THE BIOLOGICAL BULLETIN
PUBLISHED BY THE MARINE BIOLOGICAL LABORATORY

THE MARINE BIOLOGICAL LABORATORY
Thirty-Third Report for the Year 1930—Forty-Third Year

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I. TRUSTEES

EX OFFICIO

Frank R. Lillie, President of the Corporation, The University of Chicago.

Merkel H. Jacobs, Director, University of Pennsylvania.

Lawrason Riggs, Jr., Treasurer, 25 Broad Street, New York City.

Gary N. Calkins, Clerk of the Corporation, and Secretary of the Board of Trustees, Columbia University.

EMERITUS

Cornelia M. Clapp, Mount Holyoke College.

C. R. Crane, New York City.

H. H. Donaldson, Wistar Institute of Anatomy and Biology.

Gilman A. Drew, Eagle Lake, Florida.

William Patten, Dartmouth College.

W. B. Scott, Princeton University.

E. B. Wilson, Columbia University.
MARINE BIOLOGICAL LABORATORY

TO SERVE UNTIL 1934

E. R. Clark, University of Pennsylvania.
E. G. Conklin, Princeton University.
Otto C. Glaser, Amherst College.
Ross G. Harrison, Yale University.
E. N. Harvey, Princeton University.
H. S. Jennings, Johns Hopkins University.
F. P. Knowlton, Syracuse University.
M. M. Metcalf, Johns Hopkins University.

TO SERVE UNTIL 1933

H. C. Bradley, University of Wisconsin.
I. F. Lewis, University of Virginia.
R. S. Lillie, The University of Chicago.
E. P. Lyon, University of Minnesota.
C. E. McClung, University of Pennsylvania.
T. H. Morgan, California Institute of Technology.
A. C. Redfield, Harvard University Medical School.
D. H. Tennent, Bryn Mawr College.

TO SERVE UNTIL 1932

R. Chambers, Washington Square College, New York University.
W. E. Garrey, Vanderbilt University Medical School.
Caswell Grave, Washington University.
M. J. Greenman, Wistar Institute of Anatomy and Biology.
A. P. Mathews, The University of Cincinnati.
G. H. Parker, Harvard University.
C. R. Stockard, Cornell University Medical College.

TO SERVE UNTIL 1931

H. C. Bumpus, Brown University.
W. C. Curtis, University of Missouri.
B. M. Duggar, University of Wisconsin.
George T. Moore, Missouri Botanical Garden, St. Louis.
W. J. V. Osterhout, Member of the Rockefeller Institute for Medical Research.
J. R. Schramm, University of Pennsylvania.
Lorande L. Woodruff, Yale University.

EXECUTIVE COMMITTEE OF THE BOARD OF TRUSTEES

Frank R. Lillie, Ex Off., Chairman.
Merkel H. Jacobs, Ex Off.
Lawrason Riggs, Jr., Ex Off.
G. N. Calkins, to serve until 1931.
L. L. Woodruff, to serve until 1931.
W. C. Curtis, to serve until 1932.
A. C. Redfield, to serve until 1932.
ACT OF INCORPORATION

The Library Committee
C. E. McClung, Chairman.
Robert A. Budington.
E. E. Just.
M. M. Metcalf.
Alfred C. Redfield.
A. H. Sturtevant.

II. ACT OF INCORPORATION
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 investigation, 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.

[Seal]

Henry B. Pierce,
Secretary of the Commonwealth.

III. BY-LAWS OF THE CORPORATION OF THE MARINE BIOLOGICAL LABORATORY

I. The annual meeting of the members shall be held on the second Tuesday in August, at the Laboratory, in Woods Hole, Mass., at 12 o'clock noon, in each year, and at such meeting the members shall choose by ballot a Treasurer and a Clerk to serve one year, and eight Trustees to serve four years. There shall be thirty-two Trustees thus chosen divided into four classes, each to serve four years, and in addition there shall be two
groups of Trustees as follows: (a) Trustees ex officio, who shall be the
President of the Corporation, the Director of the Laboratory, the Associate
Director, the Treasurer and the Clerk; (b) Trustees Emeritus, who shall be
elected from the Trustees by the Corporation. Any regular Trustee who
has attained the age of seventy years shall continue to serve as Trustee
until the next annual meeting of the Corporation, whereupon his office as
regular Trustee shall become vacant and be filled by election by the Cor-
poration and he shall become eligible for election as Trustee Emeritus for
life. The Trustees ex officio and Emeritus shall each have the same right
to vote as the regular Trustees.

The Trustees and officers shall hold their respective offices until their
successors are chosen and have qualified in their stead.

II. Special meetings of the members may be called by the Trustees to
be held in Boston or in Woods Hole at such time and place as may be
designated.

III. The Clerk shall give notice of meetings of the members by pub-
lication in some daily newspaper published in Boston at least fifteen days
before such meeting, and in case of a special meeting the notice shall state
the purpose for which it is called.

IV. Twenty-five members shall constitute a quorum at any meeting.

V. 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 of the Cor-
poration who shall also be Chairman of the Board of Trustees; they shall
appoint a Director of the Laboratory; and they 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 to the Corporation
upon such terms and conditions as they may think best.

VI. Meetings of the Trustees shall be called by the President, or by
any two Trustees, and the Secretary shall give notice thereof by written
or printed notice sent to each Trustee by mail, postpaid. Seven Trustees
shall constitute a quorum for the transaction of business. The Board of
Trustees shall have power to choose an Executive Committee from their
own number, and to delegate to such Committee such of their own powers
as they may deem expedient.

VII. The accounts of the Treasurer shall be audited annually by a
certified public accountant.

VIII. The consent of every Trustee shall be necessary to dissolution
of the Marine Biological Laboratory. In case of dissolution, the property
shall be disposed of in such manner and upon such terms as shall be de-
determined by the affirmative vote of two-thirds of the Board of Trustees.

IX. These By-laws may be altered at any meeting of the Trustees, pro-
vided that the notice of such meeting shall state that an alteration of the
By-laws will be acted upon.

X. Any member in good standing may vote at any meeting, either in
person or by proxy duly executed.
IV. THE REPORT OF THE TREASURER

To the Trustees of the Marine Biological Laboratory:

Gentlemen: Herewith is submitted my report as Treasurer of the Marine Biological Laboratory for the year 1930.

The accounts have been audited by Seamans, Stetson and Tuttle, certified public accountants. A copy of their report is on file at the Laboratory and is open to inspection by members of the Corporation.

At the end of the year 1930, the book value of the General Endowment Fund in the hands of the Central Hanover Bank and Trust Company (of New York) as Trustee was $908,915 in securities and $34.50 in cash. The actual market value of the securities in this fund on the 9th day of May taking the mortgages at face value, was $931,981.25, showing a very satisfactory appreciation of the value over cost.

The book value of the Library Fund was $199,922.50 in securities and $77.50 in cash. The actual market value of the securities on May 9th was $203,031.25.

At the end of the year the Lucretia Crocker Fund consisted of securities of the book value of $4,707.59 and $374.32 in cash.

The Bio Club Scholarship Fund consisted of a mortgage participation of $2,000 and cash of $31.28, the Reynold A. Spaeth Memorial Lecture Fund of $3,000 in mortgage securities and cash of $75.46.

The Reserve Fund, consisting of the proceeds of the sale of part of the Bar Neck property to the Woods Hole Oceanographic Institution, consisted at the end of the year of bonds of the book value of $20,868.75 and cash of $3,090.55, of which cash $3,000 was later paid out under the contract, leaving net proceeds of the transaction of $20,959.30 which is being held with its income to meet maturing mortgage obligations or for such other purposes as the Trustees may decide.

The Retirement Fund at the end of the year consisted of $15,800 invested in mortgage participations, less an overdraft of $9.73, leaving $15,790.27.

The land, buildings, equipment and library, excluding the Devil's Lane and Gansett property, represented an investment of $1,617,086.71, less depreciation of $246,625.64, or a net amount of $1,370,461.07.

Current expenses including depreciation exceeded income for the year by $3,767.25.

Over $29,000 was expended from current funds on buildings, equipment and library.

At the end of the year the Laboratory owed $1,640.99 on accounts payable and $27,000 on bonds secured by mortgage.

Following is the Balance Sheet as of December 31, 1930, and the condensed statement of income and outgo for the year, also the surplus account.
EXHIBIT A

MARINE BIOLOGICAL LABORATORY

BALANCE SHEET,

DECEMBER 31, 1930

Assets

Endowment Assets and Equities:

Securities and Cash in Hands of Central Hanover Bank & Trust Company (of New York) Trustee—Schedules I-a and I-b .............. $1,108,949.50

Securities and Cash—Minor Funds—

Schedule II ...................................... 10,188.65 $1,119,138.15

Plant Assets:

Land—Schedule IV .............................. $ 97,103.05
Buildings—Schedule IV .................... 1,207,354.03
Equipment—Schedule IV .................. 155,222.28
Library—Schedule IV ....................... 157,407.35 $1,617,086.71

Less Reserve for Depreciation ........... 246,625.64

Securities and Cash in Reserve Fund ........ 23,675.43
Cash in Dormitory Building Fund ........ 818.96 $1,394,955.46

Current Assets:

Cash ............................................... $ 18,010.39
Accounts Receivable .......................... 18,902.69

Inventories:

Supply Department .......................... $ 29,063.54
Biological Bulletin ........................... 7,951.85 37,015.39

Investments:

Devil's Lane Property ....................... $ 37,780.91
Gansett Property ............................. 2,273.34
Stock in General Biological Supply House, Inc. .......... 12,000.00
Retirement Fund Assets ..................... 15,790.27 68,544.52

Prepaid Insurance ............................... 3,992.51 $146,465.50

Liabilities

Endowment Funds:

General Endowment Funds—Schedule III ........ $1,108,949.50
Minor Endowment Funds—Schedule III ........ 10,188.65 $1,119,138.15

