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THE BIOLOGICAL BULLETIN

PUBLISHED BY THE MARINE BIOLOGICAL LABORATORY

THE MARINE BIOLOGICAL LABORATORY

FORTY-NINTH REPORT, FOR THE YEAR 1946—FIFTY-NINTH YEAR

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UNIVERSITY OF

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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 members of the Corporation shall consist of persons elected by the Board of Trustees.

II. The officers of the Corporation shall consist of a President, Vice President, Director, Treasurer, and Clerk.

III. The Annual Meeting of the members shall be held on the second Tuesday in August in each year, at the Laboratory in Woods Hole, Massachusetts, at 11:30 A.M., 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, and shall transact such other business as may properly come before the meeting. Special meetings of the members may be called by the Trustees to be held at such time and place as may be designated.

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

V. Any member in good standing may vote at any meeting, either in person or by proxy duly executed.

VI. Inasmuch as the time and place of the Annual Meeting of members are 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 such 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.

VII. The Annual Meeting of the Trustees shall be held on the second Tuesday in August in each year, at the Laboratory in Woods Hole, Mass., at 10 A.M. Special meetings of the Trustees shall be called by the President, or by any seven Trustees, to be

held at such time and place as may be designated, and the Secretary shall give notice thereof by written or printed notice, mailed to each Trustee at his address as shown on the records of the Corporation, at least one (1) week before the meeting. At such special meeting only matters stated in the notice shall be considered. Seven Trustees of those eligible to vote shall constitute a quorum for the transaction of business at any meeting.

VIII. There shall be three groups of Trustees:

(A) Thirty-two Trustees chosen by the Corporation, divided into four classes, each to serve four years; and in addition there shall be two groups of Trustees as follows:

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 1946.

The accounts have been audited as in recent years by Messrs. Seamans, Stetson, and Tuttle, certified public accountants of Boston. A copy of their report is on file at the Laboratory office and inspection of it by Trustees or other Members of the Corporation will be welcomed.

The principal summaries of their report—The Balance Sheet, Statement of Income and Expense, and Current Surplus Account—are appended hereto as Exhibits A, B, and C.

The financial operations of 1946 may be summarized as follows:

I. Assets

1. Endowment Assets

As of December 31, 1946, the total book value of all the Endowment Assets, including the Scholarship Funds, was $977,199.30, an increase for the year of $10,427.14 due to profits on securities sold.

These Assets consisted of: marketable securities (bonds, preferred stocks, and common stocks) with a book or cost value of $889,416.18 and a market value of $934,042.19; six participations in mortgages on New York City realty costing $82,491.14, estimated by the Treasurer to have an actual value of $52,000,000; and $5,291.98 in uninvested principal cash.

The total current valuation of Endowment Assets was $991,334.17, $14,134.87 more than current book value, but $13,603.44 less than the actual value at the end of the previous year. This slight decline in market values during the year was due chiefly to lower prices for some of the common stocks.

2. Plant Assets

The total of Plant Assets at the end of the year was $1,312,963.70, or $17,-884.05 less than at the end of 1945. New expenditures were more than offset by the depreciation charge of $25,314.41. In addition to heavy expenditures for repairs that were regarded as current expenditures, a total of $21,425.02 was paid out for improvements to buildings and new equipment that were regarded as capital

items. To take care of some of these payments $15,000 of the Reserve Fund was used, leaving a balance in the Reserve Fund of $15,859.89, a substantial portion of which has already been appropriated for repairs and equipment.

3. Current Assets

At the end of the year Current Assets had increased by $7,881.53 to a total of $220,851.88. Accounts Payable were $8,411.64. Current Surplus had increased $6,022.47 to $202,360.31.

II. Income and Expenditures

Both income and expense totals were much larger than in recent years. Total Income was $227,104.26. Total Expense, including $25,314.41 Reserve for Depreciation, was $234,537.13, leaving an accounting deficit of $7,432.87 compared with a surplus of $9,773.28 for 1945. The 1946 expenditures contained a number of unusual items such as $11,510.00 for "Special Repairs to the Brick Laboratory" and further "1944 Hurricane Damage Repairs" of $2,012.50.

On December 31, 1946, current cash on hand amounted to $28,135.30, but as in the case of the Reserve Fund, a portion of this was designated for further improvements and purchases already authorized.

Noteworthy in the income account are the contributions totalling $1,070.00 from the Marine Biological Laboratory Associates that were used for purchases of especially needed apparatus and a gift of $700 from Mrs. W. Murray Crane.

The total receipts of the Supply Department also attained what is believed to be a new high, $73,394.26. The expenses of the Supply Department, particularly the purchases of specimens from outside sources, also increased however to $62,-527.53, so that the net gain from operations rose only moderately to $10,866.73.

EXHIBIT A

MARINE BIOLOGICAL LABORATORY BALANCE SHEET, DECEMBER 31, 1946

Assets

Endowment Assets and Equities:			
Securities and Cash in Hands of Central Hanover Bank and Trust Company, New York, Trustee		$ 960,062.58	
Securities and Cash in Minor Funds		17,136.72	
			$ 977,199.30
Plant Assets:			
Land	$ 110,425.38		
Buildings	1,324,036.67		
Equipment	193,539.92		
Library	349,234.22		
	$1,977,236.19		
Less Reserve for Depreciation	696,981.38		
		$1,280,254.81	
Reserve Fund, Securities and Cash		15,859.89	
Book Fund, Securities and Cash		16,849.00	
			$1,312,963.70

Current Assets:			
Cash		$ 28,135.30	
Mortgage Note Receivable		2,500.00	
Accounts Receivable		30,114.98	
Inventories:			
Supply Department	$ 39,083.91		
Biological Bulletin	18,557.44	57,641.35	
Investments:			
Devil's Lane Property and Accounts Receivable	$ 48,055.31		
Gansett Property and Accounts Receivable	1,074.67		
Stock in General Biological Supply House, Inc.	12,700.00		
Other Investment Securities	20,795.00		
Retirement Fund Securities and Cash	12,757.24	95,382.22	
Prepaid Insurance		4,556.59	
Items in Suspense (Debits)		2,521.44	
			$ 220,851.88
Total Assets			$2,511,014.88

Liabilities

Endowment Funds:			
Endowment Funds	$ 958.871.15		
Reserve for Amortization of Bond Premiums	1,191.43		
		$ 960,062.58	
Minor Funds		17,136.72	
			$ 977,199.30
Plant Funds:			
Mortgage Note Payable		$ 5,000.00	
Donations and Gifts	$1,172,564.04		
Other Investments in Plant from Gifts and Current Funds	135,399.66	1,307,963.70	
			$1,312,963.70
Current Liabilities and Surplus:			
Accounts Payable		$ 8,411.64	
Items in Suspense (Credits)		$ 1,751.24	
Reserve for Repairs and Replacements		8,328.63	
Current Surplus		202,360.37	
			$ 220,851.88
Total Liabilities			$2,511,014.88

EXHIBIT B

MARINE BIOLOGICAL LABORATORY INCOME AND EXPENSE, YEAR ENDED DECEMBER 31, 1946

	Total		Net	
	Expense	Income	Expense	Income
Income:				
General Endowment Fund		$ 29,966.14		$ 29,966.14
Library Fund		6,000.47		6,000.47
Donations		2,170.00		2,170.00
Instruction	$ 11,788.90	9,030.00	$ 2,758.90	
Research	6,329.17	20,645.14		14,315.97
Evening Lectures	75.00		75.00	
Biological Bulletin and Membership Dues	10,500.17	12,863.15		2,362.98
Supply Department	62,527.53	73,394.26		10,866.73
Mess	32,567.63	30,069.72	2,497.91	
Dormitories	30,640.35	16,880.30	13,760.05	
(Interest and Depreciation charged to above 3 Departments)	(26,008.91)			26,008.91
Dividends, General Biological Supply House		17,272.00		17,272.00
Dividends, Other Investment Stocks		1,000.00		1,000.00
Rents:				
Bar Neck Property	873.71	6,000.00		5,126.29
Janitor House	21.45	360.00		338.55
Sale of Library Duplicates, Micro Film, etc.		331.61		331.61
Microscope and Apparatus Rental		1,011.47		1,011.47
Sundry Income		10.00		10.00
Interest on Mortgage Receivable		100.00		100.00
Maintenance of Plant:				
Buildings and Grounds	28,337.37		28,337.37	
Apparatus Department	8,267.02		8,267.02	
Chemical Department	3,859.74		3,859.74	
Library Expense	6,664.76		6,664.76	
Workmen's Compensation Insurance	435.15		435.15	
Truck Expense	157.11		157.11	
Bay Shore Property	172.32		172.32	
Great Cedar Swamp	22.80		22.80	
General Expenses:				
Administration Expense	16,429.92		16,429.92	
Endowment Fund Trustee and Safe-Keeping	1,033.70		1,033.70	
Bad Debts	352.83		352.83	
Special Repairs 1944 Hurricane Damage	2,012.50		2,012.50	
Cost of Living Bonus	240.00		240.00	
Gift to Naples Biological Station	100.00		100.00	
Special Repairs, Brick Laboratory	11,510.00		11,510.00	
Interest	312.50		312.50	
Reserve for Depreciation	25,314.41		25,314.41	
	$234,537.13	$227,104.26	$124,313.99	$116,881.12
Excess of Expense over Income carried to Current Surplus		7,432.87		7,432.87
		$234,537.13		$124,313.99

EXHIBIT C

MARINE BIOLOGICAL LABORATORY CURRENT SURPLUS ACCOUNT, YEAR ENDED DECEMBER 31, 1946

Balance, January 1, 1946			$196,337.90
Add:			
Transfer from Reserve Fund		$15,000.00	
Reserve for Depreciation Charged to Plant Funds		25,314.41	40,314.41
			$236,652.31
Deduct:			
Excess of Expense over Income for Year		$ 7,432.87	
Payments from Current Funds during Year for Plant Assets:			
Buildings	$ 2,691.13		
Equipment	8,324.14		
Library	10,409.75		
	$21,425.02		
Less Received for Plant Assets Sold	3,306.90	18,118.12	
Transfers to Reserve Fund:			
Portion of Dividends from General Biological Supply House	$ 2,500.00		
Dividends from Crane Co.	875.00		
Gansett Property Profits, 1945	464.18	3,839.18	
Retirement Fund:			
Payments to Pensioners	$ 3,460.00		
Less Retirement Fund Income	200.11		
	$ 3,259.89		
Loss on Sale of Interest in Real Estate	1,030.34	4,290.23	
Loss on Sale of Gansett Property in 1946		81.60	
Adjustment of Sundry Accounts-Receivable, etc., account of Prior Years		529.94	34,291.94
Balance, December 31, 1946			$202,360.37

Respectfully submitted,

DONALD M. BRODIE,
Treasurer

V. REPORT OF THE LIBRARIAN

1946

The sum of $13,500 appropriated to the library in 1946 was expended as follows: books, $546.47; serials, $2,747.01; binding, $618.39; express, $74.34; supplies, $431.05; salaries, $7,886.13 ($1,700 of this sum was contributed by the Woods Hole Oceanographic Institution); back sets, $417.04; insurance, $45.00; total, $12,765.43. The cash receipts of the library totalled $331.61: for microfilms, $195.03 ($78.45 expenses paid by the library and accounted above under "sup-

plies"); sale of duplicates, $135.65; sale of the "Serial List" Biological Bulletin supplement number, $0.93. This sum, $331.61, reverts to the laboratory and does not include rent payments for library readers which are collected by the main office. There were 38 library readers accommodated in the library during the summer of 1946, and practically all of these for the whole season, an improvement over 1945 when many of the 49 readers rented desks for short terms.

