THE

MARINE BIOLOGICAL

LABORATORY.

SEVENTH ANNUAL REPORT,

FOR THE YEAR

1894.

BOSTON: 1895.
THE MARINE BIOLOGICAL LABORATORY.

SEVENTH ANNUAL REPORT,

FOR THE YEAR

1894.

BOSTON:
1895.
OFFICERS.

1894.

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Assistant Director.

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Winthrop J. V. Osterhaut, Brown University, Providence, R.I.

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Frederic S. Lee, Columbia College, New York, N.Y.
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EDITH F. SAMPSON, Bryn Mawr College, Bryn Mawr, Pa.
LILIAN V. SAMPSON, Bryn Mawr College, Bryn Mawr, Pa.
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LOUISE B. WALLACE, Mt. Holyoke College, South Hadley, Mass.
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ESTHER F. BYRNES, Bryn Mawr College, Bryn Mawr, Pa.

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JOHN McCRAE, University of Toronto, Toronto, Ontario.
JOHN P. MUNSON, University of Chicago, Chicago, Ill.
W. W. NORMAN, De Pauw University, Greencastle, Ind.
MARY M. STURGES, University of Chicago, Chicago, Ill.
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STUDENTS IN EMBRYOLOGY.

C. S. BACON, Chicago Polyclinic, Chicago, Ill.
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FRANCES CRANE, 2541 Michigan Avenue, Chicago, Ill.
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GILBERT L. HOUSE, State University, Iowa City, Iowa.
CRESSWELL SHEARER, College P. & S., Chicago, Ill.
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GEORGE A. TALBERT, High School, La Porte, Ind.
SUSANNAH USHER, Massachusetts Institute of Technology, Boston, Mass.
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EMILY S. RICHARDS, Ross Street, Germantown, Pa.
L. K. RUSSELL, Massachusetts Institute of Technology, Boston, Mass.
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G. D. Stailey, Pennsylvania College, Gettysburg, Pa.
Robert P. Starkweather, Columbia College Physicians and Surgeons,
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Lydia Van Meter, Womans' College, Baltimore, Md.
E. C. Walden, Rust University, Holly Springs, Miss.
Alice W. Wilcox, Norwalk, Conn.

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W. Whitman Bailey, Brown University, Providence, R.I.
Bradley Moore Davis, Harvard University, Cambridge, Mass.
Isaac Holden, 142 Stratford Avenue, Bridgeport, Conn.

INVESTIGATOR UNDER INSTRUCTION.

Emily Ray Gregory, Milwaukee College, Milwaukee, Wis.

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    pa.
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Charlotte L. Tillinghast, Brown University, Providence, R.I.
Florence Woods, 936 Beacon Street, Brookline, Mass.
In making a report to the Corporation of the condition of the Laboratory, the Trustees have the satisfaction of saying that the only serious perplexities of the last year have been the result of its rapid growth and prosperity. The fact that one hundred and thirty-four persons were at work in the different departments during the summer session, and that those represented seventy-five universities, colleges, and schools, will sufficiently indicate this growth.

At the close of 1893 we found ourselves free from debt. The current expenses of the Laboratory had been covered by the fees received from colleges, in support of tables, and from students and investigators. The Dining Club also had met its running expenses. But to no educational institution, with much vitality and little endowment, is a condition of permanent financial equilibrium possible. The prosperity of 1893 demanded larger accommodation for the students of 1894.

Unfortunately, the demands upon a biological laboratory at the sea-shore are of two kinds. The intellectual needs of the student are not alone to be provided for. He must also be fed. This necessity is the more serious in the case of our Laboratory, as, in the small town of Wood's Holl, at a distance from large markets, no adequate provision for supplying food, under the circumstances, would offer any profit.

With a recognition of this need, and of the probability that it would be permanent, the Trustees, in 1890, bought the small house and estate known as the "Gifford Homestead," which
became, through the generosity of Mr. Joseph S. Fay, mainly his gift. The rooms on the first and second floor were used for the Dining Club, and the sheds attached, which were in a very dilapidated state, served four years as kitchen and laundry.

