THE BIOLOGICAL BULLETIN
PUBLISHED BY THE MARINE BIOLOGICAL LABORATORY

THE MARINE BIOLOGICAL LABORATORY
Thirty-Seventh Report for the Year 1934—Forty-Seventh 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, 120 Broadway, New York City.
CHARLES PACKARD, Clerk of the Corporation, Columbia University.

EMERITUS

H. C. BUMPUS, Brown University.
CORNELIA M. CLAPP, Mount Holyoke College.
E. G. CONKLIN, Princeton University.
C. R. CRANE, New York City.
H. H. DONALDSON, Wistar Institute of Anatomy and Biology.
GILMAN A. DREW, Eagle Lake, Florida.
R. A. HARPER, Columbia University.
M. M. Metcalf, Waban, Mass.
W. B. Scott, Princeton University.
E. B. Wilson, Columbia University.

TO SERVE UNTIL 1938

E. R. Clark, University of Pennsylvania.
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.
Franz Schrader, Columbia University.
B. H. Willier, University of Rochester.

TO SERVE UNTIL 1937

W. R. Amberson, University of Tennessee.
H. B. Goodrich, Wesleyan University.
I. F. Lewis, University of Virginia.
R. S. Lillie, The University of Chicago.
T. H. Morgan, California Institute of Technology.
A. C. Redfield, Harvard University.
C. C. Speidel, University of Virginia.
D. H. Tennent, Bryn Mawr College.

TO SERVE UNTIL 1936

H. B. Bigelow, Harvard University.
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, University of Cincinnati.
G. H. Parker, Harvard University.
C. R. Stockard, Cornell University Medical College.

TO SERVE UNTIL 1935

W. C. Allee, The University of Chicago.
Gary N. Calkins, Columbia University, Secretary of the Board of Trustees
W. C. Curtis, University of Missouri.
B. M. Duggar, University of Wisconsin.
L. V. Heilbrunn, University of Pennsylvania.
W. J. V. Osterhout, Rockefeller Institute for Medical Research.
Lorande L. Woodruff, Yale University.

EXECUTIVE COMMITTEE OF THE BOARD OF TRUSTEES

Frank R. Lillie, Ex Off. Chairman.
Lawrason Riggs, Jr., Ex. Off.
E. Newton Harvey, to serve until 1935.
C. R. Stockard, to serve until 1935.
ACT OF INCORPORATION

G. N. Calkins, to serve until 1936.
L. V. Heilbrunn, to serve until 1936.

THE LIBRARY COMMITTEE

E. G. Conklin, Chairman.
William R. Amberson.
C. O. Iselin, II.
C. C. Speidel.
A. H. Sturtevant.
William R. Taylor.

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 11.30 A.M., daylight saving time, 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 Corporation and he shall become eligible for election as Trustee Emeritus for life. The Trustees ex officio and Emeritus shall have all rights of the Trustees except that Trustees Emeritus shall not have the right to vote.

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. Inasmuch as the time and place of the Annual Meeting of Members is fixed by these By-laws, no notice of the Annual Meeting need be given. Notice of any special meeting of members, however, shall be given by the Clerk by mailing notice of the time and place and purpose of said meeting, at least fifteen (15) days before such meeting, to each member at his or her address as shown on the records of the Corporation.

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 Corporation 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 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 my report as Treasurer of the Marine Biological Laboratory for the year 1934.

The accounts have been audited by Messrs. Seaman, Stetson, and Tuttle, certified public accountants, and 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 1934, the book value of the Endowments Funds in the hands of the Central Hanover Bank and Trust Company as Trustee, was

<table>
<thead>
<tr>
<th>Fund Type</th>
<th>Securities</th>
<th>Cash</th>
<th>Total Book Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Fund</td>
<td>$908,979.66</td>
<td>$2,635.71</td>
<td>$1,105,430.06</td>
</tr>
<tr>
<td>Library Fund</td>
<td>$192,820.25</td>
<td>$994.44</td>
<td></td>
</tr>
</tbody>
</table>

The income collected from these Funds was as follows:

<table>
<thead>
<tr>
<th>Fund Type</th>
<th>Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Endowment</td>
<td>$39,394.02</td>
</tr>
<tr>
<td>Library Fund</td>
<td>$7,543.95</td>
</tr>
</tbody>
</table>

Income in arrears, some of which may never be collected, was on December 31, 1934:

<table>
<thead>
<tr>
<th>Fund Type</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Fund</td>
<td>$12,966.50</td>
</tr>
<tr>
<td>Library Fund</td>
<td>$2,897.05</td>
</tr>
</tbody>
</table>

The shrinkage in income from Endowment Funds was more than made up by the extra dividends of the General Biological Supply House, Inc. The income from this stock amounted during the year to $11,834.00.

The Reserve Fund was liquidated and the proceeds applied to the further reduction of Devil’s Lane mortgage.

Retirement Fund. A net total of $4,060 was paid out of the Retirement Fund in pensions. The fund at the end of the year consisted of securities of the book value of $21,847.03

<table>
<thead>
<tr>
<th>Fund Type</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$713.24</td>
</tr>
</tbody>
</table>

Total $22,560.27

Income in arrears on December 31, was $131.63
The land, building, equipment and library, exclusive of the Gansett and Devil's Lane tracts, represented an investment of $1,717,498.34
Less reserve for depreciation 412,658.40
$1,304,839.94

Expenses including $43,427.07 depreciation exceeded income by $15,667.92. There was expended from current funds $16,642.08 in additions to plant, mostly for books.

At the end of the year the Laboratory owed $2,000 on Bond and Mortgage (paid since the end of the year) and $4,760.59 on open account and had $9,937.82 in cash and bank accounts.

Following is the balance sheet as of December 31, 1934, the condensed statement of income and outgo, also the surplus account, as set out by the accountants:

EXHIBIT A
Marine Biological Laboratory Balance Sheet,
December 31, 1934

Assets
Endowment Assets and Equities:
  Securities and Cash in Hands of Central Hanover
  Bank and Trust Company, New York, Trustee—Schedules I-a and I-b $1,105,430.06
  Securities and Cash—Minor Funds—Schedule II 7,959.34 $1,113,389.40

Plant Assets:
  Land—Schedule IV $98,103.05
  Buildings—Schedule IV 1,224,732.28
  Equipment—Schedule IV 173,840.34
  Library—Schedule IV 220,822.67 $1,717,498.34

Less Reserve for Depreciation 412,658.40
$1,304,839.94

Cash in Dormitory Building Fund 523.85
Cash in Reserve Fund 24.65 $1,305,388.44

Current Assets:
  Cash $9,937.82
  Accounts and Notes-Receiveable 10,055.61
  Inventories:
    Supply Department $37,589.22
    Biological Bulletin 10,573.93 48,163.15

Investments:
  Devil's Lane Property $42,991.05
  Gansett Property 5,351.29
  Stock in General Biological
    Supply House, Inc. 12,700.00
  Retirement Fund Assets 22,560.27 83,602.61
REPORT OF THE TREASURER

Prepaid Insurance ................................................. 3,662.78
Items in Suspense (Net) ........................................... 340.24 $ 155,762.21

Liabilities

Endowment Funds:
Endowment Funds—Schedule III .............................. $1,105,430.06
Minor Funds—Schedule III .................................. 7,959.34 $1,113,389.40

Plant Funds:
Donations and Gifts—Schedule III ......................... $1,029,572.61
Other Investments in Plant from Gifts and Current Funds .............. 275,815.83 $1,305,388.44

Current Liabilities and Surplus:
Accounts-Payable .............................................. $ 4,760.59
Woods Hole Oceanographic Institution ...................... 490.94
Mortgage Note—Devil's Lane Property ...................... 2,000.00

$ 7,251.53

Current Surplus—Exhibit C .................................. 148,510.68 $ 155,762.21

