THE MARINE BIOLOGICAL LABORATORY.

EIGHTH ANNUAL REPORT,

FOR THE YEAR

1895.

BOSTON:
1896.
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TRUSTEES.

\[\text{Samuel H. Scudder, President, Cambridge, Mass.}\]
\[\text{William K. Brooks, Johns Hopkins University, Baltimore, Md.}\]
\[\text{Samuel F. Clarke, Williams College, Williamstown, Mass.}\]
\[\text{Florence M. Cushing, 8 Walnut street, Boston.}\]
\[\text{William G. Farlow, Harvard University, Cambridge, Mass.}\]
\[\text{William Libby, Jr., College of New Jersey, Princeton, N.J.}\]
\[\text{J. Playfair McMurrich, University of Michigan, Ann Arbor, Mich.}\]
\[\text{Charles S. Minot, Harvard Medical School, Boston, Mass.}\]
\[\text{Henry F. Osborn, Columbia College, New York.}\]
\[\text{William T. Sedgwick, Massachusetts Institute of Technology, Boston.}\]
\[\text{Benjamin Sharp, Academy of Natural Sciences of Philadelphia, Philadelphia, Penn.}\]
\[\text{Georgiana W. Smith, 286 Marlborough street, Boston.}\]
\[\text{Sidney I. Smith, Yale University, New Haven, Conn.}\]
\[\text{William TRELEASE, Missouri Botanical Garden, St. Louis, Mo.}\]
\[\text{C. O. Whitman, Director, University of Chicago, Chicago, Ill.}\]
\[\text{Edmund B. Wilson, Columbia College, New York, N.Y.}\]
\[\text{W. P. Wilson, University of Pennsylvania, Philadelphia, Penn.}\]
\[\text{R. Ramsay Wright, University of Toronto. Toronto, Canada.}\]
\[\text{Edward G. Gardiner, Clerk, 131 Mt. Vernon street, Boston.}\]
\[\text{Laurence Minot, Treasurer, 39 Court street, Boston.}\]
\[\text{Anna Phillips Williams, Secretary, 23 Marlborough street, Boston.}\]

OFFICERS.

Director.

C. O. Whitman, University of Chicago, Chicago, Ill.

Assistant Director.

H. C. Bumpus, Brown University, Providence, R.I.
INSTRUCTORS.

ZOÖLOGY.

A. INVESTIGATION.
Howard Ayers, Professor of Biology, University of Missouri.
E. G. Conklin, Professor of Zoölogy and Neurology, Northwestern University.
S. Watase, Assistant Professor of Zoölogy, University of Chicago.
M. M. Metcalf, Professor of Biology, The Woman's College of Baltimore.
C. M. Child, Fellow in Zoölogy, University of Chicago.
F. R. Lillie, Instructor in Zoölogy, University of Michigan.
O. S. Strong, Instructor in Zoölogy, Columbia College.
H. S. Brode, Fellow in Zoölogy, University of Chicago.

B. INSTRUCTION.
W. M. Rankin, Assistant Professor of Biology, Princeton College.
J. L. Kellogg, Professor of Biology, Olivet College.
P. A. Fish, Instructor in Physiology, Zoölogy, and Neurology, Cornell University.
H. E. Walter, Instructor in Biology, N. Division High School, Chicago.

BOTANY.
W. A. Setchell, Assistant Professor of Botany, Yale University.
W. J. V. Osterhout, Instructor in Botany, Brown University.

PHYSIOLOGY.
Jacques Loeb, Associate Professor of Physiology, University of Chicago.
W. N. Norman, Professor of Biology, University of Texas.

INVESTIGATORS.

A. OCCUPYING PRIVATE ROOMS.

1. ZOÖLOGY.
Ayers, Howard, B.S., Ph.D., Professor of Biology, University of Missouri, Columbia, Mo.
Bigelow, R. P., Ph.D., Instructor in Biology, Massachusetts Institute of Technology, Boston, Mass.
Boyer, E. R., Honorary Fellow, University of Chicago, Ill.
Brode, Howard S., Fellow in Zoölogy, University of Chicago, Chicago, Ill.
INVESTIGATORS AT THE LABORATORY.

Bumpus, H. C., Ph.D., Professor of Comparative Anatomy, Brown University, Providence, R.I.
Calkins, G. N., Instructor in Biology, Columbia College, New York.
Child, Charles M., Ph.D., Fellow University of Chicago, Chicago, Ill.
Clapp, Cornelia Maria, Ph.D., Professor of Zoology, Mt. Holyoke College, South Hadley, Mass.
Clark, Gaylord P., M.D., Professor of Physiology, Syracuse University, Syracuse, N.Y.
Conklin, Edwin Grant, Ph.D., M.A., Professor of Zoology and Neurology, Northwestern University, Evanston, Ill.
Crampton, Henry E., Jr., B.A., Assistant in Biology, Columbia College, New York.
Fish, Pierre A., D.Sc., Instructor in Physiology, Zoology, and Neurology, Cornell University, Ithaca, N.Y.
Foote, Katherine, Evanston, Ill.
Gardiner, Edward G., S.B., Ph.D., Boston, Mass.
Graf, Arnold, Ph.D., Department of Biology, Columbia College, New York.
Kean, Alexander Livingston, Elizabeth, N.J.
Kellogg, James L., Ph.D., Professor of Biology, Olivet College, Olivet, Mich.
Lillie, Frank R., B.A., Ph.D., Instructor in Zoology, University of Michigan, Ann Arbor, Mich.
McMurrich, J. P., M.A., Ph.D., Professor of Anatomy, University of Michigan, Ann Arbor, Mich.
Mead, Albert D., M.A., Ph.D., Instructor in Neurology, Brown University, Providence, R.I.
Metcalf, Maynard M., A.B., Ph.D., Associate Professor of Biology, Woman's College of Baltimore, Md.
Morrill, A. D., B.S., M.S., Professor of Chemistry and Biology, Hamilton College, Clinton, N.Y.
Randolph, Harriet, Demonstrator in Biology and Botany, Bryn Mawr College, Pennsylvania.
Rankin, Walter M., B.A., Ph.D., Assistant Professor of Biology, Princeton College.
Sampson, Lillian V., M.A., Instructor in Biology, Bryn Mawr College, Pennsylvania.
Shrader, William, Ph.D., Professor of Electrical Engineering, University of Missouri.
Strong, Oliver S., M.A., Ph.D., Instructor in Biology, Columbia College, New York.
Tower, R. W., M.A., Instructor in Chemical Physiology, Brown University, Providence, R.I.
Wallace, Louise B., Instructor in Zoology, Mt. Holyoke College, South Hadley, Mass.
Walter, Herbert E., A.M., Instructor in Biology, North Division High School, Chicago, Ill.
WATASÉ, Sho, Ph.D., Assistant Professor of Zoology, University of Chicago, Ill.
WHITMAN, C. O., Ph.D., LL.D., Head Professor of Zoology, University of Chicago, Ill.
WILSON, E. B., Ph.D., Professor of Zoology, Columbia College, New York.

2. PHYSIOLOGY.
FLEXNER, Simon, Associate Professor of Pathology, Johns Hopkins University, Baltimore, Md.
HARDESTY, Irving, A.B., Student, University of Chicago.
LEE, Frederic S., Ph.D., Adjunct Professor of Physiology, Columbia College, New York.
LOEB, Jacques, Assistant Professor of Physiology, University of Chicago, Chicago, Ill.
NORMAN, W. W., B.S., A.M., Adjunct Professor of Biology, University of Texas, Austin, Texas.
VANDUYN, John, M.A., M.D., Professor of Surgery, Syracuse University, Syracuse, N.Y.

3. BOTANY.
OSTERHOUT, W. J. V., A.B., A.M., Instructor in Botany, Brown University, Providence, R.I.
SETCHELL, WM. ALBERT, A.B., A.M., Assistant Professor of Botany, Yale University, New Haven, Conn.

B. OCCUPYING TABLES.

1. ZOOLOGY.
CLAYPOLE, AGNES M., Ph.B., M.S., Fellow, University of Chicago, Ill.
FLYING, HARRY R., A.B., Graduate Student, University of Chicago, Ill.
GRIFFIN, B. B., B.S., Fellow in Biology, Columbia College, N.Y.
KEITH, S. EMMA, B.S., Graduate Student, Mt. Holyoke College, Mass.
LANGENSECK, CLARA, B.S., Fellow in Biology, Bryn Mawr College, Penn.
LEWIS, MARGARET, A.B., Graduate Student, Radcliffe College, Harvard University.
LEWIS, WARREN HERMON, A.B., Graduate Assistant in Vertebrate Morphology, University of Michigan, Ann Arbor, Mich.
McCASKELL, VIRGIL E., Fellow, University of Chicago.
MENSCH, CALVIN P., M.D., Ph.D., Professor of Biology, Ursinus College, Penn.
MUNSON, WILLIAM HENRY, B.S., Professor of Biology, Hillsdale College, Hillsdale, Mich.
PACKARD, WALES H., B.S., Fellow, University of Chicago.
STURGES, MARY MATHEWS, B.S., Student, University of Chicago.
TALBERT, GEORGE A., M.S., Instructor in Science, High School, La Porte, Ind.
STUDENTS AT THE LABORATORY.

2. PHYSIOLOGY.
Maxwell, S., B.S., M.S., Professor of Biology, Monmouth College, Ill.
Dean, Miss L. C., A.B., Assistant in Biology, Vassar College, Poughkeepsie, N.Y.

3. BOTANY.
Bement, Fred, A.B., Student, Brown University, Providence, R.I.
Bliss, Clara A., Professor of Botany, Wells College, N.Y.
Derrick, C. M., B.A., Demonstrator in Botany, McGill University, Montreal.
Esten, Rhoda A., Superintendent's Assistant, Providence Public Schools, Providence, R.I.
Nott, Charles Palmer, Student, Brown University, Providence, R.I.

STUDENTS.

1. EMBRYOLOGY.
(Course preparatory to investigation.)
Atherton, Lewis, B.S., Student, Albion College, Albion, Mich.
Barr, Charles E., A.B., A.M., Professor of Astronomy and Biology, Albion College, Albion, Mich.
Barrows, Franklin W., A.B., A.M., M.D., Lecturer in Histology, University of Buffalo, N.Y.
Barrows, Isabella, S.D., Special Student, University of Buffalo, N.Y.
Brace, Edith M., S.B., Graduate Student, University of Chicago, Chicago, Ill.
Brownell, Laura, A.B., Assistant in Biological Laboratory, Vassar College, Poughkeepsie, N.Y.
Coleman, Anne C., A.B., Bryn Mawr College, Bryn Mawr, Penn.
Davis, Louise Dudley, Student, Bryn Mawr College, Bryn Mawr, Penn.
Ellsworth, Julia, Student, Mt. Holyoke College, South Hadley, Mass.
Gaines, Elizabeth V., Instructor in Biology, Adelphi Academy, Brooklyn, N.Y.
Gilbert, J. L., M.D., Professor of Histology, Pathology, and Bacteriology, Kansas Medical College, Topeka, Kan.
Hazen, Anna Putnam, B.L., Smith College, Northampton, Mass.
Hubbard, Ernest V., B.A., Student, College Physicians and Surgeons, Columbia College, N.Y.
Hunter, George William, Jr., B.A., Assistant in Biological Laboratory, Williams College, Williamstown, Mass.
JONES, PAUL M., Instructor in Biology, Vanderbilt University, Nashville, Tenn.
LEWIS, FRED Z., A.B., Assistant in Biology, Syracuse University, Syracuse, N.Y.
MARTIN, GEORGE W., B.S., A.M., Ph.D., Instructor in Biology, High School, Indianapolis, Ind.
Monsch, ANNA, A.B., Graduate Student, Vassar College, Poughkeepsie, N.Y.
Peedles, Florence, A.B., Bryn Mawr College, Bryn Mawr, Penn.
Richards Emily S., B.A., Vassar College, Poughkeepsie, N.Y.
Schively, Adeline F., Assistant in Department of Biology, Girls' Normal School, Philadelphia, Penn.
Shibley, Mary C., M.D., Student, University of Chicago, Ill.
Smallwood, Martin, Assistant in Biological Laboratory, Syracuse University, Syracuse, N.Y.
Snow, Letitia Morris, A.B., Graduate, Woman's College, Baltimore, Md.
Sperry, Mary A., M.D., Woman's Medical College, Philadelphia, Penn.
Storrre, Frances, A.B., M.D., Assistant Professor of Surgery, Kansas Medical School, Topeka, Kan.
Van Kleek, Melvina, A.B., Vassar College, Poughkeepsie, N.Y.
Van Meter, Lillian, Student, Woman's College of Baltimore, Md.
Wilcox, Alice Wilson, A.B., Teacher of Science, Warren Academy, Warren, Ill.

2. ZOOLOGY.

A. INVERTEBRATE COURSE.

Allport, W. H., M.D., Professor of Anatomy, Chicago Medical College.
Atwater, David H., Student, James School, Syracuse, N.Y.
Bailey, David T., Student, University of Chicago.
Beckler, Alice H., S.B., Assistant in Biology, Girls' Normal School, Philadelphia, Penn.
Bridgham, Joseph, Artist, Brown University, Providence, R.I.
Bushnell, Charlotte, Cleveland, Ohio.
Coon, Marion, M.D., Instructor in Comparative Anatomy, Boston University School of Medicine, Boston, Mass.
Cragin, Henry B., Jr., Student, Lake Forest University, Lake Forest, III.
Darby, Fred. J., Ph.B., Instructor, High School, LaGrange, Ill.
De Veney, Isabella M., Teacher, Central High School, Cleveland, Ohio.
Dimon, A. C., Student, Bryn Mawr College, Pennsylvania.
Eply, Francis W., A.B., Principal, High School, Marquette, Mich.
STUDENTS AT THE LABORATORY.