Plant Funds:

Donations and Gifts—Schedule III ............. $1,025,548.61
Other Investments in Plant from Gifts and Current Funds .......... 364,406.85

$1,389,955.46

Mortgage, Danchakoff Estate .................... 2,000.00
Accrued Charges on Sale of Bar Neck Land ...... 3,000.00 $1,394,955.46
REPORT OF THE TREASURER

Current Liabilities and Surplus:
Mortgage, Devil's Lane Property .................. $ 25,000.00
Accounts—Payable ................................ 1,640.99
Woods Hole Oceanographic Institution:
 Amount received for Purchase of
 Books for their Library .... $2,500.00
 Less Expenditures .................. 2,147.07 352.93

Items in Suspense (Net) .................. 70.49

$ 27,064.41

Current Surplus—Exhibit C .................. 119,401.09 $146,465.50

EXHIBIT B

MARINE BIOLOGICAL LABORATORY INCOME AND EXPENSE,
YEAR ENDED DECEMBER 31, 1930

<table>
<thead>
<tr>
<th>Income:</th>
<th>Total Expense</th>
<th>Total Income</th>
<th>Net Income</th>
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</thead>
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<tr>
<td>General Endowment Fund</td>
<td>$48,020.46</td>
<td>$48,020.46</td>
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<tr>
<td>Library Fund</td>
<td>9,270.24</td>
<td>9,270.24</td>
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<tr>
<td>Gifts</td>
<td>500.00</td>
<td>500.00</td>
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<td>Instruction</td>
<td>8,110.03</td>
<td>10,230.00</td>
<td>2,119.97</td>
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<td>Research</td>
<td>4,009.37</td>
<td>16,261.06</td>
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<tr>
<td>Evening Lectures</td>
<td>135.48</td>
<td>135.48</td>
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<tr>
<td>Biological Bulletin and Mem-</td>
<td>7,557.17</td>
<td>9,421.18</td>
<td>1,864.01</td>
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<tr>
<td>bership Dues</td>
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<td></td>
<td></td>
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<tr>
<td>Supply Department—</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Schedule V</td>
<td>62,030.00</td>
<td>62,162.82</td>
<td>132.82</td>
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<td>Mess—Schedule VI</td>
<td>30,943.36</td>
<td>32,973.28</td>
<td>2,029.92</td>
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<td>Dormitories—</td>
<td></td>
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<td>Schedule VII</td>
<td>31,188.42</td>
<td>13,764.28</td>
<td>17,424.14</td>
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<tr>
<td>(Interest and Depreciation</td>
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<td></td>
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<tr>
<td>charged to above three De-</td>
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<td></td>
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<tr>
<td>partments. See Schedules</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>V, VI, and VII) ............. 35,424.79</td>
<td>35,424.79</td>
<td></td>
<td></td>
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<tr>
<td>Dividends, General Biological</td>
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<tr>
<td>Supply House, Inc.</td>
<td>2,540.00</td>
<td>2,540.00</td>
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<tr>
<td>Rent, Danchakoff Cottages</td>
<td>634.11</td>
<td>1,039.00</td>
<td>404.89</td>
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<tr>
<td>Rent, Microscopes</td>
<td>462.50</td>
<td>462.50</td>
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<tr>
<td>Rent, Garage, Railway, etc.</td>
<td>154.90</td>
<td>154.90</td>
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<tr>
<td>Rent, Newman Cottage</td>
<td>137.27</td>
<td>150.00</td>
<td>12.73</td>
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<td>Rent, Janitor's House</td>
<td>35.84</td>
<td>422.50</td>
<td>386.66</td>
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<td>Sale of Duplicate Library Sets</td>
<td>2,198.13</td>
<td>2,198.13</td>
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<tr>
<td>Interest on Bank Balances</td>
<td>529.87</td>
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<tr>
<td>Sundry Items</td>
<td>10.64</td>
<td>10.64</td>
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<tr>
<td>Maintenance of Plant:</td>
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<tr>
<td>New Laboratory Expense</td>
<td>16,839.26</td>
<td>16,839.26</td>
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<tr>
<td>Chemical and Special Appara-</td>
<td>10,783.01</td>
<td>10,783.01</td>
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<td>tus</td>
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<tr>
<td>Maintenance, Buildings and</td>
<td>9,892.82</td>
<td>9,892.82</td>
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<tr>
<td>Grounds</td>
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<tr>
<td>Description</td>
<td>Amount 1</td>
<td>Amount 2</td>
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</tr>
<tr>
<td>--------------------------------------------------</td>
<td>----------</td>
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<tr>
<td>Library Department Expenses</td>
<td>8,912.66</td>
<td>8,912.66</td>
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<tr>
<td>Carpenter Department Expenses</td>
<td>1,516.91</td>
<td>1,516.91</td>
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<tr>
<td>Truck Expenses</td>
<td>851.48</td>
<td>851.48</td>
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<tr>
<td>Sundry Expenses</td>
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<td>772.69</td>
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<td>Bar Neck Property Expenses</td>
<td>162.54</td>
<td>162.54</td>
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<tr>
<td>Workmen’s Compensation Insurance</td>
<td>592.59</td>
<td>592.59</td>
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<tr>
<td>General Expenses:</td>
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<tr>
<td>Administration Expenses</td>
<td>14,509.68</td>
<td>14,509.68</td>
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<td>Endowment Fund Trustee</td>
<td>787.50</td>
<td>787.50</td>
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<td>Interest on Loans</td>
<td>120.00</td>
<td>120.00</td>
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<td>Bad Debts</td>
<td>317.98</td>
<td>317.98</td>
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<tr>
<td>Naples Zoological Station, for Research</td>
<td>250.00</td>
<td>250.00</td>
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<tr>
<td>Mosquito Fund Contribution</td>
<td>100.00</td>
<td>100.00</td>
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<tr>
<td>Reserve for Depreciation</td>
<td>38,052.73</td>
<td>38,052.73</td>
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<tr>
<td>Excess of Expenses over Income carried to Current Surplus—Exhibit C</td>
<td>3,767.25</td>
<td>3,767.25</td>
<td></td>
</tr>
</tbody>
</table>

$213,878.11 $213,878.11 $122,021.47 $122,021.47

**EXHIBIT C**

**MARINE BIOLOGICAL LABORATORY, CURRENT SURPLUS ACCOUNT**

**YEAR ENDED DECEMBER 31, 1930**

Balance, January 1, 1930 ........................................... $119,933.29

Add:  
- Reserve for Depreciation charged to Plant Funds .................. 38,052.73
- Income from Retirement Fund ....................................... 603.30
- Cash received from Sale of Plant Assets deposited in Current Cash (Motor-Boat) ........................................... 50.00

$158,839.32

Deduct:  
- Payments from Current Funds during Year for Plant Assets as shown in Schedule IV,  
  - Buildings .................................................. $ 479.47
  - Equipment .................................................. 5,464.23
  - Library Books, etc. ....................................... 23,099.38

$29,042.78

- Purchase of Books from Balance of General Education Board Gift of $50,000.00 for Purchase of Books ........................................... 5,708.20
- Payment of Pensions from Retirement Fund ......................... 720.06
- Excess of Expenses over Income for Year as shown in Exhibit B .................................................. 3,767.25

39,238.23

Balance, December 31, 1930—Exhibit A .......................... $119,401.09

Respectfully submitted,

LAWRASON RIGGS, JR.,  
Treasurer.
V. THE REPORT OF THE LIBRARIAN

The important feature of 1930, which was the establishment of a regular endowment fund for the Library which would ordinarily give, along with the usual laboratory allowance, about $24,000 annually, was included in the report of last year. A general statement of the future apportionment of this sum as there given has been carried out in fact. A very important addition occurred in the spring, however, when the Director of the Woods Hole Oceanographic Institution placed $5,000 at the disposal of the Library to be used exclusively for the purchase of oceanographic books and journals. Of this amount, $2,149.73 had been spent at the end of the year 1930. The items thus purchased are indicated specifically in the general statement of additions to the Library as follows: journal subscriptions were 346, 24 new, and of these 5 were for the Woods Hole Oceanographic Institution. One hundred and fifteen books were purchased, 45 for oceanography. Back sets of journals were filled in complete to the number of 45, and 37 only partially completed—none of these were regarded as strictly for the Woods Hole Oceanographic Institution. The number of journals received in exchange for the Biological Bulletin was 442, an increase of 22, and 15 back sets that we needed were filled in. The reprint collection was augmented by 5,573.

The Library consists, then, of 26,519 bound journal volumes, 4,991 books, 64,231 reprints; and is receiving 1,060 current journals.

Gifts of books have been made to the Library by the following publishers, and the Librarian takes this opportunity to acknowledge these in the name of the Marine Biological Laboratory Library, although formal thanks have in all cases been directly addressed by letter.

P. Blakiston's Son & Co. ........................................... 9
R. R. Bowker Co. ..................................................... 1
Chemical Foundation, Inc. ......................................... 1
Chicago University Press ........................................... 5
Harvard University Press .......................................... 2
Paul B. Hoeber ....................................................... 2
Henry Holt & Co. ..................................................... 1
Alfred A. Knopf ....................................................... 2
J. B. Lippincott Co. .................................................. 1
McGraw-Hill Book Co., Inc. ........................................ 5
Macmillan Co. ......................................................... 21
C. V. Mosby Co. ...................................................... 1
W. B. Saunders Co. ................................................... 4
Wm. Wood & Co. ....................................................... 2
Yale University Press ............................................... 1
VI. THE REPORT OF THE DIRECTOR

To the Trustees of the Marine Biological Laboratory:

Gentlemen: I beg to submit herewith a report of the forty-third session of the Marine Biological Laboratory for the year 1930.