EXHIBIT B

MARINE BIOLOGICAL LABORATORY INCOME AND EXPENSE,
YEAR ENDED DECEMBER 31, 1934

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th></th>
<th>Net</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Expense</td>
<td>Income</td>
<td>Expense</td>
<td>Income</td>
</tr>
<tr>
<td>Income:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Endowment Fund</td>
<td>$39,394.02</td>
<td>$39,394.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Library Fund</td>
<td>7,543.95</td>
<td>7,543.95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instruction</td>
<td>8,030.83</td>
<td>9,825.00</td>
<td>1,794.17</td>
<td></td>
</tr>
<tr>
<td>Research</td>
<td>4,012.52</td>
<td>12,237.00</td>
<td>8,224.48</td>
<td></td>
</tr>
<tr>
<td>Evening Lectures</td>
<td>55.41</td>
<td>55.41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biological Bulletin and Membership Dues</td>
<td>7,786.86</td>
<td>9,113.30</td>
<td>1,326.44</td>
<td></td>
</tr>
<tr>
<td>Supply Department—</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schedule V</td>
<td>43,428.23</td>
<td>45,439.72</td>
<td>2,011.49</td>
<td></td>
</tr>
<tr>
<td>Mess—Schedule VI</td>
<td>21,138.68</td>
<td>21,468.16</td>
<td>329.48</td>
<td></td>
</tr>
<tr>
<td>Dormitories—Schedule VII</td>
<td>30,421.08</td>
<td>11,839.13</td>
<td>18,581.95</td>
<td></td>
</tr>
<tr>
<td>(Interest and Depreciation charged to above three Departments—See Schedules V, VI, and VII)</td>
<td>36,296.75</td>
<td></td>
<td>36,296.75</td>
<td></td>
</tr>
<tr>
<td>Dividends, General Biological Supply House, Inc.</td>
<td>11,834.00</td>
<td>11,834.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rents:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Danchakoff Cottages</td>
<td>377.07</td>
<td>750.00</td>
<td>372.93</td>
<td></td>
</tr>
<tr>
<td>Microscopes</td>
<td>530.90</td>
<td>530.90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Newman Cottage</td>
<td>114.40</td>
<td>250.00</td>
<td>135.60</td>
<td></td>
</tr>
<tr>
<td>Janitor's House</td>
<td>242.36</td>
<td>360.00</td>
<td>117.64</td>
<td></td>
</tr>
<tr>
<td>Sale of Duplicate Library Sets</td>
<td>20.54</td>
<td>20.54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sundries</td>
<td>9.44</td>
<td>9.44</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Maintenance of Plant:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Laboratory Expenses</td>
<td>16,008.45</td>
<td>Chemical and Special Apparatus</td>
<td>12,999.05</td>
</tr>
<tr>
<td>Maintenance, Buildings and Grounds</td>
<td>7,816.95</td>
<td>Library Department Expenses</td>
<td>7,559.80</td>
</tr>
<tr>
<td>Carpenter Department Expenses</td>
<td>533.83</td>
<td>Truck Expenses</td>
<td>731.74</td>
</tr>
<tr>
<td>Sundry Expenses</td>
<td>309.99</td>
<td>Workmen’s Compensation Insurance</td>
<td>579.93</td>
</tr>
<tr>
<td>Pumping Station Expenses</td>
<td>150.76</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**General Expenses:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration Expenses</td>
<td>15,095.21</td>
<td>Endowment Fund Trustee</td>
<td>968.50</td>
</tr>
<tr>
<td>Interest on Loans</td>
<td>25.00</td>
<td>Bad Debts</td>
<td>452.51</td>
</tr>
<tr>
<td>Reserve for Depreciation</td>
<td>43,427.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Museum Expenses</td>
<td>313.60</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total:**

$186,283.08 $170,615.16 $125,609.75 $109,941.83

Excess of Expenses over Income carried to Current Surplus—Exhibit C

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total:**

$186,283.08 $125,609.75

**EXHIBIT C**

**MARINE BIOLOGICAL LABORATORY, CURRENT SURPLUS ACCOUNT, YEAR ENDED DECEMBER 31, 1934**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balance, January 1, 1934</td>
<td>$130,138.26</td>
<td>Add:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reserve for Depreciation charged to Plant Funds</td>
<td>43,427.07</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cash transferred from Reserve Fund and used to reduce Mortgage on Devil’s Lane Land</td>
<td>12,000.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Federal Tax on Checks drawn on Building Fund Cash and charged to Administration Expense</td>
<td>.04</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deduct:</td>
<td>$185,565.37</td>
<td>Payments from Current Funds during Year for Plant Assets as shown in Schedule IV:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Buildings</td>
<td>$256.09</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Equipment</td>
<td>3,660.84</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Library, Books, etc.</td>
<td>12,725.15</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$16,642.08</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Less Cash received for Plant Assets sold and charged to Current Cash</td>
<td>70.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$16,572.08</td>
<td></td>
</tr>
</tbody>
</table>
REPORT OF THE LIBRARIAN

Pensions and Allowances Paid ........... $4,060.00
Less Income of Retirement Fund received .................................. 245.31
Payment of Balance due on Danchakoff Mortgage from Current Funds .......... 1,000.00
Excess of Expenses over Income for Year as shown in Exhibit B .................. 15,667.92
Balance, December 31, 1934—Exhibit A ...................................... $148,510.68

Respectfully submitted,

LAWRASON RIGGS, JR., Treasurer.

V. THE REPORT OF THE LIBRARIAN

The Library budget for 1934 remained the same as that for 1933 and was apportioned as follows: current books, $300; serials, $6,000; current serial binding, $1,500; express, $300; supplies, $500; back sets, $1,850; salaries, $7,150; total, $17,600. The amount spent under each item is here set out: current books, $288.31; serials, $7,388.47; binding, $1,192.24; express, $88.05; supplies, $278.01; back sets, $1,093.86; salaries, $7,150; total, $17,478.94. The total expenditure made for the Woods Hole Oceanographic Institution for their year March 1 to March 1, 1934–35, was approximately as follows: books, $130.60; serials, $229.64; binding, $69.70; supplies, $2.12; back sets, $442.89; total, $874.95.

The Library now contains 38,558 volumes and 86,236 separates. Of the bound volumes 6,036 are books and 32,522 are serials. Of the separates 2,546 are bound or are sizeable volumes and collected reprints. There are received at the Library 1,197 current serials. Of these 349 are subscriptions paid by the Marine Biological Laboratory, 37 by the Woods Hole Oceanographic Institution; 582 are exchanges with the Biological Bulletin, 19 with the Woods Hole Oceanographic Institution publications; and 200 are gifts to the Marine Biological Laboratory, 10 to the Woods Hole Oceanographic Institution. The new books number 170, of which 71 were purchased by the Marine Biological Laboratory, 30 by the Woods Hole Oceanographic Institution; 21 were gifts from publishers, 24 from authors, and 24 were miscellaneous gifts. The new current serials number 32, of which 5 are subscriptions paid by the Marine Biological Laboratory and 8 by the Woods Hole Oceanographic Institution; 13 are exchanges with the Biological Bulletin and 6 with the Woods Hole Oceanographic Institution publications. The new separates received this year number 5,028 and approximately
3,500 are of current issue while the remainder date back three years or more. These older reprints, many of them very old and hard to fill in, were gifts generously made by the following members of the Corporation: Dr. M. E. Collett, Dr. E. O. Jordan, Dr. L. Michaelis, Dr. S. Morgulis, Dr. E. F. Phillips, and Dr. E. B. Wilson.

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-seventh session of the Marine Biological Laboratory for the year 1934.

1. Attendance. The attendance both of investigators and students for 1934 shows a slight increase over that for 1933, amounting to 4 for investigators and 13 for students, the total attendance for the two years in question being 439 and 425, respectively. The number of institutions represented by investigators also increased from 120 to 131 and that by students from 58 to 75. The seasonal distribution of the attendance of investigators for 1934, and for comparison that for the preceding 7 years, is indicated in the following table:

<table>
<thead>
<tr>
<th>Month</th>
<th>1927</th>
<th>1928</th>
<th>1929</th>
<th>1930</th>
<th>1931</th>
<th>1932</th>
<th>1933</th>
<th>1934</th>
</tr>
</thead>
<tbody>
<tr>
<td>May</td>
<td>30</td>
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<td>July</td>
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<td>August</td>
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<td>September</td>
<td>10</td>
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2. The Report of the Treasurer. The decline in the income from endowment funds of the Laboratory, to which attention was called in the reports for 1932 and 1933, has continued during 1934, though fortunately at a somewhat reduced rate. The amounts received from this source for the four years 1931 to 1935 inclusive (no decline having occurred prior to 1931) were: $57,728.26, $55,668.92, $49,067.17 and $46,937.97. It will be noted that the loss of income from endowment, as based on the 1931 figure, has now reached approximately 19 per cent, which under existing conditions may be considered to indicate a very satisfactory soundness of the investments of the Laboratory as a whole.
The income from the other usual sources remained approximately the same in 1934 as in 1933, further declines in receipts for research space and from the Mess and the dormitories being approximately balanced by gains in those from the Supply Department and from the Courses of Instruction. A dividend from the General Biological Supply House, representing profits accumulated during a number of years, is chiefly responsible for the considerable increase in the total income for 1934 over that for the preceding year. Advantage was taken of this favorable opportunity to pay off, shortly after the period formally covered by this report, the remainder of the Devil's Lane mortgage. Since this mortgage was the only one still outstanding, the property owned by the Laboratory is now free from all encumbrances, and annual payments of interest on mortgages which three years ago amounted to $1,350.00 have been completely eliminated.

It is scarcely necessary to emphasize the fact that the relatively favorable financial showing of the Laboratory in 1934 would have been impossible without a continuation of the drastic economies mentioned in several previous reports. Some of these economies, notably the curtailment of the purchase of books and back sets of journals for the Library and of certain repairs and improvements of buildings and equipment are to be looked upon as emergency measures only, which cannot be long continued without detriment to the scientific activities of the institution.