Of the Carnegie of New York Fund, $1,534.46 was expended for the completion of four back sets and for the partial completion of one other.

The sum appropriated by the Woods Hole Oceanographic Institution in 1946 for purchases was $800. A balance of $802.27 remaining from 1945 made an available total of $1,602.27. The expenditures amounted to $1,910.43, overrunning the account by the sum of $308.16. In addition to the above, the Woods Hole Oceanographic Institution contributed $1,700 (see above under salaries).

During 1946 the library received 1,065 current journals: 320 (19 new) by subscription to the Marine Biological Laboratory; 43 (15 new) to the Woods Hole Oceanographic Institution; exchanges with the "Biological Bulletin" 433 (13 new; 68 reinstated foreign) and 96 (21 new; 17 reinstated foreign) with the Woods Hole Oceanographic Institution; 165 as gifts to the former and 8 to the latter. The Library acquired 261 books: 81 by purchase of the Marine Biological Laboratory; 53 by purchase of the Woods Hole Oceanographic Institution; 13 gifts by the authors; 22 by the publishers; 48 by miscellaneous donors; 23 from the French Embassy Library, New York City; 1 from Dr. R. S. Lillie; 3 from Dr. Oliver S. Strong; 1 from Dr. Alfred C. Redfield; and 16 from Mrs. Priscilla B. Montgomery. There were 43 back sets of serial publications completed; 15 purchased by the Marine Biological Laboratory (4 with the Carnegie Fund); 7 by the Woods Hole Oceanographic Institution; 5 by exchange of the "Biological Bulletin"; 14 by exchange with the Woods Hole Oceanographic Institution publications; and 2 by gift and exchange of duplicate material. Partially completed sets were 73: purchased by the Marine Biological Laboratory, 10 (1 with the Carnegie Fund); purchased by the Woods Hole Oceanographic Institution, 10; by exchange with the "Biological Bulletin," 9; by exchange with the Woods Hole Oceanographic Institution publications, 11; by gift and exchange of duplicate material, 33.

The reprint additions to the library were 4,618: current of 1945, 841; current of 1946, 97; and of previous dates, 3,680. There were gifts of reprints from Dr. Alfred C. Redfield; Dr. E. G. Butler; and from Dr. L. C. Wyman.

At the end of the year 1946 the library contained 55,312 bound volumes and 142,292 reprints.

It is discouraging to report that no part of the German journals that have been lacking since 1940 have come through. We have heard, however, by letter of February 28, 1947, from the Otto Harrassowitz Company that there is "in preparation" a box of "stored material" that "will leave Berlin in summer via the Library of Congress Mission Berlin." We are hoping to discover whether this means some volumes of our standing order of the war years. If nothing comes to us in this direct way or through other of the Library of Congress "Mission Berlin" shipments I understand that a plan is already under way to reprint such lacking volumes provided a sufficient number of libraries are interested to assure the expense of the undertaking.

VI. REPORT OF THE DIRECTOR

To the Trustees of the Marine Biological Laboratory

Gentlemen:

I submit herewith the report of the fifty-ninth session of the Marine Biological Laboratory for the year 1946.

The past year has seen a continued recovery from war-time conditions. Our attendance increased, especially in the groups of Beginning Investigators and students, in large part due to returning veterans; many foreign journals have begun to come regularly after a lapse of several years; our gross income (and also expense) exceeded that of any recent year; the budget for research equipment was greatly increased; a good start was made in the repair of our buildings; the Lalor Fellowships were established.

1. Financial

During the past 10 years notable changes have occurred in the net income from some of our regular sources of revenue. Decreases appear in the return from the Endowments, from Instruction, and from the Mess; increases are seen in Research fees and the Supply Department. Changes in the cost of running the various departments have been due to war conditions. The accompanying table gives only the more important items of the budget. Net incomes are shown, rather than gross incomes. For the Supply Department, the Dormitories, and the Mess, the amounts do not include depreciation and other bookkeeping charges.

Net Income

	Endowments	Dividends	Research	Instruction	Supply Dept.	Dorm.	Mess
1946	35,965	18,270	14,315	(2,760)	14,545	5,290	780
1944	33,010	17,295	3,675	(2,915)	11,780	875	790
1942	36,085	11,420	4,950	(2,065)	1,760	9,275	1,385
1940	44,140	18,940	15,070	(615)	5,030	7,080	2,120
1936	50,190	12,700	10,070	2,130	9,160	6,660	3,125

Expense

	Bldgs. and Grds.	App. and Chem.	Library	Spec. Repairs	Admin.	Pensions
1946	37,420	15,055	17,075	13,525	16,430	3,460
1944	32,675	6,135	12,315	2,465	15,275	3,460
1942	25,130	9,805	15,335	5,810	12,500	3,460
1940	28,785	19,005	17,780	1,650	12,425	3,710
1936	37,925	17,190	22,140	—	14,910	4,060

Most important is the decline in the return from the Endowments. In 1930 our receipts from these sources amounted to $57,000. A sharp drop occurred in 1933, and smaller but steady declines each year until 1946. Our income now is less than two-thirds of the 1930 amount. In the meantime, returns from Dividends

have risen, and have made up nearly half of the loss incurred in the Endowment income. The budget for Instruction showed a substantial loss during the war years when attendance was light. With larger numbers of students and an increase in tuition from $75.00 to $100.00 the deficit should disappear. The net gain from the Mess has fallen materially. In view of the high cost of food and services we are fortunate to end each season without loss.

On the other hand, the net return from Research fees is now high, due in part to rentals received from the Oceanographic Institution which has occupied rooms throughout the year. The Supply Department has been exceedingly active. For 1946 the gross receipts were over $73,000, as compared with $43,000 ten years ago. However, the net income has not increased proportionately, for the cost of specimens purchased from dealers, of containers, chemicals, and other items, has kept down the profits. Salaries have been increased by more than 25 per cent.

The major categories of expense, shown on the lower part of the Table are now, with one exception, only a little above what they were in 1936. During the war we could not obtain many items of scientific equipment and so could not replace outworn apparatus. The budget for the Apparatus Department was, therefore, small. Now when equipment is available we can not buy all that we need because of its high cost. So, although we are spending as much as we did 10 years ago, we obtain far less. Our physical plant fell into disrepair, but is now gradually being put into sound condition. The cost of this work in 1946 is shown in the column Special Repairs.

We stand in need of additional funds to increase our endowments, to improve and enlarge our research facilities, to make further essential repairs in our buildings, to improve the working conditions of the Supply Department, and finally, to replace the wooden laboratories with a modern, well equipped building. The Executive Committee submitted to the Rockefeller Foundation a full statement of our needs with a request for funds to meet all or a part of them. The Foundation, in reply, recognized the importance of these projects but stated that because of its large contribution to the Peking Union Medical College, it could not at this time consider our request. In view of this, the Laboratory, should seek moderate contributions from a number of sources, thus broadening our base of support. One such source is our own membership which has been asked to contribute to a fund for a new collecting boat. The response has been encouraging, the donors expressing their hearty approval of the project.

2. Buildings and Grounds

All of the Laboratory buildings will be in active use during the summer of 1947. The Lecture Hall, which was stripped of its salt water and gas when the Navy occupied it, is now fully restored and will be filled with investigators. Rooms in the Supply Department will also be used for research.

Repairs and replacements have been made elsewhere. The sea wall is now rebuilt, the waterproofing of the Brick Building is finished. The experience of the past winter has proved that the operation was successful. The Dormitory is now undergoing the same treatment. In addition, many of its rooms, left unpainted since the building was erected more than 20 years ago, will be painted. A most desirable improvement is the partial painting of the Auditorium.

Room 106 in the Brick Building has been transformed into an Associates Room. The Trustees, at the Special Meeting in Boston, directed that this be done in response to the request of the Associates who want some place in the Laboratory where they can meet. These friends will constitute an increasingly important part of our membership.

A part of the Devil's Lane Tract is now open, and roads through it have been constructed. Thus far 8 lots have been purchased by members of the Corporation. Now that all lots in the Gansett tract are sold, this new area is the only Laboratory property which is available to investigators who want to solve the housing problem by owning their own homes.

3. The Lalor Fellowships

Through the generosity and cooperation of the Lalor Foundation this Laboratory, during the next five years, can offer to well prepared young investigators, a place to work, adequate equipment, and funds sufficient for their living and travelling expenses. The Fellows will work primarily in the fields of Biophysics, Biochemistry, and Physiological Chemistry, but other fields are not excluded. Dr. Metz who conducted the negotiations with Dr. Burdick of the Lalor Foundation is to be congratulated on their successful conclusion.

