects of this building, whatever they may be, are certainly not due to any lack of foresight. There may possibly have been confusion of counsel, though the spirit of combined action in a common cause reduced even this to a minimum.

The present occasion is clouded by the absence of Dr. Drew, owing to continued ill-health, towards which his unremitting labors on this building were certainly a contributing cause.

The amount raised for the purposes described was $1,648,000. The donors were The Friendship Fund (Mr. C. R. Crane, president), Mr. John D. Rockefeller, Jr., The Rockefeller Foundation and the Carnegie Corporation. Of this amount $900,000 has been invested in securities, and placed in the hands of a trust company as a permanent endowment fund. The balance, amounting to $748,000, has been expended on the building and equipment or set to credit of the latter. The total resources of the laboratory now amount to considerably over $2,000,000.

The immediate purposes of this building are explained by the progress of the biologcial sciences in the last twenty-five years. During the nineteenth century a large part of the descriptive functions of biological investigation was accomplished, whether in the identification, naming and description of the various species of animals and plants or in the comprehensive study of their gross or microscopical anatomical structure or of their stages of development or of their distribution in space and time. Accompanying these descriptive disciplines, theoretical interpretations, as in the evolution theory and the cell-theory as instances, were developed. In the latter part of the nineteenth century, also, in proportion as descriptive disciplines laid bare the problems, experimental methods of analysis of these problems arose. The *raison d'être* of this tendency is not difficult to see: in the first place the experimental method had established itself in physics and in chemistry and in certain of the medical sciences as the only method for a progressive attack on the problems of these sciences, and had justified itself by the control thus acquired over natural processes; and in the second place it was becoming apparent that all vital processes were susceptible of analysis into chemical and physical processes, to an extent at least that justified the expectation of far-reaching control.

Fundamental biological analysis requires experiment and also the facilities of chemical and physical laboratories, joined to the equipment of a biological laboratory. Such experiments were begun by Jacques Loeb, Albert Mathews and others in our old wooden buildings, but the inadequacy of such structures for thorough exploitation of the problems soon became manifest. Hence the first of our permanent buildings was erected in 1913. Since then there has been a rapidly increasing rate of development of the experimental method in biology, and it has long been apparent that in order to continue to serve the interests of biological science in America a building of the type of this new one was required.

We have often been asked, seeing that our work lies so largely in the summer months, why we could not be satisfied with additional wooden buildings. We are not convinced that the work will always continue to be so exclusively confined to summer months; there is already a pronounced tendency for it to spread into the spring and into the autumn. However, a conclusive reason is that operations of extreme delicacy, as in measurements of minutest electrical fluctuations or thousandths of a degree of temperature, are involved in certain experimental work, and that the greatest possible degree of stability of the building is required for such work, and other work also. Hence such buildings must be constructed solidly of steel and cement.

You will find in this building arrangements for

the study of X-ray and other radiations on protoplasm, arrangements for study of minutest electrical and thermal variations, arrangements in dark rooms for studying all phases of the effects of light upon protoplasm, rooms for studying the chemistry of protoplasm and its constituent parts, photographic, cold storage and constant temperature rooms, laboratories for more strictly biological work, large supply rooms and a machine shop for manufacture of apparatus. To each work-room fresh water, sea-water, electrical current, both direct and indirect, capable of regulation as to voltage, and gas are supplied. Across the street is a small but very efficient pumping plant.

In constructing this building we also took account of the rapidly growing needs of our library and have provided stack rooms for 100,000 volumes, a commodious reading room and librarians', cataloguing and work rooms. Finally, this beautiful auditorium will provide for our public lectures and meetings, which have hitherto been so poorly housed.

The laboratory is a research, teaching, cooperative, national and international institution covering all fields of biology, with roots of gradual growth firmly planted in American soil. This is claiming much, but we dare not adventure less. May all our friends aid us in the effort to live up to these declared ideals!