3. The Report of the Librarian. Handicapped both by a reduced appropriation for books and back sets of periodicals and by unfavorable foreign exchange, the Library has nevertheless been able not merely to maintain but slightly to increase the number of journals currently received. At the same time, the valuable reprint collection has continued to grow at an undiminished rate. This growth has been made possible by the many persons who have contributed reprints of their own papers and in particular by those mentioned in the report of the Librarian who have generously made additional gifts. To all these persons the thanks of the Laboratory are hereby extended. The growth of the library during the past 10 years is concisely set forth in the following table:

<table>
<thead>
<tr>
<th>Year</th>
<th>1925</th>
<th>1926</th>
<th>1927</th>
<th>1928</th>
<th>1929</th>
<th>1930</th>
<th>1931</th>
<th>1932</th>
<th>1933</th>
<th>1934</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>1,060</td>
<td>1,080</td>
<td>1,126</td>
<td>1,137</td>
<td>1,197</td>
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<tr>
<td>Total number of bound volumes</td>
<td>15,000</td>
<td>18,200</td>
<td>22,800</td>
<td>26,500</td>
<td>28,300</td>
<td>31,500</td>
<td>33,800</td>
<td>36,000</td>
<td>37,400</td>
<td>38,600</td>
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<tr>
<td>Reprints</td>
<td>25,000</td>
<td>38,000</td>
<td>43,000</td>
<td>51,000</td>
<td>59,000</td>
<td>64,000</td>
<td>70,000</td>
<td>76,000</td>
<td>81,000</td>
<td>86,000</td>
</tr>
</tbody>
</table>
4. Lectures and Scientific Meetings. A complete record of this important activity of the Laboratory for the season of 1934 will be found below (pages 28 to 35). The regular evening lectures numbered 10, and these were supplemented by several special lectures and exhibits of motion pictures. Ten scientific meetings were also held at which 69 shorter papers were presented and discussed. The last of these meetings was, as usual, an all-day session at the close of the summer, devoted exclusively to work done at the Laboratory during the current season. Abstracts of many of the papers presented at this and at earlier meetings will be found in the Biological Bulletin for October, 1934. In addition to the regular scientific programs, a Woods Hole meeting of the Genetics Society of America on August 22, for which the Marine Biological Laboratory acted as host, was also largely attended by Laboratory workers.

5. Courses of Instruction. The resignation of Dr. William R. Amberson as Head of the Physiology Course, a position which he first assumed in 1930, was accepted by the Executive Committee with regret, and Dr. Laurence Irving of the University of Toronto was selected to take his place. In recognition of Dr. Amberson’s unusual success during his connection with the Physiology Course in stimulating the interest of students in research, he was elected a member of the Research Staff of the Laboratory.

6. Change in the By-laws. At the regular meeting of the Trustees held on Tuesday, August 14, 1934, due notice having previously been given that a change in the By-laws would be acted upon, it was unanimously voted to strike out the former By-law III and to substitute for it a new By-law III as follows:

“Inasmuch as the time and place of the Annual Meeting of Members is fixed by these By-laws, no notice of the Annual Meeting need be given. Notice of any special meeting of members, however, shall be given by the Clerk by mailing notice of the time and place and purpose of said meeting, at least fifteen (15) days before such meeting, to each member at his or her address as shown on the records of the Corporation.”

7. Board of Trustees. At the meeting of the Corporation held on Tuesday, August 14, 1934, Professor E. G. Conklin, whose long and active service on the Board of Trustees began in 1898, was elected a Trustee Emeritus, and Professor B. H. Willier of the University of Rochester was chosen to fill the vacancy thus created in the Class of 1938.

It is with deep regret that announcement is made of the deaths during 1934 of two members of the Board of Trustees whose connections with the Laboratory were particularly long and intimate.
Dr. Gilman A. Drew, whose death occurred on October 26, first attended the Laboratory as an investigator in 1900. From that year until ill-health necessitated his retirement from active scientific work, he made many important contributions to a better understanding of the marine animals of the Woods Hole region. His services to the Laboratory as an administrator covered almost a quarter of a century, first as Head of the Course in Invertebrate Zoology (1901-1909) and later as Assistant Director of the Laboratory (1909-1925). As an elected Trustee and a Trustee ex officio he served from 1907 to 1925 and as a Trustee Emeritus from the latter date until the time of his death. Among the many important services of Dr. Drew to the Marine Biological Laboratory, particular mention should be made of the indispensable part he played in the planning, construction, and equipment of the modern fireproof buildings in which so much of the work of the Laboratory is now carried on. As long as these buildings are used for scientific purposes, investigators will continue to profit by Dr. Drew's foresight, ingenuity, and conscientious attention to details.

Dr. Cornelia M. Clapp was one of the small group of seven persons who attended the Laboratory during its first season in the summer of 1888. Her important scientific work on the toadfish was begun in that year. For a period of 46 years, covering the entire existence of the Laboratory up to the time of her death, her interest in its welfare remained undiminished, and few summers passed without her active participation in its affairs. A member of the Corporation from 1890 until her death on December 31, 1934, she served from 1895 to 1908 as Librarian, from 1897 to 1903 as a member of the Staff of the Course in Embryology, from 1901 to 1904 and from 1910 to 1922 as a Trustee, and since 1922 as a Trustee Emeritus. In her death the Marine Biological Laboratory has sustained an irreparable loss.

8. Committee of Review. In the deed of trust covering the endowment funds contributed to the Laboratory in 1924 by the Friendship Fund, Inc., provision was made for a review at 10-year intervals of the activities of the institution by a committee consisting of 9 members in all, including official representatives of the National Academy of Sciences, the National Research Council, the American Association for the Advancement of Science and 6 professors in the field of biology, named respectively by a majority vote of the professors of the departments in the field of biology of the following universities: Harvard University, Columbia University, the University of Chicago, Princeton University, Yale University and the University of Pennsylvania. Provision was further made that if at any time, in the opinion of two-thirds of the members of such a Committee of Review, the Marine Biological
Laboratory is not performing valuable service in biological research, and if, after appropriate notification of the trustees of the fund and the Beneficiary, a second report by the Committee five years later is similarly unfavorable, then the fund may be used for other purposes recommended by two-thirds of the members of the Committee.

The first Committee of Review met at Woods Hole on July 21, 1934. Its members, chosen in the manner prescribed, were Professors G. N. Calkins (Columbia University), Wesley R. Coe (Yale University), Edwin G. Conklin (Princeton University), Frank R. Lillie (The University of Chicago), T. H. Morgan (The American Association for Advancement of Science), Fernandus Payne (The National Research Council), Alfred C. Redfield (Harvard University), Charles R. Stockard (The National Academy of Sciences) and Rodney H. True (The University of Pennsylvania). The Committee, after a study of the work of the Laboratory for the preceding 10 years, based on reports from its President and Director and on exhibits illustrating its attendance and scientific activities during the period in question, reached the following conclusions which were incorporated in the Minutes of the Meeting:

"1. The organization of the Laboratory, as embodied in its Constitution and By-Laws, continues to operate effectively under the control of professional biologists.

"2. The large number of investigators who have worked at the Laboratory as shown by Exhibits III and V, drawn as they have been from more than four hundred (400) institutions in this country and in many foreign lands, indicates the breadth of the Laboratory's influence and services.

"3. The Laboratory is especially well equipped for researches in general biology, experimental zoology and botany, embryology, physiology, biochemistry, biophysics, and other branches of the biological sciences. Its research rooms, apparatus, and facilities are excellent, and during the summer these are used to capacity. Living material for research is abundant and is promptly supplied by the Collecting (Supply) Department.

"4. The Library is generally recognized as one of the best biological libraries in the country; and, as shown by Exhibit VII, has increased about three-fold during the past decennium. It is freely accessible to investigators and is extensively used.

"5. General lectures and conferences are given at least twice a week throughout the summer session. They are largely attended and in general are very instructive and stimulating.

"6. One of the most important features of the Laboratory is the
close personal association of workers in many fields over considerable periods of time. This is one of the chief attractions of the Marine Biological Laboratory."

The Committee in conclusion voted unanimously that the Marine Biological Laboratory is performing valuable services in biological research.

There are appended as parts of the report:
1. The Staff, 1934.
2. Investigators and Students, 1934.
4. Subscribing and Coöperating Institutions, 1934.
5. Evening Lectures, 1934.
7. Members of the Corporation, August, 1934.

Respectfully submitted,

M. H. JACOBS,
Director.

1. THE STAFF, 1934

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, The 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

T. H. BISSONNETTE, Professor of Biology, Trinity College.
E. C. COLE, Professor of Biology, Williams College.
B. R. COONFIELD, Instructor in Biology, Brooklyn College.
C. E. HADLEY, Associate Professor of Biology, New Jersey State Teachers College at Montclair.
S. A. Matthews, Associate in Anatomy, School of Medicine, University of Pennsylvania.
O. E. Nelsen, Instructor in Zoölogy, University of Pennsylvania.
L. P. Sayles, Instructor in Biology, College of the City of New York.

Junior Instructors

F. R. Hayes, Associate Professor of Zoölogy, Dalhousie University.
F. H. Woods, Assistant Professor of Zoölogy, University of Missouri.

Protozoölogy

I. Investigation
(See Zoölogy)

II. Instruction

Gary N. Calkins, Professor of Protozoology, Columbia University.
Rachel Bowling, Instructor in Zoölogy, Columbia University.
Robert W. Stabler, Instructor in Zoölogy, University of Pennsylvania.