4. Gifts

The Laboratory acknowledges with sincere thanks gifts from the following donors:

The Associates: $1,070 for the purchase of special apparatus.
Mrs. Murray Crane: A $1,000 bond, the proceeds of which have been used to purchase special apparatus.
Dr. W. D. Curtis: $100 for carpenter shop equipment.
Dr. A. C. Redfield: $100 for trees and shrubs.
Mr. Laurence Saunders: $200 for the bathing beach raft.

5. Losses by Death

The Laboratory has lost by death, since the last meeting of the Trustees, five men, three of whom were closely associated with the institution for more than 50 years.

Prof. William B. Scott, member of the Corporation since 1890; elected Trustee in 1897; Emeritus, 1931.
Prof. Robert A. Harper, Corporation member since 1891; Trustee from 1911 until his retirement in 1926 when he became Emeritus.
Mr. George M. Gray, laboratory assistant in 1891; full time manager of the Supply Department from 1899 until his retirement in 1933.
Prof. Herbert S. Jennings, Trustee from 1905 to 1938, when he was elected Trustee Emeritus.
Prof. Samuel O. Mast, Trustee from 1936 to 1943; Trustee Emeritus until his death.

We honor the memory of these men who through many years greatly helped in the development of this Laboratory.

6. Election of Trustees

At the Meeting of the Corporation on August 13, 1946, the following trustees were elected:

Class of 1950

D. E. S. Brown
D. P. Costello
M. H. Jacobs
D. M. Marsland
A. K. Parpart
F. Schrader
H. B. Steinbach
B. H. Willier

Class of 1949

F. A. Brown, Jr., to replace W. C. Curtis retired

Trustee Emeritus

W. C. Curtis

7. There are appended as parts of this report

1. Memorials to Dr. T. H. Morgan and C. E. McClung.
2. The Staff.
3. Investigators and Students.
4. Tabular View of Attendance.
5. Subscribing and Cooperating Institutions.
6. Evening Lectures.
7. Shorter Scientific Papers (Seminars).
8. Members of the Corporation.

Respectfully submitted,

CHARLES PACKARD,
Director

1. MEMORIALS TO DECEASED TRUSTEES

Thomas Hunt Morgan, 1866–1945

by E. G. Conklin

In the death of T. H. Morgan at Pasadena, California, on December 4, 1945, the world of science lost one of its foremost students of Experimental Zoology and Genetics, and the Marine Biological Laboratory one of its earliest and most eminent members. He was born at Lexington, Kentucky, September 25, 1866, member of a family distinguished in American history for patriotic and military achievements. He graduated from the University of Kentucky in 1886 with the degree of B.S. and was given the M.S. Degree in 1887. In the summer of 1886 he was a student at the marine laboratory at Annisquam, Massachusetts, during the last session of that laboratory, which was the immediate predecessor of the Woods Hole Marine Biological Laboratory. Thus he was the last surviving personal link between the Annisquam and the Woods Hole Laboratories. The Annisquam Laboratory was not widely known, although it was the successor through its founder, Alpheus Hyatt, of

the famous but short-lived laboratory established by Louis Agassiz at Penikese Island in 1872. It would be interesting to learn how Morgan, immediately after his undergraduate course, came to attend this last session of the Annisquam Laboratory, but the fact of his attendance is evidence of his early interest in marine biology.

In the fall of 1886 he entered the Johns Hopkins University as a graduate student in the department of biology taking morphology under W. K. Brooks as his major subject and physiology under H. Newell Martin as his minor. His superior qualities were soon recognized by his appointment as teaching assistant during his first two years and by the University fellowship in biology during his third year. He received the Ph.D. degree in 1890 and was at once appointed to the Adam Bruce post-doctoral fellowship for the following year, part of which he spent on research expeditions in the Bahamas and Jamaica.

On his return from the West Indies in 1891 he was appointed Associate Professor of Biology at Bryn Mawr College, in succession to Professor E. B. Wilson who had been called to Columbia University. Morgan remained at Bryn Mawr as Associate Professor and Professor until 1904, when he was appointed Professor of Experimental Zoology at Columbia, where he remained for 24 years, during which his research work in genetics received world-wide recognition and, together with that of his students and associates, led to many fundamental discoveries regarding the mechanism of heredity and sex. Finally in 1928 he accepted the position of Professor of Biology and Director of the Wm. G. Kerckhoff Laboratories of Biology at the California Institute at Pasadena, where he remained for the balance of his life.

From his first acquaintance with marine biology at Annisquam to the end of his life Morgan was closely associated with marine laboratories, especially during his summer vacations. In 1888 and 1889, while still a graduate student, he occupied the Johns Hopkins Table at the laboratory of the U. S. Fish Commission at Woods Hole. Those were the first two years of the M. B. L. and although he is not listed as a member of this new laboratory for those years, he was closely associated with it from its beginning, for relations between these two Woods Hole laboratories in those days of few workers were very intimate. In 1890 Morgan became an active member of the M. B. L., occupied a room in the laboratory, gave lectures in the Zoology course, and one of the evening lectures, and became a member of the Corporation. In 1899 he became a life member, in 1897 a trustee and in 1936 trustee emeritus. During this long official connection, extending over 55 years, he was always an active collaborator in the plans and work of the laboratory, and was one of its most productive and inspiring investigators. He was for many years a member of the Executive Committee as well as of other special committees and his judgment and cooperation had much to do in shaping policy. Although he believed that once the laboratory was well endowed it should abandon teaching and devote all its resources to research, he nevertheless cooperated in the past and present policy of combining both teaching and research. In his earlier years here he lectured in some of the courses, and throughout his connection with the laboratory he served as a member of the "Staff of Investigation" and supervised the work of many research students. His general lectures to the whole laboratory were many and notable summaries of his research work. Sixteen such "Evening Lectures" are listed in the Annual Reports of the Laboratory and many of these were published in the former series of *Biological Lectures* or in the later *Biological Bulletin*.

He was rarely absent from the sessions of this laboratory, except in 1894, 1895 and 1900 when he was at the Zoological Station in Naples. Even after his chief interests had turned from experiments on marine animals to the genetics of insects he continued to come to Woods Hole summers, transporting his material and continuing his work here. And after his removal to California he and Mrs. Morgan continued to make the long journey to Woods Hole every summer until prevented by war conditions in the past two years. In California he made frequent visits to the marine laboratory of the California Institute at Corona del Mar, which he had established, and his last work there was done last summer on "Normal and Abnormal Development of the Eggs of Ciona" and was published about a month after his death.

When he was a student at Johns Hopkins, morphology, which was his chief subject, consisted largely of observational rather than experimental work and was centered to a large extent on the embryology of various classes of animals with the primary purpose of determining their phylogeny and relationships. Morgan's early researches were of this sort. By the time he had taken his Ph.D. he had finished eight papers and in the two following years he published eight more on this general theme. After 1892 he published no papers that were not experimental or analytical. This sudden change in his interests was due in large part to associations formed and interests aroused at Woods Hole and at the Naples Zoological Station. His experiments at Woods Hole began on teleost and echinoderm eggs in 1893, and at Naples in 1894 he collaborated with Hans Driesch on the embryolgoy of ctenophores and began experiments on many other groups. Thereafter he was always interested in the factors controlling development and always had some work going on that subject even when he was more deeply involved in other projects. In all he published about sixty papers and three books on the experimental embryology of animals belonging to ten different phyla or classes. Another field in which he did an enormous amount of work is regeneration, on which he published about forty papers and two books, on some eight classes of animals.

About the time of his removal to Columbia University in 1904 he began work on general cytology and especially on the cytology of sex determination. This led to extensive studies on the Cytological basis of peculiar sex ratios in parthenogenesis and on non-typical Mendelian ratios in general. Here also may be classed his studies on sex-limited and sex-linked heredity together with the causes of secondary sexual characters, as well as his numerous papers on fertility and sterility, which continued intermittently until the end of his life. In this field he published some fifty papers and two books.

Finally in the general field of Mendelism, mutations, and the "constitution of the germ plasm," he published either individually or in collaboration with assistants, about one hundred and twenty-five papers and ten books. Other publications of a more general character, such as those on evolution, natural selection, reviews, and biographies, bring the total number of his publications, as listed in the bound volumes of his reprints in our library and in unbound separates since 1937, to three hundred and seventy separate titles, of which twenty-four are books, some of which are translations into the Dutch, German, Spanish and Russian languages.

This long list of Morgan's published work on a great variety of subjects throws light on many of his personal characteristics. His biological interests were very extensive and he was extraordinarily alert in picking up new leads in research. He worked with great intensity and rapidity and published his journal articles promptly,

and sometimes without adequate caution; as a result he often made mistakes. His laboratory room was always open to callers, but unless their business was important he did not permit them to interrupt his work. He would go right on with what he was doing and would answer questions without looking up from his microscope or dishes. But he was always cordial and helpful and if the business were important he would give it prompt attention. In more leisurely moments he loved to joke and gossip and was gay and full of fun, but in the laboratory he usually kept right on with his work. On one occasion during the first World War I wandered into his room and said, "This War is getting terrible." Without looking up he replied, "What war?" And yet he was as anxious as anyone about the course of events. He dwelt in no "ivory tower," but just then he was most interested in counting flies. I think I have never known any other man who wasted so little time. His work was his life.

He could do good work with the most primitive accommodations and instruments, and he cared little for show and finesse. His work room and table and aquaria might be crowded and apparently disorderly but he usually knew just where to put his hand on what he wanted. His microscope slides and bottles and dishes might be crudely labelled but they served his purpose. In short, he wasted no time on needless techniques but went as directly as possible to the results which he sought.

He disliked organizational and committee work, which is often a great waste of time, but in really important matters he took an active and important part, as in the affairs of the Marine Biological Laboratory, the American support of the Naples Station, the founding of the Journal of Experimental Zoology, and many other institutional and professional matters. In a halting and confused situation no one could be more helpful than he, for with lightening-like rapidity he would isolate the main issues from minor ones and go straight to a logical conclusion. His judgment of men was especially sound and forthright and he did not allow it to be warped by personal sentiments. But he was genuinely kind and affectionate with family, friends, students and associates, and no one learned, except by chance, of his many kindnesses and contributions to persons and institutions. I forbear to say more on this subject out of respect to his well known wishes.

