THE

MARINE BIOLOGICAL LABORATORY.

FOURTH ANNUAL REPORT,

FOR THE YEAR

1891.

BOSTON:
1891.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Officers of the Marine Biological Laboratory</td>
<td>5</td>
</tr>
<tr>
<td>Investigators at the Laboratory during 1891</td>
<td>6</td>
</tr>
<tr>
<td>Students at the Laboratory during 1891</td>
<td>7</td>
</tr>
<tr>
<td>Annual Report of the Trustees to the Corporation</td>
<td>9</td>
</tr>
<tr>
<td>Annual Report of the Treasurer</td>
<td>12</td>
</tr>
<tr>
<td>Annual Report of the Director</td>
<td>14</td>
</tr>
<tr>
<td>List of Members of the Corporation</td>
<td>30</td>
</tr>
<tr>
<td>List of Life Members of the Corporation</td>
<td>33</td>
</tr>
<tr>
<td>Incorporation</td>
<td>34</td>
</tr>
<tr>
<td>By-Laws</td>
<td>35</td>
</tr>
<tr>
<td>The Annual Circular for 1891</td>
<td>37</td>
</tr>
</tbody>
</table>
OFFICERS.

1891.

Trustees.


\textbf{FLORENCE M. CUSHING}, 8 Walnut street, Boston.

\textbf{WILLIAM G. FARLOW}, Harvard University, Cambridge, Mass.

\textbf{EDWARD G. GARDINER}, Massachusetts Institute of Technology, Boston.

\textbf{WILLIAM LIBBEY, Jr.}, College of New Jersey, Princeton, N.J.

\textbf{CHARLES S. MINOT}, Harvard Medical School, Boston, Mass.

\textbf{HENRY F. OSBORN}, Columbia College, New York.

\textbf{WILLIAM T. SEDGWICK}, Massachusetts Institute of Technology, Boston.

\textbf{BENJAMIN SHARP}, Academy of Natural Sciences, Philadelphia, Pa.

\textbf{GEORGIANA W. SMITH}, 283 Marlborough street, Boston.

\textbf{SIDNEY I. SMITH}, Yale University, New Haven, Conn.

\textbf{EDMUND B. WILSON}, Columbia College, New York, N.Y.

\textbf{R. RAMSAY WRIGHT}, University of Toronto, Toronto, Canada.

\textbf{EDWARD T. CABOT}, Treasurer, 53 State street, Boston.

\textbf{ANNA PHILLIPS WILLIAMS}, Secretary, 23 Marlborough street, Boston.

\textbf{A. LAWRENCE LOWELL}, Clerk, 53 State street, Boston.

Director.

C. O. WHITMAN, Clark University, Worcester, Mass.

Instructors at the Laboratory.

\textbf{H. C. BUMPUS}, Brown University.

\textbf{E. G. GARDINER}, Institute of Technology.

\textbf{J. P. McMURRICH}, Clark University.

\textbf{W. M. RANKIN}, Princeton College.

\textbf{W. A. SETCHELL}, Yale University.

\textbf{W. M. WHEELER}, Clark University.

Artist.

\textbf{RYOICHE TAKANO}.
INVESTIGATORS AT THE LABORATORY.

A.—OCCUPYING PRIVATE ROOMS.

H. C. Bumpus, Ph.D., Assistant Professor of Zoölogy, Brown University, Providence, R.I.
Edward G. Gardiner, Ph.D., Instructor in Biology, Massachusetts Institute of Technology, Boston, Mass.
Herbert P. Johnson, Fellow in Morphology, Clark University, Worcester, Mass.
Edwin O. Jordan, Fellow in Morphology, Clark University, Worcester, Mass.
J. Playfair McMurrich, Ph.D., Assistant Professor of Morphology, Clark University, Worcester, Mass.
Thomas H. Morgan, Ph.D., Associate Professor of Biology, Bryn Mawr College, Bryn Mawr, Pa.
W. M. Rankin, Ph.D., Instructor in Zoölogy, Princeton College, Princeton, N.J.
W. A. Setchell, Instructor in Botany, Yale University, New Haven, Conn.
Sho Watase, Ph.D., Assistant in Morphology, Clark University, Worcester, Mass.
William Morton Wheeler, Fellow in Morphology, Clark University, Worcester, Mass.
C. O. Whitman, Ph.D., Professor of Animal Morphology, Clark University, Worcester, Mass.
Edmund B. Wilson, Ph.D., Adjunct Professor of Zoölogy, Columbia College, New York, N.Y.

B.—RECEIVING INSTRUCTION.

Charles L. Bristol, Fellow in Morphology, Clark University, Worcester, Mass.
Martha Bunting, Student at Bryn Mawr College, Bryn Mawr, Penn.
Cornelia M. Clapp, Professor of Zoölogy, Mt. Holyoke Seminary and College, South Hadley, Mass.
Frank R. Lillie, Fellow in Morphology, Clark University, Worcester, Mass.
Albert D. Mead, Fellow in Morphology, Clark University, Worcester, Mass.
Albro D. Morrill, Professor of Biology, Hamilton College, Clinton, N.Y.
James F. Porter, Student at Harvard University, Cambridge, Mass.
Aaron L. Treadwell, Assistant in Natural History, Miami College, Oxford, O.
STUDENTS AT THE LABORATORY.

ALICE H. ALBRO, Teacher of Science, Dunkirk High School, Fredonia, N.Y.
ANETTA F. ARMES, Teacher in the Martin School, Boston, Mass.
THOMAS J. BATTEY, Teacher of Science, Friends' School, Providence, R.I.
ALICE H. BECKLER, Student of Biology, Institute of Technology, Boston, Mass.
ELIZABETH E. BICKFORD, Teacher of Science, Bryn Mawr School, Baltimore, Md.
MELVIN A. BRANNON, Teacher of Natural Science, Fort Wayne High School, Fort Wayne, Ind.
BERTHA M. BROWN, Student of Biology, Institute of Technology, Boston, Mass.
SEVERANCE BURREG, Student of Biology, Institute of Technology, Boston, Mass.
ESTHER F. BYRNES, Assistant at Vassar College, Poughkeepsie, N.Y.
MRS. E. G. CONKLIN, Delaware, Ohio.
ELIZABETH COOKE, Student at Bryn Mawr College, Bryn Mawr, Pa.
BRADLEY M. DAVIS, Fellow in the Leland Stanford, Jr. University, Palo Alto, Cal.
MRS. RHODA A. ESTEN, First Assistant, Doyle Avenue Grammar School, Providence, R.I.
ANNE EVANS, Student at Bryn Mawr College, Bryn Mawr, Pa.
GUSTAV FISCHER, Principal of the High School, New Ulm, Minn.
Pierre A. Fish, Instructor in Physiology and Anatomy, Cornell University, Ithaca, N.Y.
KATHERINE FOOT, Denver, Col.
MARY A. H. FULLER, Teacher in the Dorchester High School, Dorchester, Mass.
JOHN H. GEROULD, Student at Harvard University, Cambridge, Mass.
FREDERIC P. GORHAM, Student at Brown University, Providence, R.I.
ROBERT A. HARPER, Professor of Botany, Lake Forest College, Lake Forest, Ill.
HAROLD HEATH, Assistant in Biology, Ohio Wesleyan University, Delaware, Ohio.
GRANT S. HOPKINS, Instructor in Anatomy, Cornell University, Ithaca, N.Y.
IDA H. HYDE, Student at Cornell University, Ithaca, N.Y.
Paul M. Jones, Assistant in Natural History and Geology, Vanderbilt University, Nashville, Tenn.
HARRIET G. KING, Assistant in Oak Park High School, Oak Park, Ill.
M. E. KLECKNER, Professor of Biology and Geology, Heidelberg University, Tiffin, Ohio.
ARCHIBALD P. KNIGHT, M.A., Principal of the Collegiate Institute, Kingston, Canada.