FIELD, Adele M., New York City.
FINDLAY, Merlin C., A.B., A.M., Professor of Natural Science, Park College, Parkville, Mo.
GILCHRIST, Maude, Instructor in Botany, Wellesley College, Wellesley, Mass.
GOLDMARK, Pauline D., Student, Bryn Mawr College, Penn.
GRUBBS, E. C., B.S., Superintendent of Schools, Wymore, Neb.
HATHERELL, Rosalia A., B.S., Teacher in Botany, Normal School, River Falls, Wis.
HAYNES, Earl P., A.B., Instructor, Academy, Middletown, N.Y.
HOUSER, Gilbert L., B.S., M.S., Assistant Professor of Animal Morphology, Iowa College, Iowa City, Iowa.
HUGUENIN, Edith, Teacher of Biology, Medill High School, Chicago, Ill.
JAMES, Lucille A., Student, Boston University School of Medicine, Boston, Mass.
JOHNSON, Roswell H., Student, Cornell University, Ithaca, N.Y.
KERR, Ellis K., Student, Northwestern University, Evanston, Ill.
LEWIS, Fred Z., Assistant in Biology, Syracuse University, Syracuse, N.Y.
LOW, Grace Elizabeth, Student, Mt. Holyoke College, South Hadley, Mass.
LYNDALL, Helen M., Head of Zoological Department, Girls' High School, Philadelphia, Penn.
MANSFIELD, Mary Page, Student, Mt. Holyoke College, South Hadley, Mass.
MARSHALL, Mary A., Teacher of Botany and Zoology, Hillsdale High School, New Haven, Conn.
McGREGOR, James H., B.S., Fellow in Biology, Columbia College, New York.
MINER, Roy Waldo, Student, Williams College, Williamstown, Mass.
MITCHELL, L. N., Ph.B., Teacher of Zoology and Botany, Normal School, Milwaukee, Wis.
MORGAN, H. A., B.S.A., Professor of Zoology, Louisiana State University, and Entomologist of State Experiment Stations, Baton Rouge, La.
NEIGLICK, Anna, B.S., Student, Northwestern University, Evanston, Ill.
OGLEVEE, Christopher S., B.S., Instructor in Zoology, Lincoln University, Lincoln, Ill.
OLDBERG, Olga, Student, Englewood High School, Chicago, Ill.
O'NEILL, Helen McFarlan, Student, Smith College, Northampton, Mass.
OSGOOD, Lucy Royal, A.B., Assistant in Zoological Laboratory, Mt. Holyoke College, South Hadley, Mass.
OWEN, D. A., A.B., A.M., Professor of Biology, Franklin College, Franklin, Ind.
PENFIELD, Benjamin B., A.B., A.M., Ph.D., Professor of Biology, University of Nashville, Tenn.
POTTER, E. L., Invertebrate Department, Ward's Natural Science Establishment, Rochester, N.Y.
PRATHER, MARY BURD, Teacher of Zoölogy and Physiology, Hughes High School, Cincinnati, O.
ROBBINS, EMILY CURTIS, Student, Radcliffe College, Cambridge, Mass.
ROBY, C. F., Student, University of Chicago, Chicago, Ill.
ROCKWELL, JOHN A., Student, Massachusetts Institute of Technology, Boston, Mass.
SLAGLE, S. ELIZABETH, Student, Boston University School of Medicine, Boston, Mass.
SMALLWOOD, MABEL E., Teacher of Biology, Englewood High School, Chicago, Ill.
SLOWDEN, LOUISE HORTENSE, Student, University of Pennsylvania, Philadelphia, Penn.
STICKNEY, MYRON B., A.B., A.M., Graduate Student, Brown University, Providence, R.I.
STONE, ELLEN APPLETON, A.B., Graduate Student, Brown University, Providence, R.I.
STORKE, SOPHIA D., A.B., A.M., Science Teacher, South High School, Cleveland, O.
VOGT, FREDERICK A., Principal, High School, Buffalo, N.Y.
WATERS, EULA JENNIE, Student, Northwestern University, Evanston, Ill.
WILLARD, WM. A., Ph.B., Assistant in Biology, Iowa College, Grinnell, Iowa.
WILLIAMS, ROY D., Student, Northwestern University, Evanston, Ill.
WINN, MARY ELEANOR, Teacher, Bennet School, Boston, Mass.
YOCOM, BERTHA E. C., Student, University of Pennsylvania, Philadelphia, Penn.

B. VERTEBRATE COURSE.
ANDERSON, ABRAM E., Student, Columbia College, New York City.
ATWATER, DAVID H., Student, James School, Syracuse, N.Y.
BAILEY, DAVID T., Student, University of Chicago.
BARLOW, JOHN, Student, Middlebury College, Middlebury, Vt.
BOYER, A., Professor of Natural Philosophy, St. Mary's Seminary, Baltimore, Md.
BROCKWAY, FRED. J., A.B., M.D., Assistant Demonstrator in Anatomy, Columbia College, New York City.
BUSHNELL, CHARLOTTE, Cleveland, O.
COLLINS, A. E., Student, University of Pennsylvania, Philadelphia, Penn.
COON, MARION, M.D., Instructor, Comparative Anatomy and Zoölogy, Boston University School of Medicine, Boston, Mass.
CRAGIL', HENRY B., Jr., Student, Lake Forest University, Lake Forest, Ill.
CRAWFORD, A.M., Teacher, Botany, Zoölogy, Physics, High School, Buffalo, N.Y.
DE VENNEY, ISABELLA M., Teacher, Central High School, Cleveland, O.
DORR, A. W., Student, Hillsdale College, Mich.
EMERSON, DORA B., Instructor in Science, Teachers' College, New York City.
EPLY, FRANCIS W., Principal, High School, Marquette, Mich.
STUDENTS AT THE LABORATORY.

FINDLAY, MERLIN C., Professor of Natural Science, Park College, Parkville, Mo.

GRISTE, ETHEL L., Student, College for Women, Western Reserve University, Cleveland, O.

GRUBBS, E. C., B.S., Superintendent of Schools, Wymore, Neb.

HATHERELL, ROSALIA A., B.S., Teacher in Biology, Normal School, River Falls, Wis.

HAUSER, GILBERT L., B.S., M.S., Assistant Professor, Animal Morphology, State University of Iowa, Iowa City, Iowa.

HAYNES, EARL P., A.B., Instructor, Academy, Middletown, N.Y.

HOWLAND, BERTHA M., Special Student, Radcliffe College, Cambridge, Mass.


HUGUENIN, EDITH, Teacher of Biology, Medill High School, Chicago, Ill.

JAMES, LUCILLE A., Student, Boston University School of Medicine, Boston, Mass.

JANVIER, MRS. NEIL F., New York City.

JOHNSON, ROSWELL H., Student and Teacher of Zoology, Cornell University, Ithaca, N.Y.

KELLEY, A. W., Teacher of Biology, Battle Creek, Mich.

KERR, ELLIS K., Student, Northwestern University, Evanston, Ill.

KNOWLTON, F. P., Student, Hamilton College, Clinton, N.Y.


MIXNER, FREDERICK V., Buffalo, N.Y.

MYERS, CLARA B., Student, College for Women, Western Reserve University, Cleveland, Ohio.

NEIGLICK, ANNA, B.S., Student, Northwestern University.

OSGOOD, LUCY R., A.B., Assistant in Zoological Laboratory, Mt. Holyoke College, South Hadley, Mass.

PAFFARD, F. C., Student, College of Physicians and Surgeons, New York City.

PEASE, E. DEK., Student, College for Women, Western Reserve University, Cleveland, Ohio.

PENFIELD, BENJ. B., A.M., Ph.D., Professor of Biology, University of Nashville, Tenn.

PERLEY, CLARENCE W., Student, Massachusetts Institute of Technology, Boston, Mass.

PRICE, GEORGE M., M.D., Instructor in Anatomy, Syracuse University, Medical Department.

RAND, H. F., M.D., Battle Creek, Mich.

RING, REBECCA LEE, Teacher, Federal School, Providence, R.I.

ROBBINS, EMILY CURTIS, Special Student, Radcliffe College, Cambridge, Mass.

ROBY, C. F., Student, University of Chicago, Chicago, Ill.

ROCKWELL, JOHN A., Student, Massachusetts Institute of Technology, Boston, Mass.

SLAGLE, S. ELIZABETH, Student, Boston University School of Medicine, Boston, Mass.
3. BOTANY.

AUSTIN, MARTHA T., B.S., Teacher of Natural Science, High School, Holyoke, Mass.

CHENEY, ALICE MARIA, Student, Mt. Holyoke College, So. Hadley, Mass.

CLARKE, MARTHA REYNOLDS, A.B., Student, Brown University, Providence, R.I.

COYLE, SUSAN EDMOND, Teacher, St. Mary's Institute, Dallas, Texas.

EVANS, SUSAN HOYT, A.B., Student, Vassar College, Poughkeepsie, N.Y.

FARSON, ANNIE, Student, University of Pennsylvania, Phila., Penn.


HALEY, GEORGE, Student, State of Maine College, E. Brownfield, Me.

HOUGH, ELIZABETH E., Teacher, Girls' High School, Boston, Mass.

LYMAN, KATHERINE T., B.A., Vice-Principal, Brownell Hall, Omaha, Neb.

Metcalf, Haven, Student, Brown University, Providence, R.I.

MORSE, EVELYN EDNA, Teacher, Everett School, Boston, Mass.

MUDGE, CORA BELL, Teacher, Bowditch School, Boston, Mass.

MURRAY, P. S., Teacher, Girls' High School, Boston, Mass.

Pattison, Mary L., B.A., Teacher, McGill University, Clarenceville, P.Q.

TOWNE, LILLIAN M., Teacher, Charlestown High School, Boston, Mass.
EIGHTH ANNUAL REPORT

OF THE

TRUSTEES OF THE MARINE BIOLOGICAL LABORATORY.

The Trustees have to report a year of prosperous development, by which the position of the Laboratory has been strengthened. As shown by the Director’s Report, the attendance has been larger than ever before, and the number of educational institutions which have co-operated to maintain the Laboratory has also increased. The development in these respects has fulfilled the most sanguine expectations, and is chiefly due to the influence and devotion of the Director, Dr. Whitman.

The Laboratory has now reached a position in which its income somewhat more than suffices to cover the actual running expenses of the summer’s work. Subscriptions from the public are, however, necessary to meet the cost of annual repairs and improvements, and to pay for the mortgage and the botanical building, on which we owe $3,500 and $2,485, respectively. Numerous minor repairs and alterations will be unavoidable before another season.

The financial future is complicated by two other factors: first, the question of salaries; second, the need of a permanent endowment. To these two a third factor may be properly added; namely, the need of a permanent building, exclusively for investigators and the library. This building should be so constructed as to be reasonably free from danger from fire. The question of salaries for the officers deserves immediate consideration. The Assistant Director has hitherto been the only officer with a more than nominal salary, the salaries received by
the instructors being barely sufficient to cover their actual expenses. The total amount paid for salaries and wages during the past year was only $1,950.00. The instructors have found certain substantial advantages at the Laboratory for their own work, and these opportunities have undoubtedly gone far towards securing to the Laboratory the valuable services of our teaching corps. The work of teaching has become more and more laborious, and demands so much time that the instructors have little opportunity for their own work. It has, therefore, become a legitimate wish of the trustees to pay the instructors, for we do not believe it either desirable or practicable that the present system of gratuitous work should be permanently continued.

The Dining Room Club during the past season was improved in many respects under the satisfactory management of Mrs. M. S. Connors. Some thirty persons from the U. S. Fish Commission have used it, and a number of friends of students have also been admitted, making the total average number very large (170 daily). It may be advisable hereafter to put some restrictions upon the use of the Club by persons not working either at the Laboratory or the U. S. Fish Commission.

During the past year the total amount of gifts received by the Treasurer is $2,368, as is shown by his report.

The Trustees have felt much regret in accepting the resignation of the Assistant Director, Prof. H. C. Bumpus. We are indebted to him for valuable services which have contributed in many important ways to the success of the Laboratory, and we wish to express publicly our hearty appreciation of his devotion and abilities.

We have again to thank the United States Fish Commission for valuable services and many courtesies.

The Laboratory has proved useful and stimulating to the cause of education and of biological research beyond the expectations of its founders. To secure its future usefulness, however, it still needs strong financial support.
To the Trustees of the Marine Biological Laboratory:

Having completed eight sessions, it may be profitable, in connection with the details of this report, to consider some general questions of policy.

We are in the formative period of our history, with no traditions to impede, with no binding precedents, and with no laws except those of a provisional constitution. We are still in statu nascendi, with the possibilities of a promising germ before us, and as yet no indications of crystalline fixity anywhere.

The direction in which the Laboratory is developing, although clear to those who have participated in the work from the beginning, may stand in need of some explanation to those who have looked on from a distance. As the development of an organism can only be understood from the standpoint of genetic continuity, — each stage being the promise of the original germ executed with such fulness as circumstances and conditions permit, and all stages being but successive states of one and the same individual, — so the development of the Laboratory, if it is to be fairly understood, must be examined, not in the light of what may transpire in a week or even a whole session, but in the light of its continuous history. Each session may be regarded as a developmental phase, as the promise of the germinal inception unfolded to the extent determined by all the
co-operating factors. But each phase or stage is the fulfilment of all that have gone before and the prophecy of all that are to follow.

In order to know whether we have fulfilled well or ill, we must go back to the germ in its first stage, and see what promise it contained and what general policy and means were proposed for the fulfilment. If we have pursued one purpose and one method from the beginning, we ought now to be in a position to see whether theory has stood the test of experience, and whether the results are such as to warrant the continuance of the work along the same line, or perhaps such as to suggest the advisability of more or less radical changes in policy and method.

Our main purpose, and the guiding principles of our policy, were clearly defined at the beginning, in 1888. The first step towards organization was taken at a preliminary meeting held on March 5, 1887, by the appointment of a committee of twelve, who were to elect trustees and devise ways and means for collecting the funds necessary to starting a seaside laboratory.

"At the first meeting held by the committee, its members showed by votes that it was their desire to found a laboratory that should give opportunity for original research as well as for instruction." (First Annual Report, p. 8.)

In June of the following year, just before the opening of the first session, a "circular addressed to colleges" was sent out, which "indicated the general policy adopted by the Trustees." The fundamentals of the whole scheme are struck in the first paragraph of this circular:

"The Trustees of the Marine Biological Laboratory earnestly desire to enlist your co-operation in the support of a seaside laboratory for instruction and investigation in Biology."

A concluding paragraph shows that the primary condition of co-operation — participation in the government as well as in the privileges of the Laboratory — was well understood, and provided for in a way which, however imperfect, bore testimony to correct intentions. It runs thus:
It is the desire of the Trustees that the enterprise shall enlist the active support of the universities and colleges of the country. To prevent its becoming a simply local undertaking, they wish to see all who aid in its support by subscribing to investigators' tables share with the other members of the Corporation in the annual election of Trustees. The Trustees will, therefore, invite each institution which holds an investigator's table to name five persons for members of the Corporation during the term of subscription.

Here we see sketched the elemental basis of our germ-organization—mainly potentialities of a theoretical nature, but “instinct with spirit.” The aim was a permanent biological station; the function was to be instruction and investigation; the formative principle relied upon was co-operation.

The general character of the aim and the theory of our work were defined in my first report, as follows:

“The new Laboratory at Wood's Holl is nothing more, and, I trust, nothing less, than a first step towards 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. It should be provided eventually with means for sending men to different points of the coast to undertake the investigation of subjects of special interest, thus adding to the advantages of a fixed station those of an itinerant laboratory.

“The research department should furnish just the elements required for the organization of an efficient department of instruction. Other things being equal, the investigator is always the best instructor. The highest grade of instruction in any science can only be furnished by one who is thoroughly imbued with the scientific spirit, and who is actually engaged in original work. Hence the propriety—and I may say the necessity—of linking the function of instruction with that of investigation. The advantages of so doing are not by any means confined to one side. Teaching is beneficial to the investigator, and the highest powers of acquisition are never reached where the faculty of imparting is neglected. . . . To limit the work of
the Laboratory to teaching [as some desired] would be a most serious mistake; and to exclude teaching [as some others advocated] would shut out the possibilities of the highest development. The combination of the two functions in mutually stimulating relations is a feature of the Laboratory to be strongly commended."

There were differences of opinion on this vital point, but they were at length so far harmonized that all acquiesced in the idea and plan of action as defined in these citations from our first report. Such was the germ of the enterprise in its conceptional stage.

Had it been practicable to start a laboratory devoted exclusively to research, it is not improbable that this would have been the choice of a majority of the original members of the Corporation. It was seen, however, that research could not go on without investigators, and that investigators could not work to any great effect without a more substantial backing than was then in sight. The problem was (1), *how to multiply investigators*; and (2), *how to provide for them*. The only solution in a self-sustaining direction was instruction. Instruction meant tuition, and tuition would at least help pay expenses, and possibly afford a margin of profit. In the absence of any assured means of support, and with no other way open for earning money, instruction was the *sine qua non* of existence. It was not only the sole source of revenue which the administration of the Laboratory could supply through its own exertion, but it was also our main reliance for *multiplying* investigators. Whatever we have accomplished in either direction must be credited very largely to instruction.