He received abundant recognition and honors from many universities and scientific societies in America and foreign countries; he was president of our leading biological and zoological societies as well as of the more inclusive American Association for the Advancement of Science and the more exclusive National Academy of Sciences; he was a foreign member of the Royal Society and the one and only American zoologist to receive the Nobel Award; but these honors never changed in any respect his sincere and modest behavior.

When he began his epoch-making work on *Drosophila* who could have predicted the amazing discoveries which would be revealed in the course of a few years! It had been customary among students of heredity, following Weismann, to speak of "the architecture of the germ plasm," but practically nothing was known of that architecture except its location in the germ cells. After the work of Morgan and his associates that architecture became a detailed plan with precise location of hereditary factors or genes in chromosome maps, and in turn these maps led to fundamental discoveries in the phenomena of heredity itself. In this work he had the invaluable assistance of students who became his assistants and associates, and his judgment of men was never shown better than in his selection of these associates. Together they made an extraordinary team, working in harmonious cooperation and

in a spirit of great adventure. Morgan was the leader of this team and he received chief recognition and honor for their important discoveries but he always gave full credit to his associates and shared his honors with them. And now this great leader and discoverer is gone from among us but his work and inspiration will remain with us and with future generations.

Professor C. E. McClung

April 5, 1870 to January 17, 1946

by F. R. Lillie

It is difficult, and indeed impossible in a short space, to do justice to the many-sided life of McClung. Here we record our sorrow and sense of loss to our own institution and express our gratitude for the many services that he rendered us. A graduate in Pharmacology of the University of Kansas in 1892, he received his A.B. Degree there in 1896 and, after study elsewhere, his Ph.D. Degree in 1902. He served as head of the department of Zoology at the University of Kansas until he succeeded the lamented Thomas H. Montgomery at the University of Pennsylvania in 1912. He continued unbroken Montgomery's loyalty and devotion to the M. B. L. and was elected a member of the Corporation and Trustee in 1913. With the exception of the year 1934 when he was visiting professor at Keio University in Tokyo, his membership was continuous until his death.

His first appearance at this Laboratory was as investigator and instructor in Embryology in 1903. Thereafter he was occupied in the work of the University of Kansas until his appointment at the University of Pennsylvania. He was then appointed on the M. B. L. staff of investigations and served throughout his life assisting not only his own students but many others who sought his advice. He also became interested in the library and served as Chairman of the Library Committee from 1923 to 1933 during the great development of the library after the erection of the main building in 1924; he was especially helpful when the General Education Board in 1925 presented $50,000.00 to be expended over a period of five years for purchase of books, periodicals and pamphlets, and in 1929 $200,000.00 for endowment of the library.

After the erection of the Crane Laboratory in 1913, the Laboratory rapidly became over-crowded again, and in 1919 the trustees decided that steps should be taken to provide construction and endowment that should be adequate to meet the requirements of a generation of biologists. One of the first steps toward this program was to approach the National Research Council through Dr. McClung, Chairman of the Division of Biology and Agriculture. He was instrumental in the appointment of a committee of his division to report on the situation. Their favorable report was approved by the Executive Board of the Council. This encouraged the presentation of the matter to the Rockefeller Foundation, and the raising of the funds for the great plan was soon well under way. Dr. McClung was also helpful at the laboratory from the start of the new plans. The arrangement of the large lecture room, which has proved so successful, was his suggestion.

Many of us remember Dr. McClung's kindliness, simplicity of character and friendliness. These qualities were displayed in many way in the social life of Woods Hole; thus, he served as President of the M. B. L. Tennis Club and also of the

M. B. L. Club, the social club of the students and investigators. Such activities, however, never detracted from his main interests in research, and a significant part of his most famous investigations on chromosomes was carried on here.

He was a member of the National Academy of Sciences, of the American Philosophical Society and of numerous national biological societies, and in most of them occupied positions of trust and influence at various times. He was indeed a consecrated man of science! His memory will long endure.

2. The Staff, 1946

Charles Packard, Director, Marine Biological Laboratory, Woods Hole, Massachusetts.

Senior Staff of Investigation

E. G. Conklin, Professor of Zoology, Emeritus, Princeton University.
Frank R. Lillie, Professor of Embryology, Emeritus, The University of Chicago.
Ralph S. Lillie, Professor of General Physiology, Emeritus, The University of Chicago.
S. O. Mast, Professor of Zoology, Emeritus, Johns Hopkins University.
A. P. Mathews, Professor of Biochemistry, Emeritus, University of Cincinnati.
G. H. Parker, Professor of Zoology, Emeritus, Harvard University.

ZOOLOGY

I. Consultants

T. H. Bissonnette, Professor of Biology, Trinity College.
L. L. Woodruff, Professor of Protozoology, Yale University.

II. Instructors

F. A. Brown, Associate Professor of Zoology, Northwestern University, in charge of course.
T. H. Bullock, Assistant Professor of Neurology University of Missouri Medical School.
W. D. Burbanck, Associate Professor of Biology, Drury College.
C. G. Goodchild, Professor of Biology, Southwest Missouri State Teachers College.
John H. Lochhead, Instructor in Zoology, University of Vermont.
Madelene E. Pierce, Assistant Professor of Zoology, Vassar College.
W. M. Reid, Assistant Professor of Biology, Monmouth College.
Mary D. Rogick, Professor of Biology, College of New Rochelle.

III. Laboratory Assistant

Antoin Baca, Duke University Medical School.

EMBRYOLOGY

I. Consultants

H. B. Goodrich, Professor of Biology, Wesleyan University.

II. Instructors

Donald P. Costello, Professor of Zoology, University of North Carolina, in charge of course.
Howard L. Hamilton, Assistant Professor of Zoology, Iowa State College.

JOHN A. MOORE, Assistant Professor of Zoology, Barnard College.
ALBERT TYLER, Assistant Professor of Embryology, California Institute of Technology.

III. RESEARCH ASSISTANT

MARJORIE HOPKINS FOX, University of California.

IV. LABORATORY ASSISTANTS

CATHERINE HENLEY, The Johns Hopkins University.
ELEANOR LERNER, Washington University.

PHYSIOLOGY

I. CONSULTANTS

WILLIAM R. AMBERSON, Professor of Physiology, University of Maryland, School of Medicine.
HAROLD C. BRADLEY, Professor of Physiological Chemistry, University of Wisconsin.
WALTER E. GARREY, Professor of Physiology, Vanderbilt University Medical School.
MERKEL H. JACOBS, Professor of Physiology, University of Pennsylvania.

II. INSTRUCTORS

ARTHUR K. PARPART, Associate Professor of Biology, Princeton Universtiy, in charge of course.
E. S. GUZMAN BARRON, Associate Professor of Biochemistry, The University of Chicago.
EDWARD CHAMBERS, New York City.
AURIN M. CHASE, Assistant Professor of Biology, Princeton University.
ARTHUR C. GIESE, Associate Professor of Biology, Stanford University.
RUDOLPH T. KEMPTON, Professor of Zoology, Vasser College (absent in 1946).
ROBERT RAMSEY, Associate Professor of Physiology, Medical College of Virginia.

BOTANY

I. CONSULTANTS

S. C. BROOKS, Professor of Zoology, University of California.

II. INSTRUCTORS

MAXWELL S. DOTY, Instructor of Botany, Northwestern University.
HANNAH CROASDALE, Dartmouth College.

EXPERIMENTAL RADIOLOGY

G. FAILLA, College of Physicians and Surgeons, Columbia University.
L. ROBINSON HYDE, Phillips Exeter Academy, Exeter, N. H.

LIBRARY

PRISCILLA B. MONTGOMERY (MRS. THOMAS H. MONTGOMERY, JR.), Librarian
DEBORAH LAWRENCE, Assistant Librarian
MRS. ELON JESSUP MARY A. ROHAN

APPARATUS DEPARTMENT

E. P. LITTLE, Phillips Exeter Academy, Exeter, N. H., Manager
J. D. GRAHAM DOROTHY LEFEVRE

CHEMICAL DEPARTMENT

E. P. LITTLE, Phillips Exeter Academy, Exeter, N. H., Manager

SUPPLY DEPARTMENT

JAMES MCINNIS, Manager
D. J. ZINN, Naturalist

RUTH CROWELL GRACE M. WITZELL
M. B. GRAY W. E. KAHLER F. N. WHITMAN
A. M. HILTON G. LEHY

GENERAL OFFICE

F. M. MACNAUGHT, Business Manager
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GENERAL MAINTENANCE

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R. W. KAHLER T. E. TAWELL
A. J. PIERCE

THE GEORGE M. GRAY MUSEUM

GEORGE M. GRAY, Curator Emeritus

3. INVESTIGATORS AND STUDENTS

Independent Investigators, 1946

ABELL, RICHARD G., Assistant Professor of Anatomy, University of Pennsylvania.
ADDISON, WILLIAM H. F., Professor of Normal Histology and Embryology, University of Pennsylvania.
ANDERSON, RUBERT S., Assistant Professor of Physiology, University of Maryland.
ANFINSEN, CHRISTIAN B., Instructor in Biological Chemistry, Harvard Medical School.
ARMSTRONG, PHILIP B., Professor of Anatomy, College of Medicine, Syracuse University.
BALL, ERIC G., Associate Professor of Biological Chemistry, Harvard Medical School.
BARRON, E. S. GUZMAN, Associate Professor of Biochemistry, University of Chicago.
BARTLETT, JAMES H., Professor of Theoretical Physics, University of Illinois.
BERGER, CHARLES A., Director, Biological Laboratory, Fordham University.
BEVELANDER, GERRIT, Associate Professor of Anatomy, New York University.
BLISS, ALFRED F., Instructor in Physiology and Pharmacology, Albany Medical College.
BOELL, EDGAR J., Associate Professor of Biology, Yale University.
BONNER, JOHN T., Junior Fellow, Harvard University.
BRIDGMAN, JOSEPHINE, Associate Professor of Biology, Limestone College.
BRINK, FRANK, JR., Research Associate, Johnson Foundation, University of Pennsylvania.
BROOKS, MATILDA M., Research Associate in Biology, University of California.
BROOKS, SUMNER C., Professor of Zoology, University of California.
BROWN, DUGALD E. S., Professor of Physiology, New York University.
BROWN, FRANK A., JR., Associate Professor of Zoology, Northwestern University.