WM. S. LEMEN, Teacher of Biology, Indianapolis High School, Indianapolis, Ind.

SILAS ALPHA LOTTRIDGE, Student at St. Lawrence University, Canton, N.Y.

MARGARET M. McCOLLIN, Teacher of Science, Friends' Select School, Philadelphia, Pa.

JAMES A. MERRILL, Teacher of Geology and Zoology, State Normal School, Warrenburg, Mo.

HARRY A. ROTHROCK, Assistant Instructor in Botany, University of Pennsylvania, Pa.

WM. H. SAYWARD, Jr., Student of Biology, Institute of Technology, Boston, Mass.

RICHARD C. SCHIEDT, D.D., Adjunct Professor of Natural Science, Franklin and Marshall College, Lancaster, Pa.

ADELINE F. SCHIVELY, Student at University of Pennsylvania, Philadelphia, Pa.

CHARLES P. SIGERFOOS, Assistant Instructor in Biology, University of Virginia, Charlottesville, Va.

SUSAN B. SMITH, West Town Boarding School, Parkersburg, Pa.

UME TSUDA, Student at Bryn Mawr College, Bryn Mawr, Pa.

LOUISE B. WALLACE, Student at Mt. Holyoke College, South Hadley, Mass.


A. M. WORTHINGTON, Student of Biology, Institute of Technology, Boston, Mass.
FOURTH ANNUAL REPORT

OF THE

TRUSTEES OF THE MARINE BIOLOGICAL LABORATORY.

The Trustees have the pleasure of reporting to the Corporation another year of great prosperity in the history of the Laboratory. A year ago the Treasurer's report to the Trustees showed a debt to the amount of about $5,000. This was owing to the large outlay for the L to the present building, to the purchase of the steam-launch, to other permanent improvements, and also to the lack of sufficient funds to pay all of the running expenses during the summer of 1890.

In the spring, however, the Treasurer reported that all debts had been paid, and that a balance of $2,000 was on hand, so that the summer's work was undertaken with confidence. To aid in raising these funds Mrs. H. H. A. Beach presented to the corporation the entire receipts from two piano recitals given in Tremont Temple, Boston, in aid of the Laboratory. The Trustees desire to express to Mrs. Beach their deep gratitude for her generous and timely gift.

The Lucretia Crocker scholarships have been held by Miss A. T. Armes and Miss Mary Fuller, of the Boston public schools. The Director's report for the summer shows a great increase in the attendance, both of students and investigators, over any previous year, and it is a grave problem now under consideration by the Trustees whether a further enlargement of the Laboratory to accommodate the ever-increasing numbers, will not be required. During the past summer, as
during previous years, Miss Fay kindly placed Gardiner cottage at the disposal of the Laboratory. This season, however, it was used as a dormitory instead of as a mess-room.

The experience of the previous year had shown that the number of cheap rooms in Woods Holl was not only somewhat limited but decreasing, since the increased demand for rooms tempted the householders of Woods Holl to advance their room-rent. The Trustees, therefore, wishing to keep the living expenses of students as small as possible, voted to furnish Gardiner cottage with cot beds, etc., and to rent the rooms to male students. The demand for these rooms proved so great that Miss Fay cheerfully loaned to the Laboratory another cottage, which was furnished in a similar manner. The rent received from these rooms paid nearly one-half the cost of the furniture purchased. The "Gifford Homestead," which is a part of the property acquired in 1890 through the liberality of Mr. Joseph S. Fay, was used this season for the mess-room.

The mess was under the charge of Mr. E. G. Dexter, a student in Brown University, and was on the whole satisfactory. By a vote of the Trustees the name of the steam-launch was changed to "Sagitta," a word of much biological significance.

In previous years the Trustees have made reports to the corporation of matters concerning the library, and of certain details in regard to boats, collecting apparatus, etc. Recently, however, the Trustees voted that the Director take full charge of all such matters, and the more important changes which have been instituted, will be found recorded beyond in the report of the Director.

Last year, in their annual report, the Trustees recommended that an effort be made, first, to obtain money to pay outstanding debts and to cover the running expenses during the coming summer; second, to place the Laboratory on a permanent footing by raising the sum of $60,000, which should be held as an endowment fund. The first recommendation was fully carried out, and a small sum toward the endowment fund has also been raised. The Trustees beg for your earnest cooperation in securing, during this winter, funds sufficient for the running expenses
during the next summer (1892), and, also, additional subscriptions to the endowment fund.

The whole history of the Laboratory, from its foundation, has been one of steadily increasing usefulness, and we sincerely hope that the day is not far distant when it shall be endowed, as it deserves to be, as a permanent station.

(Signed) SAMUEL H. SCUDDER, President.
EDWARD T. CABOT, Treasurer.
ANNA PHILLIPS WILLIAMS, Secretary.
A. LAWRENCE LOWELL, Clerk.
SAMUEL F. CLARKE,
FLORENCE M. CUSHING,
WILLIAM G. FARLOW,
EDWARD G. GARDINER,
WILLIAM LIBBEY, Jr.,
CHARLES S. MINOT,
HENRY F. OSBORN,
WILLIAM T. SEDGWICK,
BENJAMIN SHARP,
GEORGIANA W. SMITH,
SIDNEY I. SMITH,
EDMUND B. WILSON,
R. RAMSAY WRIGHT.
Dr. TREASURER’S MARINE BIOLOGICAL LABORATORY IN

By cash paid as follows:

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructors</td>
<td>$959 00</td>
</tr>
<tr>
<td>Balance due Professor Kingsley</td>
<td>147 87</td>
</tr>
<tr>
<td>Wages</td>
<td>695 44</td>
</tr>
<tr>
<td>Balance due for addition to Laboratory</td>
<td>990 37</td>
</tr>
<tr>
<td>Fay mortgage (on account of principal)</td>
<td>500 00</td>
</tr>
<tr>
<td>Launch (new propeller, tanks, duck, repairs, and running expenses)</td>
<td>423 46</td>
</tr>
<tr>
<td>Furniture for Laboratory, cottage, and mess</td>
<td>485 81</td>
</tr>
<tr>
<td>Carter mortgage</td>
<td>800 00</td>
</tr>
<tr>
<td>Expenses connected with Carter mortgage</td>
<td>14 25</td>
</tr>
<tr>
<td>Advances repaid</td>
<td>1,073 19</td>
</tr>
<tr>
<td>Repairs and running expenses</td>
<td>241 17</td>
</tr>
<tr>
<td>Chemicals and supplies</td>
<td>377 61</td>
</tr>
<tr>
<td>Recital expenses</td>
<td>263 35</td>
</tr>
<tr>
<td>Periodicals, etc.</td>
<td>308 80</td>
</tr>
<tr>
<td>Printing</td>
<td>82 61</td>
</tr>
<tr>
<td>Interest</td>
<td>90 00</td>
</tr>
<tr>
<td>Alcohol</td>
<td>110 40</td>
</tr>
<tr>
<td>Postage</td>
<td>56 15</td>
</tr>
<tr>
<td>Skiff</td>
<td>18 00</td>
</tr>
<tr>
<td>Freight</td>
<td>21 02</td>
</tr>
<tr>
<td>Tax</td>
<td>13 00</td>
</tr>
<tr>
<td>Sundries</td>
<td>123 30</td>
</tr>
</tbody>
</table>

$7,794 80

Balance                                                125 06

$7,919 86
REPORT.

ACCOUNT WITH EDWARD T. CABOT, TREASURER.  Cr.

By cash as follows:—

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balance Nov. 10, 1890</td>
<td>$188.44</td>
</tr>
<tr>
<td>Assessments</td>
<td>101.00</td>
</tr>
<tr>
<td>Contributions</td>
<td>4,135.00</td>
</tr>
<tr>
<td>Mrs. Beach's recitals</td>
<td>1,740.00</td>
</tr>
<tr>
<td>Fees of students</td>
<td>964.29</td>
</tr>
<tr>
<td>Fees of investigators</td>
<td>450.00</td>
</tr>
<tr>
<td>Mess account</td>
<td>84.55</td>
</tr>
<tr>
<td>Sale of supplies</td>
<td>36.55</td>
</tr>
<tr>
<td>Interest</td>
<td>19.03</td>
</tr>
<tr>
<td>Advanced</td>
<td>200.00</td>
</tr>
</tbody>
</table>

$7,919.86

Nov. 10, 1891. Examined and found correct.

Also examined securities, as follows:—

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bond, $1,000 4%, St. Paul, Minn., &amp; Manit.</td>
<td>$1,171.62</td>
</tr>
<tr>
<td>Deposit in Suffolk Savings Bank, for Carter mortgage</td>
<td>$800.00</td>
</tr>
</tbody>
</table>

Also belonging to the Crocker Fund:—

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 shares Vermont &amp; Mass. R.R. Co. Deposit in Home Savings Bank, for</td>
<td>$835.00</td>
</tr>
</tbody>
</table>

A. LAWRENCE LOWELL,

For the Committee on Finance.
REPORT OF THE DIRECTOR

OF THE

MARINE BIOLOGICAL LABORATORY,

FOR THE

FOURTH SESSION, 1891.

To the Trustees of the Marine Biological Laboratory:

The experiences and results of the fourth session have defined new needs and possibilities of further development.

The unexpectedly large increase in our numbers this year has taxed to the utmost limit available room for work. Next year we have reason to expect a still larger demand for tables, and they must be provided, or the number admitted must be limited. As we have been compelled to turn the library room and lecture hall into laboratories this season, the need of more room for the next is plain.

But there are other considerations which emphasize this need, and make it clear that the addition of a new wing of the size of the original building will be required. With no increase in number, and with our two departments as now organized, we should be cramped for space. But our courses of instruction must now be amplified so as to include an intermediate course, adapted to the needs of those who desire more advanced work than can be conveniently offered in the general courses. Such work is now called for, and there can be no doubt that, as a preparatory step to investigation, it would become a very important connecting link between instruction and research. This course would be one of investigation, but only the simpler and
more limited problems would be attempted. The occupants of tables in this course would rank as beginners in investigation, and the fees would be the same as are now required in the general laboratory for investigators. Obviously, a special laboratory would be needed for this purpose.

The botanical work of the laboratory under the able direction of Dr. Setchell is rapidly developing, and a separate laboratory is now much needed for this branch.

There remains still one of the most important branches of our science, which, for want of room, has thus far been totally neglected. Physiology unquestionably represents quite as important a part of the work of a marine laboratory as morphology. It is of the highest importance that we should make a beginning in this direction, and this can be done as soon as room is provided. It is not Animal or Human Physiology, as commonly understood, that I have more especially in mind; but what, for want of a better name, I shall venture to call Biological Physiology.

Physiology, as Semper has well shown in his "Animal Life," has hitherto devoted itself mainly to the functional economy of the organs, and has scarcely touched the broader and higher province of the biological economy of organisms. It is in this almost new province that we meet with the great problems of geographical and geological distribution, and those of the interrelations of species in both the animal and vegetable kingdoms. It is here that we study life-histories, habits, food; the influences of the physical environment, and the reciprocal relations, which are ever varying according to the issues of the universal struggle for existence.

It is in this direction that experimental physiology finds one of the most inviting fields in the whole range of biology. As instances of what varied and interesting problems here await the physiological experimenter, may be mentioned the experiments of Pflüger and others to determine the influence of gravitation on the development of the egg; Roux's experiments on the frog's egg; Boveri's experiments to determine where the formative power resides, and whether it is shared equally by both
sexes; Fol's studies on fertilization; Auerbach's determination of sexual distinction between the paternal and the maternal elements of the nucleus; Weismann's studies on the laws and causes of variation; the effects of chemical agencies on germ-cells as tested by Oscar and Richard Hertwig; the experimental studies of Maupas on the conjugation and life-history of Infusoria; Steiner's experiments on the central nervous system; Darwin's beautiful studies on Drosera and on the Earthworm; Trembley's celebrated experiments on Hydra, and the recent ones of Nussbaum and Ischikawa on the same object; Wilson's study of the heliotropism of Hydra; Loeb's observations on "Physiological Morphology," and his studies on the geotropism and heliotropism of animals; the experiments of Beudant, Plateau, and Schmankevitsch in transferring animals from salt to fresh water, and vice versa; Semper's observations on the effect of the volume of water on the size of the creatures living in it. This list will suffice to show that biological physiology is in the main a new field teeming with a great variety of the most interesting problems of life. Dohrn has repeatedly called attention to the importance of such studies, and he has added to his station a laboratory for their cultivation.