The increased number of students made it necessary, in 1893, to build a dining-room, and in 1894 the dining-room was altered into a kitchen and pantry, and a new building, accommodating one hundred and fifty persons, and containing three dining-rooms, was put up at right angles to and adjoining the kitchen. The rooms in the Gifford House were furnished and let to students, or occupied by the service of the Dining Club. The expense of these considerable additions was met by a loan of $3,500, secured by a mortgage upon the property of the Laboratory.

With the steady gains of experience, this department has been each year more successfully managed and the table more satisfactory, while it has met what may strictly be called its running expenses. But it is an open question whether the Dining Club, with full numbers for only six weeks of the year, with a local market of the high prices prevailing in summer at the seaside, and the city markets at such a distance as to necessitate a large expense for freight, will ever be able, at a price within the reach of the average student, to meet the outlay yearly needed for furnishing and repairs, or to pay interest on the needful buildings. The Trustees are inclined to believe that a certain yearly expenditure for this department must always be provided for.

The original building for the Laboratory had received two large additions previous to the summer of 1893, and at that time, according to the last report, "every available space was occupied, and during the greater part of the season it would have been impossible to receive another worker." At the end of last winter, it became evident that the number of applicants for the opportunities of the Laboratory was greater than could be accommodated. It was the opinion of the Director, to whose valuable and self-sacrificing labors the Laboratory is so greatly indebted, that a new building was essential to its continued success. The requisite amount, $3,000, was advanced by one of
The Trustees, while another member of the Board pledged himself within a given time to raise and repay $1,000 of this amount. The building, which was placed on land included in the Gifford Homestead, was ready for occupancy at the beginning of the summer session, and was devoted specially to the Botanical Department, which included, last summer, twenty-one members.

Reluctant as the Trustees were to incur expenses which would make it necessary, in this time of financial stress, to ask help from the friends of the Laboratory, yet, in the opinion of many, to have checked the growth of the institution at this stage, by turning away desirable students and investigators, would have inflicted a permanent injury. We ask, then, from those whose conviction of the value of such a laboratory has helped to bring it to its present condition of prosperity, still further aid in its future development.

While the work of the Laboratory the past season is matter for the Director's Report, an interesting adjunct of that work, the department of supplies, is not unimportant. Beginning with the preparation of a few specimens in alcohol, a few dried echinoderms, etc., for the use of teachers returning home from the Laboratory, it has grown to a business of $1,200. Specimens are sent over the country to universities and schools, even as far as California. Recognizing the value of such material to the teacher, and remembering how many instructors, after a summer at the Laboratory, return to educational centres, it is evident that the influence of the Laboratory on the teaching of Biology throughout the country must be very considerable.

At Wood's Holl, during the session of the Laboratory, a spirit of earnestness and of enthusiasm in study is very noticeable. Early in the morning, students may be seen in search of such objects of study as are found in the desired condition at that hour, and the lamps in the large building burn far into the night.

In taking account, then, at the end of the season, of the liabilities and invested property of the Laboratory, the Trustees recognize the enthusiastic devotion of its instructors and students as one of the most valuable portions of its as yet unproductive
estate. Scattered, as they are, over the country, representing last summer, as has been said, seventy-five institutions, their own interest in the Laboratory, communicated to their pupils and to the institutions with which they are connected, may be safely counted on as an element of strength in the future. The grateful appreciation of the students took a practical shape last summer, in the formation of a Biological Association, the members of which pledged themselves to raise certain amounts "for the purpose of aiding in the establishing of a permanent Biological Station." Two thousand dollars was subscribed at once. It is a satisfaction to know that, while the urgent demands of each season have forced the Trustees reluctantly to postpone their efforts toward a permanent station, the students have made this their special interest, and recognize its full importance.