1. Attendance. The attendance for 1930 showed a slight increase over that of the preceding year in the numbers of both investigators and students, the figures for 1930 being 337 investigators and 136 students as compared with 329 investigators and 125 students in 1929. An inspection of the Tabular View of Attendance on page 28 will show that since 1927, when for the first time the research rooms in both the brick and the wooden buildings were practically all in use at the same time, the number of independent investigators has scarcely changed, except for the record-breaking summer of 1929 when visiting foreign physiologists, most of whom came to the Laboratory after the crowded season, swelled the total to figures not likely to be reached under normal conditions. On the other hand, investigators under instruction and research assistants whose numbers are not limited by that of the smaller laboratories have increased from 85 to 120 in the same period. The limit for the further increase of this class of investigators, however, is now in sight, and at the present rate will soon be reached.

The number of students, being limited by action of the Trustees, has shown only minor fluctuations for many years. The slight falling-off in 1929, caused chiefly by the change in that year in the times for holding the courses, was more than made up in 1930, though the maximum number which may at present be admitted to the courses, namely 142, has not yet been reached. This failure of the registration to reach its maximum value is not due to a deficiency of applications, since in nearly all of the courses the number of applicants greatly exceeds the number of available places, but rather to late withdrawals of students who have been accepted. To discourage such withdrawals, which are unfair to the rest of the applicants, who have usually in the meantime made other arrangements for the summer, the Executive Committee has recently voted to make a substantial increase in the registration fee which is forfeited in case of withdrawal.

Following the custom of the past three years, there are here presented figures which show the distribution of the attendance of investigators throughout the four seasons, including that of 1930, for which the necessary records have been kept.
2. The Report of the Treasurer. This report shows that the total assets of the Laboratory at the end of 1930 were $2,660,559.11 as compared with $2,660,478.82 at the end of 1929. A further analysis of the figures shows that the book value of the endowment fund has remained practically stationary (though the Treasurer calls attention to a gratifying appreciation in the market value of the securities represented) while additions to the plant assets, chiefly in the form of books and new equipment, have about balanced the estimated depreciation on buildings and equipment. A decrease in the value of the land held by the Laboratory and the simultaneous appearance of a reserve fund of approximately twenty thousand dollars are accounted for by the sale by the Laboratory to the Woods Hole Oceanographic Institution of the tract of land upon which the new building of the latter institution now stands.

The income of the Laboratory increased from $200,408.91 in 1929 to $210,110.86 in 1930. A part of this increase is of a temporary nature only, as for example that from the sale of duplicate sets by the library; of the remainder the largest single item is the additional income from the funds appropriated last year by the General Education Board. In 1930 for the first time the full annual income from this fund became available. Since, however, this fund is at present being applied exclusively to the support of the library, the income available for general laboratory purposes remains practically unchanged.

The ordinary expenses of the Laboratory during 1930 showed a comparatively small increase over those for 1929, but expenses incidental to the reorganization of the Supply Department and the creation of a Museum, and, in particular, the reduction of the inventory of the Supply Department by discarding material originally valued at several thousand dollars, but for which there is at present little or no sale, have again prevented the appearance of a favorable balance, the excess of expenses over income after making allowance for depreciation being $3,767.25 as
compared with the similar deficit on paper of $855.33 for 1929. It is
evident, however, when account is taken of the unusual expenses of the
Supply Department in 1930 and of the necessarily large allowances for
depreciation, that the finances of the Laboratory are in a very sound
ccondition.

In 1930, for the first time in many years, the sum paid to the Labo-
ramory for research space, chiefly by subscribing and cooperating insti-
tutions, showed a slight decrease. This was to have been expected in
view of business conditions, which have materially reduced the incomes
of most of the institutions concerned. It is a very encouraging fact,
however, that the decrease even under these abnormal conditions
amounted to less than three per cent.

3. The Report of the Librarian shows a continuation of the steady
growth of the library which has been made possible especially by the
generous support of the General Education Board. For purposes of
comparison the figures for 1930 may be added to those listed in the
Director’s Report for 1929.

<table>
<thead>
<tr>
<th>Year</th>
<th>1925</th>
<th>1926</th>
<th>1927</th>
<th>1928</th>
<th>1929</th>
<th>1930</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serials received currently</td>
<td>500</td>
<td>628</td>
<td>764</td>
<td>874</td>
<td>985</td>
<td>1060</td>
</tr>
<tr>
<td>Total number of bound volumes</td>
<td>15000</td>
<td>18200</td>
<td>22800</td>
<td>26500</td>
<td>28300</td>
<td>31500</td>
</tr>
<tr>
<td>Reprints</td>
<td>25000</td>
<td>38000</td>
<td>43000</td>
<td>51000</td>
<td>59000</td>
<td>64000</td>
</tr>
</tbody>
</table>

One especially noteworthy feature of the past year has been the strength-
ening of the part of the library devoted to the subject of oceanography,
the development in this direction having been made possible by a co-
operative arrangement with the Woods Hole Oceanographic Institution,
assisted by special funds appropriated by that institution.

4. Lectures and Scientific Meetings. During the season of 1930
the number of formal scientific lectures, including the Reynold A.
Spaeth Memorial Lecture delivered by Professor Hardolph Wastenys
of the University of Toronto, was thirteen, with several other evenings
devoted to non-scientific lectures and motion pictures. In addition,
there were held 13 less formal meetings at which 56 shorter papers,
whose titles are given on pages 31 to 33, were presented and discussed.
Two of these meetings were of especial interest. The first, held on
June 27, assumed the character of a celebration of the sixtieth birthday
of Dr. Frank R. Lillie and of the fortieth consecutive year of his con-
nection with the Marine Biological Laboratory. In addition to the
scientific papers presented on that occasion, which were all based upon
work having its inception in Dr. Lillie’s laboratory, a special address of
congratulation was delivered by Dr. E. B. Wilson, and a ship’s clock, the
gift of Dr. Lillie’s former students, was presented to him by Dr. L. V.
Heilbrunn. The evening was concluded by an informal reception at the M. B. L. Club. The second meeting of an unusual character was the one held on the morning of July 26 at which 12 papers in the field of neuro-muscular physiology were presented and discussed. This meeting formed the most important part of a two days' program, social as well as scientific in character, which was arranged by the workers in this field and was attended not only by laboratory workers but by a number of physiologists from a distance. So successful was this meeting that it is to be hoped that similar ones, devoted to various fields of biological research may be held in the future.

5. Supply Department and Museum. At the last annual meeting of the Board of Trustees it was voted to develop for the use of investigators and students working in Woods Hole a museum in which specimens of the local fauna and flora may at all times be available for purposes of study, and in which there may at the same time be preserved full records of the distribution of all the local forms, the seasons of their maximum abundance, their breeding habits, etc. The development of this important activity of the Laboratory was very appropriately placed in the hands of Mr. George M. Gray, whose long experience as Curator of the Supply Department has given him unique qualification for such a position. In order to fill the vacancy thus created in the Supply Department and to provide for a possible ultimate separation of the two present functions of this Department, namely, that of supplying living material for experimental purposes to workers at the Laboratory and of furnishing preserved material to schools and colleges, the General Biological Supply House of Chicago was invited to assume its temporary management. In preparation for the new arrangement, Dr. D. L. Gamble, representing this firm, spent several months in residence in Woods Hole during the summer of 1930 and has since continued the general supervision of this Department from Chicago with very satisfactory results, being ably assisted by Mr. James McInnis as Resident Manager.

6. Facilities for Work with X-rays. During the summer of 1930, through an appropriation of $500.00 by the Committee on the Effects of Radiation upon Living Organisms of the National Research Council and with the active assistance of the Chairman of that Committee, Professor W. C. Curtis, special facilities, not hitherto available for work with X-rays and other radiations were provided for workers at the Laboratory. In particular, there was made available throughout the summer the expert advice of Dr. G. Failla of the Memorial Hospital, New York, together with the assistance of competent technicians in the operation of the apparatus. Several manufacturers also furnished very valuable aid
of various sorts which is here gratefully acknowledged. So successful was this arrangement in 1930 that it is gratifying to be able to announce at the time of the writing of this report that it will be continued and somewhat extended in 1931.

7. The Woods Hole Oceanographic Institution. The position which Woods Hole has held for many years as one of the leading biological centers in the United States was materially strengthened by the erection during the past year of the large and splendidly equipped building which will be the permanent headquarters of the Woods Hole Oceanographic Institution. The land on which this building stands was formerly held by the Marine Biological Laboratory and leased by it to the Bar Neck Corporation. At a special meeting of the Board of Trustees, held in Washington, D. C., on April 28, 1930, it was voted to enter into an agreement with the Woods Hole Oceanographic Institution and the Bar Neck Corporation by which the former institution would acquire by purchase from the Marine Biological Laboratory approximately 54,000 square feet of the westerly portion of the so-called "Bar Neck Wharf." Full details as to this agreement will be found in the Report of the Auditors for 1930. Though there is no official connection between the Woods Hole Oceanographic Institution and the Marine Biological Laboratory, the work of each institution will supplement that of the other, and it is planned that there shall be close scientific cooperation between them. This cooperation has already assumed the form of a sharing of library facilities and Mess accommodations and will be extended in the future in all possible ways.

8. The Board of Trustees. One change in the Board of Trustees occurred during the past year. Professor William Patten of Dartmouth College having been elected Trustee Emeritus at the annual meeting of the Corporation and Professor E. R. Clark of the University of Pennsylvania having been selected to fill the place thereby made vacant in the Class of 1934.

9. Gifts. Appreciative acknowledgment is made of the gift by Mr. Ware Cattell and the "Collecting Net" of $500.00 for scholarships to students who in the courses given by the Laboratory show unusual promise as research workers.

There are appended as parts of this report:

1. The Staff, 1930.
2. Investigators and Students, 1930.
4. Subscribing and Coöperating Institutions, 1930.
5. Evening Lectures, 1930.
REPORT OF THE DIRECTOR

7. Members of the Corporation, August, 1930.
Respectfully submitted,

M. H. Jacobs,
Director.

1. THE STAFF, 1930

Merkel H. Jacobs, Director, Professor of General Physiology, University of Pennsylvania.