Embryology

I. Investigation
(See Zoölogy)

II. Instruction

L. G. Barth, Instructor of Experimental Zoölogy, Columbia University.
Hubert B. Goodrich, Professor of Biology, Wesleyan University.
Benjamin H. Grave, Professor of Biology, De Pauw University.
Leigh Hoadley, Professor of Zoölogy, Harvard University. (Absent in 1934.)
Charles Packard, Assistant Professor of Zoölogy, Institute of Cancer Research, Columbia University.
Oscar Schotte, Assistant Professor of Biology, Amherst College.

Physiology

I. Investigation

William R. Amberson, Professor of Physiology, University of Tennessee.
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, The University of Chicago.
Albert P. Mathews, Professor of Biochemistry, University of Cincinnati.

II. Instruction

Teaching Staff

William R. Amberson, Professor of Physiology, University of Tennessee.
Robert Chambers, Professor of Biology, New York University.
Rudolf Höber, Visiting Professor of Physiology, University of Pennsylvania.
Laurence Irving, Associate Professor of Physiology, University of Toronto.
Balduin Lucké, Associate Professor of Pathology, University of Pennsylvania.
Leonor Michaelis, Member of the Rockefeller Institute, New York City.

Junior Instructors
A. L. Chute, University of Toronto.
F. J. M. Sichel, New York University.

BOTANY

I. Investigation
C. E. Allen, Professor of Botany, University of Wisconsin.
S. C. Brooks, Professor of Zoology, University of California.
B. M. Duggar, Professor of Physiological and Economic Botany, University of Wisconsin.
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 Michigan.
G. W. Prescott, Assistant Professor of Biology, Albion College. (Absent in 1934.)
Francis Drouet, Research Fellow, University of Missouri.
George J. Hollenberg, Professor of Botany, LaVerne College.

GENERAL OFFICE
F. M. MacNaught, Business Manager.
Polly L. Crowell, Assistant.

RESEARCH SERVICE AND GENERAL MAINTENANCE
Samuel E. Pond, Technical Manager.
Oscar W. Richards, Chemical Service.
G. Failla, X-Ray Physicist.
Thomas E. Larkin, Superintendent.
William Hemenway, Carpenter.
Lester F. Boss, Research Technician.
J. D. Graham, Glassblower.
P. H. Liljestrand, Assistant.

LIBRARY
Priscilla B. Montgomery (Mrs. Thomas H. Montgomery, Jr.), Librarian.
Deborah Lawrence, Secretary.
Doris Endrejat, Mary A. Rohan, Assistants.

SUPPLY DEPARTMENT
James McInnis, Manager.
John J. Veeder, Captain.
Ellis M. Lewis, Engineer.
A. M. Hilton, Collector.

MUSEUM
George M. Gray, Curator.
2. INVESTIGATORS AND STUDENTS, 1934

Independent Investigators

Addison, William H. F., Professor of Normal Histology and Embryology, University of Pennsylvania.
Albaum, Harry G., Fellow in Biology, Brooklyn College.
Allee, W. C., Professor of Zoology, The University of Chicago.
Amberson, William R., Professor of Physiology, University of Tennessee.
Anderson, Russell L., Professor of Biology, Johnson C. Smith University.
Apel, F. W., Associate Professor of Biology, St. John's College.
Armstrong, Philip B., Assistant Professor of Anatomy, Cornell University Medical College.
Bailey, Gladys Holmes, Instructor, Hunter College.
Bailey, P. L., Jr., Instructor in Physiology, College of the City of New York.
Baker, Horace B., Associate Professor, University of Pennsylvania.
Ball, Eric G., Associate, Johns Hopkins University Medical School.
Baltzer, F., Professor, University of Berne, Berne, Switzerland.
Bart, L. G., Instructor, Columbia University.
Beams, H. W., Assistant Professor of Zoology, State University of Iowa.
Bernstein, Felix, Visiting Professor, Columbia University.
Bigelow, Robert P., Professor of Zoology, Emeritus, Massachusetts Institute of Technology.
Birnie, James H., Graduate Student, Brown University.
Bissonnette, T. Hume, Professor of Biology, Trinity College.
Blanchard, Kenneth C., Associate Professor of Biology, Washington Square College, New York University.
Bogert, L. Jean, Writer of Textbooks on Chemistry and Nutrition.
Bowen, Rufus E., Assistant Professor of Biology, Long Island University.
Bowling, Rachel, Columbia University.
Bradley, H. C., Professor of Physical Chemistry, University of Wisconsin.
Brinley, F. J., Assistant Professor, North Dakota State College.
Brown, Dugald E. S., Assistant Professor of Physiology, New York University and Bellevue Medical College.
Budington, Robert A., Professor of Zoology, Oberlin College.
Butler, Elmer G., Associate Professor of Biology, Princeton University.
Buyse, Adrian, Instructor in Zoology, University of Rochester.
Calkins, Gary N., Professor of Protozoology, Columbia University.
Cannan, Robert Keith, Professor, University and Bellevue Hospital Medical College.
Carothers, E. Eleanor, University of Pennsylvania.
Carpenter, Russell L., Associate in Anatomy, College of Physicians and Surgeons, Columbia University.
Cattell, Ware, Associate Editor, The Scientific Monthly.
Chambers, Robert, Research Professor of Biology, Washington Square College, New York University.
Chen, T. T., Instructor, University of Pennsylvania.
Cheney, R. H., Professor of Biology, Long Island University.
Chidester, F. E., University of Michigan.
Chow, Bacon F., Fellowship, Rockefeller Institute.
Clark, Eleanor Linton, Medical School, University of Pennsylvania.
Clark, Eliot R., Professor of Anatomy, University of Pennsylvania.
Clark, Leonard B., Assistant Professor of Biology, Union College.
Clowes, G. H. A., Director of Research, Lilly Research Laboratories.
Coen, W. R., Professor of Biology, Yale University.
Cohen, Rose S., Teaching Fellow, University of Cincinnati.
Cole, Elbert C., Professor of Biology, Williams College.
Collett, Mary E., Associate Professor of Biology, Western Reserve University.
Conklin, Edwin G., Professor of Biology, Emeritus, Princeton University.
Coonfield, B. R., Instructor, Brooklyn College.
Copeland, Donald E., Professor of Biology, Bowdoin College.
Crowell, Prince Sears, Jr., Graduate Student and Assistant in Zoology, Harvard University.
Crowell, Hannah T., Graduate Student, University of Pennsylvania.
Dan, Katsuma, Graduate Student, University of Pennsylvania.
Danforth, Louise L., American University.
Danielli, James F., Princeton University.
Davis, James E., Research Assistant, The University of Chicago.
Diller, William F., Instructor in Zoology, Dartmouth College.
Donaldson, Henry H., Member, Wistar Institute.
Drouet, Francis, in Charge of the Herbarium, University of Missouri.
DuBois, Eugene F., Professor of Medicine, Cornell University Medical College.
Duggar, B. M., Professor of Plant Physiology and Applied Botany, University of Wisconsin.
Dunning, Wilhelmina F., Associate in Cancer Research, Institute of Cancer Research, Columbia University.
Dunn, Edwin E., Instructor in Biochemistry, University of Nebraska, College of Medicine.
Duryee, William R., Instructor in Zoology, Northwestern University.
Edwards, Dayton J., Associate Professor of Physiology, Cornell University Medical College.
Ephrussi, Boris, Fellow, Rockefeller Foundation.
Ets, Harold N., Associate Professor, Pharmacology, Loyola University School of Medicine.
Everett, John W., Instructor in Anatomy, Duke University.
Fahnestock, Margaret, Instructor, Northwestern University.
Fleisher, Moyer S., Professor of Bacteriology and Hygiene, St. Louis University.
Forbes, Grace S., Instructor in Zoology, Barnard College, Columbia University.
Fowler, Coleen, Graduate Student, Johns Hopkins University.
Francis, W. L., Fellow, Rockefeller Foundation.
Fry, Henry J., Visiting Investigator, Cornell University Medical College.
Fuchs, Barrett, American University.
Furth, Jacob, Assistant Professor in Pathology, Cornell University Medical College.
Furtos, Norma C., Fellow in Zoology, Western Reserve University.
Garrey, W. E., Professor of Physiology, School of Medicine, Vanderbilt University.
Goddard, David R., National Research Council Fellow, Rockefeller Institute.
Goldborn, A. J., Professor of Biology, College of the City of New York.
Goodrich, H. B., Professor of Biology, Wesleyan University.
Graubard, Marc A., Columbia University.
Grave, B. H., Professor of Zoology, DePauw University.
Grave, Caswell, Professor of Zoology, Washington University.
Green, David E., Medical Fellow, Cambridge University.
Hadley, Charles E., Associate Professor of Biology, Montclair State Teachers College.
Hall, F. G., Professor of Zoology, Duke University.
Harnly, Marie L., Assistant in Biology, Washington Square College, New York University.
Harnly, Morris H., Assistant Professor, Washington Square College, New York University.
Hartline, H. K., Fellow in Medical Physics, University of Pennsylvania.
Harvey, E. Newton, Professor of Physiology, Princeton University.
Harvey, Ethel E., Princeton University.
Hayes, F. Ronald, Associate Professor of Zoology, Dalhousie University.
Haywood, Charlotte, Associate Professor of Physiology, Mount Holyoke College.
Heilbrunn, L. V., Associate Professor of Zoology, University of Pennsylvania.
Höber, Josephine, University of Pennsylvania.
Höber, Rudolf, Visiting Professor, University of Pennsylvania.
Hooker, Charles W., National Research Council Fellow, University of Rochester.
Howe, H. E., Editor, Industrial and Engineering Chemistry.
Irving, Laurence, Associate Professor of Physiology, University of Toronto.
Jacobs, M. H., Professor of General Physiology, University of Pennsylvania.
Jastrow, Joseph, Emeritus Professor of Psychology, University of Wisconsin.
Jenkins, George B., Professor of Anatomy, George Washington University.
Johnlin, J. M., Associate Professor of Biochemistry, Vanderbilt Medical School.
Jollos, Victor, Visiting Professor of Zoology and Genetics, University of Wisconsin.
Jones, Edgar P., Instructor, University of Akron.
Jones, Ruth McClung, Instructor in Biology, Swarthmore College.
Kagan, Benjamin M., Johns Hopkins University Medical School.
Kagan, H. E., West Virginia University.
Kaiser, Samuel, Tutor in Biology, Brooklyn College.
Keil, Elsa M., Instructor in Zoology, New Jersey College for Women.
Keyes, Donald R., Professor of Chemical Engineering, University of Illinois.
Kidder, George W., Tutor, College of the City of New York.
Kille, Frank R., Instructor in Zoology, Swarthmore College.
Kilpatrick, Martin, Assistant Professor of Chemistry, University of Pennsylvania.
Kilpatrick, Mary L., University of Pennsylvania.
Kirkpatrick, T. Bruce, Associate Professor of Physical Education, Columbia University.
Kleinholz, Lewis H., Graduate Student, Harvard University.
Knowler, Henry M., Research Associate in Biology, Yale University.
Knowlton, Frank P., Professor of Physiology, College of Medicine, Syracuse University.
Lancefield, D. E., Associate Professor of Zoology, Columbia University.
Laug, Edwin P., Fellow in Chemistry, University of Tennessee.
Levy, Milton, Assistant Professor of Chemistry, University and Bellevue Hospital Medical College.
Liedke, Kathie R., Graduate Student, Columbia University.
Lillie, Frank R., Chairman of the Department of Zoology, The University of Chicago.
Lillie, Ralph S., Professor of General Physiology, The University of Chicago.
Lippay-Wastl, Helene, Head of Department of Physiology, Woman's Medical College of Pennsylvania.
Livingston, Luzern C., National Research Council Fellow in Botany, Bussey Institution, Harvard University.
Loehwing, W. F., Professor of Botany, State University of Iowa.
Lucke, Baldwin, Professor of Pathology, University of Pennsylvania, School of Medicine.
REPORT OF THE DIRECTOR