While this part of our work has been to us a source of increasing strength, it has at the same time been the occasion of considerable misapprehension. Some seem to be of the opinion that instruction and investigation are antagonistic, or reciprocally exclusive functions. These are apt to imagine that glorification of the one is increased by contempt for the other. Some would tolerate instruction merely as a means of subsisting, and abandon it as soon as an endowment is provided sufficient
to allow of restricting the work to investigation. Some, who see that the two functions have a mutual connection which is essential to the best in each, are only anxious to see the proper balance maintained. Of these standpoints, the first is an extreme that may be ignored; the second has a respectable number of sympathizers; the third expresses the attitude of those who, though firm on the main question, are not fully settled as to how the two functions can be adjusted to secure the most progressive "moving equilibrium."

Any indecision on such fundamental questions tends to unsettle aim, check purpose, dissipate energy; in short, to general paralysis. It is right here that sound views and settled convictions are absolutely indispensable to the welfare of the Laboratory. It may conduce to this end to look back over the work of eight years and see what conclusions are furnished in our experience.

When we started in 1888, we faced uncertainty in every direction. No resources beyond the mere necessities of the moment, no library, no lecture-room, no rooms for investigators; only a corner reserved for bottles, chemicals, and the Director; no mess-quarter, but for the timely permission from Mr. Fay to occupy one of his cottages; nothing but a small row-boat for collecting; only one thickness of board and shingle between us and the weather; no constituency but our few selves; no organization except the small nucleus of prime movers from the Woman's Education Association, of Boston, and the Boston Society of Natural History; no recognition, influence, or co-operation among the colleges; confronted by rival schemes, and sympathy prudently reserved for our future delectation; the outlook shadowed by previous failures; our first muster-roll only seventeen names,—two instructors, seven investigators (all beginners, except one), and eight students.

Our cause was mighty, but we were impotent. Even the power of our cause was scarcely felt beyond our own little circle. We had no standing, no authority, no influence at all proportionate to our aim. We were completely destitute of all credentials that could move private beneficence. We felt the
utter weakness of our position, and went to work in the humble business of preparation.

There was no little doubt in regard to the wisdom of our undertaking. The magnificent example of the Naples Station made it impossible to dispute the high importance of such institutions; but the failure of several notable efforts to found such an institution on this side of the Atlantic led many to think that American biology had not yet sufficiently developed to require other facilities than those already provided in the laboratories of Mr. Agassiz, Professor Brooks, and the United States Fish Commission. Scientific opinion was divided, and many of the leading zoölogists of the country disapproved of the project, and opposed it, or held aloof from it. This lack of confidence at home had its influence abroad, and deterred a few from giving us even the encouragement of their approval.

Our first business, then, was to vindicate our project; to show that a need actually existed, which could and should be met; to convince the sceptical and the indifferent and draw them into active sympathy and collaboration; to enlist the colleges and universities in our support; to extend the work and the constituency of the Laboratory until its possibilities for usefulness should become generally known; in short, to reduce the situation to control, and to improve it to such a degree that the main issue might be released from every unnecessary embarrassment.

In some respects the situation is practically the same as at the beginning; in others it is radically changed. Our material possessions have been multiplied, but they were so small to begin with that their multiplication has been barely sufficient to provide for actual necessities. A steam-launch, a small library, a lecture-room, a convenient dining-hall, a small cottage, three new Laboratory buildings, with the indispensable furniture and equipment, and an acre or two of ground, constitute the chief acquisitions.

Small as our fulfilment in material acquisitions has been, the work has moved on, gaining each year, until our productivity in original research will compare favorably with that of any other similar institution except the Naples Station. So far as instruc-
tion is concerned, we have no competitor offering even approximately equal advantages. These facts are nothing to boast of, nothing even to be contented with; but they represent the fruits of our effort and hence must stand as a test of the policy pursued.

We must look into the data for these facts, but before doing so I desire to answer one leading question; namely, — What is the regulating principle in the development of our two chief functions? It would be a very simple matter to develop these functions side by side, and yet so independently of each other, that the balance between them might be of a wholly arbitrary nature. It would cost no great effort to vote one up and the other down, and this operation might be repeated in the same or the reverse order ad libitum. Such conditions and methods are only too prevalent, and wherever they control, they poison the prime sources of any vital union and are fruitful only in pathogenic products. If there is to be a normal vigorous development, the regulating principle must be within the organism itself. The biologist is usually presumed to know that fact, and to understand its application a little better than other people; but knowledge does not always shield us from the danger of going astray in this matter. Intrusted with the life and well-being of a growing organism, it behooves us to study it as closely as possible. Unless our vision penetrates to its innermost life, and reveals to us the dominating principle of its existence, we cannot even know our one duty, which, to my mind, is summed up in this: to remove obstacles and provide means for the largest possible development.

Now, I repeat, what is the regulating principle of development for our germ-organism? To answer in a single word, it is correlation. Correlation is the principle which blends our two functions in vital harmony. The principle is self-regulating, so that we need have no anxiety whatever about keeping the balance. All we have to do is to see that growth is not stunted by artificial obstruction or lack of the necessaries of life.

This principle of correlation was recognized at the start, and the direction of the Laboratory has involved no more important
work than to guard and tend its natural growth. The principle has leavened all our forces, and thus enabled us to enlarge our field of work, made it possible to secure all the aid we needed in teaching, all the investigators we could supply with rooms, all the students we could find seats for, all the lectures we had time to hear, given us the confidence and active co-operation of the colleges, and raised us from a state of absolute dependence on charity to a self-sustaining basis.

In what lies the potency of correlation? Is not instruction instruction and investigation investigation the world over? and what vital connection is comprehended in their correlation? The answer is simple: Two functions are correlated when they conspire to a common end. That is a very different thing from two functions exercised independently, each for its own sake, or exercised each at the expense of the other. Our instruction and investigation have been inspired by a common purpose, and thus kept in such relations that each has added strength to the other, and added more and more with every stride forward. If instruction has increased, it is chiefly due to the stimulating influence of investigation; if investigation has gained, it is because instruction has multiplied workers. Mutual service is the bond of union, but the union is not merely one of co-ordination, in which the two elements are simply balanced one against the other; it is one of a more vital order, in which each is servant and only one is master. All our classes face in one direction,—towards original work,—and all our activities, sympathies, and interests are dominated by the spirit of research. Does that render our instruction less efficient? Just the contrary. It fills it with life and purpose, makes students more earnest, dignifies the work of the teachers and wins their best effort. Moreover, it re-enforces the service of the regular staff by contributions from every member of the investigating departments. When you consider the number and the representative character of our staff, and reflect how its inherent strength is intensified and magnified by these contributions, you will understand that I am not exaggerating when I say, to the credit of all who have participated, that no such height of efficiency.
is attainable except through a unique combination of forces such as the Laboratory now commands.

One point further should be noticed just here, in order to put our instruction in its true light, and to show you where correlation has its focal intensity. Instruction connotes different ideas to different individuals. It is so generally devoted exclusively to elementary work, that it is hard for some people to understand that it can mean anything more. What does it mean for us? It means, not wholly, but pre-eminently, preparation for original work, and much of it is especially designed for the benefit of investigators, not beginners only, but for specialists who are independent workers and represent heads of departments in various colleges and universities. In fact, the larger part of our instruction is devoted to those engaged in research work. The main purpose of the class work in embryology is preparation for investigation, although a number of other purposes of a practical nature for teachers are always kept in mind.

The Biological Seminar is designed to supplement the more advanced preparatory work and at the same time to provide for interchange of thought between investigators. The evening lectures, for which we are so deeply indebted to colleagues who are not regular members of the Laboratory, are addressed to all departments and all grades, and enjoyed no less by specialists than by elementary students.

It will now be plain, I trust, that we are not cultivating two antagonistic functions, between which we have to carefully guard the balance, lest one may prosper at the expense of the other. There can be no excess in either direction, for every gain, whether on one side or the other, is a gain not only for the part but also for the whole. The instruction cannot be made too strong, for its strength is continually transferred to investigation; and every proper extension of investigation must react to improve and enrich instruction.

The prime elements of our germ and the regulating factor of its development appear to be sound; but perhaps some one may still ask whether, after all, students are not a nuisance to investigators. But are we not all students? And will the term
of our studentship expire so long as we are not too wise to learn from others? To avoid self-crimination we shall have to admit that some students are not a nuisance to the investigator. If the objection lies only in the number, then what is the limit? If it be a hundred, we are near the line. But is there any reason why biological students can only be tolerated by the hundred, while other classes of students are welcomed by the thousands in our best universities? The suggestion is utterly preposterous, and could never come from an investigator in full touch with the work of the Laboratory.

These introductory remarks may be briefly summarized:

1. We have a thrifty germ with the first rudiments of limbs in process of formation. Each organ stands in vital connection with every other, and on the internal adjustments and the external adaptations to conditions and needs hangs the law of symmetry for the whole. Each function has its complex internal correlations and fulfils its part or parts according to its capacity and the support it receives.

2. You cannot amputate these limbs, or sever a joint here and there, or interpose an arbitrary limit to their growth, without mutilating and disfiguring the whole, deranging the co-adaptation of parts, and weakening or overthrowing functional correlation.

3. The present stage has only been reached through great expense of time and energy, and through steady adherence to the policy adopted at the beginning. To abandon this policy while we are still in statu nascendi would be fatal, and to attempt to obstruct its natural development would only tend to demoralize all the forces now co-operating. You might as well interrupt the incubation of an egg and try to regulate the first throbs of the punctum saliens as undertake to control the development of the Laboratory by legislative tinkering at the valves of its life-current. Growth and development must be regulated by the animating principle from within, not by arbitrary dicta of extra-ovate concoction.

4. Our problem still is how to multiply investigators and how to provide for them. We are making progress in the
solution, and our prospects have steadily improved with our growth. We have at last buried the bugbear of a deficit under an income sufficiently ample to refute the assertion heard only a year ago, to the effect that every addition in buildings would only increase the deficit in our annual budget.

5. It is impossible just now to provide the space we need by brick or stone buildings. It would be unwise to begin the permanent building in piecemeal, while we have no more than a few hundred or a thousand dollars to devote to it each year. Moreover, that plan of procedure, if adopted, would make it impossible to get any large gift for the structure.

6. The data to be presented in this report, especially the curve of growth as compared with those of expense and income, supply the crucial test of policy:

**RECORD OF ATTENDANCE.**

<table>
<thead>
<tr>
<th>I. — INVESTIGATION.</th>
<th>1893</th>
<th>1894</th>
<th>1895</th>
<th>1888-1895.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investigators</td>
<td>Zoölogy</td>
<td>23</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td>occupying rooms.</td>
<td>Physiology</td>
<td>4</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Botany</td>
<td>4</td>
<td>6</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>31</td>
<td>45</td>
<td>42</td>
<td>83</td>
</tr>
<tr>
<td>Investigators</td>
<td>Zoölogy</td>
<td>9</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>receiving instruction.</td>
<td>Physiology</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Botany</td>
<td>3</td>
<td>1</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>13</td>
<td>21</td>
<td>92</td>
</tr>
</tbody>
</table>

Whole number of investigators who have not worked under instruction .............................. 130

" " " " who have worked under instruction .............................. 38

" " " " under instruction who have published original work .. 92

" " " " under instruction who have not published, but have work more or less advanced ....................... 39 \{15 women. \24 men.\}

" " " " under instruction, who, so far as known, have not continued their research. 38 \{13 women \25 men.\}

" " " " under instruction, who, so far as known, have not continued their research. 15 \7 women. \8 men.\
2. — INSTRUCTION.

<table>
<thead>
<tr>
<th>Course</th>
<th>1893</th>
<th>1894</th>
<th>1895</th>
<th>1888-1895</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attending Course in Embryology</td>
<td>14</td>
<td>10</td>
<td>35</td>
<td>59</td>
</tr>
<tr>
<td>Attending Introductory Courses</td>
<td>42</td>
<td>54</td>
<td>85</td>
<td></td>
</tr>
<tr>
<td>Botany</td>
<td>10</td>
<td>12</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Whole Number in Introductory Courses</td>
<td>52</td>
<td>66</td>
<td>101</td>
<td>311</td>
</tr>
<tr>
<td>Whole Number in Attendance</td>
<td>111</td>
<td>134</td>
<td>199</td>
<td>483</td>
</tr>
</tbody>
</table>

3. — INSTITUTIONS REPRESENTED.

<table>
<thead>
<tr>
<th>Institution Type</th>
<th>1893</th>
<th>1894</th>
<th>1895</th>
<th>1888-1895</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universities and Colleges subscribing for rooms and tables</td>
<td>18</td>
<td>23</td>
<td>25</td>
<td>27</td>
</tr>
<tr>
<td>Universities and Colleges represented</td>
<td>30</td>
<td>48</td>
<td>51</td>
<td>101</td>
</tr>
<tr>
<td>Schools, Academies, etc.</td>
<td>42</td>
<td>27</td>
<td>34</td>
<td>114</td>
</tr>
<tr>
<td>Whole number of Institutions represented</td>
<td>72</td>
<td>75</td>
<td>85</td>
<td>215</td>
</tr>
</tbody>
</table>

SUMMARY OF ATTENDANCE AND INSTITUTIONS.

<table>
<thead>
<tr>
<th>Year</th>
<th>1888</th>
<th>1889</th>
<th>1890</th>
<th>1891</th>
<th>1892</th>
<th>1893</th>
<th>1894</th>
<th>1895</th>
<th>1888-1895</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persons in attendance</td>
<td>17</td>
<td>44</td>
<td>47</td>
<td>66</td>
<td>110</td>
<td>111</td>
<td>134</td>
<td>199</td>
<td>483</td>
</tr>
<tr>
<td>Institutions represented</td>
<td>13</td>
<td>29</td>
<td>32</td>
<td>41</td>
<td>52</td>
<td>72</td>
<td>75</td>
<td>85</td>
<td>215</td>
</tr>
</tbody>
</table>

The curve of expenses comprehends a variety of items which have not been kept sufficiently distinct in our reports to admit of being exactly estimated in all cases. I have followed a uni-
form method of computing them, so that the curve as a whole will be correct, as any plus or minus quantity will appear in each sum. The important thing in this curve is its direction and its relation to the curve of income, and that is not affected in either respect by any uniform addition or subtraction.

The reason for excluding cost of land, buildings, and permanent equipment, obviously is that these things are not consumed by use, and are therefore no part of the loss involved in work. If we wish to know whether our work means gain or loss in dollars and cents, we must compare what it consumes with what it produces. The question just now is not what our buildings cost, but whether the work done in them costs more than it brings. If we exclude from the income, interest on investments, donations, and everything received from sources other than our regular work, then we must likewise exclude from the expense any loss we sustain from such outside sources. The income curve would properly include the receipts from the Supply Department, but I have omitted this in order that the direct earnings of our main work might be measured against the whole sum of our regular expenses, and measured for every stage of our growth, so that the direction of progress could be seen at a glance. In the expense curve I have included one item on the side of permanent equipment; namely, the cost of journals, as that is a regular outlay, never finished or lessened by additions, and just as necessary for a few as many. Items connected with the maintenance of the Laboratory and its equipment, such as taxes, insurance, interest, legal services, repairs, printing, postage, stationery, advertising, custom-house expenses, transportation, etc., have all been added to swell the aggregate of expense. The gains and losses on the mess account have been about equal; and as this account is now kept separate from that of the Laboratory, it has neither value nor place in either of our curves.