BROWNELL, KATHERINE A., Research Associate, Ohio State University.
BUCK, JOHN, National Institute of Health, Bethesda, Maryland.
BUDINGTON, ROBERT A., Professor of Zoology, Emeritus, Oberlin College.
BULLOCK, THEODORE H., Assistant Professor of Anatomy, University of Missouri.
BURBANCK, WILLIAM D., Professor of Biology, Drury College.
BURKHOLDER, PAUL R., Professor of Botany, Yale University.
CANNAN, R. KEITH, Professor of Chemistry, New York University.
CHAMBERS, ROBERT, Research Professor of Biology, New York University.
CHASE, AURIN M., Assistant Professor of Biology, Princeton University.
CHENEY, RALPH HOLT, Chairman of Biology Department, Long Island University.
CHRYSTALL, FRIEDA L., Teacher of Biology, Julia Richman High School.
CLAFF, C. LLOYD, Research Fellow in Surgery, Harvard Medical School.
CLARK, ELEANOR LINTON, Voluntary Research Worker, University of Pennsylvania.
CLARK, ELIOT R., Professor of Anatomy, University of Pennsylvania School of Medicine.
CLEMENT, A. C., Associate Professor of Biology, College of Charleston.
CLOWES, G. H. A., Research Director, Emeritus, Eli Lilly and Company.
COLE, KENNETH S., Professor of Biophysics, University of Chicago.
CONKLIN, EDWIN G., Professor of Biology, Emeritus, Princeton University.
COOPER, KENNETH W., Associate Professor of Biology, Princeton University.
COPELAND, D. EUGENE, Assistant Professor of Zoology, Brown University.
COPLEY, ALFRED E., Research Associate, Mount Sinai Hospital.
COSTELLO, DONALD P., Professor of Zoology, University of North Carolina.
CROASDALE, HANNAH T., Technical Assistant, Dartmouth College.
CROUSE, HELEN V., Research Associate in Zoology, University of Pennsylvania.
CROWELL, SEARS, Associate Professor of Zoology, Miami University.
CURTIS, W. C., Professor of Zoology, University of Missouri.
DALCQ, ALBERT M., Head of Anatomy and Embryology, Faculty of Medicine, Brussels.
DALTON, HOWARD C., Instructor in Biology, Brown University.
DEAN, HELEN W., Department of Anatomy, Harvard Medical School.
DILLER, IRENE COREY, Research Cytologist, Institute for Cancer Research, Lankinau Hospital.
DOTY, MAXWELL S., Instructor in Botany, Northwestern University.
DUMM, MARY E., Instructor in Chemistry, New York University Medical College.
ELLINGER, TAGE U. H., Professor of Zoology, Howard University.
ERDMAN, J. GORDON, Fellow, Mellon Institute of Industrial Research.
FAILLA, G., Professor of Radiology, Columbia University.
FIGGE, FRANK H. J., Associate Professor of Anatomy, University of Maryland School of Medicine.
FISKE, VIRGINIA MAYO, Instructor in Zoology, Wellesley College.
FRISCH, JOHN A., Professor of Biology, Canisius College.
FROEHLICH, ALFRED, Associate, May Institute for Medical Research.
FURTH, JACOB, Professor of Pathology, Cornell University Medical College.
GARREY, WALTER E., Professor of Physiology, Emeritus, Vanderbilt University.
GIESE, ARTHUR C., Associate Professor of Biology, Stanford University.
GILBERT, PERRY W., Assistant Professor of Zoology, Cornell University.
GILMAN, LAUREN C., Assistant Professor of Zoology, University of South Dakota.
GLASER, OTTO C., Professor of Biology, Amherst College.
GOODCHILD, CHAUNCEY G., Professor of Biology, Missouri State College.
GOULD, HARLEY N., Professor of Biology, H. Sophie Newcomb College.
GRAND, C. G., Research Associate, New York University.
GRAY, I. E., Professor of Zoology, Duke University.
GREGG, JOHN R., Instructor in Biology, Johns Hopkins University.
GRUNDFEST, DR. HARRY, Research Associate, Department of Neurology, Columbia University.
HARDING, CLIFFORD V., Assistant in Physiology, Brown University.
HARNLY, MORRIS H., Associate Professor, Washington Square College.
HARTMAN, FRANK A., Professor and Chairman, Department of Physiology, Ohio State University.
HARVEY, ETHEL BROWNE, Independent Investigator, Princeton University.
HARVEY, E. NEWTON, Professor of Physiology, Princeton University.

HAYWOOD, CHARLOTTE, Professor of Physiology, Mount Holyoke College.
HEILBRUNN, L. V., Professor of Zoology, University of Pennsylvania.
HIBBARD, HOPE, Professor of Zoology, Oberlin College.
HOPKINS, HOYT S., Associate Professor of Physiology, New York University.
HUNTER, FRANCIS ROBERT, Assistant Professor of Zoology, University of Oklahoma..
HUTCHINGS, LOIS M., Instructor in Biology, New York University.
IFFT, JOHN D., Assistant Professor of Biology, Simmons College.
JACOBS, M. H., Professor of General Physiology, University of Pennsylvania.
JAKUS, MARIE A., Research Associate in Biology, Massachusetts Institute of Technology.
JENKINS, GEORGE B., Professor of Anatomy, Emeritus, George Washington University.
JEROME, SISTER FRANCIS, Instructor, Ohio State University.
JOHLIN, J. M., Associate Professor of Biochemistry, Vanderbilt Medical School.
KAAN, HELEN W., Associate Professor of Zoology, Wellesley College.
KEMP, MARGARET, Assistant Professor of Botany, Smith College.
KEMP, NORMAN E., Instructor in Biology, Wayne University.
KINDRED, JAMES E., Professor of Anatomy, University of Virginia.
KLEINHOLZ, LEWIS H., Guggenheim Fellow, Harvard University.
KLOTZ, JOHN W., Instructor in Biology, Concordia Teachers College.
KREEZER, GEORGE L., Guggenheim Fellow, Princeton University.
KRUGELIS, EDITH J., Instructor of Zoology, Vassar College.
KUNTZ, ELOISE, Assistant in Biology Department, Brown University.
LAVIN, GEORGE I., In charge of Spectroscopic Laboratory, Rockefeller Institute for Medical Research.
LAZAROW, ARNOLD, Instructor in Anatomy, Western Reserve Medical School.
LEFEVRE, PAUL G., Instructor in Physiology, University of Vermont, College of Medicine.
LILLIE, RALPH S., Professor of Physiology, Emeritus, The University of Chicago.
LILLY, DANIEL M., Assistant Professor in Biology, Providence College.
LLANA, DR. ALFRED H., Assistant Director, University of Chile.
LOCHHEAD, JOHN H., Assistant Professor of Zoology, University of Vermont.
LUCKE, BALDUIN, Professor of Pathology, University of Pennsylvania School of Medicine.
LYNCH, REV. WM. F., Teaching Fellow, New York University.
MANGINELLI, PIERO, Assistant, Faculdade de Medicina, Sao Paulo, Brazil.
MARINELLI, LEONIDES D., Physicist, Memorial Hospital.
MARMONT, GEORGE H., Assistant Professor of Biophysics, University of Chicago.
MARSLAND, DOUGLAS, Associate Professor of Biology, New York University.
MAST, S. O., Professor of Zoology, Emeritus, Johns Hopkins University.
MATHEWS, ALBERT P., Professor of Biochemistry, Emeritus, University of Cincinnati.
MENDES, ERASMO GARCIA, Assistant Professor, University of Sao Paulo, Brazil.
MENKIN, VALY, Assistant Professor of Pathology, Duke University School of Medicine.
METZ, CHARLES W., Director, Zoological Laboratory, University of Pennsylvania.
MOORE, JOHN A., Assistant Professor of Zoology, Barnard College.
NACHMANSOHN, DAVID, Research Associate in Neurology, Columbia University.
NELSON, LEONARD, Independent Investigator, University of Pennsylvania.
NORTHROP, JOHN H., Member of the Institute, Rockefeller Institute for Medical Research.
OPPENHEIMER, JANE M., Assistant Professor of Biology, Bryn Mawr College.
ORMSBEE, RICHARD A., Associate, Sloan-Kettering Institute, Memorial Hospital.
ORR, PAUL R., Assistant Professor, Brooklyn College.
OSTER, ROBERT H., Professor of Physiology, University of Maryland School of Medicine.
OSTERHOUT, W. J. V., Member Emeritus, Rockefeller Institute for Medical Research.
PALADE, GEORGE, Assistant Department of Anatomy, University of Bucharest, Rumania.
PARPART, ARTHUR K., Professor of Biology, Princeton University.
PIERCE, MADELENE E., Associate Professor of Zoology, Vassar College.
PIERSON, BERNICE F., Independent Investigator, Johns Hopkins University.
PLOUGH, HAROLD H., Professor of Biology, Amherst College,
POULSON, D. F., Assistant Professor of Biology, Yale University.
RAKESTRAW, NORRIS W., Research Associate, Woods Hole Oceanographic Institute.
RAMSEY, ROBERT W., Associate Professor of Physiology, Medical College of Virginia.
RANKIN, JOHN S., Assistant Professor of Zoology, University of Connecticut.