MacCardle, Ross C., Instructor in Zoology, Temple University.
Magers, Elizabeth, Assistant Professor of Physiology, Vassar College.
Magruder, Samuel R., Assistant, University of Cincinnati.
Margolis, Otto S., Assistant, Washington Square College.
Marsland, Douglas, Assistant Professor of Biology, New York University.
Martin, Earl A., Chairman, Department of Biology, Brooklyn College.
Matthews, A. P., Professor of Biochemistry, University of Cincinnati.
Matthews, Samuel A., Associate in Anatomy, University of Pennsylvania.
Mayor, James W., Professor of Biology, Union College.
Michaelis, Leonor, Member, Rockefeller Institute.
Miersky, Alfred E., Associate in Medicine, Rockefeller Institute.
Moment, Gairdner B., Instructor, Goucher College.
Morgan, Lillian V., California Institute of Technology.
Morgan, T. H., Professor of Biology, California Institute of Technology.
Morrill, Charles V., Associate Professor, Cornell University Medical College.
Nabrit, S. M., Chairman, Department of Biology, Atlanta University.
Nasset, E. S., Instructor in Physiology, University of Rochester.
Nelsen, O. E., Instructor in Zoology, University of Pennsylvania.
Nonidez, Jose F., Assistant Professor of Anatomy, Cornell University Medical College.
Northrop, John H., Member, The Rockefeller Institute.
Novikoff, Alex B., Tutor, Brooklyn College.
Osterhout, W. J. V., Member, Rockefeller Institute for Medical Research.
Orr, Paul R., Instructor in Biology, Brooklyn College.
Packard, Charles, Assistant Professor, Institute of Cancer Research, Columbia University.
Parker, George H., Professor of Zoology, Harvard University.
Parfart, Arthur K., Assistant Professor, Princeton University.
Pelluert, Dixie, Assistant Professor of Zoology, Dalhousie University.
PloUGH, Harold H., Professor of Biology, Amherst College.
Pollister, Arthur W., Instructor in Zoology, Columbia University.
Pollard, Samuel E., Technical Manager, Marine Biological Laboratory.
Rand, Herbert W., Associate Professor of Zoology, Harvard University.
de Renyi, George S., Associate Professor of Anatomy, University of Pennsylvania.
Reznikoff, Paul, Assistant Professor of Medicine, Cornell University Medical College.
Richards, Oscar W., Instructor in Biology, Yale University.
Robertson, C. W., Assistant in Biology, Washington Square College, New York University.
Root, Walter S., Associate Professor of Physiology, College of Medicine, Syracuse University.
Rugh, Roberts, Instructor, Hunter College.
Rundles, Wayne, Assistant in Anatomy, Cornell University.
Runnström, John, Professor, University of Stockholm.
Saslow, George, Assistant Professor of Biology, New York University.
Sayles, Leonard P., Instructor, College of the City of New York.
Schechter, Victor, Tutor in Biology, College of the City of New York.
Schmidt, Ida Genther, Research Assistant and Instructor in Histology, Children's Hospital and University of Cincinnati.
Schmidt, Leon H., Research Fellow in Biochemistry, Christ Hospital and University of Cincinnati.
Schotte, Oscar E., Assistant Professor of Zoology, Amherst College.
Scott, Allan C., Assistant in Zoology, Columbia University.
Shaw, Myrtle, Junior Bacteriologist, New York State Department of Health.
SHUMWAY, Waldo, Professor of Zoology, University of Illinois.
Sichel, Ferdinand J. M., Instructor in Zoology, University of Pennsylvania.
Sliper, Eleanor H., Associate, State University of Iowa.
Solberg, Archie N., Assistant in Zoology, Columbia University.
Sonneborn, Tracy M., Associate, Johns Hopkins University.
Specht, H., Adam T. Bruce Fellow in Zoology, Johns Hopkins University.
Speicher, Kathryn Gilmore, Instructor, Pennsylvania College for Women.
Speidel, Carl C., Professor of Anatomy, University of Virginia.
Stabler, Robert M., Instructor in Zoology, University of Pennsylvania.
Stancati, Milton F., Graduate Student, University of Pittsburgh.
Steinbach, Henry B., National Research Fellow in Biology, The University of Chicago.
Stewart, Dorothy R., Assistant Professor of Biology, Skidmore College.
Stockard, C. R., Professor of Anatomy, Cornell University Medical College.
Stokey, Alma G., Professor, Mount Holyoke College.
Strong, Oliver S., Professor of Neurology and Neuro-Histology, College of Physicians and Surgeons, Columbia University.
Stuck, Florence, Graduate Student, Columbia University.
Stunkard, H. W., Professor of Biology, New York University.
Sumwalt, Margaret, National Research Fellow, University of Pennsylvania.
Tashiro, Shiro, Professor of Biochemistry, University of Cincinnati.
Taylor, George W., National Research Fellow, Princeton University.
Taylor, William R., Professor of Botany, University of Michigan.
Troisi, Raphael A., Instructor, Temple University.
Tulloch, George S., Instructor, Brooklyn College.
Weisman, Maxwell N., Tutor of Biology, College of the City of New York.
Whedon, Arthur D., Professor of Zoology, North Dakota State College.
Whitting, Anna R., Professor of Biology, Pennsylvania College for Women.
Whitting, P. W., Carnegie Institution of Washington, Cold Spring Harbor, N. Y.
Wieman, H. L., Professor of Zoology, University of Cincinnati.
Williams, R. G., Assistant Professor of Anatomy, University of Pennsylvania.
Willier, B. H., Professor of Zoology, University of Rochester.
Wilson, E. B., Professor Emeritus in Residence, Columbia University.
Witschi, Emil, Professor of Zoology, State University of Iowa.
Wodehouse, R. P., Director Hayfever Department, The Arlington Chemical Company.
Wolff, E. Alfred, Associate Professor, University of Pittsburgh.
Woodruff, Lorande L., Professor of Protozoology, Yale University.
Wood, Farris H., Assistant Professor of Zoology, University of Missouri.
Woodward, Alvalyn E., University of Michigan.
Yeager, J. Franklin, Associate Professor, Iowa State College.
Young, Roger A., Assistant Professor, Howard University.
Zelewski, Charles, Professor of Zoology, University of Illinois.
Zirkle, Conway, Associate Professor, University of Pennsylvania.