In view of the objection raised against our last addition in buildings, namely, that the expenses of the Laboratory increase more rapidly than the income, this table of curves deserves special attention. The two curves of expense and income show that the objection was made several seasons too late to be true.
It was literally true at the time we asked for the first extension (1890); but no one was then looking for an objection to growth, and all labored to mend the difficulty. In 1891, when the curve of expense ran farthest above that of income, our growth in membership made a considerable advance, rising from forty-seven to sixty-six. Still, no one discovered that increase in numbers was leading us to perdition. On the contrary, all united in reporting "a year of great prosperity," and in claiming that "the whole history of the Laboratory, from its foundation, has been one of steadily increasing usefulness." The next year carried our number to one hundred and ten, and gave the curve of income an upward incline which it has since steadily improved upon. All this still meant prosperity, and all rejoiced in what then appeared to be "by far the most successful season." Before the opening in 1893, the fear was quite general that the World's Fair would reduce our number. When it was seen that the Laboratory, not only held its number, but also brought its expenses and income to nearly the same level, we considered ourselves "so fortunate as to be able to state that not only has the past season been very successful as far as the number of students and investigators and the quality of their work are concerned, but also that the condition of the finances is more satisfactory than at any time since the foundation of the Laboratory."

It was not until 1894, just before the curve of income crossed above the curve of expense, that some one, looking for objections to the proposition for a new building, discovered that all our "prosperity" was tending in the wrong direction. Suddenly our growth and progress, which had hitherto appeared so bright, seemed to lose all their charm and to pass under a cloud of disapprobation. Had all the dismal forebodings and evil prognostications with which we were entertained on that occasion come to pass, the Laboratory would either have been a total wreck by this time, or we should have been descending the down-grade of degeneration and financial ruin at a speed not less terrible in realization than it was in purely imaginative rhetoric. We listened, reflected, and moved on. The new botanical building went up; the pressure for space was relieved, and all departments of the Laboratory grew and prospered as
never before. We have made the most decisive gains in our whole history since that event, and made them on the very ground pictured to us as full of danger.

The curve of expenses starts at a height four times that of income; but observe that the income curve rises above that of instruction in 1890, when the first addition to our space was made, and that, it makes a strong bound upward with the second addition in 1892, and another bound with the third addition in 1894, rising at length above expenses, to a point over twenty-two times its initial height.

This has been accomplished, as you see, not by lowering the curve of expense, for that has been steadily upward. While we have been studiously economical with our means, we have not spared where we could strengthen our work. The curve of increase in facilities and efficiency of work, if it could be estimated in figures, would show a rate of ascent more rapid than any other thus far considered.

Comparing the end terms with the beginning in our curves, we find that we have multiplied

<table>
<thead>
<tr>
<th></th>
<th>by 3.5</th>
<th>&quot;5.3</th>
<th>&quot;11.</th>
<th>&quot;22.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The cost of instruction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current expenses</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Membership</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receipts from fees</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The average annual increase has been:

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Membership</td>
<td></td>
<td></td>
<td>$199</td>
<td></td>
</tr>
<tr>
<td>Cost of instruction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current expenses</td>
<td></td>
<td></td>
<td>$817</td>
<td></td>
</tr>
<tr>
<td>Receipts from fees</td>
<td></td>
<td></td>
<td>$1,092</td>
<td></td>
</tr>
</tbody>
</table>

The Bursar’s Report for the last session shows an income of about $1,000 from fees and $800 more from the Supply Department. Allowing for outstanding bills, the net income is probably not less than $1,500. To have reached a self-sustaining basis with the slender means at our command, and to have done this with a steady improvement of every side of our work, is the merest beginning of germ-fulfilment, but it is a fact somewhat more composing than the catastrophes divined for us.
RESEARCH WORK.

Regarding our research work from the point of view before defined, the questions of chief interest relate to its growth, correlations, and needs. Healthy growth means increase in the number of investigators, increase in space and facilities, and progress in the quantity and the quality of the work. In all these respects, growth implies harmonious development of correlated functions and progressive adaptation to needs. What has been the fulfilment in this part of the germ?

INCREASE IN NUMBER.

<table>
<thead>
<tr>
<th>YEAR</th>
<th>Total membership</th>
<th>Independent</th>
<th>Under supervision</th>
<th>Whole number</th>
<th>Independent Investigators who began at the Laboratory</th>
<th>Preparatory course in Embryology</th>
<th>Introductory courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1888</td>
<td>17</td>
<td>3</td>
<td>6</td>
<td>9</td>
<td></td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>1889</td>
<td>47</td>
<td>14</td>
<td>5</td>
<td>19</td>
<td></td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>1890</td>
<td>66</td>
<td>14</td>
<td>7</td>
<td>20</td>
<td></td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>1891</td>
<td>110</td>
<td>31</td>
<td>19</td>
<td>50</td>
<td></td>
<td>43</td>
<td></td>
</tr>
<tr>
<td>1892</td>
<td>111</td>
<td>31</td>
<td>14</td>
<td>44</td>
<td></td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>1893</td>
<td>134</td>
<td>45</td>
<td>13</td>
<td>58</td>
<td></td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>1894</td>
<td>199</td>
<td>42</td>
<td>21</td>
<td>63</td>
<td></td>
<td>21</td>
<td>10</td>
</tr>
<tr>
<td>1895</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>22</td>
<td>35</td>
</tr>
</tbody>
</table>

In comparing the rates of growth shown in this table, it must be remembered that, beginning with the introduction of the course in Embryology in 1893, the column of "Investigators under Supervision" loses the numbers set off under Embryology. Had this column continued on without division, the last three numbers would have been 28, 23, and 56, instead of 14, 13, and
21. Thus while there is an apparent fall from 19 to 14 in passing from 1892 to 1893, there is in reality a rise from 19 to 28. The division, then, instead of marking a loss, introduces a most decided gain not only in numbers but also in the grade and correlation of our work. It was seen from the very beginning that many of those who applied for work in investigation were not properly prepared for it; but the number remained too small before 1892 to justify division and the consequent increase in the work of instruction. Since the division was made, the class in Embryology has grown from 14 to 35, and now represents an indispensable connecting link between our introductory courses and investigation.

Assuming, for the sake of a uniform basis of computation, that the division had not been made, it will be seen by comparing the first and last terms of the column in each case that we have multiplied

<table>
<thead>
<tr>
<th>Total membership</th>
<th>by 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent investigators</td>
<td>&quot; 14</td>
</tr>
<tr>
<td>Investigators under supervision</td>
<td>&quot; 9½</td>
</tr>
<tr>
<td>Whole number of investigators</td>
<td>&quot; 11</td>
</tr>
<tr>
<td>Students in introductory courses</td>
<td>&quot; 12½</td>
</tr>
</tbody>
</table>

The agreement in these rates of growth is much closer than I anticipated, and doubtless it will be an agreeable surprise to some that the highest rate of increase is found in the column for independent investigators. If the twenty new names added to our lists by the new course in vertebrate anatomy be subtracted, as they should be in order that all the numbers in the column of "introductory courses" stand for the same thing, then the rate of increase in this column falls from 12½ to 10.

Comparing the last four years of growth with the first four, it will be seen that we moved on with no very great gains in the earlier period, while the later period is marked by a sudden rise of 50% in student membership and a gain of over 100% on the investigators' side. Our rooms were full in 1892, and in 1893 we had to turn away several investigators for lack of space.
In 1894, *malis avibus invitis*, the new Laboratory enabled us to find room for forty-five independent investigators, and these, with the beginners in investigation, brought the total number up to fifty-eight. All this, while the number of students only increased from fifty-four to sixty-six. In 1895, one of the odd years, which we are accustomed to consecrate to the prayers for surcease of building, with a loss of two rooms sacrificed to the class in Embryology, we still were able to record a total of sixty-three investigators, forty-two of whom were independent workers.

Possibly this record may fall under the vision of some critic fly, who will alight at the foot of the column of independent investigators, discovering that the number in 1895 is three less than in 1894. This small loss, as shown in the table of attendance, falls to the Botanical Department, and it is explained by the absence of members who will return to us next year. On the zoological side, notwithstanding the loss of two rooms, we held our full number, not without crowding, however, two into one room in several cases. Five investigators applied for rooms, whom we were unable to receive.

If there is anything remarkable in our record, it is the increase in the number of investigators. When we remember that it is easier to multiply students by thousands than investigators by tens, the increase in the number of the latter, although numerically less than that of the former, appears very large proportionally. The ratio varies between $\frac{1}{4}$ and $\frac{1}{2}$, showing that we are far removed from any undue preponderance of students.

There remains one column in this table which is of special interest; it is the last on the investigators' side, showing what we have done in multiplying investigators. The numbers run from 0 to 22, the highest being the latest. Out of forty-two independent investigators in 1895, twenty-two were indebted to the Laboratory for their first work in research. Twenty-one more, now working under supervision, are indebted in the same way, and will be rapidly added to the list of independent workers.
Our record of attendance shows that one hundred and thirty investigators have worked at the Laboratory during the eight years of its existence. Of this number no less than ninety-two have worked under instruction, while only thirty-eight have come to us as independent investigators. These facts show what investigation owes to instruction.

**ADDITIONS IN BUILDINGS AND EQUIPMENT.**

In order to keep pace with our growth in number, we have had to extend our laboratories every second year. The additions thus far made have, however, only multiplied the original space by three. At the beginning our space was divided equally between research and instruction. While we have not yet doubled the space devoted to instruction (with botany and embryology included), we have nearly quadrupled that devoted to research. The new building proposed for 1896 would make the proportion in space-division 2:5 in favor of research. The laboratories for investigators have, moreover, been greatly improved by division into private rooms and by the addition of aquaria.

The new laboratories have cost about $9,000, and we have spent fully $5,000 in alterations and improvements. About $15,000 have been spent in equipment—fully eight times the original outfit. The additions to the library have amounted to an average of about $450 annually.
THE PRODUCTS OF RESEARCH WORK.

The products of work comprise every increment of growth and development. The Laboratory as a whole is as much a product of work as an organism is the result of developmental processes. But we have now to do with those products of work which, as contributions to science, are rightly esteemed the best test of fulfilment. The following is a list of over one hundred and fifty published papers, worked out in whole or in part at the Laboratory, and mainly within the last four years:

H. Ayers.


Die Membrana tectoria, was sie ist, und die Membrana basilaris, was sie verrichtet. *Anat. Anz.*, VI, 1891.


G. Baur.

Elizabeth E. Bickford.

Martha Bunting.

H. C. Bumpus.
A New Method in the use of Celloidin. *Amer. Nat.*, 1892.
A Laboratory Course in Invertebrate Zoology. 1892.

Gary N. Calkins.

Cornelia M. Clapp.

Gaylord P. Clark.
Ueber Gleichgewichtsphanomene in Gewissen Crustaceen.

Bradley M. Davis.

A. E. Dolbear.
Explanations or How Phenomena are Interpreted. *Biol. Lectures*, IV, 1895.

George Wilton Field.
Katharine Foote.


E. G. Gardiner.


Arnold Graf.


J. E. Humphrey.

Notes on Technique. *Botanical Gazette*, XV, 7, 1890.

Ida H. Hyde.


E. O. Jordan.


J. S. Kingsley.


Frederic S. Lee.

REPORT OF THE DIRECTOR.

Part II. Ibid., XVII, 1894.

WM. LIBBEY, JR.

F. R. LILLIE.

D. J. LINGLE.
On the Reversal of the Direction of the Contraction of the Heart in Ascidians.

WM. A. LACY.
Nachtrag. Ibid., Jan., 1894.
Metameric Segmentation in the Medullary Folds and Embryonic Rim. Ibid., 13, April, 1894.
The Mid-brain and the Accessory Optic Vesicles. Ibid., 15, May, 1894.

JACQUES LOEB.
Ueber künstliche Umwandlung positiv heliotropischer Thiere in negativ heliotropische und umgekehrt. Pflüger's Archiv für Physiologie, LIV.

Ueber die Entwicklung von Fischembryonen ohne Kreislauf. *Pflüger's Archiv*, LV.


J. MUIRHEAD MACFARLANE.


E. L. MARK.


ALBERT P. MATHEWS.


J. P. McMURRICH.


The Development of Cyanea arctica. *Amer. Nat.*, XXV.


A Text-book of Invertebrate Morphology. 1894.


A. D. MEAD.


HARRIET BELL MERRILL.


MAYNARD M. METCALF.

Notes on Tunicate Morphology.


T. H. MORGAN.


A. D. Morrill.

H. F. Osborn.

Julia B. Platt.
The Ontogenetic Differentiation of the Ectoderm in Necturus. (Preliminary notice.)

John A. Ryder.

Mary Schively.

W. A. Setchell.
Phycodema Boreali-Americana.
Fascicle I. Feb., 1895.
Fascicle II. Apr., 1895.
Published at Malden, Mass., and edited by F. S. Collins,
I. Holden, and W. A. Setchell.

OLIVER S. STRONG.

LOUISE B. WALLACE.
The Structure and Development of the Axillary Gland of

S. WATASE.
On the Phenomena of Sex Differentiation. *Journ. Morph.*, VI, 3, 1892.

HERBERT J. WEBBER.

WM. M. WHEELER.
Planocera Inquilina, a Polyclad Inhabiting the Branchial
The Behavior of the Centrosomes in the Fertilized Egg of
The Problems, Methods, and Scope of Developmental Me-
*Biol. Lectures*, 1894.
C. O. WHITMAN.

The Palingenesia and Germ-Doctrine of Bonnet. *Ibid*.

E. B. WILSON.


W. P. WILSON.

If there is one word more than another in our platform which requires elucidation, that word is *co-operation*. The word may signify much or little or next to nothing. It may mean that we want help and expect to get it because we want it; it may mean that we expect no help which we do not pay for, which would be a very modest expectation; it may mean, further, that money compensation is not thought of as an essential condition, that we are looking rather to the mutual advantages of scientific fellowship, and propose to cultivate it on a basis of copartnership. This latter view is the one to which it is far easier to
conform in preaching than in practice, and I find that many are inclined to be very sceptical as to the success of an enterprise which builds upon co-operation. Indeed, some have regarded our whole scheme of organization as one foredoomed to collapse in internal dissensions and personal rivalries, and we have yet to convince some of our best friends that scientific fellowship is worth the effort it costs to maintain it. The closer the fellowship the greater the liability that individual interests will clash. Petty grievances arise, and these become an excuse for the weakness that seeks to shelter selfish instincts in isolation. Isolation is protection against gossip and scientific piracy and at the same time an asylum for conceit, ill-temper, distrust, contempt for others, and all those qualities about which the public must not know too much to the damage of reputation. No wonder that some are prone to doubt both the desirability and possibility of co-operative work in science. Co-operation appeals to the higher interests of science and tests sincerity, loyalty, honor, and all the finer qualities of personality; isolation is the peril of science and only a solace for the infirmities of self. Nevertheless we must confess that co-operation raises many difficult questions, which our experience has not yet settled. Hence there may be legitimate doubt, and one may ask whether co-operation which works well in poverty may not break down the moment the Laboratory ceases to be dependent upon it for support. A blessing in need, but a curse in prosperity, — that might be the diagnosis of some who are not too optimistic.

Have we done all that might have been done to prove that the co-operation we seek means the fullest reciprocity? How have we kept the promise held out in our first circular? In order to "enlist the active support of the universities and colleges of the country," and keep the Laboratory from "becoming a simply local undertaking," the Trustees promised that all who aided in its support, by subscribing to tables, should "share with the other members of the Corporation in the annual election of Trustees, and that each institution holding a table should be invited to name five persons for members of the Corporation during the term of subscription."
REPORT OF THE DIRECTOR.