Associate Director: —

ZOÖLOGY

I. Investigation

Gary N. Calkins, Professor of Protozoology, Columbia University.
E. G. Conklin, Professor of Zoology, Princeton University.
Caswell Grave, Professor of Zoology, Washington University.
H. S. Jennings, Professor of Zoology, Johns Hopkins University.
Frank R. Lillie, Professor of Embryology, University of Chicago.
C. E. McClung, Professor of Zoology, University of Pennsylvania.
S. O. Mast, Professor of Zoology, Johns Hopkins University.
T. H. Morgan, Director of the Biological Laboratory, California Institute of Technology.
G. H. Parker, Professor of Zoology, Harvard University.
E. B. Wilson, Professor of Zoology, Columbia University.
Lorande L. Woodruff, Professor of Protozoology, Yale University.

II. Instruction

J. A. Dawson, Assistant Professor of Biology, College of the City of New York.
T. H. Bissonnette, Professor of Biology, Trinity College.
E. C. Cole, Associate Professor of Biology, Williams College.
O. E. Nelson, Instructor in Zoology, University of Pennsylvania.
A. W. Pollister, Instructor in Zoology, Columbia University.
L. P. Sayles, Instructor in Biology, College of the City of New York.
A. E. Severinghaus, Assistant Professor of Anatomy, College of Physicians and Surgeons, Columbia University.

Junior Instructors

B. R. Coonfield, Professor of Biology, Southwestern College.
I. B. Hansen, Graduate Student, University of Chicago.

PROTOZOOLOGY

I. Investigation

(See Zoology)

II. Instruction

Gary N. Calkins, Professor of Protozoology, Columbia University.
Rachel Bowling, Instructor in Zoology, Columbia University.
Roberts Rugh, Assistant in Zoology, Columbia University.
EMBRYOLOGY

I. Investigation

(See Zoology)

II. Instruction

Hubert B. Goodrich, Professor of Biology, Wesleyan University.
Benjamin H. Grave, Professor of Biology, De Pauw University.
Charles Packard, Assistant Professor of Zoology, Institute of Cancer Research, Columbia University.
Charles G. Rogers, Professor of Comparative Physiology, Oberlin College.
B. C. Twitty, Instructor in Zoology, Yale University.

PHYSIOLOGY

I. Investigation

Harold C. Bradley, Professor of Physiological Chemistry, University of Wisconsin.
Walter E. Garrey, Professor of Physiology, Vanderbilt University Medical School.
Ralph S. Lillie, Professor of General Physiology, University of Chicago.
Albert P. Mathews, Professor of Biochemistry, University of Cincinnati.

II. Instruction

Teaching Staff

William R. Amstrong, Assistant Professor of Physiology, University of Pennsylvania.
Philip Bard, Assistant Professor of Physiology, Princeton University.
Hallowell Davis, Assistant Professor of Physiology, Harvard University.
Ralph W. Gerard, Assistant Professor of Physiology, University of Chicago.
Charlotte Haywood, Assistant Professor of Physiology, Vassar College.
Leonor Michaelis, Member of the Rockefeller Institute, New York City.

Special Lecturers

Edwin J. Cohen, Associate Professor of Physical Chemistry, Harvard University.
Henry J. Fry, Associate Professor of Biology, Washington Square College, New York University.
E. Newton Harvey, Professor of Physiology, Princeton University.
Selig Hecht, Professor of Biophysics, Columbia University.
Merkel H. Jacobs, Professor of General Physiology, University of Pennsylvania.
Balduin Lucké, Associate Professor of Pathology, University of Pennsylvania.

BOTANY

I. Investigation

B. M. Duggar, Professor of Physiological and Economic Botany, University of Wisconsin.
C. E. Allen, Professor of Botany, University of Wisconsin.
REPORT OF THE DIRECTOR

S. C. Brooks, Professor of Zoology, University of California.
Ivey F. Lewis, Professor of Biology, University of Virginia.
Wm. J. Robbins, Professor of Botany, University of Missouri.

II. INSTRUCTION

William Randolph Taylor, Professor of Botany, University of Pennsylvania.
H. C. Bold, Instructor in Botany, University of Vermont.
James P. Poole, Professor of Evolution, Dartmouth College.

LIBRARY

Priscilla B. Montgomery (Mrs. Thomas H. Montgomery, Jr.), Librarian.
Deborah Lawrence, Secretary.
Hester Ann Bradbury, Lillian F. Briggs, Mary A. Rohan, Assistants.

CHEMICAL SUPPLIES

Oliver S. Strong, Professor of Neurology and Neuro-Histology, Columbia University, Chemist.

APPARATUS ROOM

Samuel E. Pond, Assistant Professor of Physiology, Medical School, University of Pennsylvania, Custodian of Apparatus.

MUSEUM

George M. Gray, Curator.

SUPPLY DEPARTMENT

James McInnis, Manager.
A. M. Hilton, Collector.
Milton B. Gray, Collector.

Walter Kahler, Collector.
Geoffrey Lehiy, Collector.
A. W. Leathers, Shipping.

BOATS

John J. Veeder, Captain.
E. M. Lewis, Chief Engineer.

F. M. MacNaught, Business Manager.
Thomas Larkin, Superintendent of Mechanical Department.
Lester F. Boss, Mechanician.
J. D. Graham, Glass-blowing Service.
A. R. Apgar, Photographic Service.
William Hemenway, Carpenter.