Beginning Investigators

Abramowitz, A. A., Austin Teaching Fellow in Zoology, Harvard University.
Angevin, C. A., Harrison Fellow in Zoology, University of Pennsylvania.
Bosworth, Millard W., Research Assistant, Wesleyan University.
Buck, John E., Assistant in Zoology, Johns Hopkins University.
Butler, Thomas C., Research Assistant, Vanderbilt University Medical School.
Carlson, J. Gordon, Instructor in Biology, Bryn Mawr College.
Chao, IpIng, Graduate Student, The University of Chicago.
Churney, Leon, Graduate Student, University of Pennsylvania.
Clark, Jean M., Graduate Student in Zoology, University of Pennsylvania.
Clement, A. C., Graduate Student, Princeton University.
Derrickson, Mary B., Assistant, Vassar College.
Dubois, Elizabeth, Assistant in Zoology, Barnard College.
Engel, Frank L., Dartmouth College.
Engel, George L., Student, Dartmouth College.
Fisher, Saul H., Student, University and Bellevue Hospital Medical College.
Frank, John A., Columbia University.
Gubner, Richard, Student, University and Bellevue Hospital Medical College.
Hollingsworth, Josephine, Graduate Student, University of Pennsylvania.
Hopkins, Florian, Teaching Fellow, University of Tennessee.
Hunter, Francis R., Laboratory Assistant, Princeton University.
Hunter, Laura N., Graduate Student, University of Pennsylvania.
Jones, Roy W., Associate Professor of Biology, Central State Teachers College.
Kaliss, Nathan, Assistant in Zoology, Columbia University.
Keller, Thelma C., Graduate Student, Columbia University.
Keltch, Anna K., Research Assistant, Lilly Research Laboratories.
Krahl, Maurice E., Research Assistant, Lilly Research Laboratories.
Lansing, Albert I., Student, University of Pennsylvania.
McLane, Kathryn, Instructor in Biology, Annapolis High School.
Mast, Louise R., Graduate Student, Johns Hopkins University.
Maxwell, Jane, Instructor. Carnegie Institute of Technology.
Mazia, Daniel, University of Pennsylvania.
Miller, James A., Jr., Graduate Assistant, The University of Chicago.
Miller, Roland E., Graduate Assistant, University of Pittsburgh.
Morris, Samuel, Graduate Student, University of Pennsylvania.
Moser, Floyd, Graduate Student, University of Pennsylvania.
Peabody, Elizabeth B., Graduate Student, Radcliffe College.
Redmond, Albert C., Student Assistant, Cornell University Medical College.
Shapiro, Herbert, National Research Fellow, Princeton University.
Stanbury, John, Duke University.
Stirling, Arthur C., Student, Princeton University.
Stone, Faith, Fellow in Department of Zoology, The University of Chicago.
Summers, Francis M., Graduate Student, Columbia University.
Tonks, Robert E., University of Pennsylvania.
Townsend, Grace, Graduate Student, The University of Chicago.
Verwey, Willard P., Graduate, Rutgers University.
Webster, Edward C., Teaching Fellow, New York University.
Wichterman, Ralph, Graduate Student, University of Pennsylvania.
Wildbrandt, Walther, Travelling Fellow, Rockefeller Foundation.
Wilson, Hildesgaard, Assistant in Chemistry, University and Bellevue Hospital Medical College.

Research Assistants

Adams, Philip D., Research Assistant, University of Cincinnati.
Armstrong, Louise S., Cornell University Medical College.
Avery, Charles, Undergraduate, Amherst College.
Beck, Lyle V., Lilly Research Laboratories, Indianapolis, Indiana.
Bengel, Walter Z., Assistant, DePauw University.
Bitterlick, Gerhard, Chemist, Rockefeller Institute.
Bradley, E. Morton, Teaching Assistant, University of Rochester.
Bramble, C. E., Instructor, Johns Hopkins University.
Collings, Doyne, Assistant in Zoology, DePauw University.
Corson, Samuel A., Research Assistant, University of Pennsylvania.
Cunningham, Mary Alice, Assistant, DePauw University.
Eagle, Harry, Associate, University of Pennsylvania Medical School.
Evans, Gertrude, Research Assistant, The University of Chicago.
Fraser, Doris A., Research Fellow, University of Pennsylvania.
FUCHS, HERBERT A., American University.
GLASSMAN, HAROLD N., University of Pennsylvania.
GODRICH, JACK, Research Assistant, Columbia University.
GRAND, C. G., Research Assistant, Washington Square College, New York University.

HAMILTON, MARY ALICE, Graduate Student, Columbia University.
HILL, EDGAR S., Research Assistant, Rockefeller Institute.
HOLLENBERG, GEORGE J., Professor of Biology, LaVerne College.
HOWE, CLARRISA R., Undergraduate, Goucher College.
JAO, CHIN-CHIH, University Fellowship, University of Michigan.
KONDRITZER, ALBERT A., Graduate Student, University of Cincinnati.
LANDOWNE, MILDON, Student, Harvard University Medical School.
LARRABEE, MARTIN G., Johnson Foundation, University of Pennsylvania.
LIPPMAN, RICHARD W., Undergraduate, Yale University.
MANERY, JEANNE F., Fellow in Physiology, University of Toronto.
MORELAND, FERRIN B., Assistant in Biochemistry, Vanderbilt University Medical School.

NAUMANN, RUDOLPH V., Assistant, Yale University.
NESTLER, HERBERT A., Substitute in Biology, Brooklyn College.
OESTING, R. B., Research Assistant, The University of Chicago.
PORTER, HELEN, Laboratory Assistant, Harvard University.
RAWLES, MARY E., Research Assistant, University of Rochester.
RICHARDSON, MARGARET S., Research Assistant, Cornell University Medical College.

ROBERTSON, LOLA E., Research Assistant, New York University.
ROBINSON, MILES H., Graduate Student, Swarthmore College.
RUNNSTRÖM, ASTRI, University of Stockholm.
SCHLUMBERGER, HANS G., University of Pennsylvania Medical School.
SCHWEITZER, MORTON D., Assistant in Zoology, Columbia University.
SHAW, ISIDOR, Research Assistant, Long Island University.
SOLANDT, DONALD Y., Research Associate, University of Toronto.
SOLANDT, OMOND MCK., Research Associate, University of Toronto.
STRICKER, GEORGE J., Student, Yale University.
STUECK, GEORGE H., JR., Teaching Fellow in Chemistry, New York University.
TAUBER, OSCAR E., Research Fellow, Iowa State College.
WADE, LUCILLE W., Research Assistant, Lilly Research Laboratories.
WEBSTER, MARGARET D., Dalhousie University.
WHARTON, MARGUERITE, Graduate Assistant, Montclair State Teachers College.
WHITMAN, B. L., Student, University of Pennsylvania.

YOUNG, SAUL B., Rockefeller Institute for Medical Research.

Students

BOTANY

ALMSTEDT, MARGARET E., University of Missouri.
CHUTE, HETTIE M., Assistant Professor of Botany, New Jersey College for Women.

COHEN, AARON A., Student, Harvard University.
COHN, JULIUS, 1987 Davidson Avenue, Bronx, New York.

DAVIDHEISER, CEDRIC B., Swarthmore College.
HIRSCH, DOROTHY, Laboratory Assistant, New York University.
KERSHAW, MARGARET A., Student, Wheaton College.
KRUEGER, LILLIAN K., Teacher, Scott High School.
PLITT, THORA M., Instructor, Vassar College.
REPORT OF THE DIRECTOR

Sielke, Dorothy H., Instructor in Botany, Hunter College.
Smith, Arlo I., Graduate Assistant, Northwestern University.
Stewart, Sara R., Wellesley College.

EMBRYOLOGY

Andrew, Warren, Graduate Student, Yale University.
Bartholomew, Olive F., Radcliffe College.
Beeson, Rose M., Assistant, H. Sophie Newcomb College.
Blegg, Amy E., Assistant Professor of Zoology, Grinnell College.
Bradley, Encil M., Jr., Graduate Teaching Assistant, University of Rochester.
Collings, William D., Undergraduate Assistant, DePauw University.
Compton, Alfred D., Jr., Princeton University.
Cotton, Cornelia M., Instructor in Zoology, American University.
DeLamater, Doan E., Student, Johns Hopkins University.
Dewey, Virginia C., Simmons College.
Doan, Dorothy A., Barnard College.
Flynn, Carl M., Instructor in Zoology, University of Maine.
Forster, Margaret, 61 Anderson Street, Boston, Massachusetts.
Foster, Dorothy L., Oberlin College.
Hamilton, Dorothy B., Graduate Research Assistant, Western Reserve University.
Hughes, Roscoe D., Assistant in Zoology, Columbia University.
Ives, Philip T., Research Fellow, Amherst College.
Jackson, Floretta A., Assistant in Zoology, Barnard College, Columbia University.
Jones, Lawrence M., Student, University of Colorado.
Kammeraad, Adrian, Graduate Student, Yale University.
Knight, Betty L., Technician, Rockefeller Institute.
Mohr, John L., Graduate Student, Oberlin College.
Moore, Caroline, University of Pennsylvania.
Porter, Homer C., Instructor in Biology and Geology, Washington and Jefferson College.
Robinson, Miles H., Swarthmore College.
Sabin, Leonore, Student, Hunter College.
Sofford, Walter R., II, Graduate Student, Yale University.
Sumner, Ruth, Instructor, University of Colorado.
Tiller, Martha G., Teacher Public Schools, Birmingham.
Williams, Margarita, Research Assistant, University of Iowa.