EXTRACTS FROM REMARKS BY PROFESSOR EDMUND B. WILSON

Professor Wilson, who referred to himself as the "oldest inhabitant," recalled memories of the U. S. Fish Commission and the "M. B. L." extending back over a period of nearly fifty years. He emphasized the astonishing contrast between the primitive conditions of the early years at Woods Hole and the splendid development that ensued. Recalling some of the earlier leaders who shaped the destinies of biological work at Woods Hole, Professor Wilson continued:

Among the memories of those earlier days there are two dominating figures, which in this company I do not need to name—Spencer F. Baird and Charles O. Whitman; Baird, the discoverer of biological Woods Hole, the man who first clearly saw the possibilities of the place for a great center of biological work, and the founder of the U. S. Fish Commission; Whitman, the creator and first director of the M. B. L. It was my good fortune to know both of them well, and I esteem it an especial privilege to pay my tribute of homage to them to-day. The two men were widely different, in some respects diametrical opposites. Baird was a typical American, and he looked the part. I have heard it said that he seemed like a fine old Yankee farmer—which I take to have been a compliment both to the farmer and to Baird. He was a man of forceful but winning personality. I seem to see him at this moment strolling along the road out there—his burly figure; his rather slow, ponderous and rolling gait; his bright and expressive eye. I recall his friendly manner, and seem to hear his characteristic voice—rather high pitched, cultivated and pleasant to the ear. He was an eminent naturalist of the old school, trained as a field collector and systematist, distinguished as an ornithologist, mammalogist and ichthyologist. I am afraid he had not overmuch sympathy with what was then the new movement in biology, and I remember hearing him give emphatic expression to this attitude—very likely as a friendly reproof to an excess of zeal on the part of some youngster. But Baird was a great man, able, forward-looking and large-minded. He was not only a scientific leader but also an excellent business man and executive; and the respect and confidence inspired by his personality and character were important factors in securing from Congress the funds needed to carry on the long-continued and valuable work of the U. S. Fish Commission. All honor be his!

Whitman was in some respects of very different stamp, far less a man of the world, but no less than Baird a leader of men. His manner was quiet and rather reserved; but, like Baird, he possessed an indefinable personal charm and magnetism that was an important factor in his leadership. He too was a good naturalist and a large part of his time in later life was passed in the study of animal behavior. But Whitman was essentially a product of European laboratories, as Baird was a product of American studies in natural history. He was what we irreverently used to call a "section-cutter"—an excellent technician, a close student of the finest details of development and cell-structure. Together with Charles S. Minot and Edward L. Mark, he was among the first to introduce into this country the refinements of laboratory technique in zoological work. Whatever he undertook was carried out with deliberate and exact care; and there was a certain artistic quality about his work that used to remind me of that remarkable man, Theodor Boveri. This quality set him apart from most of the men of his time and marked a new standard of work for all of us who came into close touch with him. He was a hard fighter, unsparing, almost bitter, in his criticism of what he considered careless or superficial work, but quick to appreciate and encourage merit on the part of younger investigators. In these respects he often made me think of my dear old friend, Anton Dohrn, one of the great leaders of zoology in his time, and the creator of the Naples Zoological Station. If the truth must be told,

Whitman was not exactly what might be called an ideal business man—in fact, his methods (or lack of them) would have filled Baird with holy horror. He used to argue half seriously that a financial deficit was an excellent thing for any laboratory; and in his time the M. B. L., as a matter of fact, always had one. Why waste money, Whitman would say, on fire insurance for the old wooden buildings? Long experience has proved that they are absolutely fireproof—you couldn't set fire to them if you tried—not if you soaked them in turpentine and benzine and put a Bunsen burner under them!

Different as Baird and Whitman were, they possessed certain great and shining virtues in common. Both were men of vision, of imagination, of high ideals and ambitions, steadfast in purpose and forceful in character. Perhaps it may surprise some of you to learn that long before the M. B. L. was born, or thought of, Baird, like Whitman, ardently cherished the ideal of making Woods Hole a great center of cooperative work in biology in which colleges, universities and research institutions should come together in friendly association and rivalry. In Baird's time this was but a romantic dream—one that he did not live to see realized, that perhaps never could have been realized under purely governmental support and administration. Whitman made it a living reality; Lillie, ably seconded by Drew, has brought it to the full fruition, which to-day we celebrate. I would like to think that the disembodied spirits of Baird and Whitman might on this happy occasion be floating around somewhere up there to-day in the blue empyrean and watching our doings here. Could they do so I know they would shake hands (or wings) and go their way rejoicing.