This was definite enough—perhaps too definite for a promise to be fulfilled in "innocuous desuetude." Although the enlargement of the number of Trustees from nine to nineteen does something to redeem the non-fulfilment, it still remains possible for a minority of four to hold meetings at convenience in Boston, and regulate the affairs of the Laboratory; and that, too, in the absence of every one familiar with the needs. It makes no difference whether this has, or has not, been done; the possibility of its being done is what jeopardizes vital interests of the Laboratory, and fixes upon our organization the reproach of being a "local undertaking."

The blemish of localism in our By-laws stands to-day the greatest obstacle to permanent co-operation. The co-operation which we have thus far secured, valuable as it is, lacks every element of permanency. We have quite a respectable list of subscribing institutions, but not one of them is committed to continued support.

We have, however, made some possibilities clear. It is something to have secured temporary co-operation in the work of the Laboratory. Our staff of twenty instructors for 1895 represented no less than thirteen different colleges and universities. The above list of colleges and societies subscribing for rooms and tables, and a membership of one hundred and ninety-nine, coming from eighty-five of our higher educational institutions, show how widely co-operation is possible. The record of attendance, the list of papers already published, the lecture courses freely contributed,—all show that our growth has been a steadily enlarging circle of intercollegiate fellowship.

The thing of paramount importance to be attended to now is to find some stable basis for all that we have gained. Temporary arrangements must be exchanged for permanent ones. Instead of annual subscriptions, we must have endowments; and these will come only to a safe organization, which excludes every possibility of local domination.

It remains to indicate summarily and by way of suggestion some of the possible forms of co-operation by endowments:

1. \textit{Tables in the General Laboratories} may be endowed at
$1,250 each. Endowment to secure the right of use in perpetuity; the right of appointing the occupant, subject to confirmation by the Director or an Administrative Board; and to provide for instruction, material for study, apparatus for collecting, and table outfit of glassware, reagents, etc.

2. Rooms for Investigators may be endowed at $2,500 each. Endowment to secure the same rights and equipment as before (without instruction), and the additional right of membership on an Advisory (or Administrative) Board, representing the heads of departments in co-operating institutions.

3. Scholarships, like the Lucretia Crocker Fund, yielding from one to two or more hundred dollars annually, designed to aid worthy students in completing preparatory courses of instruction.

4. Fellowships, yielding from four to five hundred dollars or more, to be awarded to students of high promise, already engaged in, or prepared to begin, original research. Such provisions are much needed, and of the highest utility.

5. Research Funds, such as the Elizabeth Thompson Fund, the income of which may be applied in carrying out costly investigations.

6. Library Fund.—A thousand dollars a year is needed to keep the library supplied with current publications.

7. Publication Fund.—Indispensable to a permanent station. An annual income of two or three thousand would suffice to begin with.

8. Building Fund.—The main building for the exclusive use of investigators, providing for library, auditorium, aquarium, laboratories, etc., would cost about a hundred thousand dollars. Dormitories are much needed; and a residence for officers and investigators would be required.

9. General Endowment Fund.—This would be the necessary foundation for an inter-collegiate biological station. The annual outlay for a station such as we have, hoped for would not be less than fifty thousand dollars. Probably about one fourth this sum could be obtained by tuition, fees for rooms and tables, sales of laboratory supplies, etc.
THE BIOLOGICAL ASSOCIATION.

At a full meeting of the members of the Laboratory, held July 24, 1894, the question of forming a Biological Association, as a means of securing the active co-operation of all interested in the establishment of a permanent station, was discussed. It was the first time that those in attendance at the Laboratory had been invited as a body to take formal action in reference to this matter. The response was hearty, and the deep and cordial interest manifested throughout the discussion showed that the time had come for an earnest working organization.

Over seventy schools, colleges, and universities were represented at this meeting, and thus it was in reality a national convention of students, teachers, and investigators in Biology. The action taken has therefore some significance. It means an army of earnest and able workers operating at as many centres as possible, and coming together annually to report progress in the collection of funds and in the enlistment of new recruits. It means that we shall move on with cumulative momentum until the conquest is as complete as united effort can make it.

The plan of organization proposed by Drs. Conklin, Lee, and Bumpus carries out the idea of "local committees," first suggested by Professor Osborn, of Columbia College. The following was unanimously approved and adopted:

"Name and Purpose. — This organization shall be known as the Biological Association. Its chief object is to aid the Marine Biological Laboratory in securing funds necessary to the foundation of a Biological Station, as a national centre of research in every department of Biology. For such a station a substantial building and equipment and an ample endowment are required.

"Membership. — Any person interested in the object of the Association may become a member by enrolment with an officer. Membership requires no fee and implies no obligation
beyond the pledge of active co-operation in securing the ends in view.

"Officers.—The officers of the Association shall consist of a president, secretary, and treasurer. Local committees shall be formed to take charge of the work in different localities, such committees to be approved by the officers of the Association.

"The officers of such local committees shall consist of a chairman and secretary-treasurer. The funds collected shall be placed in the hands of the treasurer of the Association on or before the next annual meeting.

"Executive Council.—The officers of the Association and one delegate from each local committee shall constitute an Executive Council to determine when and how to use the funds obtained, and to settle any general questions that may arise. Two-thirds of the membership of the Council shall constitute a quorum for the transaction of business.

"Annual Meeting.—There shall be an annual meeting of the Association at such time and place as the Executive Council may determine."

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Atwater, David H., Syracuse, N.Y.
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Barrows, M., Mrs. Franklin W., 45 Park street, Buffalo, N.Y.
Baur, G., University of Chicago.
Beckler, Alice H., 590 E. Seventh street, South Boston, Mass.
Besse, Alice S., Mt. Holyoke College, South Hadley, Mass.
Bigelow, Robert P., Massachusetts Institute Technology, Boston, Mass.
Bloss, J. M., Titusville, Penn.
Brannon, M. A., Grand Forks, N. Dak.
Brokway, Fred J., 183 W. Seventy-third street, N.Y.
Brode, H. S., University of Chicago.
Brown, Bertha M., Vassar College.
Bumpus, H. C., Providence, R.I.
REPORT OF THE DIRECTOR.

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CALKINS, MRS. G. N., New York.
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CLARK, EDITH L., Misses Haywards' School for Girls, Philadelphia,
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DAVIS, BRADLEY M., University of Chicago.
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President . . . . C. O. WHITMAN.
Secretary . . . . W. M. WHEELER.
Treasurer . . . . F. S. LEE.
ACKNOWLEDGMENTS.

Early in 1894, the need for more laboratory room was anticipated; but as there was no money on hand for adding to our buildings, it was thought best to postpone action. Applications for rooms and tables soon made it evident that the need was an urgent one, so urgent, in fact, that I felt compelled to ask the Board to authorize the erection of a new building, provided the money necessary thereto could be obtained by gift or loan. The time for opening the Laboratory was close at hand, but neither gift nor loan was in sight. Much to my disappointment, a decision was reached towards the end of May, to the effect that the desired addition could not be made for lack of funds. There seemed to be no remedy, for there was no time left for any attempt to raise the money. It was a loan or nothing, and a loan was a burden which was not quite welcome.

The interests of the Laboratory, at least for the summer, must suffer, and suffer greatly, as it seemed to me. Such a turn in the work would have carried disappointment and discouragement to every one who was sacrificing time and energy for the development of the Laboratory. Every extremity must be tried before submitting to such results.

As a last resort, I appealed to friends of the Laboratory in Boston, New York, Philadelphia, and Bryn Mawr, and had the gratification of a cordial and generous response. Dr. E. G. Gardner, at considerable personal inconvenience, shouldered the whole burden of loaning the money required for the building and its equipment. Professor Osborn generously offered to be responsible for one-third of the whole amount. Cash contributions covering nearly another third were made by Dr. Morgan, of Bryn Mawr, by Bryn Mawr College, through the liberality of President Thomas, by Provost Harrison, of the University of Pennsylvania, and by one other whose name I am not at liberty to mention.
REPORT OF THE DIRECTOR.

This does not exhaust the list of those who helped to mend the situation and prepare the way for whatever progress might be possible. Probably no expression of gratitude on my part could give so much satisfaction to those concerned as the fact that the summer's work was thereby made successful in all directions.

Grateful acknowledgments are due to Miss S. B. Fay, of Wood's Holl, to whom we are indebted for the free use of two cottages which have served as dormitories for several summers, and for many generous donations of money. To Mr. Joseph S. Fay, who has been the never-failing patron of the Laboratory from the beginning, we are under continued obligation for donations of books, bathing privileges at the shore, and numerous benefactions timely bestowed.

Special thanks are due to Professor Trelease for the subscriptions received from the Missouri Botanical Garden in maintenance of an investigators' room. Professor Farlow has several times provided similar privileges for research students of Harvard, and the botanical department is indebted to him for very valuable additions to its herbarium. President Coulter and Professor Locy have contributed to the support of rooms and tables. We are under great obligation to Mrs. Rhoda A. Esten, of Providence, for important contributions to, and care of, the herbarium, and for the efficient and self-sacrificing labor which she has devoted to this work and to the Biological Association. To Miss Katharine Foot, of Evanston, grateful acknowledgments are due for having led the first effort to raise an endowment for a room at the Laboratory, an example which has inspired others to similar work; and, further, for most of the money raised by the Biological Association during the past year. The unique "Science Calendar," devised by Dr. Harriet Randolph, of Bryn Mawr, in the hope that there would be some profits from the sale which could be added to the funds of the Laboratory, is another instance of the disinterested work undertaken by members of the Biological Association. Subscriptions amounting to $1,500 have been pledged by individual members of the Association, to be applied in payment of one-
half the cost of the new laboratory proposed for next season. To John Maxwell, superintendent of the U.S. Fish Commission laboratories at Wood's Hall, we are deeply indebted for many courtesies, and for privileges granted from year to year to the Laboratory. For our water supply, pounds for keeping fish and other animals, and wharf privileges, we have been wholly dependent upon the resources of the Fish Commission so generously placed at our disposal.

The resignation of Dr. Bumpus at the close of five summers is a serious blow to the Department of Instruction which has grown with great rapidity under his successful direction. In many other ways the Laboratory suffers a great loss in the termination of Dr. Bumpus' services as instructor and assistant director. The growing prosperity of the Laboratory must be credited in large measure to his able management of its business affairs. Much as we regret the loss, we do not forget that five years devoted to this work represents an enormous sacrifice of the time available for research — a sacrifice for which there was no adequate compensation.

With Dr. Bumpus we lose his entire staff of assistants.

The Botanical Department also sustains a serious loss in the interruption of Dr. Setchell's connection with the Laboratory, owing to his acceptance of the chair in Botany in the University of California. The work of this department has been conducted with marked success, and Dr. Setchell has been ably supported by Mr. Osterhout, who takes leave of us for a year in Europe.

The reorganization of these two branches of our work is already completed, and the Laboratory shows its strength in being able to fill up its ranks so promptly. The zoological instruction is to be conducted by Prof. James I. Peck, of Williams College, who will be assisted by Messrs. Dahlgren, of Princeton, Murbach and Packard, of Chicago, and Greene, of Leland Stanford University.

The work in "General Botany" will be under the direction of Profs. Macfarland and Porter, of the University of Pennsylvania, while Dr. Humphrey, of Johns Hopkins University, will
take charge of the course in the "Morphology and Development of Cryptogams."

A new course in Physiology will be given under the direction of Drs. Loeb and Norman. The growing interest in this department fully warrants the introduction of this course.

The munificence of the recent gift of Miss Helen Culver to Biology extends to marine biology, and renders it possible to secure permanent co-operation with the University of Chicago. As the gift is of direct interest to us and of general significance to science, some expression of appreciation to be sent to Miss Culver would be a fitting tribute of respect from this Board.

May we not see in this event a testimonial of great significance, not only to the intrinsic worth of our cause, but also to the wisdom of the policy pursued? I have reason to believe that other testimonials of a like substantial nature await us, and that we can hasten them by wisely anticipating the conditions necessary thereto.

THE NEED OF MORE ROOMS FOR INVESTIGATORS.

During the last session we managed to provide tables and rooms for sixty-three investigators; but we were obliged in five cases to crowd two persons into one room, none too large for the convenience of one worker. Besides, we had to refuse five applications for rooms. The demand next summer will be still greater. The need of more space is thus made evident. A larger lecture-room is also a pressing need. A new building of the size of the original laboratory would just meet these two needs, and it would give us one laboratory for the exclusive use of investigators, entirely free from classes in elementary instruction.

This matter was brought before the Executive Committee, with the result that all united in the following recommendation:

To the Board of Trustees:

In view of the large increase in the membership of the Marine Biological Laboratory during the season just closed, and in view of the probability that more rooms will be needed for investiga-
tors next summer; it seems to the undersigned members of the Board of Trustees that it would be an advantage to the Laboratory to have additional space at its disposal.

It is to be noted also that the statements of the Director show that the expenses of the Laboratory have increased less rapidly than the number in attendance, and it is to be concluded that by making provision for a larger number of investigators the income of the Laboratory will be increased.

The undersigned respectfully suggest to the Board the advisability of erecting another building, approximately the size of the original building, the upper story to be used for rooms for investigators, and the lower story as a lecture-room, the present lecture-room having proved entirely inadequate.

As a means of carrying out this suggestion we beg to call the attention of the Board to the plan to be proposed by the Director.

HENRY FAIRFIELD OSBORN,
J. PLAYFAIR McMURRICH,
EDWARD G. GARDINER,
C. O. WHITMAN,
Executive Committee.

The plan referred to is that of raising the money required by subscription, the Biological Association offering to aid to the extent of $1,500, provided the Trustees secure an equal sum.

It must be abundantly evident by this time that we have seen only the small beginnings of our undertaking. Our development is proceeding along perfectly natural lines; and as our growth has not been forced, it cannot be safely checked. We must keep our organization plastic, and be ready and prompt to revise opinions and adopt new measures as often as our forecasts fall short of necessities. We are bound to do our utmost to satisfy the needs which we have created, and provide for every interest which we have invited. If we set a student at work in an introductory course, we must be ready to receive him in a more advanced course if he fulfils all requirements and applies for it. If space is wanting to meet such obligations it must be provided, and as speedily as possible.
PUBLIC LECTURES.

1894.


27. "Some Problems connected with the Cerebral Fissures." B. G. Wilder.


"Origin of the Centrosome." S. Watase.


1895.


  17. "Infection and Intoxication." Dr. S. Flexner.

  24, A.M. "The Interpretation of Phenomena." Prof.
  A. E. Dolbear.

  25, "Ether and its Properties. Prof. A. E. Dol-
  bear.

  26, "Matter and its Properties." Prof. A. E.
  Dolbear.

  26, P.M. "Motions and their Relations." Prof. A. E.
  Dolbear.

  27, A.M. "The Continuity of Phenomena." Prof. A. E.
  Dolbear.

  31, P.M. "The Metamerism of the Vertebrate Head."  
  Dr. W. A. Locy.

Aug. 2, "The Segmentation of the Vertebrate Head."  
Dr. J. S. Kingsley.


  8, P.M. "Memorial Address on Huxley." Dr. H. F.
  Osborn.

  9, A.M. "God and Immortality." Dr. Paul Carus.

  9, P.M. "Palæontology as a Morphological Discipline."  
  Dr. W. B. Scott.