REID, W. MALCOLM, Head of Biology Department, Monmouth College.
REINHARD, EDWARD G., Professor of Biology and Head of Department, Catholic University of America.
RIS, HANS, Assistant in Physiology, Rockefeller Institute.
ROBBIE, WILBUR A., Research Associate, State University of Iowa.
ROGICK, MARY DORA, Professor of Biology, College of New Rochelle.
RYAN, FRANCIS, Assistant Professor of Zoology, Columbia University.
SCHAEFFER, A. A., Chairman Department of Biology, Temple University.
SCHARRER, ERNST, Associate Professor of Anatomy, University of Colorado School of Medicine.
SCHMIDT, GERHARD, Senior Research Fellow in Medicine, Tufts College Medical School.
SCHNEYER, LEON H., Instructor, New York University Dental College.
SCOTT, SISTER FLORENCE MARIE, Professor of Biology, Seton Hill College.
SHANES, ABRAHAM M., Assistant Professor of Physiology, New York University College of Dentistry.
SHERESHEFSKY, J. LEON, Professor of Physical Chemistry, Howard University.
SICHEL, DR. F., Professor of Physiology, University of Vermont College of Medicine.
SLIFER, ELEANOR H., Assistant Professor of Zoology, State University of Iowa.
STEINBACH, H. B., Associate Professor of Zoology, Washington University.
STEWART, DOROTHY R., Research Associate in Physiology, University of Pennsylvania Medical School.
STOKEY, ALMA G., Professor of Botany, Emeritus, Mount Holyoke College.
STUNKARD, HORACE H., Professor of Biology, New York University.
STURTEVANT, ALFRED H., Professor of Genetics, California Institute of Technology.
TAFT, CHARLES H., Associate Professor of Pharmacology, University of Texas.
TAYLOR, WM. RANDOLPH, Professor of Botany, University of Michigan.
TEWINKEL, LOIS E., Associate Professor of Zoology, Smith College.
THOMPSON, BETTY F., Instructor in Botany, Connecticut College for Women.
TODD, EDGAR W., Visiting Investigator, Rockefeller Institute.
TRACY, HENRY C., Professor of Anatomy, University of Kansas.
TYLER, ALBERT, Assistant Professor of Embryology, California Institute of Technology.
VILLEE, CLAUDE A., Instructor in Biological Chemistry, Harvard Medical School.
WAINIO, WALTER W., Assistant Professor, New York University College of Dentistry.
WARNER, ROBERT C., Assistant Professor of Chemistry, New York University College of Medicine.
WEBER, NEAL A., Associate Professor of Anatomy, University of North Dakota.
WEISS, DR. PAUL, Professor of Zoology, University of Chicago.
WENRICH, D. H., Professor of Zoology, University of Pennsylvania.
WHITING, ANNA R., Instructor in Zoology, University of Pennsylvania.
WHITING, P. W., Associate Professor of Zoology, University of Pennsylvania.
WICHTERMAN, RALPH, Assistant Professor of Biology, Temple University.
WIERCINSKI, FLOYD J., Chairman and Professor of Biology, Lewis College of Science and Technology.
WILBER, CHARLES G., Instructor in Physiology, Fordham University.
WILLIER, B. H., Professor of Zoology, Johns Hopkins University.
WOODWARD, ARTHUR A., JR., Research Assistant in Zoology, University of Pennsylvania.
WRINCH, DOROTHY, Lecturer, Smith College.
YNTEMA, CHESTER L., Assistant Professor of Anatomy, Cornell University Medical College.

Beginning Investigators, 1946

BENDER, ALBERT, Investigator, University of Pennsylvania.
BENEDICT, DORA, Student, Harvard Medical School.
BERG, GEORGE G., Graduate Student, Columbia University.
BLUMENTHAL, GERTRUDE, University of Pennsylvania.
BRUST, MANFRED, Teaching Fellow in Biology, Washington Square College.
CHAMBERS, EDWARD L., Research Associate, University of California.
DOUGLIS, MARJORIE B., Assistant in Zoology Department, University of Chicago.
FISK, ALBERT A., Brown Fellow in Pathology, Yale University School of Medicine.

GOREAU, THOMAS F., Student, University of Pennsylvania School of Medicine.
GOULD, DAVID, Voluntary Investigator, New York University College of Medicine.
GREEN, JAMES W., Graduate Student, Princeton University.
GREENBERG, RUVEN, Graduate Student, Ohio State University.
GREGORY, JOHN C., Graduate Student, Yale University.
KOZAM, GEORGE, Graduate Student and Research Assistant, New York University Graduate School.
LEIN, JOSEPH, Graduate Student, Princeton University.
LOVELACE, ROBERTA, Teaching Fellow, University of North Carolina.
MCLEAN, DOROTHY J., Demonstrator, University of Toronto.
MOUL, EDWIN T., Teaching Fellow, University of Pennsylvania.
NARAHARA, HIROMICHI, Columbia College of Physicians and Surgeons.
RECKNAGEL, RICHARD O., Graduate Student, University of Pennsylvania.
REMOND, A., Research Fellow, Johnson Foundation, University of Pennsylvania.
ROGER, HENRY C., Student, Deerfield Academy.
ROYS, CHESTER C., University of Chicago.
SHENG, T. C., Graduate Student, Columbia University.
TAYLOR, BABETTE, Graduate Student, Washington University.
WEINER, MILTON H., Student, Western Reserve University.
WEISS, MICHAEL S., Teaching Fellow in Biology, New York University.
WHITE, ELIZABETH L., Graduate Student, Bryn Mawr College.
WILSON, T. HASTINGS, University of Pennsylvania Medical School.
WILSON, WALTER L., Graduate Student, University of Pennsylvania.

Research Assistants, 1946

ABRAMSKY, TESS A., Research Assistant, Rockefeller Institute for Medical Research.
BERMAN, MARJORIE, Research Assistant, Columbia University.
BURT, AGNES S., Research Assistant, University of Chicago.
CAMPBELL, MARGARET L., Research Assistant, California Institute of Technology.
CARLSON, FRANCIS D., Research Assistant, Johnson Foundation, University of Pennsylvania.
DEFALCO, ROSE H., Research Assistant, University of Pennsylvania.
DEY, THOMAS E., Research Assistant, Princeton University.
DIETZ, ALMA, Research Assistant, American International College.
FOX, MARJORIE H., Research Fellow, University of California.
HOPKINS, C. NADINE, Graduate Student, Northwestern University.
KERSCHNER, JEAN, Research Assistant, University of Pennsylvania.
LERNER, ELEANOR, Fellow in Zoology, Washington University.
MITCHELL, CONSTANCE, Research Assistant, University of Pennsylvania.
MITCHELL, ROBERT F., Research Assistant, New York University.
NORRIS, KARL H., Electronic Engineer, University of Chicago.
RALL, WILFRID, Graduate Fellow in Biophysics, University of Chicago.
ROBBIE, JEAN, Technical Assistant, Ohio State University.
ROSEN, MRS. DAVID, Research Assistant, Yale University.
ROTHENBERG, MORTIMER A., Research Assistant, College of Physicians and Surgeons, New York University.
SERIN, B. GOLDIS, Research Assistant, University of Pennsylvania.
ULLED, ELIAS, Research Assistant, Temple University Medical School.
VISHNIAC, WOLF, Research Assistant, Washington University.
WHEELER, CHARLES B., Part time Instructor, University of Kansas.
WILLIS, MARIAN, Research Assistant, University of Pennsylvania.
ZIEGLER, BERNICE, Laboratory Assistant, Washington University.

Library Readers, 1946

AMBERSON, WILLIAM R., Professor of Physiology, University of Maryland School of Medicine.
BAKER, GLADYS E., Associate Professor of Plant Science, Vassar College.
BENNIGHOF, C. L., Assistant Professor, Western Maryland College.

BLOCH, ROBERT, Research Associate in Botany, Yale University.
BLUM, HAROLD F., Guggenheim Fellow.
BOCHER, CAROL A., Research Assistant, The Johns Hopkins University.
CASSIDY, HAROLD G., Assistant Professor of Chemistry, Yale University.
COX, EDWARD H., Professor of Chemistry, Swarthmore College.
DISCHE, ZACHARIAS, Visiting Scholar, College of Physicians and Surgeons, New York University.
FRIEDEMANN, ULRICH, Head of Department of Bacteriology, Jewish Hospital, Brooklyn.
FRIES, E. F. B., Assistant Professor of Biology, City College of New York.
GATES, R. R., Professor of Botany Emeritus, University of London.
GRANT, MADELINE P., Member Science Faculty, Sarah Lawrence College.
GUDERNATSCH, FREDERICK, Visiting Professor, New York University.
GUREWICH, VLADIMIR, Assistant Visiting Physician, Bellevue Hospital.
HAMILTON, HOWARD L., Assistant Professor of Zoology, Iowa State College.
KELLER, RUDOLPH, Researcher, The Robinson Foundation, Inc.
KRASNOW, FRANCES, Head of Department of Research, Guggenheim Dental Foundation.
LOEWI, OTTO, Research Professor of Pharmacology, New York University College of Medicine.
LOW, EVA M., Graduate Student, Yale University.
LOWENSTEIN, OTTO, Clinical Professor of Neurology, New York University College of Medicine.
MCDONALD, SISTER ELIZABETH SETON, Professor of Biology, College of Mt. Saint Joseph-on-the-Ohio.
MAVOR, JAMES WATT, Research Professor of Biology, Union College.
MEYERHOF, OTTO, Research Professor of Biochemistry, University of Pennsylvania.
MORRIS, SAMUEL
MOSCHCOWITZ, ELI, Assistant Professor Chemical Medicine, Columbia University.
PONDER, ERIC, Research Investigator, The Nassau Hospital.
PRICE, WINSTON H., Research Assistant, Washington University Medical School.
SANDOW, ALEXANDER, Assistant Professor of Biology, New York University, Washington Square College.
SAVAGE, LEONARD J., Special Rockefeller Fellow, University of Chicago.
SCHRANK, A. R., Assistant Professor of Physiology, University of Texas.
SHWARTZMAN, GREGORY, Head of Department of Bacteriology, Mt. Sinai Hospital.
SPEIDEL, CARL C., Professor of Anatomy, University of Virginia.
STERN, KURT G., Adjunct Professor of Biochemistry, Polytechnic Institute of Brooklyn.
STRAUS, WILLIAM L., JR., Associate Professor of Anatomy, Johns Hopkins University.
WHITE, MICHAEL J. D., Reader in Zoology, University College, London.
WINSOR, CHARLES P., Assistant Professor of Biology, Johns Hopkins School of Hygiene.
ZORZOLI, ANITA, Instructor in Physiology, Washington University School of Dentistry.

Students, 1946

BOTANY

CLIFFORD, SISTER ADELE, S. C., Fordham University.
FAHEY, ELIZABETH MARY, Student, Boston University.
FRAAS, JANET LOIS, Student, Wheaton College.
GARNIC, JUSTINE, Student, Carnegie Institute of Technology.
KEEFFE, MARY M., Student, Fordham University.
TORREY, ANNA MARSH, Student, Swarthmore College.
URQUHART, BETTY A., Instructor in Botany, Wheaton College, Wheaton, Illinois.
VISHNIAC, WOLF, Research Assistant, Washington University.
WILSON, MARIE ELLEN, Student, Western Maryland College.