Another plan, by which its friends in different cities hope to aid the Laboratory, is the formation of local committees, the purpose and method of which will be best shown by the following resolution of the Board of Trustees:

"Resolved, That the Board of Trustees of the Marine Biological Laboratory authorize the formation of local committees in different cities and educational centres in the country, these committees to be chosen by members of the Board of Trustees, and to be empowered to assist in raising funds in support of the Laboratory; in case they subscribe a sufficient amount for the purpose, that they have the right of nomination of a student or students to Investigators' Tables, subject to the approval of the Board. That the names of the local committees, with the chairman and secretary, be printed in the annual report of the Laboratory, in the order in which they are formed."
Dr. TREASURER’S MARINE BIOLOGICAL LABORATORY IN 1894.

To Instructors ........................................... $1,550 00
Wages ......................................................... 1,512 58
Chemicals, glassware, and instruments ...................... 569 97
Alterations and repairs .................................... 1,154 72
New dining-hall and improvements in main laboratory .... 4,039 61
New pump ..................................................... 484 48
New botanical laboratory .................................. 3,006 48
Stationery, printing, and postage .......................... 263 24
Launch, boats, etc. .......................................... 332 28
Sundry running expenses ................................... 171 94
Furniture ...................................................... 180 03
Freight and express ........................................ 156 63
Lectures ....................................................... 22 50
Books and periodicals ..................................... 770 68
Taxes .......................................................... 12 20
Insurance ..................................................... 133 32
Supply department ........................................... 940 14
Legal services ................................................ 23 17
Paid on account of money advanced by one of the Trustees .................................................. 265 00
Miss E. B. Richardson, for renewals and repairs, being balance of mess account ...................... 103 49
Balance cash on hand:
  With H. C. Bumpus, Bursar  $306 58
  Old Colony Trust Company,  364 09
  .............................................................. 670 67

$16,363 13
REPORT.

ACCOUNT WITH LAURENCE MINOT, TREASURER.  Cr.

Nov. 8, 1893.

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<th>Description</th>
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<td>1 Annual assessment, 1893</td>
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<td>194 Annual assessments, 1894</td>
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<td>6 Annual assessments, in advance</td>
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<td>General contributions</td>
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<td>Contributions for botanical laboratory</td>
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<td>Fees of students and investigators</td>
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<td>Receipts of supply department</td>
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<td>Rent of microscopes</td>
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<td>Amount borrowed on mortgage</td>
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<td>Amount borrowed of one of the Trustees</td>
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<td>Crocker Fund, 3 scholarships in 1893</td>
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<td>Interest on daily balances in bank</td>
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$16,363.13

E. & O. E., Nov. 1, 1894.

LAURENCE MINOT,
Treasurer.
The Laboratory also has the following Endowment Funds:

LUCRETIA CROCKER SCHOLARSHIP FUND.
Invested as follows:
18 shares Vermont & Massachusetts R.R.
Cash Capital, $83.50.
Income, $100.52.

INVESTMENT FUND.
Invested as follows:
$1,000 4% bond St. Paul, Minn., & Manitoba R.R., Mont. Extension.
$1,000 5% bond Chi., Bur. & Northern R.R.
Carter note and mortgage, $800.
1 share Chicago & Alton R.R.
Cash Capital, $22.34.
Income, $305.97.

LIBRARY FUND.
Invested as follows:
5 shares Chicago & Alton R.R.
Cash Income, $33.

E. & O. E., Nov. 1, 1894.

LAURENCE MINOT,
Treasurer.
DONORS AND GIFTS.