Perhaps in the course of my less serious remarks I may here and there have spoken too lightly of the remarkable modern development of the M. B. L. But if, in contrasting the past with the present era of high civilization and efficiency, I have in some degree fallen into the superior and cantankerous tone that is a common vice among the antiquated survivors of earlier and simpler days, let me assure you that it was in order to end with a serious moral. It is very short. It may be summed up by reminding you that the really important thing in the life of an institution, as in that of an individual, is not the gun but the man behind it. This is, of course, a platitude; but you must permit the oldest inhabitant to remark that great gifts and splendid new opportunities impose great responsibilities and duties. Our generous friends have given to us with overflowing hands, all and more than all, that we have asked for. They have given us more than land, buildings, equipment and endowment. They have given moral support, they have put their faith in us. That faith, I believe, has thus far been justified by our past and our present. We must justify it by our future. We shall fail if in any degree we relax our efforts, if we lie back on our oars and stop to admire the scenery. We must pull harder than ever. And above all things let us hold fast to the spirit of the M. B. L. One of our shining virtues under the leadership of Whitman and of Lillie has been a singular freedom from the vices of self-advertising, over-organization, administrative red tape, machine-made research. For heaven's sake let us strive to keep our future free from these detestable practices. And here's wishing the M. B. L. a steady forward march in achievement and in glory; and may we not forget those who came before us.

ADDRESS OF PROFESSOR EDWIN G. CONKLIN

The address of Professor Edwin G. Conklin, of Princeton University, was entitled "The changing face of nature and of man at Woods Hole," and was illustrated by numerous lantern slides. He briefly recounted the history of the discovery and naming of "Cape Cod," "Martha's Vineyard" and the "Elizabeth Islands" by Gosnold in 1602 and his planting of the first English settlement in America on the site of the present Falmouth in that year. This settlement was soon abandoned and the present town of Falmouth, including Woods Hole, was first permanently settled in 1660. In 1606 Champlain sailed along this coast as far as the present Woods Hole and, mistaking the "Hole" or channel between Buzzards Bay and Vineyard Sound for a river, gave to it his own name. The historian, E. G. Bourne, has suggested that it should now be called "Champlain Strait," but the Yankee preference for plain and homely names still prevails.

There were many stirring events in the vicinity of Woods Hole during the American Revolution and the War of 1812. British war vessels were often in Vineyard Sound and especially at Tarpaulin Cove. On April 1, 1779, a British fleet of ten sails visited Woods Hole, and marines from these ships killed cattle and attempted to burn houses, but were driven off. They returned April 3 and cannonaded Falmouth but were prevented from landing by four companies of militia of about two hundred men. At one time a schooner laden with corn from Connecticut was seized by a British privateer as she was entering the sound and taken to Tarpaulin Cove. Colonel Dimmick, who commanded the militia of the town, was notified of this and with twenty men in three whale boats he pulled to the cove, seized the schooner and

sailed away with her, finally bringing her into the harbor at Woods Hole. In 1812 the British Frigate *Nimrod* bombarded Falmouth and destroyed many buildings and later landed marines at Little Harbor, Woods Hole. Some of these events in the early history of Woods Hole were illustrated by lantern slides from sketches, paintings and old photographs made by Mr. Frank L. Gifford. Some of the most interesting of these pictures were of the whaling industry at Woods Hole, which lasted from about 1815 to 1860. During this period Woods Hole was an important center of this industry and its wharves and buildings were located on what is now property of the Marine Biological Laboratory. The old Stone Building, now occupied by the supply department, was built in 1829 and was known as the "candle factory"; here oil was stored and spermaceti candles made, and evidences of this former use are still seen in the old flues, hearths and cranes in the building. Adjoining the candle factory was a large frame building known as the "bake shop," where all the bread and hardtack was baked for the use of crews of whale ships; this building is now the laboratory's carpenter shop. In front of these buildings was the Bar Neck Wharf, at which whale ships discharged their cargoes; it is now the property of the laboratory and is occupied in part by the Penzance Garage.