  14, "Bibliography." Dr. C. S. Minot.

  15, "Biology in Education." Prof. Wm. T. Sedg-
  wick.

  16, A.M. "The Synthetic Powers of Protoplasm." Prof.
  Wm. T. Sedgwick.

  17, "Phosphorescence." Dr. S. Watasé.

  19, "Firefly." Dr. S. Watasé.

  21, P.M. "The Transformation of Sporophyllary into  
  Vegetative Organs." Prof. G. F. At-
  kinson.
REPORT OF THE ASSISTANT DIRECTOR.

(a.) ON THE LABORATORY FOR GENERAL ANATOMY.

The courses in Invertebrate Anatomy have not been materially changed since the submission of the last report, though the classes have partaken of the general growth of the Laboratory as a whole. In 1893 there were forty-one students, in 1894, fifty-three, and in 1895, sixty-five students. This increased attendance has necessitated considerable changes in the fixtures and furniture of the room, and the teaching staff has been considerably enlarged and the equipment materially improved.

Though heretofore the courses of study were largely confined to the more typical Invertebrates, after considerable hesitation, a complementary course, dealing with certain Vertebrates, was announced for the season just terminated. The Vertebrate work was under the immediate direction of Dr. A. D. Mead, of Chicago University; Dr. Kellogg, of Olivet College; Dr. Fish, of Cornell University; and Mr. H. E. Walter, of Chicago. Lectures upon the Anatomy and Physiology of Vertebrates were given by Drs. Kingsley, Fish, Strong, Minot, Osborn, and Lee, and the gross anatomy of certain fishes, Batrachia and Reptilia, received the entire time devoted to laboratory work; viz., eight hours daily. There were fifty-four students who pursued this course, and thirty-four of these were members of class in invertebrate anatomy.

With the increase in attendance there has naturally been an increased demand for Laboratory material. This demand has been met by enlarging the force of collectors and providing better facilities for the storage of living animals. The fears that the rich fauna of the neighborhood might finally, as a result of the increased demands of a larger number of workers, become depleted, have proved unfounded. Not only do the older localities still offer their abundance of vegetable and animal life,
but the semi-weekly collecting excursions, often attended by the entire class, have resulted in the discovery of new forms, and in quantities practically inexhaustible. The rich fauna and flora of the deeper water of the bays and sounds have, moreover, remained practically unused.

The lectures, designed especially for the members of this department, has been of the technical nature of those given during previous years. Investigators and officers of other departments have most generously contributed, though many have been given by the instructors directly interested.

A list of the morning lectures is subjoined:

1894.

July 4. "General View of the Vertebrates." DR. GEO. BAUR.


9. "The Vertebrate Skeleton." DR. GEO. BAUR.

12. "General Lecture." DR. H. C. BUMPUS.


27. "Morphology of Balanoglossus." DR. P. A. FISH.
REPORT OF THE DIRECTOR.  


16. "Limulus." Dr. W. M. Rankin.


1895.


LIST OF LECTURES ON VERTEBRATES.

1895.


15. "Necturus and the Amphibia." Dr. P. A. Fish.

20. "Morphology and Physiology of the Cerebellum and Cerebrum." DR. O. S. STRONG.


28. "Development of the Mammalian Brain." DR. J. P. McMURRICH.

29. "Cerebral Localization." DR. J. P. McMURRICH.

(b.) ON THE BUILDINGS.

During the past two years no considerable alterations or repairs have been made in the main Laboratory buildings, though certain minor alterations have been found necessary. The old aquaria tables, unsatisfactory from the first, have been replaced by lead-lined troughs, and certain wooden supply-pipes, badly decayed, have been replaced by pipes of lead. All the leaky wooden pipes must soon be removed, though the change is not immediately necessary, and fresh water should be conducted into all the general laboratories. A cheaply constructed storage room has been built, though the entire basement should be excavated, ample storerooms provided, and large and expensive alterations should be made in the sewage system. Improved toilet-rooms are greatly needed.

The launch, boats, etc., save certain minor repairs which arise from general use, are, as they were at the beginning of the season of '94, in good condition, though it has been necessary to purchase a new beam-trawl and two seines. The large attendance of the past year also made the purchase of a small schooner necessary.
(d.) THE SUPPLY DEPARTMENT.

During the past two years the demands made upon this department have been unprecedented, over fifty educational institutions having looked to the Marine Laboratory for material for class work. Since the establishment of the Laboratory, a new method of practical biological teaching has been made possible for schools located far inland as well as for those nearer the shore; and the building of new rooms in the basement or elsewhere with ample equipment is absolutely necessary for the successful conduction of the work.

Respectfully submitted,

H. C. BUMPUS.
The Botanical Department has passed an unusually prosperous and profitable season. The new Laboratory, although built and fitted up at short notice, has given all the necessary facilities for carrying on the work, not only of the elementary courses, but also that of the investigators. It is extremely gratifying to find during the last season, botanists of advanced standing taking advantage of the Laboratory facilities for investigation. The botanist unlike the zoölogist is not forced to go to the seashore for his material, and the investigation of marine algæ has been looked upon as a subject which could not be taken up except by some one whose position enabled him to have easy and frequent communication with the shore. The establishment of a botanical department at the Laboratory, with facilities of its own, ought to lead inland botanists to take this most favorable opportunity to at least introduce themselves to what is a very important but much neglected portion of our flora.

Seven investigators besides the instructors were present during the last summer, and it is hoped that a larger number may find their way to Wood's Holl next season of work.

The work of this department in the past has been essentially preparatory, and the energies of the instructors have been employed in giving as thorough a course in the lower cryptogamous plants as they were able to. At the same time, both students and instructors have been encouraged to undertake the investigation of special subjects wherever it was found possible. As a result of this the following papers, in the process of being put into final form and promised for the present year, are announced:
M. A. BRANNON.
The Life-History of Grinnelia-Americana, Harv.

B. M. DAVIS.
Notes on the Development of the Cystocarp in certain Florideae.

GRACE D. CHESTER.
Notes on the Development of Nemalion multifidum F. Ag.

W. J. V. OSTERHOUT.
A Simple Freezing Device.

W. J. V. OSTERHOUT.
A Study of the Life-History of Rhabdonia tenera, Ag., with especial Reference to the Cystocarp.

W. A. SETCHELL AND ISAAC HOLDEN.
Phycotéca Boréali-Américana. (In connection with Frank S. Collins.)

W. A. SETCHELL AND W. J. V. OSTERHOUT.
Experiments with certain Aqueous Fixing and Preserving Media.

Not only has the Investigators' Department yielded such gratifying results, but also the elementary courses could be conducted more satisfactorily than ever before. Thirteen students were registered for these courses and worked devotedly for the whole six weeks. The course followed nearly the scheme announced in the circular, and the students were enabled to study carefully quite a number of additional forms. By the use of freezing methods much time was saved in the preparation of material, and much more ground was satisfactorily covered on that account. The lectures, followed fairly closely by the Laboratory work, were as follows:

REPORT OF THE DIRECTOR.


2. "Relationships of the different groups of Algae."
9. (P.M.) "Morphology of the Brefeld's 'Hemi-pace.'"
16. (A.M.) "Sexual Reproduction in the Pteridophyta. (Continued.)
16. (P.M.) "Sexual Reproduction in the Spermatophyta."

Besides the regular lectures, which were combined as far as possible into a consistent course, the following lectures were given to the students of this department alone:

July 14. "On the Analysis of Flowering Plants." By Prof. MACFARLANE.
16. "On the Cytology of the Cyanophyceæ." By Mr. OSTERHOUT.

Aug. 6. "On the Development of the Cystocarp in the Florideæ." By Mr. B. M. DAVIS.
The help which the Botanical Department has received from Mrs. Esten and from Messrs. Osterhout and Nott needs especial mention. Mrs. Esten spent all of her time upon the herbarium of algæ, rearranging and caring for the valuable specimens already donated by Professor Farlow, and inserting additional specimens either not represented at all before, or else showing some especial features, so that at present, mainly through Mrs. Esten's efforts, the Laboratory possesses a working collection of great completeness and value. Messrs. Osterhout and Nott were kept busy in furnishing and preparing material for the various members, and never has the department been supplied so bountifully and so well. Mr. Nott has devoted particular attention to collecting and preparing a stock of cryptogams suitable for laboratory use, and the various teachers of botany throughout the country can obtain through him material which has hitherto been inaccessible. It is to be hoped that this work may be carried still further during the coming season. It is also very desirable that a place should be provided in the new laboratory for the housing of the herbarium, now so well attended to, and for the botanical library.

It is very desirable that both of these should be readily accessible, so that the students may derive all the advantage of being able to consult them at all times. The supply of botanical books is not very large, and the number sadly needs augmenting.

During the summer of 1895, the work of the Botanical Department has been continued along essentially the same lines as in the previous summers.

There were added to the working force, Mrs. R. A. Esten, of Providence, R.I., as curator of the herbarium and librarian, and Mr. F. Bement, of Brown University, as assistant. Both deserve special thanks for the numerous ways in which they have facilitated the work of both instructors and students. Through their efforts the herbarium has been much increased and the preparation of material has been conducted in a very satisfactory manner.
During the summer a list of the various species of algæ thus far found both in the marine and fresh waters in the vicinity of Wood's Holl has been in preparation by Mrs. Esten and the writer, and it is hoped that this may be published later, as a help both to those studying at the Laboratory itself and to those intending to come for that purpose.

Several of the papers mentioned in the report for last year are being made ready for press. The first two fascicles of the Phycotheca Boreali-Americana have been issued, and fascicle three is in preparation.

Six investigators receiving instruction were present during this session. Two were at work upon subjects already undertaken, and four more made a fair beginning upon new subjects.

Sixteen students took the ordinary course in Cryptogamic Botany, and were enabled to make even more than the usual progress under the instruction and improved methods of Messrs. Osterhout and Bement.

The lectures have been upon the same general topics, and have followed essentially the same order as those of the last session.

Respectfully submitted,

W. A. SETCHELL.
REPORT ON THE LIBRARY.

By Miss Cornelia M. Clapp, Librarian.

Since the last report in 1893 the library has acquired by gift numerous monographs and pamphlets, and has maintained and added to the Laboratory subscriptions to important journals.

The following donations have been received and catalogued:

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The library is indebted to Ginn & Co. for a complete set of the Journal of Morphology.

The following journals are now taken by the Laboratory:

**American Naturalist.**

Vols. VIII, IX. 1874, 1875.
Vols. XI, XII. 1877, 1878.
Vol. XVIII. 1884.

Botanical Gazette.
Vols. I, II. 1875, 1877.
Vol. III. 1878. Nos. 1–9, and 11, 12.
Vol. IX. 1884. Nos. 1–9, and 12.
Vol. XV. 1890. Nos. 1–8, and 11.
Vol. XIX. 1894.
Botanischer Jahresbericht. 1885–1892.
Ergebnisse der Anatomie und Entwicklungsgeschichte. 1891–1893.
Nature. Vols. 46, 47. 1892, 1893.
Zoologischer Jahresbericht. 1879-1893.
UNIVERSITIES, COLLEGES, AND SCIENTIFIC SCHOOLS REPRESENTED AT THE LABORATORY, 1888-1895.

Albion College, '95 . . . . . . . Albion, Mich.
American Medical Missionary College, '95 . . . . . . . Battle Creek, Mich.
Armour Institute, '94 . . . . . . . Chicago, Ill.
Boston University, School of Medicine, '94, '95 . . . . . . . Boston, Mass.
Bowdoin College . . . . . . . . . . Brunswick, Me.
Brown University, '94, '95 . . . . Providence, R.I.
Carrollton College . . . . . . . . Northfield, Minn.
Central Pennsylvania College . . . . New Berlin, Penn.
Chicago Medical College, '95 . . . . Chicago, Ill.
Chicago Polyclinic, '94 . . . . . . . Chicago, Ill.
Clark University . . . . . . . . . . Worcester, Mass.
College for Women, Western Reserve University, '95 . . . . . . . Cleveland, O.
College of Medicine, Syracuse Univ., '94, '95 . . . . Syracuse, N.Y.
Collegiate Institute, '94 . . . . . . . St. Thomas, Ont., Can.
Cornell University, '94, '95 . . . . Ithaca, N.Y.
De Pauw University, '94 . . . . . . . Greencastle, Ind.
Drexel Institute, '94 . . . . . . . . Philadelphia, Penn.
Franklin and Marshall College . . . . Lancaster, Penn.
Franklin College, '95 . . . . . . . Franklin, Ind.
Hamilton College, '94, '95 . . . . Clinton, N.Y.
Haverford College . . . . . . . . . Pennsylvania.
Heidelberg University . . . . . . . Tiffin, O.
Indiana University, '94  . . . . . . Bloomington, Ind.
Iowa College, '95  . . . . . . Grinnell, Ia.
Iowa University, '95  . . . . . . Grinnell, Ia.
Johns Hopkins University, '94, '95  . . . . . . Baltimore, Md.
Kansas Medical School, '95  . . . . . . Topeka, Kan.
Lake Forest University, '94, '95  . . . . . . Lake Forest, Ill.
Lawrence University  . . . . . . . . . . . . Appleton, Wis.
Louisiana State University, '94, '95  . . . . . . Baton Rouge, La.
Lincoln University, '95  . . . . . . Lincoln, Ill.
Marietta College  . . . . . . . . . . . . Marietta, O.
McGill University, '95  . . . . . . Montreal, Can.
Miami University, '94  . . . . . . Oxford, O.
Middlebury College, '95  . . . . . . Middlebury, Vt.
Milwaukee College, '94  . . . . . . Milwaukee, Wis.
Monmouth College, '94, '95  . . . . . . Monmouth, Ill.
North Dakota University, '94  . . . . . . Grand Forks, N. Dak.
Northwestern University, '94, '95  . . . . . . Evanston, Ill.
Oberlin College, '95  . . . . . . Oberlin, O.
Ohio University  . . . . . . . . . . . . Athens, O.
Ohio Wesleyan University, '94  . . . . . . Delaware, O.
Ottawa Collegiate Institute, '94  . . . . . . Ottawa, Can.
Ottawa University  . . . . . . . . . . . . Ottawa, Can.
Park College, '95  . . . . . . . . . . . . Parkville, Mo.
Pennsylvania College, '94  . . . . . . Gettysburg, Penn.
Queen's University, '94  . . . . . . Ontario, Can.
Randolph Macon College  . . . . . . Ashland, Va.
Rust University, '94  . . . . . . Holly Springs, Miss.
Shaw School of Botany  . . . . . . St. Louis, Mo.
Sheffield Scientific School  . . . . . . New Haven, Conn.
State University of South Dakota  . . . . . . Vermillion, S. Dak.
State of Maine College, '95  . . . . . . E. Brownfield, Me.
St. Lawrence University  . . . . . . Canton, N. Y.
Swarthmore College  . . . . . . . . . . . . Pennsylvania.
Syracuse University, '95 \ldots \quad Syracuse, N.Y.
Tufts College \ldots \quad College Hill, Mass.
University of Buffalo, '95 \ldots \quad Buffalo, N.Y.
University of Chicago, '94, '95 \ldots \quad Chicago, Ill.
University of Cincinnati, '94 \ldots \quad Cincinnati, O.
University of Illinois \ldots \quad Champaign, Ill.
University of Iowa, '94 \ldots \quad Iowa City, la.
University of Kansas \ldots \quad Lawrence, Kan.
University of Michigan, '94, '95 \ldots \quad Ann Arbor, Mich.
University of Missouri, '95 \ldots \quad Columbia, Mo.
University of Nashville, '95 \ldots \quad Nashville, Tenn.
University of Nebraska \ldots \quad Lincoln, Neb.
University of New York \ldots \quad New York.
University of Pennsylvania, '94, '95 \ldots \quad Philadelphia, Penn.
University of Rochester \ldots \quad Rochester, N.Y.
University of South Carolina \ldots \quad Columbia, S. C.
University of Texas, '95 \ldots \quad Austin, Tex.
University of Toronto, '94 \ldots \quad Toronto, Ont., Can.
University of Virginia \ldots \quad Charlottesville, Va.
Ursinus College, '95 \ldots \quad Collegeville, Penn.
Vanderbilt University, '95 \ldots \quad Nashville, Tenn.
Vassar College, '94, '95 \ldots \quad Poughkeepsie, N.Y.
Wake Forest College \ldots \quad Wake Forest, N.C.
Wellesley College, '94, '95 \ldots \quad Wellesley, Mass.
Wells College, '95 \ldots \quad Aurora, N.Y.
Wesleyan University \ldots \quad Middletown, Conn.
Western College and Seminary for Women, '94 \ldots \quad Oxford, O.
Whitman College \ldots \quad Walla Walla, Wash.
Williams College, '94, '95 \ldots \quad Williamstown, Mass.
Woman's College, '94, '95 \ldots \quad Baltimore, Md.
Woman's College \ldots \quad Ontario, Can.
Woman's Medical College, '94 \ldots \quad New York.
Woman's Medical College, '95 \ldots \quad Philadelphia, Penn.
Yale University, '94, '95 \ldots \quad New Haven, Conn.
SEMINARIES, ACADEMIES, SCHOOLS, AND LABORATORIES, REPRESENTED AT THE LABORATORY,
1888-1895.