Anonymous, $900 00 Laurence Minot, $10 00
Anonymous, 15 00 William Minot, Jr., 50 00
Miss H. C. Bradlee, 20 00 T. H. Morgan, 100 00
H. C. Bumpus, 4 00 Prof. E. S. Morse, 10 00
Dr. David W. Cheever, 4 00 Laura Norcross, 50 00
Eliza Collamore, 5 00 Henry F. Osborn, 50 00
Helen Collamore, 5 00 Henry F. Osborn, donation, 5 00
Miss M. H. Crocker, 10 00 Mrs. Joseph Parish, 50 00
Prof. John G. Curtis, 25 00 Alfred Pell, 10 00
Florence M. Cushing and friends, 282 01 James F. Porter, 10 00
Lucy Ellis, 200 00 Anna P. Rogers, 100 00
Miss Harriet E. Freeman, 15 00 Miss L. V. Sampson, 10 00
Miss Harriet E. Freeman, 4 00 William T. Sedgwick, 5 00
Miss Ellen Frothingham, 10 00 Mrs. Charles C. Smith, 225 00
Franklin H. Giddings, 5 00 Ellison A. Smyth, Jr., 1 20
Miss Leah Goff, 10 00 Miss Katherine A. Taylor, 5 00
Mary T. Gorham, 25 00 William Trelease, 100 00
James S. Gorsline, 5 00 Susan G. Walker, 25 00
Miss Henrietta L. Graves, 5 00 Elizabeth C. Ware, 25 00
W. O. Grover, 100 00 Mrs. S. D. Warren, 4 00
Harris Kennedy, 25 00 Samuel Wells, 4 00
Mrs. Anna C. Lowell, 100 00 Dr. W. F. Whitney, 4 00
Ida M. Mason, 200 00 Dr. Edward Wigglesworth, 9 00
Susan Minns, 100 00 Prof. W. P. Wilson, 4 00

ANNUAL SUBSCRIBERS.

Prof. N. L. Britton, $10 00 J. P. Morgan, Jr., $10 00
Charles F. Cox, 5 00 Prof. Henry F. Osborn, 5 00
BY-LAWS OF THE CORPORATION.

1. The annual meeting of the members shall be held in Boston on the first Thursday 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, Treasurer, and not more than 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 remove them, or any of them, except those chosen by the members, 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, postpaid. Four Trustees shall constitute a quorum for the transaction of business.

7. The President shall, annually, in the month of December, appoint two Trustees who 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.
ACT OF 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, S. 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.
LIFE MEMBERS OF THE CORPORATION.

Dr. W. S. Bigelow,
Mr. Robert C. Billings,
Miss H. C. Bradlee,
Mr. A. A. Carey,
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 S. B. Fay,
Miss Amy Folsom,
Mr. John M. Forbes,
Mr. John Foster,
Dr. E. G. Gardiner,
Miss Eugenia 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. S. Kidder,
Miss Anna C. Lowell,
Mr. A. Lawrence Lowell,
Miss Ellen F. Mason,
Miss Ida M. Mason,
Mrs. Daniel Merriman,
Mr. Thomas Minns,
Mr. William Minot,
Prof. Charles S. Minot,
Miss M. C. Mixter,
Miss Laura Norcross,
Mr. Alfred Pell,
Mrs. John C. Phillips,
Mr. R. M. Pulsifer,
Miss Annette P. Rogers,
Mrs. William B. Rogers,
Mr. Henry Saltonstall,
Dr. Henry F. Sears,
Mrs. C. C. Smith,
Mr. J. P. Spaulding,
Prof. William Trelease,
Mrs. C. E. Ware,
Miss M. L. Ware,
Mrs. S. D. Warren,
Mr. Henry M. Whitney,
Mr. Thomas Wigglesworth,
Miss Mary A. Willcox,
Mrs. Anna Phillips Williams,
Mrs. H. D. Wilmarth.
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Mrs. James B. Ames,
Miss Anna S. Amory,
Mrs. E. A. Andrews,
Miss A. F. Armes,
Prof. C. B. Atwell,
Miss Sarah Averill,
Dr. Howard Ayres,
Miss C. H. Barbour,
Mr. Charles E. Barr,
Miss Mary Bartlett,
Mr. J. L. Batchelder, Jr.,
Dr. G. Baur,
Dr. H. H. A. Beach,
Mrs. H. H. A. Beach,
Miss Alma E. Beale,
Miss A. H. Beckler,
Mr. E. Pierson Beebe,
Mr. J. Arthur Beebe,
Miss Elizabeth E. Bickford,
Dr. R. P. Bigelow,
Prof. E. A. Birge,
Miss Elizabeth Blanchard,
Miss Clara A. Bliss,
Miss E. D. Boardman,
Miss L. A. Bragg,
Prof. Melvin Brannon,
Mr. Edwin T. Brewster,
Mr. F. P. Briggs,
Prof. C. L. Bristol,
Mr. H. C. Brode,
Prof. W. K. Brooks,
Miss B. M. Brown,
Mr. Edward M. Brown,
Miss D. L. Bryant,
Prof. H. C. Bumpus,
Miss Martha Bunting,
Mr. E. D. Burbank,
Mr. W. H. Burr,
Mr. Severance Burrage,
Miss Charlotte Bushnell,
Miss E. F. Byrnes,
Mr. Gary N. Calkins,
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Prof. L. W. Chaney, Jr.,
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Prof. H. V. Wilson,
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THE ANNUAL CIRCULAR FOR 1894.