Although originally covered by forests the region around Woods Hole was practically treeless in 1850. About that time Mr. Joseph S. Fay began to buy barren, rocky farms in this vicinity and to reforest them, importing and planting many trees on his estate. The "Fay Woods," with their woodroads, which were open to the public, were the joy of early workers at the laboratory, but they are now sadly depleted by the gypsy moth and the inroads of civilization.

The history of Woods Hole as a biological center began in 1871, when Spencer F. Baird, secretary of the Smithsonian Institution, was made the first commissioner of the United States Fish Commission, which had just been established by Act of Congress. Baird opened a laboratory in an old shed on the Lighthouse Board's wharf in Little Harbor in the summer of 1871. During the three following summers he conducted work at Eastport and Portland, Maine, and at Noank, Connecticut, and in 1875 he again came back to Woods Hole, where a laboratory was fitted up on the Government Wharf in Little Harbor, of which Baird said in his "Report" (1876): "With the exception of the building erected by Professor Agassiz at Penikese it is the first formal and permanent sea coast laboratory, constructed and put into operation especially for the purpose, in the United States."

From 1877 to 1880 the work of the Fish Commission was carried on at Salem and Halifax, Gloucester, Provincetown, Newport, and after having tried out these places Baird decided that Woods Hole was the best place for the permanent laboratory of the fish commission. In his "Report" for 1882 he wrote: "After careful consideration of the subject, the choice was found to lie between two stations, Woods Hole and Newport." The former was finally chosen because the sea water there was exceptionally pure, free from sediment or contamination with sewage, while there were strong tide currents and no large rivers to reduce the salinity of the water.

Accordingly the Fish Commission Laboratory was permanently established at Woods Hole in 1881, the land belonging to the present Fisheries Bureau was acquired, and in the following year the present laboratory, wharf and pool were built. In 1886 the "residence" for workers at the laboratory was built, and there Baird died in the summer of that year.

While Woods Hole was thus being selected as the permanent station of the United States Fish Commission another laboratory, short-lived but of great influence, was established by Louis Agassiz on Penikese, one of the Elizabeth Islands, only fifteen miles distant from Woods Hole. This small island about two thirds of a mile long and half as broad, was given to Professor Agassiz by Mr. Anderson for the purpose of establishing there a summer school of natural history, and a large laboratory and dormitory building was erected and the school opened in the summer of 1873. This was, according to Professor Whitman, "the first seaside school of natural history." Louis Agassiz died in December, 1873, and the school was continued in the following summer under the direction of his son, Alexander Agassiz, and was then abandoned, owing chiefly to its inaccessibility.

The influence of the Penikese School was out of all proportion to its length of life; during its brief existence many subsequent leaders in American biology studied or taught there, among these, W. K. Brooks, Cornelia Clapp, Alpheus Hyatt, David Starr Jordan, Charles Sedgwick Minot, Edward S. Morse, C. O. Whitman, Burt G. Wilder and many others. In his address at the opening of the Marine Biological Laboratory in 1888 Professor Whitman said:

> At the close of the second and last session at Penikese in 1874 Alexander Agassiz appealed to the colleges and all interested Boards of Education for support; but all in vain, for not a single favorable reply was received, and so his intention to remove the laboratory to Woods Hole was never carried out. Thus that great and memorable undertaking, after absorbing money enough to build and equip a most magnificent laboratory, was

abandoned for lack of interest on the part of educational institutions rather than of means.