Adelphi Academy, '95........... Brooklyn, N.Y.
Allis Lake Laboratory........ Milwaukee, Wis.
Beloit College Academy........ Beloit, Wis.
Bennet School, '95........... Boston, Mass.
Bridesburg School............ Pennsylvania.
Brownell Hall, '95........... Omaha, Neb.
Bryn Mawr School, '95......... Baltimore, Md.
Buffalo High School, '94, '95... Buffalo, N.Y.
Burr and Burton Seminary..... Manchester, N.H.
California Academy of Sciences... San Francisco, Cal.
Central High School........... Minneapolis, Minn.
Central High School, '95..... Cleveland, O.
Central High School........... Washington, D.C.
Central High School, '94..... Buffalo, N.Y.
Central Normal School......... Lewiston, Ill.
Central School................ Brooklyn, N.Y.
Charlestown High School, '94, '95... Boston, Mass.
Chicago West Division High School, '94... Chicago, III.
Dayton High School, '94, '95... Dayton, O.
Deaf Mute Institute, '94....... Philadelphia, Penn.
Detroit High School........... Detroit, Mich.
Dorchester High School......... Dorchester, Mass.
Dunkirk High School........... Dunkirk, N.Y.
Dwight School.................. Boston, Mass.
Englewood High School, '95.... Chicago, III.
Everett School, '94, '95....... Boston, Mass.
Federal School, '95........... Providence, R.I.
Fort Wayne High School........ Fort Wayne, Ind.
Framingham Normal School, '94... Framingham, Mass.
Friends' Central School......... Philadelphia, Penn.
Friends' High School........... Philadelphia, Penn.
Friends' School ...................................................... Providence, R.I.
Friends' Select School ........................................... Philadelphia, Penn.
Girls' High School, '95 ............................................ Philadelphia, Penn.
Girls' High School, '95 ............................................ Boston, Mass.
Girls' National School ............................................ Philadelphia, Penn.
Grammar School .................................................... Providence, R.I.
Grant Collegiate Institute, '94 ................................. Ledyard, Conn.
Harvard School, '95 ............................................... Chicago, Ill.
High School ......................................................... Fort Wayne, Ind.
High School ......................................................... Minneapolis, Minn.
High School ......................................................... New Ulm, Minn.
Holyoke High School, '95 ........................................ Holyoke, Mass.
Hughes High School, '95 ......................................... Cincinnati, O.
Hyde Park High School ............................................ Chicago, Ill.
Indianapolis High School, '94, '95 ............................ Indianapolis, Ind.
International Institute, '94 ...................................... San Sebastian, Spain.
Jackson High School .............................................. Jackson, Mich.
James School, '95 .................................................. Syracuse, N.Y.
Kansas City High School ......................................... Kansas City, Mo.
LaGrange High School, '94, '95 ................................. LaGrange, Ill.
La Forest Academy, '94 .......................................... Lake Forest, Ill.
Lake View Grammar School .................................... Chicago, Ill.
Lake View High School ........................................... Chicago, Ill.
La Porte High School, '94, '95 ................................. La Porte, Ind.
Marquette High School, '95 ..................................... Marquette, Mich.
Martin School ....................................................... Boston, Mass.
Mass. Agricultural Experiment Station ..................... Amherst, Mass.
Medill High School, '95 ......................................... Chicago, Ill.
Meriden High School ............................................. Meriden, Conn.
Middletown Academy, '95 ........................................ Middletown, N.Y.
Milwaukee 17th District School, '94 ......................... Milwaukee, Wis.
Milwaukee High School .......................................... Milwaukee, Wis.
Milwaukee Normal School, '95 ................................. Milwaukee, Wis.
Milwaukee Public Museum ....................................... Milwaukee, Wis.
Miss Mittleberger's School ..................................... Cleveland, O.
Misses Masters' School .......................................... Dobbs Ferry, N.Y.
Missouri State Normal School ................................. Warrensburg, Mo.
REPORT OF THE DIRECTOR.

Normal School, '94 .... Toronto, Can.
Normal School of Physical Training .... Cambridge, Mass.
North Division High School, '95 .... Chicago, Ill.
North Side High School .... Minneapolis, Minn.
North West Division High School .... Chicago, Ill.
Norwalk High School, '94 .... Norwalk, Conn.
Oak Grove Seminary .... Vassalboro, Me.
Oak Park High School .... Oak Park, Ill.
Packer Institute .... Brooklyn, N.Y.
Preparatory School of N. W. University, Evanston, Ill.
Providence Public Schools, '94, '95 .... Providence, R.I.
Rice Training School .... Boston, Mass.
River Falls Normal School, '95 .... River Falls, Wis.
Rockford High School .... Rockford, Ill.
St. Mary's Seminary, '95 .... Baltimore, Md.
St. Mary's Institute, '95 .... Dallas, Texas.
Southern Home School .... Baltimore, Md.
South High School, '95 .... Cleveland, O.
South Jersey Institute .... New Jersey.
State Normal School .... Greensboro, N.C.
State Normal School, '94 .... Los Angeles, Cal.
State Normal School .... New Britain, Conn.
State Normal School .... Providence, R.I.
State Normal Training School .... Willimantic, Conn.
Theological Seminary .... Rochester, N.Y.
University School .... Chicago, Ill.
Warren Academy, '95 .... Warren, Ill.
Wayland Academy .... Beaver Dam, Wis.
Wesleyan Academy .... Wilbraham, Mass.
West Division High School .... Chicago, Ill.
Westtown Boarding School .... Westtown, Penn.
Williamstown High School .... Williamstown, Mass.
Wolfsborough Academy .... Wolfsborough, N.H.
Wymore Public Schools, '95 .... Wymore, Neb.
MARINE BIOLOGICAL LABORATORY.

Dr. MARINE BIOLOGICAL LABORATORY IN 1895.

To Instructors .................................. $1,950 00
Wages ............................................. 2,246 94
Chemicals, glassware, and instruments ....... 1,431 62
Alterations and repairs ......................... 245 17
Stationery, printing, and postage .............. 230 09
Launch, boats, etc. ................................ 754 19
Furniture ........................................ 345 48
Freight and express ................................ 182 27
Lectures ......................................... 45 02
Sundry running expenses ......................... 237 26
Books and periodicals ............................ 54 98
Taxes ............................................ 6 95
Supply Department ............................... 3,256 27
Insurance ........................................ 360 00
On account repayment of loan Botanical Lab-
oratory ........................................... 250 00
Interest on same ................................ 149 55
Interest on $3,500 mortgage ...................... 210 00
Balance of Dining Club account ................ 7 83
Balance cash on hand ............................ 2,747 22

$14,710 84
REPORT.

ACCOUNT WITH LAURENCE MINOT, TREASURER:  

<table>
<thead>
<tr>
<th>Description</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>By Balance from last account</td>
<td></td>
</tr>
<tr>
<td>1 Assessment, 1893</td>
<td>$670.67</td>
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<tr>
<td>13 Assessments, 1894</td>
<td>1.00</td>
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<tr>
<td>180 Assessments, 1895</td>
<td>13.00</td>
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<tr>
<td>General contributions</td>
<td>180.00</td>
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<tr>
<td>Contributions to Botanical Laboratory</td>
<td>1,908.00</td>
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<tr>
<td>Subscriptions from colleges</td>
<td>460.00</td>
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<tr>
<td>Fees of students and investigators</td>
<td>2,590.00</td>
</tr>
<tr>
<td>Receipts of Supply Department</td>
<td>5,420.50</td>
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<tr>
<td>Miscellaneous receipts</td>
<td>3,431.82</td>
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<td>35.85</td>
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$1,4710.84

E. & O. E., Nov. 6, 1895.

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

**LUCRETIA CROCKER SCHOLARSHIP FUND.**

Invested as follows:
- 18 shares Vermont & Massachusetts R.R.
- Cash Capital, $83.50.
- Income, $48.52.

**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, $474.31.

**LIBRARY FUND.**

Invested as follows:
- 5 shares Chicago & Alton R.R.
- Cash Income, $9.35.

E. & O. E., Nov. 6, 1895.

**LAURENCE MINOT,**

*Treasurer.*
DONORS AND GIFTS.

Mrs. Wm. H. Gorham, $25 00  Elizabeth C. Ware, $25 00
Harris Kennedy, 10 00  Miss M. H. Crocker, 9 90
Mary F. Bartlett, 4 00  Isaac Holden, 4 00
Prof. E. S. Morse, 10 00  Anonymous, 500 00
Myles Standish, 4 00  Henrietta L. Graves, 4 00
Samuel Wells, 4 00  Miss Lucy Ellis, 100 00
Harriet E. Freeman, 4 00  Miss Laura Norcross, 50 00
Prof. Marcella I. O'Grady, 5 00  Miss Helen C. Bradlee, 25 00
Wm. P. Wilson, 4 00  A Friend, through Mrs.
Theodore Hough, 4 00  C. C. Smith, 50 00
Edith F. Sampson, 10 00  Mrs. C. C. Smith, 200 00
Lilian V. Sampson, 10 00  Anonymous, 250 00
Miss Eliza Collamore, 5 00  Prof. Wm. G. Farlow, 100 00
Miss Helen Collamore, 5 00  A Friend, 300 00
Ida M. Mason, 150 00  Dr. Edw'd Wigglesworth, 9 00
Katherine A. Taylor, 4 00  Mrs. Orville J. Bliss, 3 00
James F. Porter, 4 00  E. Pierson Beebe, 4 00
David W. Cheever, 4 00  Anonymous, 5 00
H. C. Bumpus, 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
LIFE MEMBERS OF THE CORPORATION.

Dr. W. S. Bigelow,          Miss Ida M. Mason,
Mr. Robert C. Billings,     Mrs. Daniel Merriman,
Miss H. C. Bradlee,         Miss Susan Minns,
Mr. A. A. Carey,            Mr. Thomas Minns,
Miss F. M. Cushing,         Mr. William Minot,
Miss Lucy Ellis,            Prof. Charles S. Minot,
Mr. William Endicott, Jr.,  Miss M. C. Mixter,
Mrs. Glendower Evans,       Miss Laura Norcross,
Prof. William G. Farlow,    Mr. Alfred Pell,
Mrs. George Faulkner,       Mrs. John C. Phillips,
Mr. J. S. Fay,              Mr. R. M. Pulsifer,
Miss S. B. Fay,             Miss Annette P. Rogers,
Miss Amy Folsom,            Mrs. William B. Rogers,
Mr. John M. Forbes,         Mr. Henry Saltonstall,¹
Mr. John Foster,            Dr. Henry F. Sears,
Dr. E. G. Gardiner,         Mrs. C. C. Smith,
Miss Eugenia Gardiner,      Mr. J. P. Spaulding,
Mr. William O. Grover,¹     Prof. William Trelease,
Mr. George W. Hammond,      Mrs. C. E. Ware,
Mrs. H. L. Higginson,       Miss M. L. Ware,
Mr. C. C. Jackson,          Mrs. S. D. Warren,
Miss Marian C. Jackson,     Mr. Henry M. Whitney,
Dr. George G. Kennedy,      Mr. Thomas Wigglesworth,
Mr. N. S. Kidder,           Miss Mary A. Willcox,
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Mr. A. Lawrence Lowell,     Mrs. H. D. Wilmarth.
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Mr. James B. Ames,
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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,
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,
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Prof. E. A. Birge,
Miss Elizabeth Blanchard,
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Mr. Severance Burrage,
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Miss L. B. Clark,
Prof. S. F. Clarke,
Mr. E. A. Codman,
Miss Collamore,
Miss Helen Collamore,
Prof. J. H. Comstock,
Mr. F. Story Conant,
Prof. E. G. Conklin,
Prof. H. W. Conn,
Miss Elizabeth Cooke,
Miss Grace E. Cooley,
Prof. H. N. Conser,
Miss M. Coon,
Prof. J. M. Coulter,
Prof. W. T. Councilman,
Mr. R. H. Cowley,  
Mr. H. E. Crampton,  
Miss Frances Crane,  
Miss M. H. Crocker,  
Miss Clara E. Cummings,  
Mr. John Cummings,  
Mr. H. H. Cushing,  
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Miss Mary Faulkner,  
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Mr. John H. Gerould,  
Mr. Henry H. Goddard,  
Miss Leah Goff,
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Miss M. S. Packard,
Miss E. C. Palmer,
Mr. J. E. Peabody,
Mrs. Cora E. Pease,
Mr. H. S. Pepoon,
Mr. Robert S. Phillips,
Prof. J. H. Pillsbury,
Mr. James F. Porter,
Prof. William L. Poteat,
Mr. H. C. Potter,
Major J. W. Powell,
Prof. F. W. Putnam,
Dr. J. J. Putnam,
Dr. H. P. Quincy,
Dr. Harriet Randolph,  
Dr. W. M. Rankin,  
Mr. Richard Rathbun,  
Prof. Jacob Reighard,  
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Mrs. T. O. Richardson,  
Prof. C. V. Riley,  
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Miss Mary Rodman,  
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Mrs. William H. Rollins,  
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Miss L. V. Sampson,  
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Miss Mary A. Schively,  
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Prof. Benjamin Sharp,  
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Prof. Ellison A. Smyth, Jr.,  
Dr. Myles Standish,  
Dr. C. Ellery Stedman,  
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Mr. Israel Strauss,  
Miss Mary N. Sturges,  
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Miss Mary A. Tappan,  
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Prof. A. E. Verrill,  
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Miss Louise B. Wallace,  
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Mr. F. W. Wamsley,  
Prof. F. L. Washburn,  
Dr. S. Watsé,  
Mr. H. J. Webber,  
Mr. Samuel Wells,  
Mr. W. M. Wheeler,  
Miss Inez L. Whipple,  
Mr. Franklin W. White,  
Dr. C. O. Whitman,  
Miss C. R. Whitmore,  
Dr. W. F. Whitney,  
Dr. Edward Wigglesworth,  
Miss A. W. Wilcox,  
Prof. B. G. Wilder,  
Mr. A. Willey,  
Miss N. M. Willey,
MEMBERS OF THE CORPORATION.