PHYSIOLOGY

Appel, Frederick W., Associate Professor of Biology, St. John's College.
Averill, Charles, Student, Amherst College.
Bosworth, Millard W., Denison Research Assistant, Wesleyan University.
Campbell, Mildred L., Assistant, Mount Holyoke College.
Cortell, Ruth E., Student, Wellesley College.
Dickey, Joanna, Milton Academy.
Ets, Harold N., Professor of Pharmacology, Loyola Medical School.
Goggio, Alfred, Student, University of Toronto.
Hardy, James D., Physicist, Russell Sage Institute of Pathology.
Hechenbleikner, Herbert, Harvard University.
Hollingsworth, Josephine, Graduate Student, University of Pennsylvania.
Holzer, Franz J., Innsbruck, Austria.
Hopkins, Florian G., Teaching Fellow, University of Tennessee.
Hrubetz, M. Caroline, Instructor in Physiology and Pharmacology, College of Physicians and Surgeons.
HUNTER, FRANCIS R., Wesleyan University.
Kohn, Henry I., Assistant, Harvard University.
Kuyper, Adrian C., Instructor, State University of Iowa.
McLANE, Kathyrn, Teacher, Annapolis High School.
Neal, Mary E., Teacher, City of Boston.
Peskin, James C., Rutgers University.
Rose, Sylvan M., Graduate Assistant, Amherst College.
Stanbury, John B., Student, Duke University.
Verwey, Willard F., Rutgers University.

PROTOZOOLOGY

Averbach, Chemda, Columbia University.
Foster, Edith F., Vassar College.
Frees, Mary K., Student, Columbia University.
Greene, Margery, Student, Columbia University.
Johnson, Arlene C., Graduate Student, Columbia University.
Kahn, Ephraim M., Student, Harvard University.
Leming, Rosamond M., Student, New Jersey College for Women.
Lippman, Richard W., Student, Yale University.
Middleton, Cora D., Student, Columbia Teachers College.
Milne, Lorus J., Student, University of Toronto.
Resnick, Rose, Student, Hunter College.

INVERTEBRATE ZOOLOGY

Andrews, S. Ralph, Jr., American University.
Barton, Eleanor P., Head of Science Department, Edgewood Park Jr. College.
Beard, Raimon L., Undergraduate Assistant, Wesleyan University.
Bengel, Walter Z., Undergraduate, DePauw University.
Berliner, Robert W., Undergraduate, Yale University.
Bloom, Rozella, University of Kansas.
Blouin, Alexander, Professor of Biology, Mount St. Louis College.
Bolt, Otto A., Instructor, Negaunee High School.
Bragg, James H., Student, Central State Teachers College.
Bridges, Martha A., DePauw University.
Bridgman, Jane, Student, Smith College.
Brownman, Ludwig G., Curator, The University of Chicago.
Bumpus, Dean F., Student, Oberlin College.
Caldwell, Billie, Union City, Tennessee.
Chen, Yie, Graduate Student, University of Pennsylvania.
Crouse, Helen V., Goucher College.
Danforth, Louise L., Graduate Student, American University.
Dansereau, Antonio, Priest Professor, Montreal College.
Eckels, Richard P., Graduate Student, University of Virginia.
Ettrinsperger, Flora, Barnard College.
Gay, Elizabeth H., Graduate Student, Johns Hopkins University.
Gilbert, Perry W., Instructor, Dartmouth College.
Glass, Manuel, Yale University.
Gross, Charlotte C., Teacher, Union High School, New Jersey.
Hadley, Ruth G., Leonia, New Jersey.
Hierholzer, Carolyn Anne, Undergraduate, New Jersey College for Women.
Jailer, Joseph W., College of the City of New York.
Jakobsen, Edith M., Biology Assistant, New Jersey State Teachers College.
Kennedy, Kathleen M., St. Francis Xavier University.
Leach, Eleanor, Curator of the Laboratories, Wellesley College.
3. TABULAR VIEW OF ATTENDANCE

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<th>1932</th>
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<td><strong>Students</strong>—Total</td>
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<td><strong>TOTAL ATTENDANCE</strong></td>
<td>473</td>
<td>487</td>
<td>446</td>
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<td>Less Persons registered as both students and investigators</td>
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<th>1934</th>
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<tr>
<td><strong>Institutions Represented</strong>—Total</td>
<td>126</td>
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<td>By Investigators</td>
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4. SUBSCRIBING AND COOPERATING INSTITUTIONS IN 1934

American University  Oberlin College
Amherst College  Pennsylvania College for Women
Atlanta University  Princeton University
Barnard College  Radcliffe College
Berea College  Rockefeller Foundation
Bowdoin College  Rockefeller Institute for Medical Research
Bryn Mawr College  Rutgers University
Chinese Educational Mission  Smith College
College of St. Elizabeth  Sophie Newcomb College
Columbia University  Swarthmore College
Commonwealth Fund  Syracuse University
Cornell University  Temple University
Cornell University Medical College  Tufts College
Dalhousie University  University of Chicago
DePauw University  University of Cincinnati
Duke University  University of Illinois
General Education Board  University of Iowa
Goucher College  University of Kansas
Harvard University  University of Michigan
Harvard University Medical School  University of Pennsylvania
Hunter College  University of Pennsylvania Medical School
Industrial & Engineering Chemistry,  University of Pittsburgh
of the American Chemical Society  University of Rochester
Iowa State College  University of Rochester Medical School
Johns Hopkins University  University of Virginia
Johns Hopkins University Medical School  Vanderbilt University Medical School
Johnson C. Smith University  Vassar College
Eli Lilly & Co.  Wabash College
Long Island University  Wellesley College
Morehouse College  Wesleyan University
Mount Holyoke College  Wheaton College
New York State Department of Health  Wilson College
New York University  Wistar Institute of Anatomy and Biology
New York University Medical School  Yale University
Northwestern University

5. EVENING LECTURES, 1934

Friday, June 29
Dr. W. R. Taylor .............. "A Biologist's Impressions of the Galapagos Islands."

Friday, July 6
Dr. William R. Amberson ...... "On the Significance of the Vertebrate Erythrocyte."
Friday, July 13
Dr. B. H. Willier .............. "An Experimental Study of the Embryonic Differentiation of the Sex-gland and Germ-cells."

Friday, July 20
Dr. John Runnström ........... "Initiation of Development and the Metabolism of the Sea-urchin Eggs."

Friday, July 27
Dr. Rudolf Höber .............. "Experiments on the Osmotic Properties of Glands."

Wednesday, August 8
Dr. Irving Langmuir .......... "Monomolecular Films at the Interface between Oil and Water."

Friday, August 10
Dr. Henry E. Crampton ........ "Studies on Evolution in the Islands of the South Seas."

Friday, August 17
Dr. Lee Foshay ................. "Studies on Alteration of Virulence of Bacterium tularense."

Thursday, August 23
Dr. F. Baltzer .................. "Experiments on Sex-development in Bonellia."

Tuesday, August 28
Dr. C. G. Hartman .............. "The Time of Ovulation in the Menstrual Cycle."

SPECIAL LECTURES AND MOTION PICTURES

Thursday, July 26
Dr. Robert Chambers and Mr. C. G. Grand ................ "Motion Pictures of Microdissection and of Experimental Studies on Segmentation of Sea Urchin Eggs."

Friday, August 10
Dr. Horace W. Stunkard ........ "Life Cycles of Digenetic Trematodes."

Wednesday, August 15
Dr. E. R. and Mrs. E. L. Clark .. "Motion Pictures on Observations on the Formation of Arteriovenous Anastomoses."

Dr. C. C. Speidel .............. "Motion Pictures on Experimental Study of Striated Muscle in Vivo."
6. SHORTER SCIENTIFIC PAPERS, 1934

Tuesday, July 3
Dr. Mary E. Collett .............. "Ovarian Hormones and Basal Metabolism."

Dr. Laurence Irving and
Mrs. Mary Scott Welch ........... "The Carbon Dioxide Tension in the Brain."

Dr. E. S. Nassef .............. "A Method for the Estimation of Changes in the Rate of Intestinal Secretion."

Dr. G. H. Parker .............. "Transfer of Neurohumors."

Tuesday, July 10
Dr. Ethel Browne Harvey ........... "Some Phenomena Produced by Centrifuging Sea Urchin Eggs before and during Cleavage."

Miss Jeanne F. Manery and
Dr. Laurence Irving .............. "Water Changes in Trout Eggs at the Time of Laying."

Dr. L. G. Barth .............. 'Chemical Nature of the Amphibian Organizer."

Dr. John Runnström .............. 'Some Contributions to the Physiology of Determination in the Sea Urchin Development."

Tuesday, July 17
Mr. Henry I. Kohn .............. 'The Chlorophyl Unit in Photosynthesis."

Dr. Eric G. Ball .............. 'A Potentiometric Study of Phthiocol, the Pigment of the Human Tubercle Bacillus."