2. INVESTIGATORS AND STUDENTS, 1930

Independent Investigators

Abramson, Harold A., Instructor, Harvard University.
Anderson, William R., Assistant Professor of Physiology, University of Pennsylvania.
ARMSTRONG, PHILIP B., Instructor in Anatomy, Cornell University Medical College.
ASHWORTH, JAMES H., Professor of Natural History, University of Edinburgh.
ASTROM, I. ELISABETH, Class Assistant, University of Toronto.
BAITSELL, GEORGE A., Professor of Biology, Yale University.
BAKER, HORACE B., Associate Professor, University of Pennsylvania.
BAYL, ERIC G., National Research Fellow in Medicine, Johns Hopkins University.
Medical School.
BARD, PHILIP, Assistant Professor of Physiology, Princeton University.
BARRON, E. S. GUZMAN, Instructor in Medicine, Johns Hopkins University Medical
School.
BART, L. G., National Research Fellow, University of Chicago.
BEAMS, H. W., Dupont Fellow, University of Virginia.
BELKIN, MORRIS, Instructor, New York University.
BIDDLE, RUSSELL L., Teaching Fellow, California Institute of Technology.
BISSONNETTE, T. HUME, Professor of Biology, Trinity College.
BLANCHARD, KENNETH C., Associate Professor, New York University.
BLUMENTHAL, REUBEN, Harrison Fellow in Zoology, University of Pennsylvania.
BOLD, HAROLD C., Instructor in Botany, University of Vermont.
BORODIN, D. N., 621 West 142d Street, New York City, New York.
BOWLING, RACHEL, Instructor in Zoology, Columbia University.
BRADWAY, WRENTHRED, New York University.
BREITENBACHER, J. K., McGill University.
BRIDGES, CALVIN B., Research Assistant, Carnegie Institution of Washington.
BRONFENBRENNER, J., Professor of Bacteriology, Washington University Medical
School.
BRONK, DETLEV W., Professor of Biophysics and Director of Johnson Foundation
for Medical Physics, University of Pennsylvania.
BROOKS, MATILDA M., Research Associate in Biology, University of California.
BROOKS, S. C., Professor of Zoology, University of California.
BURNICK, DONALD L., Instructor in Biology, Union College.
BYTINSKI-SALZ, HANS, Research Fellow, Yale University.
CALKINS, GARY N., Professor of Protozoology, Columbia University.
CALKINS, EDWARD A., Associate Nematologist, United States Department of Agriculture.
CLOWES, G. H. A., Director, The Lilly Research Laboratory, Eli Lilly & Co.
COBB, N. A., Agricultural Technologist and Nematologist, United States Department of Agriculture.
COE, W. K., Professor of Biology, Yale University.
COFFEE, J. M., Assistant Bacteriologist, New York State Department of Health.
COLE, ELBERT C., Associate Professor of Biology, Williams College.
COLE, KENNETH S., Assistant Professor of Physiology, Columbia University.
COONFIELD, BENJAMIN R., Professor of Biology, Southwestern College.
COOPER, GEORGE O., Instructor, University of Wisconsin.
COPELAND, MANTON, Professor of Biology, Bowdoin College.
COWLES, R. P., Associate Professor of Zoology, Johns Hopkins University.
CURTIS, W. C., Professor of Zoology, University of Missouri.
DAVIS, HALLLOWELL, Assistant Professor of Physiology, Harvard University Medical
School.
DAWSON, ALDEN B., Associate Professor of Zoology, Harvard University.
DAWSON, J. A., Assistant Professor of Biology, College of the City of New York.
DILL, D. B., Assistant Professor of Biochemistry, Harvard University.
DOLLEY, WILLIAM L., Jr., Professor of Biology, University of Buffalo.
DU BOIS, DELAFIELD, Washington Square College, New York University.
DU BOIS, EUGENE F., Associate Professor of Medicine, Cornell University Medical College.
DU BUISSON, MARCEL, Professor of Zoology, “Ecole des Hautes Études,” Ghent, Belgium.
DEGGAR, B. M., Professor of Plant Physiology and Applied Botany, University of Wisconsin.
EDWARDS, DAYTON J., Associate Professor of Physiology, Cornell University Medical College.
EDWARDS, H. T., Assistant in Fatigue Laboratory, Harvard University.
FAILLA, G., Physicist, Memorial Hospital, New York.
FANKHAUSER, GERHARD, Fellow of the Rockefeller Foundation, University of Chicago.
FINLEY, HAROLD E., Instructor in Zoology, West Virginia State College.
FLORKIN, MARCEL, Research Fellow, Harvard University.
FREW, PRISCILLA E., Instructor, Hunter College.
FRY, HENRY J., Associate Professor of Biology, Washington Square College, New York University.
FURTH, JACOB, Associate in Pathology, The Henry Phipps Institute, University of Pennsylvania.
GARDINER, MARY S., Associate in Biology, Bryn Mawr College.
GARREY, W. E., Professor of Physiology, Vanderbilt University Medical School.
GATES, FREDERICK L., Research Fellow, Harvard University.
GELFAN, JACOB, Research Fellow, Harvard University.
GERARD, R. W., Assistant Professor of Physiology, University of Chicago.
GIBBONS, NORMAN E., Graduate Student, Yale University.
GOODRICH, HUBERT B., Professor of Biology, Wesleyan University.
GRAVE, B. H., Professor of Zoology, DePauw University.
GRAVE, CASWELL, Professor of Zoology, Washington University.
GRUNDFEST, HARRY, National Research Council Fellow, Columbia University.
HANCE, ROBERT T., Head of Department of Zoology, University of Pittsburgh.
HARVEY, ETHEL B., Instructor, Washington Square College, New York University.
HARVEY, E. NEWTON, Professor of Physiology, Princeton University.
HAYWOOD, CHARLOTTE, Assistant Professor of Physiology, Vassar College.
HEILBRUNN, L. V., Associate Professor of Zoology, University of Pennsylvania.
HENSHAW, PAUL S., Biophysicist, Memorial Hospital.
HEITLER, DONALD M., Instructor in Bacteriology, Washington University Medical School.
HIBBARD, HOPE, Assistant Professor, Oberlin College.
HILL, SAMUEL E., Assistant in Physiology, Rockefeller Institute.
HINRICHS, MARIE A., Research Associate in Physiology, University of Chicago.
HINTZE, A. LAURA, Assistant Professor of Physiology, Goucher College.
HIRSCH, G. C., Professor of Zoology, University of Utrecht.
HOPPE, ELLA N., Research Assistant, New York State Department of Health.
HOVE, H. E., Editor, Industrial and Engineering Chemistry.
HOWLAND, RUTH B., Associate Professor of Biology, Washington Square College, New York University.
HUETTNER, ALFRED F., Associate Professor, Washington Square College, New York University.
HUGHES, THOMAS P., Associate in Bacteriology, Rockefeller Institute.
HUNTER, LILLIAN M., Graduate Student and Assistant Technician, University of Toronto.
HUTCHINSON, G. E., Instructor in Biology, Yale University.
HYMAN, LIBBE H., Research Associate, University of Chicago.
JACOBS, M. H., Professor of General Physiology, University of Pennsylvania.
JENNINGS, H. S., Professor of Zoology, Johns Hopkins University.
JOHNSON, J. M., Associate Professor of Biochemistry, Vanderbilt University Medical School.
JOHNSON, H. HERBERT, Instructor, College of the City of New York.
JUST, E. E., Professor of Zoology, Howard University.
KEIL, ELSA M., Instructor in Zoology, Rutgers University.
KEITCH, ANNA K., Research Chemist, Lilly Research Laboratory.
KETTLEKAMP, B. H., Instructor, University of Pittsburgh.
KEYES, D. B., Professor of Industrial Chemistry, University of Illinois.
KEYS, ANCEL B., Fellow in the Biological Sciences, National Research Council.
KNOWER, HENRY McE., Wistar Institute.
KNOWLTON, FRANK P., Professor of Physiology, Syracuse University, College of Medicine.
KOEHRING, VERA, Beaver College, Jenkintown, Pennsylvania.
KUNITZ, MOSES, Associate Professor, Rockefeller Institute for Medical Research.
LACKY, J. B., Professor of Biology, Southwestern University.
LANCEFIELD, D. E., Associate Professor in Zoology, Columbia University.
LANCEFIELD, REBECCA C., Assistant in Bacteriology, Rockefeller Institute for Medical Research.
LEWIS, IVY F., Professor of Biology, University of Virginia.
LILLIE, FRANK R., Chairman of the Department of Zoology, University of Chicago.
LILLIE, RALPH S., Professor of General Physiology, University of Chicago.
LUCKÉ, BALDWIN, Associate Professor of Pathology, University of Pennsylvania.
LYNCH, RUTH S., Instructor in Graduate Zoology, The Johns Hopkins University.
LYON, E. P., Professor of Physics, University of Minnesota.
McCUNN, C. E., Director, Zoological Laboratory, and Professor of Zoology, University of Pennsylvania.
MACDOUGALL, MARY S., Head of Biology Department, Agnes Scott College.
McEWEN, ROBERT S., Associate Professor of Zoology, Oberlin College.
McGLOKE, BARTLES, Instructor in Physiology, University of Pennsylvania.
MANWELL, REGINALD D., Instructor, Johns Hopkins University.
MARSLAND, DOUGLAS A., Assistant Professor of Biology, Washington Square College, New York University.
MATTHEWS, A. P., Professor of Biochemistry, University of Cincinnati.
MATTHEWS, SAMUEL A., Instructor, University of Pennsylvania.
MAVOR, JAMES W., Professor of Biology and Head of Department, Union College.
MENKIN, VALY, Fellow in Medicine, Henry Phipps Institute, University of Pennsylvania.
MEYER, ROLAND K., Research Assistant, University of Wisconsin.
MICHAELIS, LÉONOR, Member, Rockefeller Institute for Medical Research.
MILLER, HELEN M., Fellow, National Research Council, Johns Hopkins University.
MITCHELL, PHILIP H., Professor of Physiology, Brown University.
MONNIER, ANDRÉ, University of Paris.
MONNIER, A. M., Assistant at the Sorbonne, Paris.
MORGAN, LILIAN V., California Institute of Technology.
MORGAN, T. H., Director of the Biological Laboratory, California Institute of Technology.
MORGELIS, S., Professor of Biochemistry, University of Nebraska, College of Medicine.
MORRILL, C. V., Associate Professor of Anatomy, Cornell University Medical College.
MORRIS, HELEN S., Graduate Student, Columbia University.
MULDER, ARTHUR G., Associate Professor of Physiology, University of Tennessee.
REPORT OF THE DIRECTOR

NABRIT, S. MILTON, Head of Department of Biology, Morehouse College.
NELSON, OLIN E., Instructor in Zoology, University of Pennsylvania.
NICHOLAS, WARREN W., X-Ray Physicist, National Bureau of Standards.
NONIDREZ, JOSÉ E., Assistant Professor of Anatomy, Cornell University Medical College.
PACKARD, CHARLES, Assistant Professor of Zoology, Columbia University.
PARK, ORLANDO, Associate Professor of Biology, Kent State College.
PARMENTER, CHARLES L., Associate Professor of Zoology, University of Pennsylvania.
PAYNE, FERNANDUS, Professor of Zoology and Dean of Graduate School, Indiana University.
PERROT, J. L., Columbia University.
PETRIK, JOSEPH M., Director of the Department of Physiology, Masaryk University.
PHILLIPS, PAUL L., Instructor in Anatomy, Cornell University Medical College.
PHILPOTT, CHARLES H., Lecturer in Medical Zoology, Washington University Medical School.
PLOUGH, HAROLD H., Professor of Biology, Amherst College.
POLLISTER, ARTHUR W., Instructor in Zoology, Columbia University.
POND, SAMUEL E., Assistant Professor of Physiology, University of Pennsylvania Medical School.
POOLE, JAMES P., Professor of Evolution, Dartmouth College.
POTTER, TRUMAN S., Seymour Coman Fellow, University of Chicago.
RAFFEL, DANIEL, National Research Fellow, Johns Hopkins University.
REDFIELD, HELEN, California Institute of Technology.
REESE, ALBERT M., Head of Department of Zoology, West Virginia University.
RICHARDS, OSCAR W., Assistant Professor of Biology, Clark University.
ROBERTS, EDITH A., Chairman of Department of Botany, Vassar College.
ROGERS, CHARLES G., Professor of Comparative Physiology, Oberlin College.
ROMANOFF, ALEXIS L., Research Instructor, Cornell University.
ROOT, WALTER S., Assistant Professor, Syracuse University Medical School.
RUGH, ROBERTS, Assistant in Zoology, Columbia University.
SAYLES, LEONARD P., Instructor in Zoology, Tufts College.
SCHAUFFLER, WILLIAM G., Princeton, New Jersey.
SCHMIDT, LEON H., University of Cincinnati.
SCHMITT, FRANCIS O., Assistant Professor of Zoology, Washington University.
SCHRADER, FRANZ, Associate Professor, Bryn Mawr College.
SCHRADER, SALLY-HUGHES, Instructor in Biology, Bryn Mawr College.
SCHULTZ, JACK, Research Assistant, Carnegie Institution of Washington.
SEVERINGHAUS, AURA E., Associate in Anatomy, Medical School, Columbia University.
SHARMA, B. M., Professor of Anatomy, Tibbi Medical College.
SHOUP, CHARLES S., Assistant Professor of Biology, Vanderbilt University.
SHULL, A. FRANKLIN, Professor of Zoology, University of Michigan.
SHUMWAY, WALDO, Professor of Zoology, University of Illinois.
SICHEL, FERDINAND J., Assistant Instructor, Washington Square College, New York University.
SLIFER, ELEANOR H., Graduate Student, University of Pennsylvania.
SMITH, FREDERICK, Research Assistant, Rockefeller Institute.
STEINBACH, H. B., Graduate Student, Brown University.
STOCKARD, CHARLES R., Professor of Anatomy, Cornell University Medical College.
STRONG, OLIVER S., Professor of Neurology and Neuro-Histology, Columbia University.
STUNKARD, H. W., Professor of Biology, New York University.
STURDIVANT, HARRIET P., Instructor, Columbia University.
STURTEVANT, A. H., Professor of Genetics, California Institute of Technology.
Szmull, Margaret, Assistant Professor, Woman's Medical College.
Tashiro, Shiro, Professor of Biochemistry, The University of Cincinnati.
Taylor, Wm. Randolph, Professor of Botany, University of Pennsylvania.
Thompson, J. W., Instructor, Swarthmore College.
Tower, Sarah S., Instructor in Anatomy, Johns Hopkins University.
Twitty, Victor C., Instructor in Zoology, Yale University.
Uhlenhuth, Eduard, Professor of Gross Anatomy, University of Maryland Medical School.
Van Cleave, C. D., Instructor in Anatomy, University of Pennsylvania.
Van Sloke, C., Professor, University of Pittsburgh.
Wang, Chi Che, 1314 East 56th Street, Chicago, Illinois.
Warren, Howard C., Stuart Professor of Psychology, Princeton University.
Wenkrich, D. H., Professor of Zoology, University of Pennsylvania.
Wesson, Laurence G., Assistant Professor of Pharmacology, Vanderbilt University Medical School.
Whedon, Arthur D., Professor of Zoology and Head of Department, North Dakota Agricultural College.
Whitaker, D. M., Assistant Professor of Zoology, Columbia University.
Whiting, Anna R., Professor, Head of Department of Biology, Pennsylvania College for Women.
Whiting, P. W., Associate Professor of Zoology, University of Pittsburgh.
Wieman, H. L., Professor of Zoology, University of Cincinnati.
Willier, B. H., Associate Professor of Zoology, University of Chicago.
Wilson, Edmund B., DaCosta Professor of Zoology, Emeritus, Columbia University.
Wilson, F. Edward, Graduate Student, Clark University.
Wilson, May G., Associate, Department of Pediatrics, Cornell University Medical College.
Wolf, E. Alfred, Assistant Professor of Zoology, University of Pittsburgh.
Woodruff, L. L., Professor of Protozoology, Yale University.
Woods, Farris H., Assistant Professor of Zoology, University of Missouri.
Young, William C., Instructor in Biology, Brown University.
Zeleny, Charles, Professor of Zoology, University of Illinois.