The Marine Biological Laboratory
AT WOOD’S HOLL, MASS.
INCORPORATED IN 1888.
SEVENTH SEASON, 1894.
JUNE 1st—AUGUST 30TH.

OFFICERS OF INSTRUCTION.

C. O. WHITMAN, Director,
Head Professor of Zoölogy, The University of Chicago; Editor of the
"Journal of Morphology."

H. C. BUMPUS, Assistant Director,
Professor of Comparative Anatomy, Brown University.

ZOOLOGY.

A. INVESTIGATION.

HOWARD AYRES . Director of the Allis Lake Laboratory, Milwaukee.
J. PLAYFAIR McMURRICH, Professor of Biology, University of Cincinnati.
E. G. CONKLIN . . Professor of Biology, Ohio Wesleyan University.
S. WATASE . . . . . . . University of Chicago.
F. R. LILLIE . . . . Fellow in Zoölogy, University of Chicago.
O. S. STRONG . . . . Department of Biology, Columbia College.

B. INSTRUCTION.

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J. L. KELLOGG . . . . . . Professor of Biology, Olivet College.
PIERRE A. FISH, Instructor in Physiology and Anatomy, Cornell University.
A. D. MEAD . . . . . . Fellow in Zoölogy, University of Chicago.
BOTANY.

W. A. SETCHELL . . . . . . Instructor in Botany, Yale University.
W. J. V. OSTERHOUT . . . . Instructor in Botany, Brown University.

PHYSIOLOGY.

JACQUES LOEB, Assistant Professor of Physiology, University of Chicago.

F. W. WALMSLEY, Collector. G. M. GRAY, Laboratory Assistant.

COOPERATING COLLEGES.

The following institutions subscribed for rooms and tables during 1893:
Bowdoin, Brown, Bryn Mawr, Cincinnati, Columbia, Mass. Institute of Techno-
logy, Miami, Mt. Holyoke, Missouri Botanical Garden, Northwestern, 

GENERAL INFORMATION.

The Laboratory was opened in the summer of 1888 for the use of students 
and investigators in Marine Zoölogy. Departments of Botany and Physiol-
ogy have since been added. The work is now organized with reference to the 
needs of three classes of workers; namely, (1) students, (2) teachers of science, 
and (3) investigators. Regular courses of instruction, consisting of lectures 
and laboratory work under the constant supervision of the instructors, are 
given in Vertebrate Anatomy, Zoölogy, Botany, Embryology, and Microscop-
cial Technique. In addition to these, there will be courses of lectures on 
special subjects open to all members of the Laboratory, as follows:

Embryology . . . . . . . . . . . . . Professor Whitman.

Invertebrate Zoölogy, by Drs. Bumpus, McMurrich, Rankin, Conklin, and 
Kellogg.