Dr. S. E. Pond .............. "Alteration in Calcified Tissues during Drying and their Significance."

Dr. Arthur K. Parpart .............. "Solvent Water in the Erythrocyte."

Dr. William R. Duryee .............. "The Relationship between the Oxygen Consumption and Water Content of the Organism."

Tuesday, July 24
Dr. E. Eleanor Carothers .............. "Spindle Fiber Attachments:—Do they Change without Chromosomal Inversions or Translocations?"

Mr. Roberts Rugh .............. "Ovulation and Egg Transport in the Frog."

Dr. John W. Everett .............. "Certain Unusual Cytoplasmic Elements in the Yolk-sac Epithelium of the White Rat."

Dr. Henry J. Fry .............. "Notes on the Behavior of Asters."

Tuesday, July 31
Dr. Colleen Fowler .............. "Permeability of Amœba proteus to Water."

Dr. J. F. Danielli .............. "The Tension at the Surface of Mackerel Oil."

Dr. H. Burr Steinbach .............. "Injury Potentials in Scallop Muscles."
Dr. Charlotte Haywood,  
Miss T. Stevens,  
Miss H. TeWinkel and  
Miss M. Schott …………….. "The Relative Effects of Increased Carbon Dioxide and Diminished Oxygen upon the Heart Rate of Young Trout."

Dr. Robert Chambers ………. "The Hyaline Plasma Membrane of the Echinoderm Eggs."

Tuesday, August 7  
Dr. Victor Schechter ………. "Effect of Centrifuging on the Alga, Griffithsia."

Dr. L. G. Livingston ………. "Plasmodesma in Plant Tissue."

Mr. Charles E. Renn ………. "Concerning the Disappearance of the Eel Grass (Zostera marina)."

Dr. Selman A. Waksman and  
Dr. Cornelia L. Carey ………. "Origin and Chemical Nature of Organic Matter in the Sea Water and Sea Bottom."

Tuesday, August 14  
Dr. Adrian Buyse ………. "The Differentiation of Rat Gonad Primordia in Normal Adult and Gonadectomized Rat Hosts."

Dr. Caswell Grave ………. "The Acceleration of Metamorphosis of Ascidian Larvae."

Dr. E. R. Clark and  
Mrs. E. L. Clark ………. "Observations on the Formation of Arteriovenous Anastomoses."

Dr. C. C. Speidel ………. "Experimental Study of Striated Muscle in Vivo."

Tuesday, August 21  
Dr. Morris H. Harnly ………. "The Temperature-effective Periods and ‘Growth Curves’ of the Vestigial Wings of Drosophila melanogaster."

Dr. P. W. Whiting ………. "Selective Fertilization in Habrobracon."

Dr. B. R. Speicher ………. ‘Maturation, Fertilization and Cleavage of Habrobracon Eggs as Revealed by the Feulgen Reaction."

Dr. H. H. Plough and  
Mr. P. I. Ives ………. ‘Mutations and Modifications in Drosophila Induced by Sub-lethal High Temperature."

Friday, August 24  
Dr. M. H. Jacobs and  
Mr. Samuel A. Corson ………. "The Influence of Minute Traces of Copper on Certain Hemolytic Processes."

Dr. David R. Goddard ………. "The Keratinoid Proteins and Enzyme Digestion."
Mr. C. P. Winsor ............. "The Theoretical Significance of Talbot's Law on Photoreception."

Dr. George Wald ............. "Carotenoids and the Vitamin A Cycle in Vision."

Friday, August 31

Dr. E. Eleanor Carothers ...... "The Chromosomal Complex of the Mexican Grasshopper, Machaero-cera sumichrasti."

Dr. R. L. Carpenter ............. "Regeneration in Brachial Nerves of Amblystoma."

Dr. Carl Caskey Speidel ...... "Polariscopic Observations of Striated Muscle of Vertebrates and Arthropods."

Dr. Paul R. Orr ................. "A Preliminary Study of Heat Death in Marine Organisms."

Mr. Ralph Oesting and
Dr. W. C. Allee ................. "Further Analysis of the Protective Value of Biologically Conditioned Fresh Water for the Marine Turbellarian, Procerodes."

Mr. Roberts Rugh ............. "Induced Sexual Reactions in Anura of the Woods Hole Region."

Dr. W. C. Allee and
Miss Gertrude Evans ........ "Effect of Numbers on Rate of Cleavage and Early Development of Arbacia."

Mr. John A. Frank ............ "The Nature of a Specific Egg-agglutinin Extracted from the Sperm of Arbacia."

Dr. Eric G. Ball ................. "Isolation of Crystalline Echinochrome."

Miss Catherine E. Goffin and
Dr. Samuel E. Pond ............ "Rapid Drying of Wet Marine Tissues by Two Liquid Phases and a Gas Phase."

Dr. Samuel E. Pond ............ "New Steps in the Quantitative Determination of Magnesium."

Dr. Dugald E. S. Brown and
Dr. Ferdinand J. M. Sichel .... "The Myogram of the Single Muscle Fibre."

Dr. Ferdinand J. M. Sichel and
Dr. Dugald E. S. Brown ....... "The Contraction of Single Muscle Fibres in Relation to the Intensity and Duration of Electrical Stimuli."

Dr. Dayton J. Edwards ........ "The Action of Hydrostatic Pressure on Two Components in a Striated Muscle Response."

Dr. G. Saslow and
Mr. E. C. Webster ............ "The Tension Output of Caffeinized Muscles."
Dr. Walter S. Root ............ "The Respiratory Metabolism of Dogfish Nerve with Special Reference to Post-mortem Change."

Miss Mary B. Derrickson and
Dr. William R. Amberson ...... "Determination of Blood Volume in the Lower Vertebrates by the Direct Method."

Dr. M. H. Jacobs and
Mr. H. N. Glassman ............ " 'Leakage' as a Factor in the Anomalous Osmotic Behavior of the Erythrocyte."

Dr. D. E. S. Brown and
Dr. Douglas Marsland ......... "Effects of High Hydrostatic Pressure on Amoeboid Movement. The Pressure Coefficient of Viscosity in Amoeba protoplasm."

Dr. Douglas Marsland and
Dr. D. E. S. Brown ............ "Amoeboid Movement under Hydrostatic Pressure."

Dr. A. K. Parpart and
Mrs. E. R. Parpart ............. "Solvent Water in the Unfertilized Egg of Arbacia."

Dr. Coleen Fowler ............. "Effect of the Alternating Current on the Permeability of the Sea Urchin Eggs to Water."

Dr. Dorothy R. Stewart and
Dr. M. H. Jacobs ............. "Further Studies on the Permeability of the Arbacia Egg to Water and to Ethylene Glycol."

Dr. L. V. Beck and
Dr. R. Chambers ............. "Penetration of Acids into Sand Dollar Eggs and Yeast Cells."

Mr. Daniel Mazia ............. "Changes in the Distribution of Calcium in the Arbacia Egg in Fertilization and NaCl Cytolysis."

Dr. Katsuma Dan ............. "The Effect of Sodium and Calcium Ions on the Surface Charge of Arbacia Eggs."

Dr. L. V. Heilbrunn and
Miss R. A. Young ............. "Cell Hormones and X-ray Effects on Arbacia Eggs."

Dr. L. V. Heilbrunn .......... "The Action of Ammonium Salts on Fatty Constituents of the Arbacia Egg."

Miss Anna K. Keltch,
Miss Lucille W. Wade and
Dr. G. H. A. Clowes .......... "Contrasting Curves of Resistance Exhibited by Arbacia Eggs Exposed to Various Chemical Agents during the Cleavage Cycle."
Dr. M. E. Krahl and
Dr. G. H. A. Clowes .............. "Action of Dinitro Compounds on Respiration and Cell Division in Arbacia Eggs."

Dr. G. H. A. Clowes and
Dr. M. E. Krahl .................. "Effect on Respiration and Cell Division of Dinitroresol and Cyanide Used in Combination."

DEMONSTRATIONS

Dr. R. L. Carpenter .............. "Regeneration in Brachial Nerves of Amblystoma." A moving picture film.

Dr. S. E. Pond and
Mr. L. F. Boss .................... "Experimental Tests of Wood for Benches, Treated to Resist Chemicals."
  "Protective Treatment of Metal against Corrosion by Sea Water."
  "Refrigerators and Types of Refrigeration Units which Meet Certain Laboratory Requirements."

Dr. Eric G. Ball .................. "Echinochrome Crystals."

Dr. E. R. Clark and
Mrs. E. L. Clark .................. "Capillary Circulation in the Rabbit’s Ear."

Dr. W. R. Duryee .................. "Demonstration of a Microrespirometer."

Dr. E. Eleanor Carothers ........ "Extreme Chromatin Diffusion in Growth Period of First Spermatoocytes of Machaerocera."

Dr. S. E. Pond and
Miss Catherine E. Goffin ....... "Determination of Magnesium as MgO, as a Step in the Comprehensive Analysis of Calcified Tissues.
  a. Colored Porcelain Crucibles as a New Tool for Quantitative Analytical Chemistry."
  "Drying of Marine and Other Tissues, Blood, etc., by Means of Two Liquid Phases (Benzol: Water) in Moderately Low Pressures.
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