Physiological inquiry has been limited too exclusively to the practical ends of medicine. The broader scientific side has been neglected because it was supposed to be too remotely connected with the welfare of humanity to be of practical value. Until quite recently the physiologist seldom extended the range of his study beyond a few of the higher vertebrates. It scarcely dawned upon his mind that man has a place in nature, and that organisms so insignificant as an amœba or a bacterium could have anything to do with determining what that place is, and still less did he suspect that man's destiny could be seriously affected by the activities of such inappreciable entities. Gradually we have been finding out that even these invisible atoms of life are of the most vital concern to our every-day life; and we not only deign to study them, but we feel that to understand their life-histories is one of the most pressing needs of our race. The development of our knowledge of parasitic worms furnishes
a no less instructive example of how greatly the world profits by the study of even the most despised forms of life. Thanks to the lessons of such experience we are now beginning to realize that all living things form one complex whole, and that to know ourselves we must know that of which we form a part. We now know that every organism bears the impress of its environment, and that man forms an exception only in so far as he has learned to understand and control his environment. We have thus far learned how to obtain from plants and animals only the most insignificant fraction of the service they are capable of rendering. Knowledge alone can command this service. A thorough knowledge of the whole realm of life would, without doubt, render every noxious organism harmless, and enable us to make all tributary to the weal of the human race. The aim, then, should be to develop our biological sciences in all directions, and to keep them all in cooperative contact.

Professor Weismann, in a letter just received, makes the following valuable suggestion as to the scope of a biological station, such as we hope to develop:

"How great the benefits already brought to science by the Zoological Station of Naples; and yet it is designed essentially only for the investigation of the fauna and flora of the sea. A station which would likewise permit of experimental studies on land plants and land animals would be sure of great success."

A number of other important letters on this subject have already been received from distinguished biologists, and these, with others that are expected, will be presented at as early a date as possible. These letters will show that our efforts to develop a biological station are most cordially indorsed by men whose names are associated with the most brilliant achievements in modern biology. It is most encouraging to meet with such a hearty feeling of sympathy and interest from different sources. The sentiment of such testimonials rises far above the plane of petty sectional rivalries, and shows how men who most worthily represent science, espouse its cause as one in which all boundary lines whatsoever, whether of a personal, local, or ethnographical nature, are impertinent and wholly out of place.
As a substantial token of the active support which the undertaking bids fair to receive, the following communication, just received from Prof. Wm. Trelease, Director of the Missouri Botanical Garden, is here offered: —

"I am glad that the Marine Biological Laboratory is taking steps toward securing a permanent and adequate endowment. I have watched its development with a good deal of interest, and have gladly contributed my mite for its support. You may consider the first table as secured for the Garden at $100 a year, even though I have to carry it for a time."

The plan of renting tables at the Laboratory, as outlined by Professor Osborn, of Columbia, is now under consideration in several colleges and universities, and I have reason to believe that favorable action will be taken in some cases before the next session. President Andrews, of Brown University, who has shown a friendly interest in this matter, has made the excellent suggestion that the best method of cooperation would be for the biological department of an institution to secure a research fund, the annual income of which should pay the rent of one or more tables. Such a plan would bring the department into closer and more stable relations with the Laboratory. The Laboratory would have the income, while the college would keep possession of the fund, and be able to turn it to other uses, in case the Laboratory should cease to need or deserve such support.

The details of the summer's work may now be reviewed. The attendance was nearly double that of any previous session. The increase in number was mainly in the Teachers and Students' Department, and must be credited to the successful and popular course of instruction inaugurated by Dr. Bumpus and Dr. Rankin. The members of the Investigators' Department were invited to coöperate in the work of instruction by giving one or more lectures, and the response was very general and important, as will be seen from Dr. Bumpus's report. Both the Director and Instructor are under great obligations
for these generous and precious contributions. These services — unrequited, be it remembered — afford our students rare privileges, such as have not been offered elsewhere, and such as cannot be procured anywhere except in a laboratory which calls together a considerable number of investigators. Our band of workers has not yet grown to the dimensions of a national biological congress, but every year thus far has certainly extended our circle.

Twenty-four tables were occupied this year by investigators, — nine in the general laboratory and fifteen in private rooms. Our private rooms were all occupied, and space for four tables had to be found in the library room. The whole number attending in the department of instruction was forty-four. It was only possible to accommodate this increased number by turning the lecture room into a laboratory.

The following statistics show the growth of the laboratory during the four years of its existence, and indicate to what extent the universities, colleges, and schools of the country have already been represented in its membership:

<table>
<thead>
<tr>
<th>No. of institutions</th>
<th>1888</th>
<th>1889</th>
<th>1890</th>
<th>1891</th>
<th>1888–1891</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. in attendance</td>
<td>17</td>
<td>44</td>
<td>47</td>
<td>71</td>
<td>135</td>
</tr>
</tbody>
</table>

The seventy-eight institutions represented are as follows:

- Allis Lake Laboratory, Milwaukee, Wis.
- Bridesburg School, Pennsylvania.
- Brown University, Providence, R.I.
- Bryn Mawr College, Bryn Mawr, Pa.
- Bryn Mawr School, Baltimore, Md.
- Burr and Burton Seminary, Manchester, Vt.
- California Academy of Sciences, San Francisco, Cal.
- Carrolton College, Northfield, Minn.
- Central School, Brooklyn, N.Y.
Clark University .......................... Worcester, Mass.
Collegiate Institute ........................ Kansas, Ontario, Canada.
Cornell University ........................ Ithaca, N.Y.
De Pauw University ........................ Greencastle, Ind.
Dorchester High School ........................ Dorchester, Mass.
Dunkirk High School ........................ Dunkirk, N.Y.
Dwight School ................................. Boston, Mass.
Franklin and Marshall College ........................ Lancaster, Pa.
Friends' School ............................... Providence, R.I.
Grammar School ............................... Providence, R.I.
Harvard Medical School ........................ Boston, Mass.
Harvard University .............................. Cambridge, Mass.
Haverford College .............................. Pennsylvania.
Heidelberg University ........................... Tiffin, Ohio.
High School ...................................... Fort Wayne, Ind.
High School ...................................... New Ulm, Minn.
Indiana University ............................ Bloomington, Ind.
Indianapolis High School ........................ Indianapolis, Ind.
Jackson High School .............................. Jackson, Mich.
Johns Hopkins University ........................ Baltimore, Md.
Lake Forest College .............................. Lake Forest, Ill.
Lake View High School ............................. Chicago, Ill.
Lawrence University ............................ Appleton, Wis.
Marietta College ................................. Marietta, Ohio.
Martin School ................................. Boston, Mass.
Massachusetts Institute of Technology ........................ Boston, Mass.
Meriden High School .............................. Meriden, Conn.
Milwaukee Public Museum ........................ Milwaukee, Wis.
Missouri State Normal School ........................ Warrensburg, Mo.
Mt. Holyoke Seminary and College ........................ South Hadley, Mass.
Oak Park High School ............................. Oak Park, Ill.
Oberlin College ................................. Oberlin, O.
Ohio University ................................. Athens, O.
Ohio Wesleyan University ........................................ Delaware, O.
Olivet College ................................................... Olivet, Mich.
Ottawa University ................................................. Ottawa, Kan.
Packer Institute .................................................. Brooklyn, N.Y.
Preparatory School of Northwestern University ............... Evanston, Ill.
Princeton College ................................................ Princeton, N.J.
Randolph Macon College .......................................... Ashland, Va.
Rockford High School ............................................ Rockford, Ill.
Shaw School of Botany ........................................... St. Louis, Mo.
South Jersey Institute ........................................... N.J.
State Normal School ................................................ Framingham, Mass.
State University of South Dakota ................................ Vermillion, S.D.
St. Lawrence University ........................................ Canton, N.Y.
Swarthmore College ............................................... Pa.
University of Illinois ........................................... Champaign, Ill.
University of Kansas ............................................. Lawrence, Kan.
University of Michigan ........................................... Ann Arbor, Mich.
University of Nebraska ........................................... Lincoln, Neb.
University of South Carolina ................................... Columbia, S.C.
University School ................................................... Chicago, Ill.
University of Toronto ........................................... Toronto, Ontario, Canada.
University of Virginia ........................................... Charlottesville, Va.
Vanderbilt University ............................................. Nashville, Tenn.
Vassar College ...................................................... Poughkeepsie, N.Y.
Wellesley College .................................................. Wellesley, Mass.
Wesleyan Academy ................................................ Wilbraham, Mass.
Wesleyan University ............................................... Middletown, Conn.
West Division High School ....................................... Chicago, Ill.
Westtown Boarding School ....................................... Westtown, Pa.
Williams College ................................................... Williamstown, Mass.

The scientific work of the Laboratory already published, or in press, is as follows: —
— "The Ear of Man; its past, its present, and its future." Lectures delivered at the Marine Biological Laboratory, 1890.


Cornelia M. Clapp. "Some points in the development of the Toad Fish." (Batrachus Tau.) Journ. of Morphology, V., p. 494.

E. G. Gardiner. "Weismann and Maupas on the origin of Death." Lectures delivered at the Marine Biological Laboratory, 1890.


W. Libbev, Jr. "Study of ocean temperatures and currents." Lectures delivered at the Marine Biological Laboratory, 1890.

— "The Gastræa theory and its successors." Lectures delivered at the Marine Biological Laboratory, 1890.


— "The Relationships of the Sea Spiders." *Lectures delivered at the Marine Biological Laboratory*, 1890.

— "The Growth and Metamorphosis of Tornaria." *Journ. of Morphology, V., No. 3*.


WORKS IN PROGRESS.

1. CHARLES L. BRISTOL. "Embryology and Morphology of Nephelis."
2. MARTHA BUNTING. "The Development of Hydractinia."
3. SEVERANCE BURRAGE. "Drosera filiformis."
4. CORNELIA M. CLAPP. "The Developmental History of the Lateral Line Organs of Batrachus."
5. BRADLEY M. DAVIS. "The Development of Champa parvula."
6. S. GLENDOLEN FOULKE. "Development of Rotifers."
7. EDWARD G. GARDINER. "Development of Convoluta."
8. HERBERT P. JOHNSON. "Infusoria."
9. EDWIN O. JORDAN. "Development of the Newt."
10. IDA KELLER. "The Algae of Woods Holl."
11. FRANK R. LILLIE. "Development of Lamellibranchs."
12. ALBERT D. MEAD. "Embryology of Annelids."
13. J. P. McMURRICH. (1) "Embryology of Scyphomedusae." (2) "Development of Isopods."
15. W. A. SETCHELL. "Batrachospermum."
16. MARY A. SHIVELY. "Spirorbis."
17. AARON L. TREADWELL. "The Development of Padarke."
18. S. WATASE. "Caryokinesis in Leeches and Cephalopods."
19. W. M. WHEELER. "Development of Arthropods."

THE EVENING COURSE OF LECTURES. (1891.)

1. HOWARD AYERS. "The Morphology of the Ear."
2. H. H. DONALDSON. "Methods of Studying the Nervous System."
4. EDWARD O. JORDAN. "Biological Analysis of Water."
5. J. S. KINGSLEY. "A Trip to the Bad Lands."
6. W. P. LOMBARD. "Some of the Influences which affect the Strength of Voluntary Muscular Contraction."
7. J. P. McMURRICH. "The Significance of the Blastopore."
9. S. WATASE. "The Role of the Asters in the Division of the Nucleus."

For these lectures the Laboratory is indebted to members of the scientific staff and to a number of gentlemen who, though not on the staff this season, generously responded to the invitation to assist us in this work. In a former report I have dwelt at some length upon the purpose and the importance of this course of lectures. I attribute no small share of whatever success we have had as a school of instruction and research to this feature of our work.

REPORT ON THE WORK OF THE STUDENTS AND TEACHERS' DEPARTMENT.

BY DR. H. C. BUMPUS.

Instruction in this department was given to forty-four teachers and students, the larger number pursuing the regular line of study as outlined in the annual announcement. Six students devoted themselves exclusively to Botany, under the direction of Dr. Setchell, while the remaining thirty-eight, pursuing more specially the subject of Zoölogy, came under the instruction of Dr. Rankin and myself. All the students, however, generally availed themselves of the morning and afternoon lectures irrespective of the subject. The lectures were planned to supplement the laboratory work, and were a feature of considerable importance, in that the larger number were delivered by advanced workers from the investigator's department, though in a few cases specialists not connected with the Laboratory kindly consented to meet the classes. The list of lectures and their subjects are as follows: —


DR. J. P. McMURRICH. Five lectures on the Anatomy and Embryology of the Cnidaria.


W. M. WHEELER. "The Affinities of the Arthropods." "The Embryology of the Tracheates."


H. P. JOHNSON. "Conjugation in the Infusoria."

DR. S. WATASE. "Caryokinetic Figures."

G. W. GRAY. "Practical demonstrations of the methods of animal preservation."


I wish to acknowledge the kindness of the many who have generously assisted in the management of the department, through lectures, or through individual direction and advice to the students.

REPORT ON THE LIBRARY.

BY J. P. McMURRICH.