The Marine Biological Laboratory is the immediate outgrowth of a seaside laboratory conducted at Annisquam, Massachusetts, from 1880 to 1886 by the Woman's Education Association of Boston in cooperation with the Boston Society of Natural History. The Annisquam Laboratory was organized to serve the same ends as the Penikese School. Its promoter and director was Alpheus Hyatt, curator of the Boston Society of Natural History, student of Agassiz and inheritor of the Penikese ideal. At first this laboratory was located in half of his own house and later in an old barn remodeled for the purpose. At the end of the sixth session letters were sent out to persons and institutions that might be interested inviting cooperation in establishing a larger and more permanent laboratory. A preliminary meeting was held at the Boston Society of Natural History in March, 1887, when it was decided to raise $15,000 to found a new laboratory. In the course of the next year about $10,000 was raised and on March 20, 1888, the Marine Biological Laboratory was incorporated. The first annual report of the laboratory says that "differences of opinion as to location, policy, etc., were difficult to reconcile," but Woods Hole was finally chosen because Baird had selected it for the Fish Commission Station after ten years of experience up and down the coast from Eastport, Maine, to Crisfield, Maryland. A small plot of land, seventy-eight by one hundred and twenty feet, near the Fisheries Station, was bought for about $1,300 and a two-story, frame building twenty-eight by sixty-three feet was erected on it, which with its water supply cost about $4,000. In the founding of the Marine Biological Laboratory Alpheus Hyatt was the leading spirit, and for two years he served as president of the trustees. Associated with him as founders of the laboratory we must include three other Penikesians, C. S. Minot, W. K. Brooks and C. O. Whitman. Their names, together with that of Agassiz, are now commemorated in the names of the roads on the Gansett property of the laboratory.

The next step was to find a suitable director. Professor Clarke, of Williams College, was offered the post but felt obliged to decline because of ill-health and because he felt there was small chance of success. Professor Whitman, of Clark University, was then offered the directorship and accepted; and it is no disparagement of what others have done to say that the character of this laboratory is due to Whitman more than to any other person. Whitman was in a peculiar sense a product of Penikese. A graduate of Bowdoin College and a teacher of Latin in the English High School, Boston, he got his first inspiration for biological work at Penikese. In his address at the opening of this laboratory July 17, 1888, he said: "The Marine Biological Laboratory traces its historic roots to Penikese. . . . Our minds naturally revert to the old Penikese School." He often referred to Penikese, and its ideals were ever present in his mind and were to a large extent embodied in this laboratory. As our parents live in us, so Penikese lives in the Marine Biological Laboratory.

In his inaugural address at the opening of this laboratory Professor Whitman clearly indicated what these ideals were. "There is great need," he said, "for a laboratory which shall represent (1) the whole of biology, (2) both teaching and research, (3) the widest possible cooperation of educational and scientific institutions. Such a laboratory should not be merely a collecting station, nor a summer school, nor a scientific workshop, nor a congress of biologists, but all these; an institution combining in itself the functions and features of the best biological institutes in the world, having the cooperation of the biologists of this country, and thus forming a national center of research in every department of biology." Again in his first annual report he said:

> The new laboratory at Woods Hole is nothing more and I trust nothing less than a first step toward the establishment of an ideal biological station, organized on a basis broad enough to represent all important features of the several types of laboratories hitherto known in Europe and America. An undertaking of such magnitude can not be a matter of local interest merely and if it be pushed with energy and wisdom, it can not fail to receive the support of the universities, colleges and schools of the country.

There was little in the early conditions of the laboratory to justify such high hopes. It began with no assured cooperation, no constituency, a bare building, no library, no private rooms for investigators, only a rowboat for collecting and with only two instructors, seven investigators and eight students. What it has grown to you see for yourselves. It is probably no exaggeration to say that this laboratory is the very best as it is certainly the largest marine biological laboratory in the world.

The growth of the laboratory in scientific cooperation was rapid, but for more than twenty years its financial support was uncertain and precarious, and its buildings and facilities were inadequate to its needs. In 1890 an L was added to the original building to serve as a lecture room on the first floor and a library on the second at a cost of about $1,000; also the "Gifford Homestead" with about one half acre of land adjoining the laboratory was bought for

$3,500, most of this being given by Mr. Joseph S. Fay; the homestead was used as a "mess hall." In 1892, in order to accommodate the increasing number of investigators, a north wing, equal in size to the original building, was added at a cost of about $4,000. In 1894 a large mess hall was constructed adjoining the homestead, costing about $3,500, and the botanical laboratory was built at a cost of $3,000. In 1896 another building was erected, at a cost of $3,400, to provide a larger lecture hall and additional rooms for investigators.