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

Professors W. G. Farlow, Harvard University; William Libbey, Jr., Prince-
ton College; John A. Ryder, W. P. Wilson, J. M. McFarlane, University of 
Pennsylvania; W. T. Councilman, C. S. Minot, Harvard Medical School; 
E. S. Morse, Salem; H. F. Osborn, E. B. Wilson, Columbia College; W. T. 
Sedgwick, Massachusetts Institute of Technology; E. G. Gardner, Boston; 
and Alpheus Hyatt.
Owing to the richness of the marine life in the neighboring waters, Wood's Holl offers exceptional advantages. It is situated on the north shore of Vineyard Sound, at the entrance of 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. Rooms accommodating two persons may be obtained near the Laboratory, at prices varying from $2.00 to $4.00 a week, and board from $4.00 to $6.00. Board will be supplied to members at the Homestead at $5.00 a week.

The Laboratory building consists of two stories, and has 33 private rooms for investigators and 5 general laboratories,—two for beginners in investigation in Animal Morphology, one for teachers and students receiving instruction in Vertebrate Anatomy and Zoölogy, one for Botany, and one for Physiology. There are numerous aquaria, boats, a steam-launch, collecting apparatus, and dredges; it is also supplied with reagents, glassware, and a limited number of microtomes and microscopes. No alcohol can be supplied beyond what is required for work in the laboratories.

By the munificence of friends, the Library will be provided not only with the ordinary text-books and works of reference, but also with the more important journals of zoölogy and botany, some of them in complete series.

A Department of Laboratory Supply has been established in order to facilitate the work of teachers and others at a distance who desire to obtain material for study or for class instruction. Certain sponges, hydroids, starfishes, sea-urchins, marine worms, crustaceans, molluscs, vertebrates, and marine plants are generally kept in stock, though larger orders should be filed some time before the material is needed. Circulars giving information, prices, etc., may be obtained by addressing the Collector, Mr. F. W. Walmsley, Wood's Holl, Mass.

**THE LABORATORIES FOR INVESTIGATORS.**

Open June 1 to August 30.

In this department there are 33 private laboratories for the exclusive use of investigators, which may be rented to cooperating colleges at $100. Each laboratory is equipped with glassware, reagents, etc., but microscopes will not be provided.

Those who are prepared to begin original work under the guidance of instructors will occupy tables in the general Laboratories for Investigators, paying for the privilege a fee of fifty dollars. The number of such tables is limited to twelve.

The Elementary Course in Vertebrate Embryology will be continued this season. This course is designed for those who have completed the general courses in the Students' Laboratory. The study will be confined mainly to the fish-egg as the best type for elucidating vertebrate development. Each member of the class will be supplied with material, and be expected to work out each step in the development from the moment of fecundation. The aim will be not only to master the details of development, but also to acquire a thorough knowledge of the methods of preparing surface-views, imbedding in
paraffin and celloidin, various methods of staining and mounting, drawing, reconstructing, modelling, etc. The course will thus combine just what is needed as a preparation for investigation. The course will open Wednesday, July 11, and continue till August 18, and it will be conducted by Messrs. Lillie, Strong, and Whitman. The fee for this course will be fifty-dollars, and the class will be limited to twelve.

Applicants should state what they have done in preparation for such a course, and whether they can bring a complete outfit; viz., a compound microscope, a dissecting microscope (the Paul Mayer pattern made by Zeiss is the best), camera-lucida, microtome, etc. In case these instruments are furnished by the Laboratory, an additional fee of ten dollars will be charged therefor. No application for less than the whole course will be granted.

THE LABORATORY FOR TEACHERS AND STUDENTS.

Open July 4 to August 18.

As the opportunities for work in this Laboratory have been very materially extended, a rearrangement of the courses has been found necessary.