During the past year the library has received numerous accessions as gifts from friends of the Laboratory, and although it was not found possible to make any purchases of volumes from the general funds of the Laboratory, yet the current subscriptions to journals have been maintained. The Laboratory
is especially indebted to Mrs. Glendower Evans for a gift of one hundred dollars to be applied to the continuance of the subscriptions to the periodicals belonging to the Evans Library.

The following is a list of the donations received since the last report:

<table>
<thead>
<tr>
<th>Donor</th>
<th>Pamphlets</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Agassiz</td>
<td>10</td>
</tr>
<tr>
<td>H. Ayers</td>
<td>3</td>
</tr>
<tr>
<td>H. P. Bowditch</td>
<td>5</td>
</tr>
<tr>
<td>Cincinnati Society of Natural History</td>
<td>2</td>
</tr>
<tr>
<td>E. G. Conklin</td>
<td>2</td>
</tr>
<tr>
<td>J. M. Coulter</td>
<td>7</td>
</tr>
<tr>
<td>K. W. Dalle Torre</td>
<td>1</td>
</tr>
<tr>
<td>E. G. Gardiner</td>
<td>1</td>
</tr>
<tr>
<td>W. F. Ganong</td>
<td>3</td>
</tr>
<tr>
<td>J. E. Ives</td>
<td>1</td>
</tr>
<tr>
<td>J. Loeb</td>
<td>10</td>
</tr>
<tr>
<td>J. P. McMurrich</td>
<td>3</td>
</tr>
<tr>
<td>C. S. Minot</td>
<td>4</td>
</tr>
<tr>
<td>T. H. Morgan</td>
<td>2</td>
</tr>
<tr>
<td>C. A. Oliver</td>
<td>1</td>
</tr>
<tr>
<td>A. S. Packard</td>
<td>2</td>
</tr>
<tr>
<td>E. E. Prince</td>
<td>3</td>
</tr>
<tr>
<td>Mrs. W. B. Rogers</td>
<td>1</td>
</tr>
<tr>
<td>W. A. Setchell</td>
<td>1</td>
</tr>
<tr>
<td>R. W. Shufeldt</td>
<td>1</td>
</tr>
<tr>
<td>A. L. Treadwell</td>
<td>1</td>
</tr>
<tr>
<td>United States Fish Commission</td>
<td>1</td>
</tr>
<tr>
<td>B. G. Wilder</td>
<td>4</td>
</tr>
<tr>
<td>E. B. Wilson</td>
<td>1</td>
</tr>
</tbody>
</table>

Special mention should be made of a donation from the Boston Society of Natural History, of certain of the publications of the Society not possessed by the Laboratory. These volumes are not included in the foregoing list, as they have not yet been catalogued. In addition to his gift of pamphlets, Prof. C. S. Minot has also added two volumes to the library.

The following periodicals have been taken during the year:

- Anatomischer Anzeiger.
- Annales des Sciences Naturelles, Botanique.
It will be seen from the above list that certain very important journals are not subscribed for, and the want of them has frequently caused considerable inconvenience. Among the journals which it would be advantageous to add to the library the following are the most desirable:

Biologisches Centralblatt.
Archives de Zoologie expérimentale et générale (of which the library already contains Vols. I.–V.).
Journal of Morphology (of which the library already contains Vols. I. and II.).
Zoologischer Jahresbericht.
Zoological Record.

To which may be added as very necessary —

Taschenberg's Bibliotheca Zoologica II.
Engelmann's Bibliotheca Zoologica.
During the three years that have passed, many volumes of periodical literature have accumulated and are, as yet, unbound. Many of the parts show signs of use, and for their proper preservation it is advisable that a sum should be appropriated for their binding. There are in the library, at present, no less than sixty-six volumes in need of binding, and it seems advisable that some, if not all, should be suitably bound before the next session of the Laboratory.

Respectfully submitted,

C. O. WHITMAN,
Director.
MEMBERS.

Mrs. Alvord,
Mr. James B. Ames,
Mrs. James B. Ames,
Miss A. F. Armes,
Mr. C. B. Atwell,
Dr. Howard Ayers,
Miss Mary Bartlett,
Mr. J. L. Batchelder, Jr.,
Dr. H. H. A. Beach,
Mrs. H. H. A. Beach,
Miss A. H. Beckler,
Miss Elizabeth E. Bickford,
Prof. E. A. Birge,
Miss Elizabeth Blanchard,
Mr. Melvin A. Brannon,
Prof. C. L. Bristol,
Mr. H. C. Brode,
Miss B. M. Brown,
Miss E. L. Brynes,
Prof. H. C. Bumpus,
Miss Martha Bunting,
Mr. Severance Burrage,
Mr. Edward T. Cabot,
Prof. L. W. Chaney, Jr.,
Dr. David W. Cheever,
Miss Mary Cheney,
Prof. Cornelia M. Clapp,
Prof. S. F. Clarke,
Mr. E. A. Codman,
Miss Collamore,
Miss Helen Collamore,
Prof. H. W. Conn,
Miss Elizabeth Cooke,
Prof. H. N. Conser,
Prof. J. M. Coulter,
Miss M. H. Crocker,
Miss Clara E. Cummings,
Mr. John Cummings,
Mr. Bradley M. Davis,
Prof. H. H. Donaldson,
Miss E. M. Drury,
Prof. William R. Dudley,
Prof. William B. Dwight,
Dr. C. A. Eigenmann,
Mrs. Rhoda A. Esten,
Miss Anne Evans,
Dr. George Faulkner,
Miss Mary Faulkner,
Dr. J. W. Fewkes,
Mr. Pierre A. Fish,
Mr. G. W. Fitz,
Miss Katharine Foot,
Miss S. G. Foulke,
Mrs. Christine Ladd Franklin,
Miss Harriet E. Freeman,
Miss Ellen Frothingham,
Miss M. A. H. Fuller,
Prof. Simon H. Gage,
FOURTH ANNUAL REPORT.
Prof. Benjamin Sharp,
Mrs. George O. Shattuck,
Miss N. L. Shaw,
Mr. C. P. Sigerfoos,
Mrs. C. C. Smith,
Prof. Sidney I. Smith,
Miss Susan B. Smith,
Prof. Ellison A. Smyth, Jr.,
Dr. Myles Standish,
Dr. William S. Stevens,
Miss Mary A. Tappan,
Mr. A. L. Treadwell,
Prof. William Trelease,
Prof. Spencer Trotter,
Prof. A. E. Verrill,
Mr. B. H. Van Vleck,
Miss Jennie E. Waldo,
Prof. F. L. Washburn,
Dr. S. Watase,
Mr. H. J. Webber,
Mr. Samuel Wells,
Mr. W. M. Wheeler,
Mr. Franklin W. White,
Dr. C. O. Whitman,
Mrs. A. L. Williston,
Prof. E. B. Wilson,
Prof. H. V. Wilson,
Prof. W. P. Wilson,
Miss C. A. Woodman,
Mr. A. M. Worthington,
Mrs. J. H. Wright,
Prof. A. A. Wright,
Prof. R. Ramsay Wright.