This rather rapid expansion had taxed severely the financial resources of the trustees, but Whitman insisted on going ahead, even though no funds were in sight. He ordered the building of the new lecture hall in spite of the fact that the trustees refused to authorize it, and he himself afterwards secured the money to pay for it. This continued pressure for expansion on his part led to friction with the trustees and ultimately to the reorganization of 1897, by which the corporation and board of trustees were enlarged and the annual meetings of those bodies transferred from Boston in November to Woods Hole in August.

At that time the total assets of the laboratory were estimated to be about $35,000. Between 1901 and 1905, friends of the laboratory, chief among whom were Mr. Charles R. Crane, Mrs. Frank R. Lillie and Mr. L. L. Nunn, gave for various objects about $25,000, and in 1903 the land on which the Old Stone Building or "candle factory" stands was bought for about $7,000. The following year the laboratory acquired its first water frontage on the harbor at a cost of about $7,000, which was given by Dr. John C. Phillips.

In 1902 the Carnegie Institution of Washington made a grant of $4,000 to the laboratory and during the three following years gave $10,000 each year. This very generous gift and the prospect of a laboratory free from debt and amply supported led the majority of the trustees to favor turning the laboratory over to the Carnegie Institution, but Whitman strenuously opposed this and insisted that the laboratory should remain an independent organization and his opposition led to the withdrawal of that proposal. At that time most of the trustees felt that this was a grave mistake, for the income of the laboratory was several thousand dollars short of meeting current expenses and there was no assured source of funds to meet this deficit or for much needed expansion. But all friends of the laboratory have now come to see the wisdom of Whitman's insistence on preserving its independence.

On January 1, 1907, the total assets of the laboratory were estimated to be about $70,000; they had doubled in ten years. Since that time they have increased almost thirty fold. The initial impulse for this great growth we owe to Mr. Charles R. Crane. Every year since 1909 Mr. Crane has contributed $20,000 to meet the deficits of the laboratory and for other purposes and every year since then he has made some notable addition to our estate. In 1909 he secured for us the Kidder lot, on which this new building stands; in 1911 he gave us the Kidder Annex and lot between the old laboratories and the botany building and also the Woods Hole Yacht Club, now the M. B. L. Club; in 1913 he gave us our first permanent, fireproof building erected at a cost of about $115,000 and dedicated in 1914; in 1915 the old "Gifford Homestead" was torn down and a new and much larger building erected in its place to be used as a dormitory, and in the following year the Ritter house and Whitman cottage were acquired and converted into dormitories; in 1916 the lot on which stands the old "bake house" of whaling days was bought and the building converted into a general shop for carpenters and plumbers, and in this same year a notable step was taken in buying the Gansett property of twenty-one acres, which was subdivided into lots to be sold to workers in the laboratory, and eighteen houses have already been built there; in 1917 the Bar Neck property and wharf, which was the whaling wharf of former days, was bought, as well as the Newman Cottage; in 1920 the mess hall having been destroyed by fire, the present enlarged and improved mess hall was erected in its place; in 1923 the Kidder Cottage was bought and converted into a dormitory, in 1924 the Hubbard house was bought and suffered a similar fate, and this year Dr. Drew's house was bought and is being used as a dormitory. Almost all this great enlargement of the laboratory's estate has been brought about by the generosity of Mr. Crane.

In 1919 efforts were begun to secure a million dollars for a new building and endowment, and in 1922 the Rockefeller Foundation contributed $500,000 and the Carnegie Corporation $100,000 on condition that a million should be raised and that the Friendship Fund, established by Mr. Crane, should endow its annual contribution of $20,000. In December, 1923, Mr. John D. Rockefeller, Jr., contributed $400,000, thus completing the million dollar fund, and the Friendship Fund turned over to a trust company for the benefit of the laboratory $405,000. In addition the Friendship Fund met the cost of this new building and its equipment in excess of $500,000. At present the total assets of the laboratory are more than two million dollars, of which about $900,000 is held as endowment.