EMBRYOLOGY

BANNER, ALBERT H., Assistant Professor, University of Hawaii.
BARISH, NATALIE, Student, Goucher College.

BRINSLEY, BERTRAM, Graduate Student, New York University.
BRUCH, PAUL ROBERT, Student, Wesleyan University.
BUCKLIN, DONALD HARTWELL, 124 Woodbine Street, Providence, Rhode Island.
DIDEA, ARTHUR, Assistant in Zoology, Washington University.
EBERT, JAMES DAVID, Student, Johns Hopkins University.
EISENBERG, NORMA, Graduate Student, Brooklyn College.
FITCH, NAOMI SELMA, Student, McGill University.
FLOOD, REV. FRANCIS X., S. J., Assistant Professor of Biology, Canisius College.
FRIEDMAN, FLORENCE L., Brooklyn College.
GALBREATH, JEAN L., Student Assistant, Elmira College.
HARRISON, JOHN W., Graduate Student, Washington and Jefferson College.
JONES, ALBERTA S., Student, Howard University.
KUFF, EDWARD LOUIS, Student, Johns Hopkins Medical School.
LEIGH, WALTER HENRY, Instructor, Chicago City Junior College.
LIU, CHIEN-KANG, McGill University.
MARKERT, CLEMENT LAWRENCE, Graduate Assistant, Johns Hopkins University.
MOORE, ELLEN LOUISE, Student, Wellesley College.
MORRIS, DAVID MARKLAND, JR., Graduate Assistant and Student, Indiana University.
MULLALLY, REV. WALTER BERNARD, Instructor in Biology, St. Anselm's College.
MURTLAND, RICHARD LEE, Graduate Student, Washington and Jefferson College.
PEQUEGNAT, WILLIS EUGENE, Assistant Professor of Zoology, Pomona College.
SCHECTER, DAVID EDWARD, McGill University.
SEAMAN, ARLENE R., Instructor in Zoology, Cornell University.
SHAPIRO, ESTHER MAY, Student, Goucher College.
TATUM, ANNE, Student, Rosemont College.
TIEMEIER, OTTO W., Graduate Fellow, University of Illinois.
TUTTLE, RUTH FRANCES, Instructor, Carnegie Institute of Technology.
UBER, VIRGINIA MAE, Assistant in Biology, Pennsylvania College for Women.

PHYSIOLOGY

ABAJIAN, JOHN, JR., Associate Professor of Anaesthesiology, University of Vermont.
BENEDICT, DORA, Student, Harvard Medical School.
BERG, GEORGE G., Graduate Student, Columbia University.
CLARK, CARL CYRUS, Assistant, Columbia University.
CONNELLY, CLARENCE M., Graduate Student, Cancer Fellow, Johnson Foundation, University of Pennsylvania.
CRAPSTER, WIRT PATTERSON, Student, Taneytown, Maryland.
GREGG, JAMES H. Graduate Student, University of Miami.
GREGORY, JOHN C., Graduate Student, Yale University.
GUTHE, KARL FREDERICK, Graduate Student, Harvard University.
HARTING, JANEY, Undergraduate Assistant, Washington University.
HUNTER, FRANCIS ROBERT, Assistant Professor, University of Oklahoma.
JOFTES, DAVID LION, Graduate Student, Tufts College.
JOHNSON, SHIRLEY ALMA, Research Assistant, University of Toronto.
KEMP, NORMAN EVERETT, Instructor in Biology, Wayne University.
LEVIN, ILENE B., Goucher College.
MARSHALL, JEAN MCELROY, Instructor in Physiology, Mount Holyoke College.
MCPHEE, GWELDA S., Assistant in Physiology, Vassar College.
MENDES, ERASMO GARCIA, Assistant Professor, University of Sao Paulo, Brazil.
NARAHARA, HIROMICHI TSUDA, Columbia University.
NELSON, THOMAS CLIFFORD, Graduate Student, Assistant, Columbia University.
ROYS, CHESTER C., University of Chicago.
SASLOW, HERBERT B., Laboratory Instructor and Graduate Student, University of Illinois.
SHULMAN, NAHUM RAPHAEL, Student, Johns Hopkins Medical School.
SILBER, EARLE, Student, University of Maryland Medical School.
ST. GEORGE, ROBERT C. C., JR., Graduate Student, Harvard University.
UMBARGER, H. EDWIN, 239 West Fifth Street, Mansfield, Ohio.

ZOOLOGY

AMBERSON, MARGARET MARY, Oberlin College.
BANNER, ALBERT HENRY, Assistant Professor of Zoology, University of Hawaii.
BERGQUIST, JEANNE BODIN, Barnard College.
BERNSAW, MARGARET IDA, Wilson College.
BINGHAM, BARBARA ALICE, University of Michigan.
CANDELAS, GUSTAVO, Assistant Instructor, University of Puerto Rico.
CATTELL, ELLY, Student, Cornell University.
CHADWICK, JOHN B., Harvard University.
CHIVERS, MIRIAN E., Howard University.
DENTON, WINSLOW CROCKER, Graduate assistant, Cornell University.
EDWARDS, JOHN PARMAN, Student, Drury College.
EHRENTHEIL, SUSANNE JUDITH, Radcliffe College.
EMERSON, JULIA RIPLEY, Student, Wellesley College.
ENDERS, ABBIE GERTRUDE, Student, Swarthmore College.
FELD, EMILY ANN, Student, University of North Carolina.
FERGUSON, EDWARD L., Student, Wesleyan University.
FOLEY, JOSEPH BRENDAN, Graduate student, Yale University.
FOREMAN, DARHL LOIS, Student Assistant, George Washington University.
FULLERTON, ANN ELIZABETH, Student, Western Maryland College.
GEHR, AGNES ROBBINS, Student, Western Reserve University.
GESE, EDWARD CHARLES, Graduate Assistant, New York University.
GESE, PHYLLIS KRING, Student, New York University.
HACKETT, THOMAS PAUL, 573 Purcell Avenue, Cincinnati, Ohio.
HAND, CADET HAMMOND, JR., Student, University of Connecticut.
HOPKINS, AMOS L., JR., Student, Harvard College.
HOPP, WILLIAM BEECHER, Graduate student, Purdue University.
HUMPHREY, JUDITH M., Student, University of Connecticut.
JAKOWSKA, SOPHIE, Fordham University.
KENYON, V. PATRICIA, Graduate assistant, Brown University.
KRAMER, DAVID, Clark University.
LIBERTI, ALFRED V., Graduate student, Fordham University.
LIU CHIEN-KANG, Graduate student, McGill University.
MACHLIS, GERTRUDE RAFFERTY, Assistant in Zoology, University of Illinois.
MEINKOTH, NORMAN AUGUST, Assistant in Zoology, University of Illinois.
MENDES, MARTA VANNUCCI, Assistant Professor, University of Sao Paulo.
MILLER, MARY ELIZABETH, Student, Western Maryland College.
MORRIS, DAVID MARKLAND, JR., Graduate assistant in Zoology, Indiana University.
MOULTON, JAMES MALCOLM, Undergraduate Laboratory assistant, Massachusetts State College.
PETERS, REV. W., Graduate student, Yale University.
POLLENS, NORMAN BURTON, Assistant in Zoology, University of Rochester.
RICE, MARY ESTHER, Drew University.
ROBINSON, EDWIN JAMES, JR., Graduate assistant, New York University.
SANDERSON, MARGARET CRASSONS, Vassar College.
SASLOW, HERBERT B., Graduate assistant, University of Illinois.
SEITNER, PHILIP G., Graduate Assistant, Purdue University.
SMITH, THOMAS C., Student, Oberlin College.
SULLIVAN, REV. THOMAS DONALD, Fordham University.
SWANSON, ANN TERESA, Graduate Assistant, Tufts College.
THOMPSON, MARY JANE, Graduate student, Yale University.
VANHOESEN, DRUSILLA, Student, University of Pennsylvania.
VIVIAN, JANET, Graduate student, Radcliffe College.
WARNER, KATHLEEN LOUISE, Instructor, Mundelein College.
WARTERS, MARY ELLEN, Student, Oberlin College.
WETMORE, KATHERINE BERYL, Student, Radcliffe College.
WILLIAMS, ERNEST E., Columbia University.

4. Tabular View of Attendance

	1942	*1943*	*1944*	*1945*	*1946*
Investigators—Total	201	160	193	212	267
Independent	132	89	112	138	175
Under instruction	16	19	11	10	29
Library readers	28	35	50	38	38
Research assistants	25	17	20	26	25
Students—Total	74	68	75	96	122
Zoology	36	47	37	55	57
Embryology	24	13	23	23	30
Physiology	6	8	10	13	26
Botany	8	—	5	5	9
Total Attendance	275	228	276	308	389
Less persons registered as both students and investigators	2	6	1		
	273	222	275		
Institutions Represented—Total	126	116	106	124	141
By investigators	83	70	74	100	102
By students	43	41	41	49	56
Schools and Academies Represented					
By investigators	2	2	1	2	2
By students	—	1	2	2	—
Foreign Institutions Represented					
By investigators	—	2	2	1	7
By students	—	—	3	—	5

5. Subscribing and Cooperating Institutions

1946

Cooperating Institutions

Amherst College
Barnard College
Bryn Mawr College
The Catholic University of America
Columbia University
Cornell University
Cornell University Medical College
Duke University
Fish and Wild Life Service, U. S. Department of the Interior
Fordham University
Goucher College
Harvard University
Harvard University Medical School
Johns Hopkins University
Lankenau Hospital Research Institute
Eli Lilly and Company
Massachusetts Institute of Technology
Mount Holyoke College
New York University
New York University College of Medicine
New York University School of Dentistry
New York University, Washington Square College
Oberlin College
Ohio State University
Princeton University
Rockefeller Institute for Medical Research
State University of Iowa
Syracuse University Medical School
Temple University
Tufts College
University of Chicago
University of Cincinnati
University of Illinois
University of Maryland Medical School
University of Missouri
University of Pennsylvania
University of Pennsylvania School of Medicine
University of Rochester
Vassar College
Washington University
Wellesley College
Wesleyan University
Western Reserve Medical School
Wheaton College
Wilson College
Woods Hole Oceanographic Institute
Yale University

Subscribing Institutions

American Philosophical Society (Penrose Fund)
Biological Institute, Philadelphia, Pennsylvania
Brown University
California Institute of Technology
Canisius College
Carnegie Institute of Technology
College of Mount Joseph-on-the-Ohio
Connecticut College for Women
Elmira College
Johns Hopkins Medical School
Lewis College of Science and Technology
Macy Foundation
Memorial Hospital
Miami University
Pomona College
Radcliffe College
St. Anselm's College
St. Michael's College
University of Kansas
University of Texas
University of Toronto
University of Vermont
Vanderbilt University Medical School
Western Maryland College

6. Friday Evening Lectures, 1946

Friday, June 28
Dr. Jane Oppenheimer ...."The Organization of the Teleost Blastoderm."