Mrs. Clara Walden,
LIFE MEMBERS.

Mr. F. L. Ames,
Dr. W. S. Bigelow,
Mr. Robert C. Billings,
Miss H. C. Bradlee,
Mr. A. A. Cary,
Miss F. M. Cushing,
Miss Lucy Ellis,
Mr. William Endicott, Jr.,
Mrs. Glendower Evans,
Prof. William G. Farlow,
Mrs. George Faulkner,
Mr. J. S. Fay,
Miss Amy Folsom,
Mr. John Foster,
Dr. E. G. Gardiner,
Mr. William O. Grover,
Mr. George W. Hammond,
Mrs. H. L. Higginson,
Mr. C. C. Jackson,
Miss Marian C. Jackson,
Dr. George G. Kennedy,
Mr. N. T. Kidder,
Miss Anna C. Lowell,
Mr. A. Lawrence Lowell,
Miss Ellen F. Mason,
Miss Ida M. Mason,
Mrs. Daniel Merriman,
Mrs. Frances A. Minns,
Mr. Thomas Minns,
Mr. William Minot,
Miss M. C. Mixter,
Miss Laura Norcross,
Mr. Alfred Pell,
Mrs. John C. Phillips,
Mr. William R. Robeson,
Miss Annette Rogers,
Mrs. William B. Rogers,
Mr. Henry Saltonstall,
Mr. J. P. Spaulding,
Miss M. A. Wales,
Mrs. C. E. Ware,
Miss M. L. Ware,
Mrs. S. D. Warren,
Mr. William F. Weld,
Mr. Henry M. Whitney,
Mr. Thomas Wigglesworth,
Miss Mary A. Wilcox,
Mrs. Anna Phillips Williams,
Mrs. H. D. Wilmarth,
Dr. R. W. Wood.
INCORPORATION.

1888.

No. 3170.

COMMONWEALTH OF MASSACHUSETTS.

BE IT KNOWN, That whereas Alpheus Hyatt, William Stanford Stevens, William T. Sedgwick, Edward G. Gardiner, Susan Minns, Charles Sedgwick Minot, Samuel Wells, William G. Farlow, Anna D. Phillips, and B. H. Van Vleck have associated themselves with the intention of forming a Corporation under the name of the Marine Biological Laboratory, for the purpose of establishing and maintaining a laboratory or station for scientific study and investigations, and a school for instruction in biology and natural history, and have complied with the provisions of the Statutes of this Commonwealth in such case made and provided, as appears from the certificate of the President, Treasurer, and Trustees of said Corporation, duly approved by the Commissioner of Corporations, and recorded in this office;

Now, therefore, I, HENRY B. PEIRCE, Secretary of the Commonwealth of Massachusetts, do hereby certify that said A. Hyatt, W. S. Stevens, W. T. Sedgwick, E. G. Gardiner, A. Minns, C. S. Minot, S. Wells, W. G. Farlow, A. D. Phillips, and B. H. Van Vleck, their associates and successors, are legally organized and established as, and are hereby made, an existing Corporation, under the name of the MARINE BIOLOGICAL LABORATORY, with the powers, rights, and privileges, and subject to the limitations, duties, and restrictions which by law appertain thereto.

Witness my official signature hereunto subscribed, and the seal of the Commonwealth of Massachusetts hereunto affixed, this twentieth day of March, in the year of our Lord ONE THOUSAND EIGHT HUNDRED AND EIGHTY-EIGHT.

HENRY B. PEIRCE, 
Secretary of the Commonwealth.
BY-LAWS.

1. The annual meeting of the members shall be held in Bos­
ton on the second Wednesday of November in each year, at such
time and place as shall be designated by the Trustees; and at
such meeting the members shall choose by ballot a Clerk, Treas­
urer, and nineteen Trustees, who shall hold their offices for one
year, and until others are chosen and qualified in their stead.
2. Special meetings of the members may be called by the
Trustees, to be held in Boston at such time and place as they
may designate.
3. The Clerk shall give notice of meetings of the members
by publication in some daily newspaper published in Boston at
least seven days before such meeting, and in case of a special
meeting the notice shall state the purpose for which it is
called.
4. Ten members shall constitute a quorum at any meeting.
5. The Trustees shall have the control and management of
the affairs of the Corporation; they shall present a report of its
condition at every annual meeting; they shall elect one of their
number President, and may choose such other officers and
agents as they may think best; they may fix the compensation
and define the duties of all the officers and agents, and may re­
move them, or any of them, except those chosen by the mem­
ers, at any time; they may fill vacancies occurring in any
manner in their own number or in any of the offices. They
shall from time to time elect members upon such terms and
conditions as they may think best.
6. Meetings of the Trustees shall be called by the President,
or by any two Trustees, and the Clerk shall give notice thereof
by written or printed notice sent to each Trustee by mail, post-
paid. Four Trustees shall constitute a quorum for the transaction of business.

7. The President shall, annually, in the month of February, appoint one Trustee who, with the President, shall constitute a committee on finance to examine from time to time the books and accounts of the Treasurer, and to audit his accounts at the close of the year. No investments of the funds of the Corporation shall be made by the Treasurer, except approved by the finance committee in writing.

8. The consent of every Trustee shall be necessary to a dissolution of the Marine Biological Laboratory. In case of dissolution, the property shall be given to the Boston Society of Natural History, or some similar public institution, on such terms as may then be agreed upon.

9. These by-laws may be altered at any meeting of the members, provided that the notice of such meeting shall state that an alteration of the by-laws will be acted upon.
THE ANNUAL CIRCULAR FOR 1891.

The Marine Biological Laboratory.

INTEGRATED IN 1888.

FOURTH SEASON, 1891.

CORPS OF INSTRUCTORS.

DR. C. O. WHITMAN, Director,
Professor of Zoology, Clark University; Editor of the Journal of Morphology.


J. PLAYFAIR McMURRICH . . . Docent in Zoology, Clark University.

T. H. MORGAN . . . . Bruce Fellow, Johns Hopkins University.

W. M. WHEELER . . . . Fellow in Biology, Clark University.

H. C. BUMPUS . . . . Assistant Professor of Zoology, Brown University.

W. M. RANKIN . . . . Instructor in Zoology, Princeton College.

RYOICHE TAKANO, G. M. GRAY,
Artist. Laboratory Assistant.

J. J. VEEDER, Collector.

In addition to the regular courses of instruction in Zoology, Botany, and Microscopical Technique, consisting of lectures and laboratory work, under the direct and constant supervision of the instructors, there will be two or more courses of lectures on special subjects, by members of the Staff. One such course of six lectures will be given by Dr. McMurrich on the Ctenophora and the Turbellaria. Similar courses on the Mollusca, Crustacea, and Echinoidea will be given by Professor Bumpus and Dr. Rankin.