Beginning Investigators

Bailey, Sarah W., Graduate Student, Radcliffe College.
Brown, Frank A., Jr., Austin Teaching Fellow, Harvard University.
Caldwell, Lucile, Johns Hopkins University.
Chang, J. H., Graduate Student, University of Chicago.
Chen, H. T., Student, Harvard University Medical School.
Cline, Elsie, Graduate Student, The Johns Hopkins University.
Coldwater, Kenneth B., Instructor in Zoology, University of Missouri.
Costello, Donald P., Assistant in Zoology, College of the City of Detroit.
Croasdale, Hannah T., Graduate Student, University of Pennsylvania.
Curtis, Mary Elizabeth, Graduate Student, Yale University.
Damback, George J., Graduate Assistant, University of Pittsburgh.
Dearing, William H., Graduate Student, University of Pennsylvania.
Deitrick, John E., Medical Student, Johns Hopkins University.
Dixon, Evelyn C., Graduate Student, Washington University.
Draper, John W., Cornell University Medical College.
Drew, William, Massachusetts Agricultural College.
Dusilane, Graham, Wabash College.
Etokin, William, Tutor, College of the City of New York.
Flammon, Sister M. Muriel, Instructor in Biology, Seton Hill College.
French, C. S., Harvard University.
Gebrak, Anton, Moscow Agricultural Academy.
REPORT OF THE DIRECTOR

Geier, Dorothy A., Student, Johns Hopkins University Medical School.
Gelman, Quentin M., Graduate Student, University of Pennsylvania.
Graubard, Marc A., Assistant in Zoology, Columbia University.
Green, David E., Assistant, New York University.
Guerlac, Henry E., Cornell University.
Hansen, Ira B., Instructor, Wesleyan University.
Haynes, Florence W., 20 Gorham Road, West Medford, Massachusetts.
Hegnauer, Albert, Assistant in Physiology, University of Rochester, School of Medicine.
Hileman, Clara M., Teacher of Biology, Columbia University.
Hoerr, Stanley O., Antioch College.
Hook, Sabra J., Assistant in Zoology, Barnard College, Columbia University.
Iglauer, Charles A., Graduate Student, University of Pennsylvania.
Imlh, Helen W., Graduate Student, Radcliffe College.
Jeffery, Helen, Research, Washington University Medical School.
Kaltreider, Nolan L., Student, Johnson Foundation, University of Pennsylvania.
Katz, Jacob D., Assistant Instructor, Washington Square College, New York University.
Kerr, Thomas, Instructor in Biology, New York University.
Kinskey, Elizabeth T., Assistant at Barnard College, Columbia University.
Kinsbergen, Maurice, Assistant, New York University.
Klose, Theodora, Instructor in Botany, Vassar College.
Lee, Katv, Graduate Assistant in Zoology, University of Missouri.
Lhérisson, Camille, Professor of Biology, University of Haiti Medical School.
Lorberblatt, Isaac, Student, Washington University Medical School.
McGoun, Ralph C., Jr., Instructor in Biology, Amherst College.
MacMurray, Mary T., 8629 109th Street, Richmond Hill, New York.
Mackmull, Gulden, Demonstrator of Histology and Embryology, Baugh Institute of Anatomy.
Miller, Evelyn H., Graduate Student, University of Pennsylvania.
Miller, Forrest W., Graduate Assistant, University of Pittsburgh.
Monaghan, Betty R., Assistant, Washington University.
Morris, Samuel, Instructor in Zoology, University of Pennsylvania.
Parpart, Arthur K., Instructor and Graduate Student, University of Pennsylvania.
Parpart, Ethel R., Technician, University of Pennsylvania.
Pitts, Robert F., Student Assistant, Johns Hopkins University.
Ranakin, Douglas, Johns Hopkins University.
Robert, Nan L., Instructor, Hunter College.
Santos, Felix V., Graduate Student, The University of Chicago.
Savin, Marion B., Graduate Student, University of Pennsylvania.
Scarborough, J. Elliott, Jr., Student of Medicine, Harvard University.
Schechter, Victor, Tutor in the Department of Biology, College of the City of New York.
Schweitzer, Morton D., Assistant in Zoology, Columbia University.
Scott, Sister Florence M., Assistant Professor of Biology, Seton Hill College.
Shapiro, Herbert, Assistant in Zoology, Columbia University.
Shaw, C. Ruth, Graduate Assistant, University of Pittsburgh.
Skinner, B. F., Graduate Student, Harvard University.
Smith, Suzanne G., Graduate Assistant in Zoology, University of Missouri.
Smythe, C. V., Fellow National Research Council, Rockefeller Institute.
Sonnerborn, Tracy M., Research Assistant, Johns Hopkins University.
Stabler, Robert M., Assistant Instructor, University of Pennsylvania.
Stancati, Milton F., Graduate Assistant, University of Pittsburgh.
Stewart, Dorothy R., Assistant Professor of Biology, Skidmore College.
STIER, Matthew M., Assistant in Biology, New York University.
STREET, Sibyl E., Assistant to Department of Zoology, Vassar College
STUCK, Florence, Student, Columbia University.
TANG, Pei-sung, Johns Hopkins University.
TWINKEL, Lois E., Assistant in Zoology, Barnard College, Columbia University.
TOOTHILL, Martha C., Assistant in Biology, Brown University.
TUAN, Hsu-Chuan, Graduate Student, University of Pennsylvania.
TURNER, Clarence D., Research Assistant, University of Missouri.
WATERS, Nelson F., Research Assistant in Applied Botany, Harvard University.
WELLS, Evelyn, Instructor in Biology, St. Mary's Seminary.
WELLS, L. J., Graduate Student, University of Chicago.
WILDE, Mary H., Graduate Assistant, New Jersey College for Women.
WRIGHT, Charles I., Fellow in Physiology, University of Rochester Medical School.
YANCEY, Patrick H., Graduate Student, St. Louis University.

Research Assistants

BECK, L. V., Teaching Fellow, New York University.
BERNSTEIN, ALAN, Research Assistant, New York University.
BUCK, LOUISE H., Research Assistant, New York University.
CAMPBELL, RAYMOND W., Assistant, Fatigue Laboratory, Harvard University.
DAVIDSON, SYDNEY A., Williams College.
EISENBRANDT, W. H., Student, University of Maryland Medical School.
FRANCIS, DOROTHY S., Research Assistant, Memorial Hospital.
FRIEDBERG, JACOB, Medical Student, Yale University Medical School.
HARRYMAN, ILENE, Research Assistant, Lilly Research Laboratory.
HEIB'SNER, A. P., Student, Swarthmore College.
Hoffman, Olive D., Research Assistant, New York University.
Lazarovich-Hrebellanovich, Mara de, Research Assistant, New York University.
MENDELSON, E. S., Research Assistant, University of Pennsylvania.
MENKIN, Miriam F., Henry Phipps Institute.
OBERG, S. ALBERT, Harvard University.
PARKS, ELIZABETH K., Graduate Assistant in Zoology, Oberlin College.
RAVENSWAY, VAN A. C., Research Assistant, Washington University.
REYNOLDS, SARAH JANE, Research Assistant, New York University.
RUDNICK, DOROTHEA, Research Assistant, University of Chicago.
SALOMON, KURT, Fellow of the Rockefeller Foundation, Rockefeller Institute for Medical Research.
SANDERS, Rosalthe, Technician, Yale University.
SCHUBERT, MAXWELL, Assistant, Rockefeller Institute for Medical Research.
SCOTT, ALLAN C., Graduate Assistant, University of Pittsburgh.
SHATTUCK, G. EDGAR, Assistant Instructor in Physiology, University of Pennsylvania.
SHIAR, M. J., Administrative Officer and Research Chemist, Pediatric Research Laboratory, Jewish Hospital.
SILLER, SIMON, Research Assistant, Columbia University.
SMITH, M. DOREEN, Research Assistant, Memorial Hospital.
SMAss, SHERLOCK, Research Associate, University of Illinois.
TUCKER, ALBERT M., Student, Washington University Medical School.
WALLACE, EDITH M., Artist and Research Assistant, Carnegie Institution of Washington.
Students

BOTANY

Breed, Helen L., Student, Wellesley College.
Bruxel, Jules, Assistant Professor of Botany, University of Montreal.
Cheever, Clarence A., Boston Society of Natural History.
Drolet, Francis, Graduate Assistant, University of Missouri.
Forbes, John M., Student, Harvard University.
Glidden, Dorothy P., Student, Smith College.
Hopkins, Milton, Student, Amherst College.
Huntington, Evelyn, Student, Vassar College.
Klose, Theodore G., Instructor in Botany, Vassar College.
Loughridge, Gasper A., Laboratory Assistant in Botany, Rutgers University.
McKee, Jewel C., University of Wisconsin.
Oppenheimer, Jane M., Student, Bryn Mawr College.
Roland, Albert E., Student, Acadia University.
Stewart, Paul A., Assistant, New Jersey College for Women.