Thus has the Marine Biological Laboratory come up from a condition of penury to one of affluence, from a day of small things to one of greatness, from anxious hope to glorious realization. In this story of the growth of the Marine Biological Laboratory there is romance and inspiration, and in dealing with its material growth there has been presented the least romantic and inspiring part of the story. That would be found in the laborious days and wakeful nights and thrilling discoveries of its workers, but there is no time left to tell this part of our history and it does not lend itself so readily to lantern slide illustration.

Let us close with a word of appreciation of the labor and service and sacrifice of those who have made this day possible. Our founders and benefactors have left to us a noble heritage in this institution and its ideals. They labored not for themselves only but for their successors, and we dedicate this building not merely to present but to future generations. Our strongest social instincts are for service; the joy of life is progress; the desire of all men is for immortality through their work. We may be forgotten, as many of our predecessors and benefactors have been, but with Huxley we may say, "I am content to be remembered or not to be remembered so only the truth is advanced." In the dedication of this superb temple of truth, all who have had any part may take a just pride and it is eminently fitting that we should recall with gratitude those who have in any way contributed to this great institution. A common mistake is to fix upon one man, one event, one gene as the cause of some complex development. No one man, foundation or event has been the cause of the Marine Biological Laboratory of to-day. In some measure it is the result of all that has gone before. Nevertheless, there are certain outstanding men who should be recalled with gratitude to-day; among these are the following forerunners and founders: Louis Agassiz, Spencer F. Baird, Alpheus Hyatt, W. G. Farlow, E. G. Gardiner, C. S. Minot, W. T. Sedgwick.

Since its foundation there has been an ever-increasing number of friends and benefactors of the laboratory. It is not possible to name them all, but we should be lacking in gratitude if we failed to name, on this occasion, those who have made possible this great material development of the Marine Biological Laboratory, *viz.*, The Rockefeller Foundation, The Carnegie Corporation, The Friendship Fund, Mr. John D. Rockefeller, Jr., and last but not least, Mr. Charles R. Crane.

Not only to these benefactors but to the men and women who have unselfishly worked here do we owe a debt of gratitude. Others gave their money and influence, these gave their work and their lives. Among them are: C. O. Whitman, director for twenty-one years; Frank R. Lillie, assistant director for ten years and director for eighteen years; H. C. Bumpus, assistant director for five years; J. I. Peck, assistant director for three years, and Gilman A. Drew, assistant director for fifteen years—the man who more than any other one person is responsible for the scientific planning of this building.

Our gratitude is due also to many others—investigators, instructors, students and staff—whose labors have become part of the fame and influence of this laboratory. Among these workers is one whom we sadly miss to-day, but whose name and fame will ever be associated with this place—Jacques Loeb. Many of these founders and workers have gone from us forever, but their memory remains a permanent and priceless possession. "They builded better than they knew." Would that they might be with us to-day to see this consummation of their labors and hopes! "They rest from their labors but their works do follow them." "Others have labored and we have entered into their labors."

This great laboratory, the greatest of its kind, offers an unparalleled opportunity and a serious responsibility. Scientific institutions such as this are the most distinctive and most hopeful contribution of this age to the progress of civilization and of mankind. Gifted with immortal youth, inspired by high ideals of truth and service, may this laboratory be a center of discovery, of learning and of progress to generations yet unborn!

This is a day not only of retrospect but of prospect; not only of rejoicing but of resolution. Here we dedicate not only this building but ourselves to the "increase and diffusion of knowledge among men," to a higher civilization and a better humanity, to the search for truth which shall make us free.

SCIENTIFIC EVENTS

THE WILD LIFE RESERVATION ON THE MISSISSIPPI RIVER

INITIAL steps have been taken by the Department of Agriculture for the purchase of lands for the creation of the upper Mississippi river wild life and fish refuge, authorized by congress in June, 1924.

Funds amounting to $400,000 became available on July 1. The expectation is that ultimately more than $1,500,000 will be expended for the acquisition of overflowed lands on either side of the Mississippi in Illinois, Iowa, Wisconsin and Minnesota for a distance of about 300 miles from Rock Island, Ill., to Wabasha, Minn.