A Course in Vertebrate Anatomy will be offered from July 4 to July 11, if the number of applications received before June 10 seem to warrant such a course. The anatomy of the shark and skate will be thoroughly studied, an abundance of material for dissection being supplied. This course may be made preparatory to the Elementary Course in Vertebrate Embryology, or to the regular course in Zoology. The fee of ten dollars includes tuition and all material used for dissection.

The Course in Zoology, open from July 11 to August 18, will embrace a study of the more typical marine forms and elementary methods of Microscopical Technique. Instruction is given by lectures, laboratory work, and collecting excursions.

The lectures are given each morning, and often by those who are specialists in the subject under consideration. For Laboratory dissection, each student is supplied with an abundance of fresh material, and the entire day is spent in study under the direction of the instructors. Collecting excursions are taken on Wednesdays and on Saturdays to the most promising collecting grounds. The steam-launch and boats are freely used, and methods of dredging, skimming, and general collecting are explained.

The course of instruction will be as follows:

July 11-18. Coelenterates (Grantia, Campanularia, Tubularia, Metridium, Mnemeoeopis).


July 26-August 1. Echinoderms (Asterias, Arbacia, Echinarachnius Thyone).

August 2-8. Mollusks (Venus, Sycotyphus, Loligo).


August 15-18. Tunicates (Molgula).
The tuition fee is thirty-five dollars, payable in advance. Applicants should state whether they can supply themselves with simple and compound microscopes, or whether they wish to hire. Microscopic slides, dissecting and drawing instruments, bottles, and other supplies, to be finally taken away, are on sale near the Laboratory by the Bausch and Lomb Optical Company.

Further information in regard to the courses in Vertebrate Anatomy and Zoology may be had by addressing Prof. HERMON C. BUMPUS, Brown University, Providence, R.I., to whom applications for admission should also be made.

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BOTANY.

THE LABORATORY FOR TEACHERS AND STUDENTS.

Open JUNE 11 to AUGUST 18.

The Laboratory work in Botany will be restricted to the study of the structure and development of types of the various orders of the cryptogamous plants. Especial attention will be given to the study of the various species of Marine Algae, which occur so abundantly in the waters about Wood’s Holli, and students desiring to give their entire attention to these plants will be encouraged to do so. The Fungi and higher Cryptogams will receive less attention than the Algae, but will be studied in a few types.

Lectures will accompany the Laboratory work. The course may be outlined somewhat as follows:

FIRST WEEK. Cyanophycææ (Lyngbya, Calothrix, Rivularia, Stigonema, Tolyphothrix, Anabena).
THIRD WEEK. Rhodophycææ (Batrachospermum, Nemalion, Callithamnion, Chondriopsis, Rhabdonia).
FOURTH WEEK. Phycomycetes (Mucor, Sporodinia, Peronospora, Cystopus, Achlya). Uredinei (Æcidium, Uredo, Puccinia, Uromyces).
FIFTH WEEK. Basidioymycetes (Agaricus, Lycoperdon). Ascomycetes (Microsphæra, Sordaria, Peziza, Physcia).

The tuition for students in the regular course of Laboratory work and lectures is thirty-five dollars, payable in advance; for students engaged in investigation the tuition is fifty dollars.

Students are expected to supply their own instruments or to pay an extra fee for those borrowed from the Laboratory.

Applications should be addressed to WILLIAM A. SETCHELL, 2 Hillhouse Avenue, New Haven, Conn.
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SIDNEY I. SMITH . . . Yale University, New Haven.
WILLIAM TRELEASE . . . Missouri Botanical Garden, St. Louis.
R. RAMSAY WRIGHT . . . University of Toronto, Toronto.

The Annual Report of the Trustees, containing an account of the organization and work of the Laboratory, may be obtained from the Secretary.

ANNOUNCEMENT FOR 1895.

The Annual Circular for the Session of 1895 will soon be issued and may be obtained from MRS. ANNA PHILLIPS WILLIAMS, Secretary, No. 23 Marlborough Street, Boston, Mass.