There will also be ten or more evening lectures on biological subjects of general interest. Among those who may contribute these lectures and take part in the discussions upon them may be mentioned, in addition to the instructors above named, the following: —

Dr. H. Ayers, of the Lake Laboratory; Prof. H. H. Donaldson, Clark University; Prof. W. G. Farlow, Harvard University; Prof. J. S. Kingsley, University of Nebraska; Prof. W. Libbey, Jr., Princeton College; Prof. C. S.
Minot, Harvard Medical School; Prof. H. F. Osborn, Princeton College; Dr. S. Watase, Clark University; Prof. E. B. Wilson, Bryn Mawr College.

The Laboratory is located on the coast at Woods Holl, Massachusetts, near the laboratories of the United States Fish Commission. The building consists of two stories: the lower for the use of teachers and students receiving instruction, the upper exclusively for investigators. The Laboratory has aquaria supplied with running sea-water, boats, a steam-launch, collecting apparatus, and dredges; it is also supplied with reagents, glassware, and a limited number of microtomes and microscopes. By the munificence of friends the library will be provided henceforth not only with the ordinary text-books and works of reference, but also with the more important journals of zoology and botany, some of them in complete series.

The Laboratory for Investigators

will be open from June 1 to August 29. It will be fully equipped with aquaria, glassware, reagents, etc., but microscopes and microtomes will not be provided. In this department there are fourteen private laboratories supplied with aquaria, running water, etc., for the exclusive use of investigators, who are invited to carry on their researches here, free of charge. Those who are prepared to begin original work, but require supervision, special suggestions, criticism, or extended instruction in technique, may occupy tables in the general Laboratory for investigators, paying for the privilege a fee of fifty dollars. The number of such tables is limited to ten. Applicants for them should state precisely what they have done in preparation for original work, and whether they can bring a complete outfit; viz., microscope, microtome, camera-lucida, etc. Special attention is invited to these opportunities, as it is believed that they are somewhat unusual.

For the completion of any considerable piece of investigation, beginners usually require from one to three full years. It is not expected, therefore, that the holders of these tables will finish their work in a single season. The aim is rather to make a secure beginning, which will lead to good results if followed up between sessions and renewed, if need be, for several successive years. No applications for less time than the whole season can be received in this department.

The Laboratory for Teachers and Students

will be opened on Wednesday, July 8, for regular courses of seven weeks in Zoology, Botany, and Microscopical Technique. The number admitted to this department will be limited to thirty, and preference will be given to teachers and others already qualified. By permission of the Director, students may begin their individual work as early as June 15, without extra charge, but the regular courses of instruction will not begin before July 8.

More advanced students who may wish to limit their work to special groups will have an opportunity to do so. The regular course in Zoology, in charge
of Professor Bumpus, will embrace a study of the more typical marine forms and elementary methods of Microscopical Technique. The Laboratory work will be accompanied by lectures. The following is an outline of the course proposed:

**JULY 8-13.** Study of the Lobster.

**JULY 13-20.**
(a) Annelids (*Nereis, Serpula, Spirorbis*, etc.).
(b) *Balanoglossus* and *Phascolosoma*.
(c) *Polyzoa*.
(d) *Turbellaria*.

**JULY 20-27.** Coelenterates.

**JULY 27-AUGUST 3.** Mollusks (*Mya, Ostrea, Sycotypus, Loligo*).

**AUGUST 3-10.** Echinoderms (*Starfish, Sea Urchin, Holothurian*, etc.)

**AUGUST 10-17.** Crustaceans (*Branchipus, Cyclops, Lernaea, Lepas, Idotea, Orchestia, Cancer*).

**AUGUST 17-26.** Vertebrates (*Amphioxus, Elasmobranch, Teleost*).

Arrangements for instruction in Botany have not yet been completed, but it is hoped that Mr. Setchell, of Harvard University, will again be able to take charge of the work in this department.

Applicants should state whether they can supply themselves with microscopes and microtomes. Microscope slides, dissecting and drawing instruments, bottles, and other supplies, to be finally taken from the Laboratory, are sold at cost. The tuition fee is twenty-five dollars, payable in advance. Further information, if desired, may be had by addressing Prof. HERMON C. BUMPUS, Woods Holl, Mass.

Applications for places in either department should be addressed to Miss A. D. PHILLIPS, Secretary, 23 Marlborough street, Boston.

Rooms accommodating two persons may be obtained near the Laboratory, at prices varying from $2.00 to $4.00 a week, and board from $4.50 to $6.00. By special arrangement, board will be supplied to members at The Homestead, at $5.00 a week.

A **Department of Laboratory Supply** has been established in order to facilitate the work of teachers and others who desire to obtain materials for study or for classes. It is proposed to furnish, e.g., certain sponges, hydroids, starfishes, sea-urchins, marine worms, crustaceans, mollusks, and vertebrates, in good condition, at fair prices. Orders for the coming college year should be given as soon as possible. Circulars giving information, prices, etc., may be obtained by addressing the "Department of Laboratory Supply," in care of the Secretary.

Woods Holl, owing to the richness of the marine life in the neighboring waters, offers exceptional advantages. It is situated on the north shore of
Vineyard Sound, at the entrance to Buzzard’s Bay, and may be reached by
the Old Colony Railroad (2½ hours from Boston), or by rail and boat from
Providence, Fall River, or New Bedford. Persons coming by the way of
Boston should buy round-trip tickets ($2.85).

The Marine Biological Laboratory is intended to continue and extend the
work of the Laboratory at Annisquam, carried on for six years by the Woman’s
Education Association, with the cooperation of the Boston Society of Natural
History. The Annual Reports of the Trustees, containing an account of its
organization and work, may be obtained from the Secretary.

TRUSTEES.

SAMUEL H. SCUDDER, President . Boston Society of Natural History.
EDWARD T. CABOT, Treasurer . . . . . . Boston.
FLORENCE M. CUSHING . . . . . . Boston.
WILLIAM G. FARLOW . . . . Harvard University, Cambridge.
EDWARD G. GARDINER, Massachusetts Institute of Technology, Boston.
A. LAWRENCE LOWELL . . . . . . Boston.
CHARLES S. MINOT . . . . Harvard Medical School, Boston.
HENRY F. OSBORN . . . . College of New Jersey, Princeton, New Jersey.
WILLIAM T. SEDGWICK, Massachusetts Institute of Technology, Boston.
GEORGIANA W. SMITH . . . . . . Boston.
SIDNEY I. SMITH . . . . Yale University, New Haven, Conn.
EDMUND B. WILSON . . . . Columbia College, New York, N.Y.
ANNA D. PHILLIPS, Secretary . . 23 Marlborough street, Boston.