Friday, July 5
Prof. E. N. Harvey ....."The Effects of High Velocity. Missiles on Tissue."

Friday, July 12
Dr. Benjamin W. Zweifach ....."The Relation of Metabolic Derangements of Liver and Kidney to Peripheral Vascular Reactions."

Friday, July 19
Dr. E. W. Dempsey ....."Observations on the Chemical Cytology of Several Mammalian Tissues."

Friday, July 26
Prof. K. S. Cole ....." "A" Bomb and Biology."

Friday, August 2
Dr. E. J. Cohn ....."The Separation of Plasma into Fractions Varying in Chemical and Biological Properties."

Friday, August 9
Dr. Eric G. Ball ....."Biochemical Studies on the Malarial Parasite."

Friday, August 16
Prof. M. H. Jacobs ....."Cell Membranes, Cell Permeability and Cell Volume."

Friday, August 23
Dr. E. J. Boell ....."Biochemical Differentiation during Amphibian Development."

Other Lectures

Thursday, July 18
Kodachrome Motion Picture
C. Lloyd Claff ....."Cardiac Resuscitation—Resuscitation Method after Asphyxia. Heart Defibrillation to Control Ventricular Fibrillation during Heart Surgery."

Thursday, July 25
DR. HOWARD MEYERHOF ..... "The Crisis in Science Legislation."

Thursday, August 15
PROF. HARLOW SHAPLEY ..... "Internationalism in Science."

Wednesday, August 21
PROF. J. H. BARTLETT ..... "A Possible Mechanism of Nerve Action."

Saturday, August 31
DR. PAUL S. GALTSOFF ..... "The Atom Bomb Test at Bikini."

7. SEMINARS, 1946

Tuesday, July 9
DR. ALBERT TYLER ..... "Inhibition of Fertilization in Sea Urchins by means of Univalent Antibodies vs. Antifertilizin.
DR. W. A. ROBBIE ..... "The Cyanide Sensitivity of the Unfertilized Sea Urchin Egg."
DR. J. E. KINDRED ..... "The Effects of Mustard Vesicants on the Hemopoietic Organs."

Tuesday, July 16
DR. A. F. BLISS ..... "Intermediate Steps in the Visual Cycle."
DR. A. M. SHANES ..... "The Role of Metabolism in the Injury Potential of Frog Nerve."
DR. W. H. PRICE ..... "Adenosine Triphosphatase, Myosine, Actin, and their Relation to the Mechanico-Chemical Coupling of Muscle."

Tuesday, July 23
M. M. BROOKS ..... "Oxidation-reduction Studies as a Clue to the Mechanism of Fertilization of Marine Eggs."
C. L. YNTEMA ..... "An Analysis of Induction of the Auditory Vesicle in the Salamander."
J. T. BONNER ..... "Aspects of Morphogenesis in the Slime Molds."

Tuesday, July 30
DR. ERNST SCHARRER ..... "Chemical Sense and Taste in the Sea Robin, Prionotus."
DR. CLAUDE A. VILLEE ..... "Studies of the Respiration of the Imaginal Discs of Drosophila, using the Cartesian Diver Ultramicrorespirometer."
DR. C. B. ANFINSEN AND DR. E. G. BALL ..... "The Action of Naphthaquinone Antimalarials on Respiratory Enzymes."

Tuesday, August 6

DR. A. R. WHITING
DR. H. C. GEORGE ..... "X-Ray Induced Visible and Dominant Lethal Mutations in Habrobracon Eggs."
DR. P. B. ARMSTRONG ..... "Specificity of Cholin Esterase."
DR. T. H. BULLOCK ..... "The Giant Synapse in the Stellate Ganglion of the Squid as a Physiological-Preparation."

DR. BERTA SCHARRER ..... "The Endocrine Function of the Corpora allata in Insects."

Tuesday, August 13

DR. KATHARINE A. BROWNELL ..... "Evidence of a New Factor from the Adrenal."
DR. F. A. HARTMAN ..... "Hyperactivity of the Adrenal Cortex."
DR. ARNOLD LAZAROW ..... "Studies on the Mechanism of Production of Diabetes with Alloxan."
DR. DOROTHY WRINCH ..... "On the Nature of Biological Specificity."

Tuesday, August 20

DR. C. G. WILBER ..... "A Comparative Study of the Lipids in some Marine Annelids."
DR. C. A. BERGER ..... "Polyploid Mitosis as a Normal Factor in the Development of Allium cepa."
DR. P. W. WHITING ..... "Reproductive Economy in Close-crossed
DR. R. G. SCHMIEDER Species with Haploid Males."
DR. T. U. H. ELLINGER ..... "Hippocrates on Semen and on the Origin of the Child.

8. MEMBERS OF THE CORPORATION, 1946

1. LIFE MEMBERS

ALLIS, MR. E. P., JR., Palais Carnoles, Menton, France.
BECKWITH, DR. CORA J., Vassar College, Poughkeepsie, New York.
BILLINGS, MR. R. C., 66 Franklin Street, Boston, Massachusetts.
CALVERT, DR. PHILIP P., University of Pennsylvania, Philadelphia, Pennsylvania.
COLE, DR. LEON J., College of Agriculture, Madison, Wisconsin.
CONKLIN, PROF. EDWIN G., Princeton University, Princeton, New Jersey.
COWDRY, DR. E. V., Washington University, St. Louis, Missouri.
JACKSON, MR. CHAS. C., 24 Congress Street, Boston, Massachusetts.
JACKSON, MISS M. C., 88 Marlboro Street, Boston, Massachusetts.
KING, MR. CHAS. A.
KINGSBURY, PROF. B. F., Cornell University, Ithaca, New York.
LEWIS, PROF. W. H., Johns Hopkins University, Baltimore, Maryland.
MEANS, DR. J. H., 15 Chestnut Street, Boston, Massachusetts.
MOORE, DR. GEORGE T., Missouri Botanical Gardens, St. Louis, Missouri.
MOORE, DR. J. PERCY, University of Pennsylvania, Philadelphia, Pa.
MORGAN, MRS. T. H., Pasadena, California.
NOYES, MISS EVA J.
PORTER, DR. H. C., University of Pennsylvania, Philadelphia, Pennsylvania.
SCOTT, DR. ERNEST L., Columbia University, New York City, New York.
SEARS, DR. HENRY F., 86 Beacon Street, Boston, Massachusetts.
SHEDD, MR. E. A.
STRONG, DR. O. S., Columbia University, New York City, New York.
WAITE, PROF. F. C., 144 Locust Street, Dover, New Hampshire.
WALLACE, LOUISE B., 359 Lytton Avenue, Palo Alto, California.

2. REGULAR MEMBERS

ADAMS, DR. A. ELIZABETH, Mount Holyoke College, South Hadley, Massachusetts.
ADDISON, DR. W. H. F., University of Pennsylvania Medical School, Philadelphia, Pennsylvania.
ADOLPH, DR. EDWARD F., University of Rochester Medical School, Rochester, New York.
ALBAUM, DR. HARRY G., Biology Dept., Brooklyn College, Brooklyn, N. Y.
ALBERT, DR. ALEXANDER, Mayo Clinic, Rochester, Minnesota.
ALLEE, DR. W. C., The University of Chicago, Chicago, Illinois.
AMBERSON, DR. WILLIAM R., Department of Physiology, University of Maryland, School of Medicine.
ANDERSON, DR. RUBERT S., University of Maryland School of Medicine, Department of Physiology, Baltimore, Maryland.
ANDERSON, DR. T. F., University of Pennsylvania, Philadelphia, Pennsylvania.
ARMSTRONG, DR. PHILIP B., College of Medicine, Syracuse University, Syracuse, New York.
AUSTIN, DR. MARY L., Wellesley College, Wellesley, Massachusetts.
BAITSELL, DR. GEORGE A., Yale University, New Haven, Connecticut.
BAKER, DR. H. B., Zoological Laboratory, University of Pennsylvania, Philadelphia, Pennsylvania.
BALLARD, DR. WILLIAM W., Dartmouth College, Hanover, New Hampshire.
BALLENTINE, DR. ROBERT, Columbia University, Department of Zoology, New York City, New York.
BALL, DR. ERIC G., Department of Biological Chemistry, Harvard University Medical School, Boston, Massachusetts.
BARD, PROF. PHILIP, Johns Hopkins Medical School, Baltimore, Maryland.
BARRON, DR. E. S. GUZMAN, Department of Medicine, The University of Chicago, Chicago, Illinois.
BARTH, DR. L. G., Department of Zoology, Columbia University, New York City, New York.
BARTLETT, DR. JAMES H., Department of Physics, University of Illinois, Urbana, Illinois.
BEADLE, DR. G. W., School of Biological Sciences, Stanford University, California.
BEAMS, DR. HAROLD W., Department of Zoology, State University of Iowa, Iowa City, Iowa.
BECK, DR. L. V., Hahnemann Medical College, Philadelphia, Pennsylvania.
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Knower, Mrs. H. McE.
Lillie, Mrs. F. R.
McMitchell, Mrs. J. McC.
Murphy, Dr. W. J.
Newton, Miss Helen.
Nims, Mrs. E. D.
Norman, Edward A.
Riggs, Mrs. Lawrason.
Rudd, Mrs. H. W. D.
Saunders, Mrs. Lawrence.
Stockard, Mrs. C. R.
Swope, Mr. and Mrs. Gerard.
Tebbets, Walter.
Webster, Mr. and Mrs. E. S.
Wick, Mrs. Myron T.
Wilson, Mrs. E. B.