Dr. F. H. Williams,  Miss Elizabeth Woodbridge,
Mrs. A. L. Willston,   Miss C. A. Woodman,
Miss B. L. Wilson,    Mr. W. M. Woodworth,
Prof. E. B. Wilson,  Mr. A. M. Worthington,
Prof. H. V. Wilson,  Prof. A. A. Wright,
Prof. W. P. Wilson,  Mrs. J. H. Wright,
Mr. B. S. Winchester, Prof. R. Ramsay Wright,
Dr. Martha Wollstein,
ACT OF INCORPORATION.

1888.

No. 3170.

COMMONWEALTH OF MASSACHUSETTS.

BE IT KNOWN, That whereas Alpheus Hyatt, William Sanford 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. PIERCE, 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. PIERCE,
Secretary of the Commonwealth.
BY-LAWS OF THE CORPORATION.

1. The annual meeting of the members shall be held in Boston on the first Thursday in 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.
THE ANNUAL CIRCULAR FOR 1895.

The Marine Biological Laboratory
AT WOOD'S HOLL, MASS.

INCORPORATED 1888.

EIGHTH SEASON, 1895.
JUNE 1ST—OCTOBER 1ST.

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

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

OFFICERS OF INSTRUCTION.

ZOÖLOGY.

A. INVESTIGATION.

HOWARD AYRES, Professor of Biology, Univ. of the State of Missouri.
E. G. CONKLIN . . . Professor of Biology, Northwestern University.
S. WATASÉ . . Assistant Professor of Zoölogy, University of Chicago.
M. M. METCALF, Prof. of Biology, The Woman's College of Baltimore.
C. M. CHILD . . . Fellow in Zoölogy, University of Chicago.
F. R. LILLIE . . . Instructor in Zoölogy, University of Michigan.
O. S. STRONG . . . Instructor in Zoölogy, Columbia College.
H. S. BRODE . . . Fellow in Zoölogy, University of Chicago.

B. INSTRUCTION.

W. M. RANKIN . . . Instructor in Zoölogy, Princeton College.
J. L. KELLOGG . . . . Professor of Biology, Olivet College.
P. A. FISH . Instructor in Physiology and Anatomy, Cornell University.
A. D. MEAD . . . . Fellow in Zoölogy, University of Chicago.
H. E. WALTER . . . . Chicago.
GENERAL INFORMATION.

The Laboratory was opened in the summer of 1888 for the use of students and investigators in Marine Zoology. Departments of Botany and Physiology 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 supervision of the instructors, are given in Zoology, Botany, Embryology, and Physiology. In addition to these, there will be courses of lectures on special subjects as follows:

Embryology
On Botanical Museum Development
On Matter and Energy

There will also be 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:

G. F. Atkinson; E. G. Conklin, Northwestern University; J. M. Coulter, President Lake Forest University; A. E. Dolbear, Tufts College; Simon Flexner, Johns Hopkins Hospital; E. O. Jordan, University of Chicago; William Libby, Jr., Princeton College; F. S. Lee, Columbia College; W. A. Locy, Lake Forest University; J. M. Macfarlane, University of Philadelphia; C. S. Minot, Harvard Medical School; E. S. Morse, Peabody Academy of Science; H. F. Osborn, Columbia College; W. B. Scott, Princeton College; W. T. Sedgwick, Massachusetts Institute of Technology; William Trelease, Director Missouri Botanical Garden; S. Watase, University of Chicago; E. B. Wilson, Columbia College; B. G. Wilder, Cornell University; W. P. Wilson, University of Pennsylvania.

WOOD'S HOLL.

Wood's Holl 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 (two and one-half 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 $1.00 to $3.00 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 location of the Laboratory at Wood's Hall gives it exceptional advantages for study and research. The shore is varied by necks, points, flats, gutters, holes, bays, and islands; there are numerous fresh-water ponds and lakes in the vicinity; there is no muddy river or city sewage to pollute the sea-water; the fauna and flora are exceptionally rich; the climate is especially favorable for summer work, and the place is free from the inconveniences and distractions of fashionable summer resorts.

THE LABORATORY.

The Laboratory consists of four two-story buildings, with forty private rooms for the exclusive use of investigators, and seven general laboratories. It is supplied with aquaria, collecting apparatus, reagents, glassware, and a limited number of microtomes and microscopes for use in the introductory courses. The investigators' rooms are furnished with glassware and reagents, but not with microscopes and microtomes. No alcohol is supplied beyond what is allowed for the work done in the laboratories; and expensive reagents, such as osmic acid and gold chloride, are not included in the list of free reagents.

The Laboratory has a steam-launch, boats, dredges, and all the apparatus necessary for collecting and keeping alive material reserved for class work or research.

LIBRARY.

The Library is provided with many works of reference and the more important journals of Zoology and Botany, some of them in complete series. Members of the Laboratory are allowed the use of books from the Library of the Boston Society of Natural History, through the courtesy of the Curator and the Librarian.

LABORATORY SUPPLY.

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, mollusks, 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 on application.

THE LABORATORIES FOR INVESTIGATORS.

The forty private laboratories are distributed as follows: Zoölogy, 22; Physiology, 8; Botany, 10. These rooms are rented at $100 to colleges, societies, or individuals.
The general laboratories are for the use of students engaged in special research under the supervision of the Director and his assistants, and for advanced courses preparatory to beginning investigation, such as the course in Embryology. There are forty-two tables, of which Zoology has twenty-two, Physiology ten, and Botany ten.

EMBRYOLOGY.

JULY 10 TO AUGUST 17.

For the course in Embryology, the introductory courses in Anatomy, or their equivalent, are considered as prerequisites. The course is designed as a preparation for beginning investigation. The aim will therefore 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, staining and mounting, drawing, reconstructing, modelling, etc. The study will be mainly confined to the fish egg as the best type for elucidating vertebrate development; but the eggs of amphibia and other vertebrates as well as some invertebrates will receive attention. Each member of the class will be supplied with material and be expected to work out the successive steps in development, beginning with the egg just after fertilization. The laboratory work will be conducted by Doctors Lillie and Strong, and accompanied with lectures and Seminar work under the Director. The fee for this course is $50, and the class is 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.

Applications should be made to Prof. C. Q. Whitman, University of Chicago, Chicago, Ill.

INVESTIGATION.

JULY 3 TO AUGUST 17.

For those prepared to begin original work, ten tables are reserved in Zoology, and the same number in Physiology and Botany. The introductory and preparatory courses in each department, or an equivalent, are prerequisites for admission to these tables. Ability to read scientific German and French is also required.

Special subjects for investigation are assigned to the occupants of tables, and the supervision of the work is so divided that each instructor has the care of but three or four students. In this way all the advantages of individual instruction are secured. All the lectures and the Seminar are open to those engaged in such work. The fee is $50.

Applications directed as above.
THE SEMINAR.

The Seminar is especially designed for members of the class in Embryology and beginners in investigation, but is open to all. It is expected that all who attend will be provided with the third volume of the Biological Lectures, as this will be made the basis of discussion. Most of the authors of these lectures will be present, and from two to three mornings each week will be devoted to the consideration of each lecture, and such questions as may be raised.

THE LABORATORY FOR TEACHERS AND STUDENTS IN ANATOMY.

OPEN JULY 2 TO AUGUST 30.

In this Laboratory two courses are offered: the first, in Invertebrate Anatomy, and the second, a newly arranged course in Vertebrate Anatomy. Either course may be made preparatory to the course in Embryology.

INVERTEBRATE ANATOMY.

JULY 2 TO JULY 31.

This course will embrace a study of the more typical marine Invertebrates, instruction being given by lectures, laboratory work, and collecting excursions.

The lectures are given each morning and by those who are specialists in the subject under consideration. For laboratory dissection, each student is supplied with fresh material, and the entire day is spent in study, under the direction of the instructors. Collecting excursions are taken on Wednesdays and Saturdays. 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 2-6: Cælenterates (Grantia, Tubularia, Campaunaria, Metridium, Muumeopsis).
JULY 8-11: Vermes (Nereis, Phascolosoma, Polyzon, Bdelloura).
JULY 12-15: Tunicates (Molgula).
JULY 16-20: Crustaceans (Branchipus, Lepas, Talorchestia, Cancer, Linulins).
JULY 22-25: Echinoderma (Asterias, Arbacia, Echinorachnius, Thyone).
JULY 26-31: Mollusks (Venus, Sycotypus, Loligo).

VERTEBRATE ANATOMY.

AUGUST 1 TO AUGUST 30.

This course has been arranged for those who desire a thorough study of the vertebrate body. Though primarily a Laboratory course, under the direction of the officers of the Laboratory, there will be daily lectures upon Anatomy, Physiology, and kindred subjects.

1 Published by Ginn & Company, Boston, Mass.
LIST OF LECTURERS.

PROF. H. P. BOWDITCH
Harvard Medical School, Boston, Mass.

DR. F. S. LEE
College of Physicians and Surgeons, New York.

DR. C. F. HODGE
Clark University, Worcester, Mass.

DR. O. S. STRONG
Columbia College, New York.

DR. C. S. MINOT
Harvard Medical School.

DR. J. S. KINGSLY
Tufts College, Mass.

DR. J. P. McMURRICH
University of Michigan, Ann Arbor.

DR. H. F. OSBORN
Columbia College, New York.

The first week will be devoted to the Elasmobranchs, the Dogfish (Galeus) and Skate receiving special attention. An abundance of material will be supplied, and methods of injection and of preservation will be introduced.

The second week will be devoted to the higher Fishes.

During the third week the Batrachia will be studied, the Frog, or *Necturus*, receiving special attention.

The fourth week will be devoted to the Reptilia.

Instruction in microscopical technique will extend throughout the month. Methods of section-cutting, differential staining, etc., will be taught, and histological preparations of the more important tissues will be made.

There will be a series of collecting excursions to different localities along the shores of Buzzard's Bay and Vineyard Sound.

The fee for either of the above courses is $40.00, payable in advance. It covers tuition, material for dissection, dissecting instruments, laboratory outlines, drawing paper and instruments, slides and covers, and a supply of glassware and reagents. The Laboratory loans, without charge, microtomes and certain other apparatus; there is a small fee, however, for the use of microscopes, and all who can provide themselves with simple and compound microscopes before coming to Wood's Holl are urged to do so.

Applications should be made, at the earliest convenient date, to

PROF. H. C. BUMPUS (until June 1),
Brown University, Providence, R.I.

JUNE 1-SEPTEMBER 1, WOOD'S HOLL, MASS.

BOTANY.

THE LABORATORY FOR TEACHERS AND STUDENTS.

OPEN JULY 10 TO AUGUST 17.

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 Holl,
and students desiring to give their entire attention to these plants will be encouraged to do so. The Fungi and Higher Cryptograms will receive less attention than the Algæ, but will be studied in a few types.

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

**FIRST WEEK.** — Cyanophyceæ (Lyngbya, Calothrix, Rivularia, Stigonema, Tolyphothrix, Anabaena).

**SECOND WEEK.** — Chlorophyceæ (Spirogyra, Uloa, Enteromorpha, Chaetomorpha, Bryopsis, Vaucheria, Edogonium). Phaeophyceæ (Ectocarpus, Mesogloia, Leathesia, Laminaria, Fucus, Sargassum).

**THIRD WEEK.** — Rhodophyceæ (Batrachospermum, Nemalion, Callithamnion, Chondriopsis, Rhabdonia).

**FOURTH WEEK.** — Phycomycetes (Mucor, Sporodinia, Peronospora, Cystopus, Achlya). Uredinei (Acidium, Uredo, Puccinia, Uronyces).

**FIFTH WEEK.** — Basidiomycetes (Agaricus, Lycoperdon). Ascomycetes (Microspora, Sordaria, Peziza, Physcia).

**SIXTH WEEK.** — Musciæ (Riccia, Madotheca, Marchantia, Mnium, Tetrarhis, Hypnum). Filicineæ (Dicksonia, Adiantum, Equisetum, Lycopodium, Marsilia, Selaginella).

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

Students are expected to supply their own microscopes 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, Connecticut.

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**CO-OPERATING COLLEGES AND SOCIETIES IN 1894.**

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<tr>
<th>Boston University School of Medicine.</th>
<th>Miami University.</th>
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<td>Brown University.</td>
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<td>Bryn Mawr College.</td>
<td>Mt. Holyoke College.</td>
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<td>College of Medicine, Syracuse University.</td>
<td>Northwestern University.</td>
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<td>College of Physicians and Surgeons,</td>
<td>Princeton College.</td>
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<td>Hamilton College.</td>
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<td>Harvard University (Prof. Farlow).</td>
<td>University of Pennsylvania (Provost Harrison).</td>
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<td>Lake Forest University (President Coulter).</td>
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<td>Massachusetts Institute of Technology.</td>
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<td>Woman's College, Baltimore.</td>
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American Association for Advancement of Science. 
American Society of Naturalists.
Beta Alpha Chapter of the K. K. G. Fraternity of the University of Pennsylvania.
Lucretia Crocker Scholarship.
Woman's School Alliance, Milwaukee.

Applications for the A. A. A. S. Room is to be made to the Secretary of the Association, Prof. F. W. Putnam, Cambridge, Mass.

TRUSTEES.

SAMUEL H. SCUDDER, President . Boston Society of Natural History.
LAURENCE MINOT, Treasurer . . . . 39 Court st., Boston, Mass.
ANNA PHILLIPS WILLIAMS, Secretary, 23 Marlborough st., Boston.
C. O. WHITMAN, Director of the Laboratory . University of Chicago.
W. K. BROOKS . . . . Johns Hopkins University, Baltimore.
SAMUEL F. CLARKE . . . . Williams College, Williamstown.
FLORENCE M. CUSHING . . . Boston.
WILLIAM G. FARLOW . . Harvard University, Cambridge.
EDWARD G. GARDINER . . Boston.
WILLIAM LIBBEY, Jr. . . College of New Jersey, Princeton.
CHARLES S. MINOT . . Harvard Medical School, Boston.
WILLIAM T. SEDGWICK, Massachusetts Institute of Technology, Boston.
BENJAMIN SHARP . Academy of Natural Sciences, Philadelphia, Penn.
GEORGIANA W. SMITH . . . . Boston.
SIDNEY I. SMITH . . . . . . Yale University, New Haven.
WILLIAM TRELEASE . . Missouri Botanical Gardens, St. Louis, Mo.
R. RAMSAY WRIGHT . . . . . University of 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 1896.

The Annual Circular for the Session of 1896 will soon be issued, and may be obtained from Mrs. Anna Phillips Williams, Secretary, No. 23 Marlborough street, Boston, Mass.
**EXPENSE AND INCOME.**

**Income.** — Tuition and subscriptions to tables and rooms. (Receipts from Supplies and Donations not included.)

**Expenses.** — Wages, cost of instruction, and other current expenses. (Buildings, land, and permanent equipment, except periodicals, not included.)

**Instruction.** — Expenses of teachers (included in the curve of running expenses).

The verticals are set at equal intervals to mark the years, and the heights obtained by allowing 2 mm. for every $100. The numbers along each curve above the datum line give the amount in dollars for successive years.

The Roman numerals I-IV mark the years in which new buildings were erected.