EMBRYOLOGY

Baker, E. G. Stanley, Student, DePauw University.
Ballard, Overton T., University of Illinois.
Bamber, Lyle E., Graduate Student and Assistant, University of Illinois.
Carter, George H., Student, Amherst College.
Dawson, Helen L., Graduate Student, Washington University.
Derbyshire, Arthur J., Jr., Harvard University.
Earl, Ruth R., Technician, College of the City of New York.
Eaton, Theodore H., Jr., Cornell University.
Green, David E., Assistant, Washington Square College.
Guelac, Henry E., Student, Cornell University.
Hileman, Clara M., Instructor in Biology, Penn State College.
Hjortland, Arthur L., Assistant, University of Illinois.
Hunninen, Arne V., Student, Wesleyan University.
Johnson, Arlene C., Student, Wheaton College.
Johnson, Myra L., Student, Smith College.
Lane, Mary, Smith College.
Loefler, John B., Graduate Assistant in Biology, New York University.
Mackmull, Guldén, Demonstrator of Histology and Embryology, Baugh Institute of Anatomy, Jefferson Medical College.
Maxwell, Florence J., Instructor, Carnegie Institute of Technology.
Nichols, Rowena, Wellesley College.
Patch, Esther M., Teacher of Biology, East Boston High School.
Reid, Marion A., Instructor, Boston University Medical School.
Riley, Lena C., Student, Wellesley College.
Rosenbaum, Louise, Student, University of Pennsylvania.
Scott, John P., University of Wyoming.
Stanley, Willard F., Graduate Student and Research Assistant, University of Illinois.
Wells, Lemen J., Graduate Student, University of Chicago.

PHYSIOLOGY

Appelrot, Samuel, Fellow, Rockefeller Foundation.
Behner, Dorothy M., Assistant, New York University.
Chang, Tsung H., Graduate Student, University of Chicago.
CHEN, Tuang T., Assistant in Biochemistry, Peking Union Medical College.
DANN, Margaret, Assistant in Physiology, Cornell University Medical College.
DREW, William B., Massachusetts Agricultural College.
DeBois, Delafield, New York University.
FENG, Te-Pei, Graduate Student, University of Chicago.
GARDNER, Edith McX., Assistant in Physiology, Vassar College.
Gates, Frederick L., Research Fellow, Harvard University.
Hegnauer, Albert H., Fellow in Physiology, University of Rochester Medical School.
Leitch, James L., University of California.
Monaghan, Betty R., Assistant and Graduate Student, Washington University.
Oldphant, Joseph F., Instructor in Biology, Union College.
Oster, Robert H., Student, Williams College.
Pitts, Robert F., Johns Hopkins University.
Shaw, Gretchen, Graduate Student, University of Chicago.
Steiner, Matthew M., Assistant in Biology, New York University.
Stevens, Thelma O., Graduate Assistant, Mt. Holyoke College.
Tang, Pei-sung, Harvard University.
Vack, Christine M., Technician, Harvard University Medical School.
Vicari, Emilia M., Research Associate, Cornell University Medical College.
Woodward, Alvalyn E., Assistant Professor, University of Michigan.

PROTOZOOLOGY

Breime, Katherine S., Barnard College.
Carter, Helen D., Elmira College.
Costello, Donald P., 3732 Heidelberg, Detroit, Michigan.
Emrich, John R., Graduate Student, Columbia University.
Flammon, Sister M. Muriel, Seton Hill College.
Frye, Mary Elizabeth, Pennsylvania College for Women.
Lhérisson, Camille, Professor of Biology, University of Haiti Medical School.
Masten, Lois E., Elmira College.
Morgan, Willia A., Assistant Instructor in Biology, Coker College.
Schoelz, Abraham H., Graduate Student, Columbia University.
Scotland, Minnie B., Teacher, New York State College for Teachers.
Smith, Claire M., Hunter College.
Steinberg, Bernhard, Director of Laboratories and Research, Toledo Hospital.
Weisman, Maxwell N., Fellow, College of the City of New York.

INVERTEBRATE ZOOLOGY

Alderman, Evangeline, Oberlin College.
Baumgartner, Frederick M., Butler University.
Bittinger, Isabel, Radcliffe College.
Boardman, Edward T., Graduate Assistant, Johns Hopkins University.
Brown, Frank A., Jr., Harvard University.
Campbell, Dan H., Student, Wabash College.
Carlson, J. Gordon, Assistant in Zoology, University of Pennsylvania.
 Chadwick, Claude S., Instructor in Biology, Vanderbilt University.
Cohen, Rose S., Graduate Assistant, University of Cincinnati.
Coleman, Lucille, Agnes Scott College.
Coplan, Helen M., Student, Goucher College.
Craig, Robert L., Student, Amherst College.
Crowell, Prince S., Jr., Bowdoin College.
Dee, M. Barbara, Assistant in Science, Jamaica Plain High School.
DeRoo, Grace, Radcliffe College.
Derrickson, Mary B., Goucher College.
REPORT OF THE DIRECTOR

Dorris, Frances S., Graduate Student, Yale University.
Doyle, William L., Johns Hopkins University.
Eichold, Eva C., Student, Newcomb College.
Everett, John W., Yale University.
Farber, Seymour M., University of Buffalo.
Fennell, R. A., Graduate Student, Duke University.
Fisher, Kenneth C., Student and Assistant, Acadia University.
French, Charles S., Harvard University.
Hamburger, Louis P., Jr., Johns Hopkins University.
Hart, Helen B., Student, Wellesley College.
Hastings, Margaret, Student, Mt. Holyoke College.
Hayes, Frederick R., Assistant Professor of Zoology, Dalhousie University.
Heiss, Elizabeth M., Assistant in Biology and Histology, Purdue University.
Heusner, Albert P., Swarthmore College.
Hewitt, Dorothy C., Graduate Student, Yale University.
Holloway, May P., Teacher of Science, Burke School.
Hubbard, Ruth A., Assistant, Cleveland Museum of Natural History.
Jackson, Jeannette A., Graduate Assistant in Zoology, Syracuse University.
Johnson, Dorothy F., Laboratory Assistant, Wellesley College.
Kille, Frank R., Assistant Professor of Biology, Birmingham-Southern College.
Kroc, Robert L., Graduate Assistant, University of Wisconsin.
Leavitt, Benjamin B., Instructor in Zoology, Dartmouth College.
Menzel, Arthur E. O., National Tuberculosis Research Fellow, Presbyterian Hospital.
Merriman, Daniel, Student, Harvard University.
Morris, Samuel, Instructor in Zoology, University of Pennsylvania.
Prest, Margaret R., Graduate Assistant, Mt. Holyoke College.
Redmond, Albert C., Student, Hamilton College.
Reynolds, Albert E., Assistant in Zoology, DePauw University.
Ritter, M. Esther, Student, Wilson College.
Shea, Margaret, Student, Oberlin College.
Sidebotham, Ruth S., Graduate Assistant in Zoology, Washington University.
Snell, Peter A., Fellow in Biology, Princeton University.
Snook, Theodore, Graduate Assistant in Zoology, Rutgers University.
Swanson, Oscar E., Student, Antioch College.
Tipton, Samuel R., Graduate Student, Duke University.
Townsend, Grace, Instructor, Joliet Township High School and Junior College.
Treat, Dorothy A., Assistant in Department of Education, Cleveland Museum of Natural History.
Waters, Nelson F., Graduate Student, Harvard University.
Weed, Milton R., Student, Wesleyan University.
Woodruff, Beth H., Graduate Assistant, Western Reserve University.
### 3. TABULAR VIEW OF ATTENDANCE

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<td><strong>TOTAL ATTENDANCE</strong></td>
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<td>Less Persons registered as both students and investigators</td>
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<td>By Investigators</td>
<td>84</td>
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<td>By Students</td>
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#### SCHOOLS AND ACADEMIES REPRESENTED

- By Investigators: 4, 1, 1, 1, 4
- By Students: 3, 8, 8, 3, 2

#### FOREIGN INSTITUTIONS REPRESENTED

- By Investigators: 17, 15, 13, 30, 7
- By Students: 3, 8, 8, 3, 2

### 4. SUBSCRIBING AND COÖPERATING INSTITUTIONS

Acadia University
Amherst College
Antioch College
Beaver College
Bowdoin College
Brown University
Bryn Mawr College
Butler College
C. R. B. Educational Foundation
California Institute of Technology
Carnegie Institution of Washington
Chinese Educational Mission
Columbia University
Cornell University
Cornell University Medical College
Dalhousie University
Dartmouth College
DePauw University
Duke University
Elmira College
General Education Board
Goucher College
Hamilton College
Harvard University
Harvard University Medical School
Howard University
Hunter College
Indiana University
Industrial & Engineering Chemistry, of the American Chemical Society
Johns Hopkins University
Johns Hopkins University Medical School
Eli Lilly & Co.
Memorial Hospital of N. Y. City
Morehouse College
Mount Holyoke College
National Research Council
New York State Department of Health
New York University
Oberlin College
Pennsylvania College for Women
Princeton University
Radcliffe College
Rockefeller Foundation
Rockefeller Institute for Medical Research
Rutgers University
Seton Hill College
Smith College
Sophie Newcomb College
Southwestern
St. Louis University
Swarthmore College
Tufts College
Union College
United States Dept. of Agriculture
University of Buffalo
University of Chicago
University of Cincinnati
University of Illinois
University of Michigan
University of Missouri
University of Nebraska
University of Pennsylvania
University of Pennsylvania Medical School
University of Pittsburgh
University of Rochester
University of Tennessee
University of Virginia
University of Wisconsin
Vanderbilt University Medical School
Vassar College
Wabash College
Washington University
Washington University Medical School
Wellesley College
Wesleyan University
Western Reserve University
West Virginia State College
West Virginia University
Wheaton College
Wistar Institute of Anatomy and Biology
Yale University

SCHOLARSHIP TABLES

Lucretia Crocker Scholarships for Teachers in Boston.
Scholarship of $100 supported by a friend of the Laboratory since 1898.
The Edwin S. Linton Memorial Scholarship of Washington and Jefferson College.
The Bio Club Scholarship of the College of the City of New York.
Ida H. Hyde Scholarship of the University of Kansas.

5. EVENING LECTURES, 1930

Tuesday, July 1
Dr. W. B. Scott ................. "New Light on the Development and Migrations of American Mammals."

Tuesday, July 8
Dr. Henry B. Bigelow ........... "Prospects and Problems of Oceanography."

Tuesday, July 15
Dr. H. S. Jennings .............. "Heredity and Mutation in Relation to Environment in Protozoa."

Friday, July 18
Dr. Edward Mellanby .......... "Food Deficiencies."

Tuesday, July 22
Dr. F. R. Lillie .............. "The Action of the Sex Hormones in the Fowl: An Account of the Chicago Experiments."
Tuesday, July 29  
Dr. Leonor Michaelis  "The Reversible Oxidizable-reducible Systems Found in Living Organisms."

Tuesday, August 5  
Dr. E. F. DuBois  "Recent Progress in the Field of Respiratory Metabolism."

Tuesday, August 12  
Dr. E. Chatton  "A Study of the Dinoflagellate, Polykrikos Schwartzi as a Basis for the Discussion of Some Problems of General Cytology."

Tuesday, August 19  
The Reynold A. Spaeth Memorial Lecture, delivered by Dr. Hardolph Wasteneys  "Protein Synthesis."

Thursday, August 21  
Dr. H. H. Gran  "The Productivity of the Ocean."

Tuesday, August 26  
Dr. D. W. Bronk  "Nerve Impulse Rhythms and the Control of Movement."

Tuesday, September 2  
Dr. G. C. Hirsch  "The Problem of Restitution with Special Regard to the Phenomena of Secretion."

Tuesday, September 9  
Dr. G. E. Hutchinson  "The Hydrobiology of Arid and Semi-arid Regions."

SPECIAL LECTURES AND MOTION PICTURES

Monday, August 11  
"The Illyria Expedition to the Galapagos, the South Sea Islands, the New Hebrides, the Solomon Islands, New Guinea, Bali and Angkor." Exhibited by Mr. Cornelius Crane, the Leader of the Expedition.

Thursday, August 14  

Thursday, August 28  

Friday, August 29  
"Motion Pictures of Marine and Fresh Water Protozoa of the Woods Hole Region," Ruth B. Howland, Department of Biology, New York University.
6. SHORTER SCIENTIFIC PAPERS, 1930

Tuesday, June 24
Dr. Balduin Lucké and Dr. Morton McCutcheon ....... "The Effect of Injury on Cellular Permeability to Water."
Dr. M. M. Brooks ................. "The Relation between rH and the Penetration of Oxidation-reduction Indicators."
Dr. S. C. Brooks ................. "Accumulation of Ions in Living Cells."
Dr. M. H. Jacobs, Mr. A. K. Parpart, Dr. W. A. Smith and Mr. G. E. Shattuck ......... "The Permeability of the Erythrocyte to Urea."

Friday, June 27
Dr. B. H. Willier ................. "The Developmental Relations of the Heart and the Liver in Chorio-allantoic Grafts."
Dr. E. E. Just ................. "Cortical Protoplasm and Vital Phenomena."
Dr. William C. Young ........ "The Post-testicular History of Spermatozoa and Reproduction in the Male Guinea Pig."
Dr. L. V. Heilbrunn ......... "The Action of Ultra-violet Rays on Arbacia Egg Protoplasm."

Thursday, July 3
Dr. Walter S. Root and Dr. Charlotte Haywood ......... "The Effect of Carbon Dioxide upon the Rate of Oxygen Consumption and of Cleavage of the Arbacia Egg."
Dr. L. Michaelis and Dr. K. Salomon ........ "Respiration of Erythrocytes."
Dr. R. W. Gerard ........ "Observations on the Metabolism of the Coccus, Sarcina lutea."
Dr. E. S. G. Barron ........ "The Effect of Methylene Blue upon the Respiration of Normal and of Cancer Tissue."

Friday, July 11
Dr. W. R. Taylor ................. "Chromosome Structure in Meiosis of Gasteria."
Dr. B. M. Duggar ................. "New Technique and Some Adsorption Studies with Virus Diseases of Plants."

Thursday, July 17
Dr. Vera Koehring ................. "Some Cytological Relationships in Narcosis."
Dr. Eleanor H. Slifer ............. "The Mitotic Activity in the Developing Grasshopper Egg."
Dr. A. F. Huetter ............."Spermatogenesis in Drosophila melanogaster."

Dr. Hope Hibbard ............."Cytological Studies on the Silk Gland of Bombyx mori."

Friday, July 25
Dr. S. Gelfan ......................."The All-or-None Law in Muscle."
Dr. W. R. Ambergon, Mr. A. K. Parpart and Miss Gertrude Sanders ............."Low Voltage Elements of the Action Potential Wave of Nerve."
Dr. F. O. Schmitt ............."The Effect of Cyanides and Carbon Monoxide on Nerve."

Saturday, July 26
Dr. M. Durcissson ............."Cardiac Automatism in Invertebrates."
Dr. W. E. Garrey ............."Observations on the Heart of Limulus."
Dr. D. J. Edwards ............."The Action of Pressure on Some Physiological Processes."
Dr. G. H. Bishop ............."The Influence of Iodo-acetic Acid on Muscle Contracture."
Dr. F. H. Pratt ............."Experiments on the Terminal Nerve-muscle Unit."
Dr. D. W. Bronk ............."Graded Muscular Contractions."
Dr. R. W. Gerard ............."Nerve Metabolism and Asphyxia."
Dr. R. S. Lillie ............."Recovery in the Passive Iron Wire Model."
Dr. A. M. Monnier ............."Mathematical Analysis Applied to the Functions of the Nervous System."
Dr. H. Davis ............."Re-education and Modification of Reflexes."
Dr. G. P. McCouch ............."Patterns of Some Extra-ocular Reflexes in the Cat."
Dr. P. Bard ............."The Behavior of a Cat without the Telencephalon."

Friday, August 1
Dr. Paul S. Hemshaw ............."Some Biological Effects Produced by Alpha Particles on Drosophila Eggs."
Mr. Ware Cattell ............."The Effect of X-Rays upon the Growth of the Wheat Seedling."
Dr. W. C. Curtis ............."Effects of X-Rays upon Regeneration."
Dr. Charles Packard ............."The Relation between Division Rate and Susceptibility to Radiation."

Friday, August 8
Dr. Helen M. Miller ............."Life Cycle of a Bisexual Rotifer."
Dr. Tracy M. Sonneborn ............."Cause, Inheritance, and Effects of the Chain-forming Tendency in the Ciliate Protozoan, Colpidium."
Dr. Ruth Stocking Lynch ...... "The Effects of Long-continued Starvation in a Rotifer in Relation to Inheritance."

Dr. H. W. Stunkard .......... "The Life History of Cryptocotyle lingua."

Friday, August 15

Dr. Mary S. MacDougall ...... "A Mutation in Chilodon uncinatus Produced by Ultra-violet Radiation —A Preliminary Report."

Dr. R. D. Manwell .......... "The Effect of Quinine and Plasmoquin on Avian Malaria."

Dr. E. Chatton ............... "The Asymmetric Motile Stages of Epistylis and the Question of the So-called Longitudinal Division of the Vorticellidae."

Dr. Ruth B. Howland .......... "Cine-photomicrograph of Microinjection of Vacuolated Protoplasm."

Friday, August 22

Dr. Calvin B. Bridges .......... "The Neutralization of the Effects of Deficiencies through Duplications of the Same Chromosome Material."

Dr. A. H. Sturtevant .......... "A Peculiar Sex-ratio in Drosophila obscura."

Dr. Helen Redfield .......... "Studies of Crossing-over in Drosophila."

Dr. Jack Schultz .......... "The Eye of Pigments of Drosophila."

Friday, August 29

Dr. H. B. Goodrich and
Mr. I. B. Hansen .......... "Embryonic Development of Mendelian Characters in the Goldfish."

Dr. H. A. Abramson .......... "The Isoelectric Point of Mammalian Red Blood Cells."

Dr. E. N. Harvey and
Mr. A. L. Loomis .......... "The Microscope-centrifuge."

Friday, September 5

Dr. J. M. Johlin .......... "The Extraction of Micro-organisms."

Dr. W. E. Garrey and
Dr. W. R. Bryan .......... "Alkalosis in Relation to Tetany following High Temperatures after Parathyroidectomy."

Dr. K. Blanchard .......... "Catalysis of Condensation Reactions by Amino-acids."

Dr. L. Michaelis and
Dr. M. Schubert .......... "Metal Complex Compounds of Thio-glycollic Acid."
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